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The interconnection between executive shareholding and firm performance

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Abstract

There has been a long standing debate regarding how firms can alleviate the agency problem and align the interests of the agent with those of the principal. In this study, we theorize that if firms can incentivize executives to act more like owners as opposed to agents, it will lead to better performance of the firm. We hypothesize that there are two approaches how this may be achieved. The first is when the executive has a substantial shareholding in the firm. The second is when the firm employs a long-term incentive program, which is based on equity or the market value of equity. In regard to the first approach, we have found it necessary to put the value of the executives' shareholding in relation to an "anchor" in an effort to account for different individuals' perceptions of the value of money. The anchor that we have used is the executives' annual salary. Subsequently, we have designed a new variable which we call the CEO level of engagement, constituted by the value of the executives' shareholding divided by the executives' annual salary.

The purpose of this thesis is thus to investigate whether or not we can identify a relationship between the CEO level of engagement and the use of equity based long-term incentive programs with the stock market performance of firms as well as with key financial performance indicators, such as return on equity, return on capital employed, change in revenue and change in the number of employees. To achieve this, we have employed a quantitative research approach based on secondary data mainly from annual reports and stock market data. We have investigated the performance of 56 firms on Stockholm Large Cap OMX over the period 2011 – 2016 and analyzed the data with descriptive statistics and regression analysis. Our findings suggest that there is a relationship between the CEO level of engagement and stock market performance, and that the relationship is statistically significant. However, our findings only provide partial support for a relationship between the CEO level of engagement and certain financial performance indicators, specifically the change in number of employees from one year to the next. Furthermore, our study does not adequately support the theory that there is a relationship between the use of equity based long-term incentive programs with either stock market performance or key financial performance indicators.

Keywords: Management Remuneration, Executive Shareholding, Long-term Incentive Programs, Agency Theory, Stock Market Performance.

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1. Introduction

In this chapter we begin with the background regarding management remuneration and incentive structures. Following this, we introduce the problem definition and purpose of our thesis which lead up to our research questions. The chapter concludes with the delimitations of our thesis.

1.1 Background

Corporate governance systems have drawn a great deal of attention since the 1980s. One of the more important but least analyzed fields is that of management remuneration and incentive structures. In order to alleviate the agency problem and ensure that executives are working toward the best interest of the firm, it is vital to ensure that they are compensated in accordance with the value they create for the firm (Baker, Jensen & Murphy, 1988). In a well cited article by Jensen and Murphy (1990), the authors argue that it is not how much you pay, but how that is important. Other critics of the executive pay process, Bebchuk and Fried (2010) argue that executive compensation should be focused more toward long-term performance as opposed to short-term performance and goes on to call for restriction and oversight of executive compensation packages.

The notion to conduct oversight on executive compensation packages should come as no surprise since firms need to take a long-term stance in order to be profitable in the long-term. In a corporate setting, there has been a tendency among firms to boost short-term performance in the next quarterly and annual reports, a practice which ostensibly indicates that the firm is profitable and its accruals are satisfactory. However, such short-term performance may often come at the expense of long-term performance. Executives may for example cut down on research and development expenditures which may lead to a higher profit in the short-term but may hurt the firm's ability to develop new products and be competitive in the long-term. They may also divest assets and realize a profit, although it would be in the best interest of the company to keep those assets. Yet another example is to initiate major lay-offs in the organization which decrease short-term expenditures but could hurt morale which may very well decrease the firm's prospects of being profitable in the long-term, in the case such actions mean key employees would leave the firm.

A well-known example of corporate mismanagement is the Enron scandal where executives destroyed value within the company while simultaneously manipulated its earnings, in an effort to reach the performance objectives which they were rewarded upon (Fligstein, 2005). Poorly designed incentive programs may lead to the destruction of value by providing incentives for earnings management, manipulation of the timing of earnings, misleading the board regarding organizational capabilities, taking on excessive or insufficient risk, forgoing profitable projects and ignoring the cost of capital (Murphy & Jensen, 2011). Cohen, Hall and Viceira (2000) conducted a study of 478 large firms over a 15 year period and found evidence which indicates that executives with compensation packages in the form of options that are more sensitive to volatility increase the volatility in the firms they control. In short, executives took on more risk in those cases where such risk taking would benefit their personal finances.

On the other hand, in firms where executives own equity in the firm, the performance of the firm will be more closely associated to the wealth of the executives, thus aligning their goals. Mehran (1995) conducted a study of 153 randomly selected manufacturing firms and found that the performance of the firms was positively associated with the percentage of equity held by managers. This finding should come as no surprise since executives who own equity in the firm have an incentive to act in the best interest of the firm, since they themselves are shareholders. The logic behind this is clear, if an executive are sufficiently invested in the firm, yet elects to engage in myopic behavior to boost short-term profit at the expense of long-term profitability, he will ultimately decrease the value of his own shareholding as opposed to if he would have taken more sound long-term oriented business decisions.

There are numerous examples of highly successful firms where executives have a substantial equity holding in the firm. One of the most prominent examples is that of Berkshire Hathaway, one of the most successful investment companies, where Chairman and CEO Warren Buffet has retained a significant share of the firm's equity. Warren Buffet who has been known for taking sound investment decisions in the long term has also been an outspoken critic of misaligned incentive programs. To quote Mr Buffet, "We think the quality of earnings as reported by a company with significant stock options grants every year is dramatically poorer than one where that doesn't exist." (Kedia & Mozumdar, 1995). Other examples of successful firms where the CEO have or have had a substantial share of the firms' equity include Swedish clothing retailer H&M with CEO Stefan Persson, Chinese e-commerce group Alibaba with former CEO Jack Ma and American technology company Google with CEO Larry Page.

1.2 Problem definition and purpose

The aim of this study is to establish whether or not there is a correlation between executive equity holdings and firm performance as well as executive long-term incentive programs and firm performance.

This problem is closely related to the principal-agent theory which stipulates that an agency problem arises under one or two conditions. The first is when there is a conflict of goals between the agent (the executive) and the principal (the corporation). The second is when it is difficult for the principal to verify what the agent is doing (Eisenhardt, 1989). In this paper we will mainly be concerned with the first condition. Eisenhardt (1989) continues to point out that agency theory acts as a reminder that businesses and organizations are mainly driven by the self-interests of individuals and reestablishes the importance of self-interest and incentives in organizational theory.

In accordance with the principal-agent theory we aim to establish if the self-interests of the individual can be aligned with the interest of the firm in either one of two ways. In the first case, we aim to establish to which degree the relative size of the executive's shareholding in the firm is associated with the performance of the firm. In the second case, we aim to establish to which degree the use of equity based long-term incentive programs is associated with the performance of the firm. In this thesis, we will examine performance both in term of market performance as well as financial performance indicators.

We define the market performance of the company as the change in market value of the company adjusted for splits and dividends. The market performance of the firm is an important benchmark for value measurement. It would be misleading to only include accrual based performance measures since accrual based performance measures do not account for value creation which emerges from research and development expenditures and certain other long-term value creating investments and expenditures. Our aim is thus not only to estimate whether or not executive shareholding and long-term incentive programs are associated with a short-term based value measure such as accounting accruals, which are susceptible to manipulation (Roychowdhury, 2006), but rather to assess the real value creation in the firm. Since the market valuation of a company is the price that investors are willing to pay for a firm's shares and since other factors which are not directly visible on the financial statements of a firm are already priced in, we assess the market valuation to be the most straightforward form of measuring the performance of a firm. We are aware that the measurement of performance based on market valuation has its drawbacks, such as boom and bust cycles in the economy, industry trends and investor optimism as well as pessimism for certain stocks. To counteract some of these effects, we will solely focus on larger firms since they tend to be analyzed and scrutinized to a larger degree than smaller firms. Furthermore, we will use a sufficiently large sample of firms in order to limit the effect of industry trends and other factors on the results to increase the validity of our findings.

Due to the limitations of solely employing the market performance as a means of valuation, we will also examine whether or not the previously mentioned factors are associated with certain financial performance indicators, such as the return on equity, the return on capital employed, the change in revenue and the change in number of employees. For the purpose of our study we have formulated the following research questions:

RQ1: Is there a relationship between the relative value of the shareholding of an executive and firm performance?

RQ2: Is there a relationship between the utilization of equity based long-term incentive programs and firm performance?

In regard to RQ1 and the term of "relative value", it is essential to put the value of the executives' shareholding into perspective. The reason is simple, an equity value of for instance ten million Swedish crowns tells us very little of its ability to incentivize an executive to act in the best interest of the firm and other shareholders unless put into perspective. In the case where an executive has an annual salary of, for example five million crowns, it follows common logic that the ten million in equity has a larger incentivizing effect on average than in the case of an executive with an annual salary of, for example, 50 million crowns. For this reason we assess that it is necessary to put the equity value into perspective which we do by putting it in relation to the annual salary of the executive.

In regard to RQ2 and the term of "equity based", we have focused on incentive programs that should be considered to most closely align the interests of the executive with that of the firm, in accordance with agency theory. With "equity based" we refer to incentive programs such as restricted stock, options and synthetic options which are designed to either make the participants shareholders in the firm or to encourage them to act as shareholders, since their personal benefit will be closely aligned with the benefit of other shareholders. In regard to long term, we have defined a vesting period of at least three years since we aim to limit the effect of adverse effects due to myopic behavior.

Due to time constraints, this study will focus solely on firms' on Large Cap Stockholm over a period of five years. Although, a larger sample over a longer time span would provide more robust findings, such a study is not deemed feasible to carry out under the time constraints of a Master thesis.

2. Literature review

In this chapter we will review the relevant literature on the topic that leads to our hypotheses. We will begin with reviewing some of the prior research on the topic that has been made in a Swedish context. This will be followed by a discussion of agency theory and a description of common incentive programs. Finally we will conclude with describing the hypotheses we have formulated for the purpose of conducting our study.

2.1 Prior research in a Swedish context

In this sub-chapter we will present the findings from other similar studies. To attain a higher degree of comparability we have elected to focus on studies conducted in a Swedish context.

Sahlin and Sakström (2009) conducted a study of 23 firms on Stockholm OMXS30 to investigate how the use of different incentive programs were associated with the performance of the firm on the stock market (Total Shareholders Return) as well as with performance in terms of common financial performance measures. They found that firms who employed a short-term incentive program had higher return on equity (re) and higher return on capital employed (roce) than other firms. Despite this, they found that firms who employed a combination of long-term and short-term incentive programs had achieved higher performance on the stock market. Furthermore, they found that the use of short-term incentive programs as well as a combination of short-term and long-term incentive programs had a weak effect on revenue growth. Moreover, the authors found that firms which had a bonus based on the performance of the firm's share on the stock market used both shareholder's equity and borrowings slightly more efficiently than other firms did. They also found that firms with a bonus based on the performance of the firm's shares had a higher revenue growth on average than the other firms. However, these firms also had lower total shareholders return than other firms. Finally, the authors observed that firms who employed a program of allotment of shares to reward good performance according to the stipulations of the bonus programs, achieved higher performance on all of the measures. In conclusion, based on their findings, the authors suggest there is a positive association between allotment of shares and value creation for the shareholders.

Kaleem and Siltanen (2009) conducted a study of 17 finance companies and portfolio companies to investigate the association between the payment of bonuses to the CEO and other members of the management team, and the firms' net income and return on equity. Out of the 14 firms who employed a bonus program, they found that six of the firms had a very strong association between the payment of bonuses and net-income, out of these six the majority also had a strong association to return on equity. They found that two of the firms had a relatively strong association between the payment of bonuses to the CEO and net income and that one firm had a negative association between the payment of bonuses to executives with both net-income and return on equity. In conclusion, the authors found an association between net income and the payment of bonus to the CEO and the management team. They also found an

association between return on equity with the payment of bonus to the CEO and the management team.

Anderberg, Eriksson and Werner (2013) conducted a study of firms on Stockholm OMX Mid Cap to examine the relationship between different incentive programs and the firms' performance on the stock market. The authors grouped the companies according to the incentive programs they employed and how extensive those incentive programs were according to certain criteria. They found that there was a connection between incentive programs and performance on the stock market. However, according to the authors, this connection was unexpected since they found that firms with a more extensive incentive program underperformed on the stock market relative to firms with a less extensive incentive program. The authors suggest that a possible explanation for this was that firms who employed a more extensive incentive program may have higher agency-costs which in turn could influence the market value of the firms. The authors, however, noted that family owned enterprises with less extensive incentive programs were the ones that performed best in their study. They also noted that according to the categorization they employed, some groups were smaller than others which may have led to their findings being a result of coincidence due to an insufficient sample size.

2.2 Agency theory

In the 1960s and early 1970s economists studied risk sharing between individuals and groups. This research focused on the risk sharing problem which emerges when parties who are engaged in collaboration have different approaches to risk. Agency theory broadened the scope of this research to include the agency problem which arise when parties who engage in cooperative behavior have different objectives as well as division of labor. Agency theory focuses on the relationship between two parties, in which one party (the principal) delegates work and responsibilities to another party (the agent). In short, agency theory focuses on two issues which may occur in the relationship between a principal and an agent. The first is when the principal and the agent has conflicting goals and it is expensive or difficult for the principal to ascertain what the agent is doing. The second is related to the issue of risk sharing which emerges when the principal and the agent have different preferences and approaches to risk (Eisenhardt, 1989).

Delegation, which is at the core of the agency problem, is a necessity in many organizations and businesses. The motivations for delegating a task may be due to economic reasons, such as benefitting from the agents expertise and knowledge regarding certain tasks. At other times the motivation is due to the principal's lack of time or expertise to carry out the task himself. The act of delegation comes with a cost however, which is that the agent gains and has access to information which is not available to the principal. When the agent has access to information which is not available to the principal, this may lead to issues if the agent and the principal have different objectives. The agent may for example use such information to engage in actions which benefit the agent personally while at the same time act against the interests of the principal if the interests of the two parties are not aligned. Moreover, the act of delegation also infers that the agent has access to private information, which can be divided into two group. In the first, the agent may engage in covert actions which are undesirable from the viewpoint of

the principal, a case of moral hazard. In the second, the agent has access to private knowledge regarding his cost or valuation that is unknown to the principal, a case of adverse selection. Such information asymmetry can take a number of forms. For example, a client in a court proceeding may delegate his defense to an attorney with the result that the attorney is the only one to know the particularities of the case. An investor may delegate his portfolio management to a broker, with the result that the broker will know the prospects of possible investments. A shareholder in a firm may delegate the management of the firm to a manager, with the result that the manager will be the only one to know the full details of the business conditions (Laffont & Martimort, 2002).

Agents who have been assigned a specific responsibility may engage in actions that is not desirable from the viewpoint of the principal when the two parties have conflicting interests. Since there usually will be information asymmetry between the agent and the principal, the principal often loses the ability to control the actions of the agent which are not observable. Such actions cannot be regulated by a contractual agreement since it is not possible to verify their value. The agent may engage in actions that benefits him personally even though they may decrease the value of the principal's assets. For example, a manager may divert some of the firm's resources into perks instead of investing in activities that are beneficial for the business. A manager could also take on excessive risk if it benefits him personally and let the principal bear the cost of those risks, which is an example of moral hazard. Both adverse selection and moral hazard would not, however, be an issue if the agent and the principal had the same objective function (Laffont & Martimort, 2002).

Although the agency problem have been understudied in certain contexts, the analysis of executive compensation is the exception. This is also the classic example of the principal agent problem and regards the separation of ownership and control in a firm. It revolves around the issue of motivating the CEO of a firm (the agent) to act according to the best interests of the shareholders (the principal). There has been a long debate regarding to which extent firms solve this issue in an effective way. In order to ensure that the CEO acts in the best interests of the firm, his compensation should be structured in a way that provides appropriate incentives (Garen, 1994).

An agency relationship can be defined as a contract in which one party (the principal) engage another party (the agent) to act according to a work description which requires certain delegation of decision making authority to the agent. Under the assumption that both parties in this relationship strive to maximize their own utility, we may infer that the agent will not always act according to the best interests of the principal. In an effort to align the interests of the agent with those of the principal, the principal can establish incentive structures designed to motivate the agent to act in a way that is desired by the principal as well as impose costs on the agent if he were to deviate from the desired course of action. The principal agent relationship will incur costs which could be broken down into three segments, which, when added together constitute the agency costs. These costs are: the monitoring expenditures by the principal, the bonding expenditures by the agent and what is referred to as residual loss. First, the monitoring expenditures by the principal comprise more than the mere measurement or observation of the agent's behavior. They also involve efforts on the principal's behalf to control the agent's

behavior by subjecting the agent to, for instance budget restrictions, compensation policies and rules of operations (Jensen & Meckling, 1976). Second, the bonding expenditures by the agent are arrangement put in place by the principal which intent is either to penalize the agent for engaging in behaviors which violate the principal's interests or to reward the agent for achieving the goals of the principal (Clegg, Hardy & Nord, 1996. p.125). In essence, the bonding expenditures by the agent are additional costs incurred on the principal, since these expenditures require the principal to pay the agent to expend resources to ensure that the latter will not take actions that could be harmful to the principal, or at least ensure that the principal will be compensated in the case the agent engages in such actions. Examples of bonding expenditures include costs incurred by the principal for arranging contractual guarantees, engaging a public accountant to audit the financial accounts of the firm as well as contractual limitations on the decision making power of the agent. Third and lastly, the residual loss refers to the cost which is incurred on the principal as a result of the agent's imperfect decision making capability. Regardless of how skilled the agent may be in taking sound decisions, it is likely that his decisions will still deviate to a certain degree from those decisions that would produce the greatest economic benefit for the principal. As such, the difference in economic value between the optimal course of action (e.g. the course of action that would produce the greatest economic benefit for the principal) and the course of action chosen by the agent is referred to as the residual loss. These three costs, when added together are what constitute the agency cost. A cost that depends on both the law as well as the human capacity of designing effective contractual agreements. Despite these costs, which inevitably are incurred under the principal-agent relationship, the widespread use of publicly held corporations suggests that the benefits of employing an agent to attend to the principal's affairs outweigh the disadvantages. Nevertheless, agency costs should be considered and attended to since they are a cost of doing business under a principal-agent relationship (Jensen & Meckling, 1976).

2.3 Incentive programs

Incentive program can take a multitude of different shapes. The most common form of incentive programs are those that are based on monetary awards. Such monetary awards could be either performance based salary increases, short-term incentive programs and long-term incentive programs. It is necessary to make a distinction between performance based plans and entitlements. The purpose of performance based plans is to incentivize employees for taking sound business decisions whereas entitlements may be granted irrespective of performance. The latter could for instance be costs of living adjustments, salary increases based on seniority or collective bargaining agreements. It is also necessary to make a distinction between salary increases and incentive programs. Although salary increases may be based on performance and thus act as an incentivizing factor, in the case some part of the salary increase is based on reaching performance targets, salary increases could also be awarded either due to entitlements or negotiation. Moreover, salary increases distinguish themselves by acting cumulatively, that is, the salary increase an employee receives lays the basis for his future salary since salaries are rarely reduced. As such, even though superior performance may lay the basis for future salary increases, the employees will at many times receive their current salary regardless of performance (Merchant & Van der Stede, 2012. p. 370).

2.3.1 Short term incentives

Many organizations, especially smaller firms in the commercial sector rely on short-term incentives, which includes awards such as bonuses, commissions and piece rate payments. The primary motive for such programs is to provide incentives for employees according to the goals of the organization. They can also act as an incentive for employees to "go the extra mile" and deliver performance above expectations. Short term incentives are awards based on performance measured over a time-frame of one year or less and are usually based on cash-payments. Short-term incentives could be based either on the performance of an individual or the performance on a group level, such as a team, profit center or the company as a whole. Furthermore, performance can be based both on financial performance, such as revenue and profit as well as non-financial performance, such as customer satisfaction ratings, employee satisfaction or turn-over (Merchant & Van der Stede, 2012. p. 371).

2.3.2 Long-term incentives

Merchant and Van der Stede (2012) define long-term incentives as awards based on performance measured over a time-frame which is greater than one year. The main objective of such awards is to reward employees for creating long-term value for the firm. The awards may also have a second objective which is to attract and retain key employees by making total expected compensation more attractive. Often, long-term incentives are restricted to top management due to the notion that decisions on high levels in the organization can make a direct impact on the long-term success of the firm. Long-term incentive plans (LTIPs) can come in different shapes. A typical program extends into a 3-4 year horizon and is subject to the requirement that pre-stipulated performance targets are met. LTIPs may be based on accounting measures, e.g. earnings per share. The target which is stipulated could either be cumulative, which requires that the target metric is not only met at the end of the period but have to be within a given range for each year, or they could be based solely on the target for the end of the period. Some firms employ a consecutive model which implies that a new cycle begins only at the completion of the previous cycle. Yet other firms may employ overlapping performance cycles, which means that a new plan begins each year, thus implying that multiple plans will run simultaneously. Such a plan would facilitate setting new long-term targets for each year or even make it possible to alternate between metrics according to what is currently deemed important. Overlapping LTIPs may also facilitate including newly employed employees into the program each year. Long-term incentives can be either monetary based, e.g. the participant receives a monetary reward based on fulfilment of targets, or they can be equity-based. Equity-based plans act as a means to reward employees based on the change in the market value of the firm's stock.

In this paper we will mainly focus on equity based incentives which take a number of different forms such as stock-option plans, restricted stock plans and performance stock or option plans.

2.3.3 Stock option plans

Merchant and Van der Stede (2012) define a stock option plan as a plan that gives the right to employees to purchase a fixed number of shares for a fixed price during a specific time period. This time period is defined as after the vesting period but before the options expire. Stock option plans take a multitude of different shapes but most are granted at the money, which implies that the exercise price equals the market price of the firm's shares at the day of the grant. Moreover, most stock option plans have a 3-5 year vesting period and a ten year expiry date according to Merchant and Van der Stede (2012). When the stock price is higher than the option exercise price, the options are said to be in the money, this means that the options are valuable since the holder may exercise the options and receive shares, given that the vesting requirements have been fulfilled. When the exercise price of the vested options is higher than the market price, however, the stock options are referred to as being underwater. This may cause motivational issues since the motivational aspects of such options are diminishing, especially if it is considered difficult to drive the stock price up to levels above the exercise price, this may in turn be a cause of morale and retention problem in the organization. Stock option plans have a number of benefits. Stock option plans incentivize employees to increase the stock price of the firm since they are only awarded if the stock price goes up. They align the interests of the employees with that of the firm since stock option plans tie the employees' personal gains to the future value of the company. Furthermore, by applying the use of vesting periods, the firm encourages the employees to take a long-term focus in creating value for the firm. Nevertheless, stock option plans also have a number of disadvantages. Since stock option plans represent a potential new issue of shares, they cause dilution, leading to existing shares to lose some of their value. Stock option plans may also create an incentive for managers to take risky business decision which are not in the best interest of the firm, since they are only rewarded on increases in stock price but not penalized for decreases in stock price. They may also reward managers for factors outside of managements control such as boom cycles in the economy while losing their ability to reward management for sound business decisions in the case a bearish economy causes downward pressure on the stock market as a whole.

2.3.4 Restricted stock plans

Merchant and Van der Stede (2012) define restricted stock plans as stocks which is given for free to employees with the covenant that the stocks cannot be sold for a specified period of time (typically 3-5 years) and that the employee remains in employment during this period. Restricted stock provides a reward to the holder for increases in stock price, they also have the benefit that the motivational aspect of the restricted stock does not disappear if the stock price goes beyond a certain point, in contrast to stock option plans. Since restricted stock has less risk than stock options, the firm may issue fewer shares than it would if it were to use stock options, which in turn leads to less dilution. Nevertheless, restricted stock plans have been criticized as being giveaways rather than a reward for performance since they still have a value even though the market value of the firm goes down. Because of this, restricted stock is said to be better for retaining employees or providing benefits which stems from ownership, as opposed to motivation per se.

2.3.5 Performance stock or option plans

In performance stock or stock option plans, awards of stock have been made contingent on the fulfilment of certain performance targets over a period of time, the purpose of which is to counteract the "give away" perception of restricted stock plans. The program could also be divided into different parts so the participant will receive more shares if the performance is above a higher threshold and less or no shares if the performance is above a lower threshold. Performance options are another form of performance award as they typically require that certain stock or non-stock goals have to be fulfilled, in order to vest or exercise the options. The main purpose of these sorts of performance plans is to create higher requirements for stock price improvements in order to exercise the instrument by providing stronger incentives for management to maximize shareholder value. The main challenge that comes with the employment of various incentive programs is to identify a program that is balanced. The performance requirements can neither be too lenient since that means the program would be considered merely a giveaway, nor can they be too hard to reach as it can lead to problems, such as motivational issues and excessive risk taking (Merchant & Van der Stede, 2012. p. 375).

2.4 Hypothesis

Based on the findings from prior studies, agency theory and commonly used incentive programs we have formulated the following hypotheses:

-H1: The ratio of executive owned equity to annual compensation is positively associated to the market performance of the firm's stock.

-H2: The ratio of executive owned equity to annual compensation is positively associated to financial performance measures such as return on equity, return on capital employed, change in revenue and change in the number of employees.

In regard to H1 and H2, as was mentioned in the introduction section, it is necessary to put the value of the executive's shareholding in relation to an "anchor", since a monetary value alone tells us very little of its ability to incentivize appropriately without knowledge of the executive's personal finances. Hence, we have elected to put it in relation to the executive's salary since this is a straightforward quantifiable measure, which in most cases is readily available in the annual reports.

-H3: The utilization of equity based long-term incentive programs in firms is positively associated to the market performance of the firm's stock.

-H4: The utilization of equity based long-term incentive programs in firms is positively associated to financial performance measures such as return on equity, return on capital employed, change in revenue and change in the number of employees.

In regard to H3 and H4, we aim to assess if the firm's utilization of incentive programs which are aimed to align the interests of the agent with those of the principal leads to superior performance, relative to firms which have elected other approaches. "Equity based" refers to incentive programs such as restricted stock (e.g. matching shares), options and synthetic options and not on for instance cash-based incentive programs. This distinction is important since our aim is to investigate if mechanisms which are intended to motivate the executives to act more as "owners" as opposed to "agents" will lead to superior performance.

3. Methodology

In this chapter the motivations for our selected research design is discussed. This is followed by a description on the delimitations of the data that has been collected. After this we describe how the data has been collected and how our variables have been constructed. Finally, the quantitative methods which have been employed to analyze the data are described.

3.1 Research design

3.1.1 Motivations for employing a quantitative research approach

Bryman and Bell (2011) make a distinction between two main research strategies, quantitative and qualitative. A research strategy is a general orientation on how to conduct research. This research will be based on a quantitative approach since it relies on a substantial amount of data which will be tested for possible linkages. Bryman and Bell (2011) defines quantitative research as a research strategy that is based on quantification in the collection and analysis of data and is based on three principles. First, it involves a deductive approach regarding the relationship between theory and research and is focused on the testing of theories. Second, it relies on the practices and norms which are related to the natural science model of conducting research, and as such, it usually relies on a positivistic approach. Third, it perceives social reality as an external and objective reality. Quantitative research should be contrasted to qualitative research which is usually an inductive approach. Whereas quantitative research is used to find evidence to support a theory, qualitative research does not usually provide evidence for various phenomena but are instead used to design new theories which can then be examined by using quantitative research. This is the main reason why a qualitative research strategy is not selected to study this topic. Since there are already a number of qualitative studies conducted which are based on, for example, interviews regarding how the interests of management can be aligned with those of the firm. We do not wish to simply add to these studies, instead, we aim to examine if we can find evidence which supports prior research by examining to which extent the CEOs stake in the company is associated with the value creation in the company. Hence, a quantitative approach is deemed feasible for this topic.

3.1.2 Arguments for using a deductive approach

This topic will be researched by using a deductive theory approach. According to Bryman and Bell (2011) deductive theory is the most common view of the connection between theory and research. By using a deductive approach, the researcher starts out by examining what is known about a particular topic and which theoretical considerations should be taken in regard to this. After this, the researcher deduces one or several hypotheses which are subsequently tested by using empirical scrutiny. The hypotheses are based on concepts, which have to be transformed into entities in order to be examined appropriately. As such, it is necessary for the researcher to both deduce hypotheses and to translate these into operational terms. An important aspect of this is for the researcher to be able to specify how the data can be collected so it is appropriately related to the hypotheses and the concepts on which the hypotheses are based. In deductive theory, the theories and hypotheses come first and are subsequently driving the data collection.

This is the opposite of an inductive approach in which the data collection comes first and are subsequently driving the formulation of theory. An important aspect of deductive theory is that it appears to be a linear process. A process in which the various steps follow each other in a clear and logical way. It should be noted, however, that this is not always the case. The process may alter its course due to a number of factors. First, new theories or findings may be published by other researchers before the researcher has published his results. Second, the data collected may be relevant for a certain theory only after the data has been collected. Third, the data that has been collected may not fit with the original theory, thus prompting the researcher to find new theories.

The process of deductive theory can be summarized in the following way: (1) Theory, (2) Hypothesis, (3) Data collection, (4) Findings, (5) Confirming or rejection of hypotheses, (6) Revision of theory. This will be applied in the following way: First, the relevant theory is examined by studying the literature and prior research in this field. Second, based on the theory, a hypothesis or several hypotheses are formulated. Third, the data regarding the CEOs shareholding and other stakes in the firm is collected from annual reports, whereas databases are used to establish the market value of the firm for different points in time. Fourth, the data is then analyzed with quantitative models which will produce findings. Fifth, the findings will either find evidence which supports the validity of the theories or they will not, which subsequently will prompt us to either confirm or reject the hypotheses. Finally, the theory will be revised depending on the findings of the analysis.

3.1.3 Motivations for research based on secondary analysis

Since this research will be based on secondary analysis, it is necessary to elaborate on this form of research in order to understand its suitability for various research designs. Bryman and Bell (2011) describe two sorts of secondary analysis. The first concerns the analysis of data collected from other researchers. Whereas the second concerns the analysis of data which have been collected by various organizations in their course of doing business. Since we primarily will find our information in annual reports, we will mainly be concerned with the latter. Bryman and Bell (2011) discuss several advantages of conducting a secondary analysis. First, the factor of cost and time. A secondary data analysis frees up time by offering the opportunity to access large amounts of high-quality data which allows more time for the researcher to focus on the relevant literature on the topic, to design the research questions as well as to analyze and interpret the data. Second, it provides access to high-quality data. A large amount of the data which is used for secondary analysis is of very high quality since the sampling procedures have been rigorous, the data collection have been carried out by highly experienced personnel and there are control mechanisms in place which check the quality of the data. Third, it provide opportunity for longitudinal analysis. A secondary data analysis provides the opportunity to study a phenomena over an extended time horizon which is usually rare in business research due to the time and cost such research entails. Fourth, it provides the opportunity for subgroup and subset analysis. Since secondary data analysis gives access to large samples, it provides the opportunity to study what can at many times be rather large subgroups and also subsets of questions. In this case, it might for example allow this topic to be studied on specific industry

sectors as opposed to grouping various industry sectors together. Fifth, it provides opportunity for cross-cultural analysis. Secondary analysis gives the opportunity to provide analysis between different countries which is of increasing importance in a time that is characterized by globalization. Sixth, it allows for more time for data analysis. Since data collection is usually very time-consuming, secondary data analysis provides more time for analyzing the data since the data is readily available. Seventh, reanalysis may offer new interpretations. Since data can be analyzed in so many ways, there are numerous opportunities for identifying new findings. Eight, concerns the wider obligations of the business researcher. Usually, research data suffers from being under-analyzed. By conducting a secondary analysis, the data that has been collected comes to more efficient use since it can be used again. However, even though there is a long list of advantages to secondary analysis, there are also a few limitations to its use which have to be considered. The first, concerns the lack of familiarity with the data. Since the researcher in the case of secondary analysis have not collected the data himself, the researcher requires some time to familiarize himself with the data, time that can be quite substantial depending on the complexity of the data. The second limitation regards the complexity of the data. At times, the sheer amount of data can add challenges to the management of the data. There is also an issue with hierarchical data sets, meaning that the data that has been collected is presented both at the level of the organization, the individual as well as at other levels. As such, the researcher needs to determine which level of analysis that should be employed. Third, it gives no control over data quality. Although the data used in secondary analysis is usually of very high quality, this is not always the case and should not be taken for granted. In the case of data provided by institutions that are regarded as independent, the data is usually of high quality. Nevertheless, the motivations of the organization that provides the data have to be accounted for. In the case of private corporations and annual reports, there may be tendencies to represent a picture of the accounts which leans more toward optimistic than realistic, in order to please various stakeholders. However, due to the constraints of law and regulation as well as the number of eyes scrutinizing annual reports of large corporations, we should deem the data to be sufficiently accurate for our research. The fourth and last limitation concerns the absence of key variables. Secondary analysis comes with the risk of accessing data that lacks certain key variables which is required for the analysis. To mitigate this risk, the data has to be sufficiently reviewed prior to starting the analysis to ensure that vital information is not missing.

3.2 Data collection

The secondary data for this thesis has been collected from a number of sources. Data regarding the salary, shareholding and long-term incentive programs has been collected from annual reports from the investigated companies. Data regarding accounting based performance such as net income, revenue, and number of employees has been collected from Retriever Business. Data regarding the performance of shares has been collected mainly from Nasdaq, the world's largest exchange company (Nasdaq, 2017). The data regarding the dividends which have been paid over the years has been collected from Morningstar, a leading provider of independent investment research in North America, Europe, Australia and Asia (Morningstar, 2017). The historic exchange rates, which are required at those instances where the companies use a different accounting currency than Swedish crowns, have been collected from x-rates.com, a

provider of currency exchange data (X-rates, 2016). These data providers have been selected due to their size and reputation in order to increase the reliability of the data. Although the data providers are private companies which may lead to an issue of biased information, their reputation rely on providing accurate information and as such, the data should be considered free of bias.

3.2.1 Delimitation of the data collection

The companies selected for this study have been subject to a number of requirements. The first requirement is that the company is traded on the OMX Stockholm Large Cap stock exchange. There are mainly two reasons for this. First, we want to limit the study to large companies since large companies with many stakeholders tend to provide more comprehensive information in their financial statements, as opposed to smaller firms with fewer stakeholders. Second, large firms tend to have more robust earnings capabilities over time as opposed to smaller firms, such as growth firms and start-ups. This makes the former's valuation more straightforward from an investor's point of view and as such they are usually less susceptible to speculation than the latter is. The second requirement is that the firm's headquarter is located in Sweden. The reason for this requirement is that we aim to limit the effect of different accounting practices in different countries on the financial reporting, since different countries may have discrepancies in their regulation which in turn could affect how financial statements are reported and which information that is provided. The third requirement is that the firm should not be a financial institution or an investment company, since those firms operate under different pre-requisites than firms in other industries and cannot be valued in the same way as an e.g. manufacturing company (Sahlin & Sakström, 2009). The fourth requirement is that the firm has been listed on the Stockholm stock exchange at least since the 31th of December 2009. The reason for this requirement is that our study spans from the 31th of December 2010 until the 31th of December 2016 and we need to be able to follow the market performance of the stock for the whole period. The reason for setting the requirement of enlistment one year prior to the beginning of our study span is that we aim to limit the effect of volatility in the valuation of firms which may have been recently introduced on the stock exchange.

3.2.2 Selection of companies

To perform the selection according to our specified criteria. Firstly, a comprehensive list of all Large Cap companies has been extracted by using Retriever Business (Retriever, 2017). The list includes the name of the company, a binary factor regarding whether or not the company has been listed on the stock exchange since the 31th of December 2009, the registration number of the parent company (organisationsnummer), the industry sub-group (branch undergrupp), the industry main group (bransch huvudgrupp) and the parent company. All this information has been extracted from Retriever Business with the exception of the data regarding enlistment on the stock exchange. The latter has instead been extracted manually from nasdaqomxnordic.com by determining whether or not the companies' shares have been available for trade since the 31th of December 2009. Secondly, the companies on the list have then been subject to a number of pre-stipulated exclusion criteria and in the case it has met at least one exclusion criteria it has

been excluded from the selection and marked in dark gray. According to the first requirement, the companies have to be listed on the Large Cap Stockholm stock exchange. Since this list only includes companies on Large Cap, no exclusion criteria has been defined. According to the second requirement, the company's headquarter has to be located in Sweden. To exclude companies which are not, we have set-up the exclusion criteria that if a company has a parent company with a non-Swedish registration number (organisationsnummer), it should be excluded from the selection. In this case, the occurrence of a non-Swedish registration number is determined if the number is constituted by something other than ten digits. In the list, this can be observed in that all numbers which begin with "AAA" are marked in gray and thus excluded. This has also been cross checked with the name of the parent company and in all these cases, they have a suffix which is not coherent with any Swedish corporate form. It should also be mentioned that the registration numbers of the listed companies themselves have also been checked, but since they are all listed in Sweden, they do have a legal entity in Sweden and thus a registration number. According to the third requirement, the firm must not be a financial institution or an investment company. To exclude companies which fall into this category, a pre-exclusion criteria has been determined that applies to all companies in the industry main group of "Bank, finans & försäkring" (banking, finance & insurance), hence, all companies in this group have been marked in light gray. Following this, all companies in this industry main group have been excluded with the exception of companies which belong in the industry sub group of "Holdingverksamhet i icke-finansiella koncerner" (holding operations in non-financial groups). The reason for this exception is that firms in this group clearly belong in other industries such as the manufacturing, mining and IT business and are neither financial institutions nor investment companies. Moreover, an important consideration was made for the sub-group of "Finansiella stödtjänster, övriga" (financial support services, other). In this group we find two companies: Collector AB and Hexpol AB. Collector is clearly a financial institution since they provide credit services to private individuals and enterprises and should be excluded according to our third requirement (Collector, 2017). Hexpol, however, is a company active in the polymers business and supplies polymer compounds to the global automotive and engineering industry (Hexpol, 2017). Although, it can be inferred that the company is neither a financial institution nor an investment company it is nevertheless excluded from the selection in order to ensure scientific rigor in our method as well as consistency in our selection. Finally, we have not made any considerations in regard to insurance companies since this has been deemed redundant due to the fact that the list does not include any companies in this category. According to our fourth requirement, the company is required to have been listed for the whole period since the 31th of December 2009. The companies which have not, have been marked with a "No" and have subsequently been excluded from the selection. After applying these four requirements we are left with 56 companies which we assess to be a sufficiently large sample to test our hypotheses. The full list is available for examination in Appendix 1.

3.2.3 Data from annual reports

Annual reports have been used to collect data regarding the executives' compensation and shareholding in the company. In order to do this, the annual reports for the years 2011 – 2015 have been downloaded for all 56 firms. The annual reports have at most cases been readily

available from the companies' websites, however, at some instances they have been downloaded from third party suppliers, such as bolagsfakta.se. The annual reports have then been examined and data has been extracted.

The data related to the CEOs shareholding has at most cases been readily available in the end of each annual report, where the executives' holdings of different classes of shares have been extracted. At a few occasions, however, this data has been missing. In the case of ICA Gruppen, the shareholding for CEO Kenneth Bengtsson is not available for the years 2011 and 2012 for undetermined reasons. Furthermore, in the case of Tele2, the shareholding of CEO Mats Granryd is not available for the year 2011, also for undetermined reasons. In other firms such as Electrolux, PEAB, and Loomis the shareholding for the CEO is not available for the years 2015, 2012 and 2015 respectively, which is due to the fact that the CEO has left the company by the time the annual report was issued, and as such, any information pertinent to his shareholding in the company is not available in the annual reports. Most values, however, are available and out of 280 data points (56 companies over a five year observation) only six values are missing.

The data related to the CEOs compensation has been readily available in the annual reports at all occasions. Firstly, the CEOs total compensation including pension and other benefits but excluding social fees (e.g. arbetsgivaravgift) has been extracted for the years 2011 – 2015. In the cases where the compensation was in another currencies than SEK such as USD or EUR, the compensation has been converted to SEK according to the final currency exchange rate at the last day of each respective year.

In those cases where there has been a replacement of a CEO in a given year, the annual salary and the shareholding of the most recent CEO has been extracted in each case. Moreover, in these cases, the CEOs salary has also been adjusted according to the number of days he has been working as CEO in the year when he assumed the executive position. For instance, in the case of Loomis, Mr Dahlfors replaced Mr Blecko as CEO of the company the 1th of September 2013 and received compensation of 8.6 MSEK for this year. In an effort to estimate what his compensation would have been if he would have worked the full year, his compensation has been adjusted in accordance to the number of days he has worked that year in order to avoid skewed results. In this case, he only worked as CEO 122 out of the years 365 days in 2013, hence, his salary of 8.6 MSEK has been adjusted to approximately 25.8 MSEK ($\frac{8.634}{122/365} = 25.831$) on an annual basis.

Apart from extracting the executive's total compensation, his compensation related to various long term incentive programs have also been extracted. Many of the companies examined have employed various long-term incentive programs to incentivize both their CEOs and other key personnel. Such long-term incentive programs are usually called "långsiktiga incitaments program" but take a multitude of different shapes. The benefits related to these programs have not been included in the executives' total compensation. This is because the aim of this study is to assess how the proportion of the executives' stake in the firm relative to his salary influences the performance of the firm. Since this long-term compensation could be argued to be part of his stake in the company, this needs to be excluded in order to not skew the results.

This is better illustrated with the following example. In the case of Lundin Petroleum, Alex Schneiter, the newly appointed CEO of 2015 received a total compensation in the amount of 10.329 million USD. However, out of this compensation, 8.946 million USD where due to the exercise of synthetic options which had been granted to Mr Schneiter as part of a long term incentive program, at a previous point in time when he was working in another capacity in the firm. Since this payout constitute almost 90 % of his salary for this particular year, it would have a major impact on the value of his shareholding in relation hos salary if it were to be included in his total compensation. In order to avoid skewing the results, these forms of compensation have been deducted from the executives' compensation.

In those cases where extensive amounts of accounting based data had to be collected in order to calculate the performance of the firms, e.g. return on equity, return on capital employed, change in revenue and change in the number of employees, data has been extracted from Retriever Business. The extracted data has then been carefully scrutinized for discrepancies, in the case such discrepancies have been observed, the data has been cross-checked with data from annual reports and when applicable, it has been corrected with the data that appears in the annual reports. The reason for this is that data from annual reports is the primary source Retriever Business employs to collect data and as such, this data has been deemed to have a higher reliability due to the rigorous control of accounting based data in annual reports.

3.2.4 Market data

Data related to the performance of the firm's shares on the stock market has been extracted from companies who specialize in delivering financial information. The data regarding the performance of shares on the stock market for all the examined companies has been downloaded from nasdaqomxnordic.com in "Comma Separated Values"-format for the period 2010-12-31 until 2016-12-30. This data has been downloaded in two separate versions. The first version is unadjusted for variations in the number of shares outstanding, variations that may have been caused by events such as splits and new issues of shares. The second version that has been downloaded is instead adjusted for variations in the number of shares outstanding. These two versions have been employed for different purposes. The first version has been used to assess the value of the executive's shareholding for the years 2011 to 2015. In this case, it is necessary with an unadjusted version since this version displays the closing price for each share at any given point in time. This is necessary since the shareholding of the CEO has been extracted from the annual reports, these reports are based on the number of shares that were outstanding at a particular point in time and as such, they are in an unadjusted format. The second version has instead been used to calculate the performance of the firm. In this case, it is necessary with an adjusted version which is better illustrated with an example. For instance, a share that was valued at 20 SEK in the end of 2014 was subsequently subject to a split of 2:1. This implies that the number of shares have doubled and that the shareholders now hold two times more shares than they previously held, but that these shares are only worth half of what they were worth before, thus suggesting that their new price is 10 SEK. In the end of 2015, the price has however risen to 20 SEK which suggests that the share is worth the double amount of what it was in the end of 2014. However, since the quote at the end of 2014 was also 20 SEK, if we

fail to adjust for the number of shares outstanding, it would indicate that the share has not changed its price. To ensure reliability of the data, the quoted price from nasdaqomxnordic.com have been cross-checked against the price quoted on Bloomberg and Avanza in case of discrepancies. On one occasion the market data from nasdaqomxnordic.com was deemed unreliable, this was in the case of Klövern A which was not properly adjusted for splits. In this case, the market data was instead extracted from Bloomberg as it was considered to be more reliable.

Moreover, to be able to follow the performance of the shares on the market. The adjusted market data had to be adjusted for the dividends that had been paid out during the years. The dividends that were paid out during 2010 to 2015 was extracted from the Morningstar fact sheet for each share which were readily available to download from Avanza. However, the fact sheet did not provide information on the dividend that was paid in 2016, subsequently this was extracted from Avanza. The reason that Avanza was not used to extract the dividends for all years was that the dividends paid as far back as 2010 was not available.

Data related to currency exchange rates have been downloaded from x-rates.com for the years 2010 to 2016. For this purpose, the last quoted price for each year has been employed which have been used to convert all monetary values in foreign currencies to SEK. These exchange rates have been used in the following way, if the last quoted exchange rate for currency Z was X in the end of year Y, all monetary values which refer to year Y in currency Z has been converted according to X. These exchange rates have only been applied to a few companies which use a different accounting currency than Swedish crowns, namely Hexagon and Lundin Petroleum which utilize EUR and USD respectively.

3.3 Description of variables

For the purpose of conducting the analysis, a number of variables have been constructed which are described in the following sub-chapter.

3.3.1 Yearly performance (yearly_perf)

This variable describes how the firm has performed on the stock market from one year to the next. The variable has been adjusted for splits, new issues of shares and dividends paid. The yearly performance for year n has been calculated in the following way.

$$yearly\_perf_n = \frac{Closing\ quote\ (adjusted)_n}{Closing\ quote\ (adjusted)_{n-1}}$$

For instance, in the case of AAK for the year 2011 we find the value 8.04 %. To arrive at this number we have extracted the closing quote adjusted for splits and new issues of shares for AAK as of the 31th of December 2010 which was 188.5 SEK, we have then added back the dividend that was paid in 2010 of 4.25 SEK to arrive at a quote adjusted for dividends of 192.75.

Subsequently we have taken the adjusted closing quote as of the 31th of December 2011 which was 199.5 SEK and added back the dividend which was paid for both the current and the previous years, which amount to 4.50 SEK for 2011 and 4.25 SEK for 2010, to arrive at a quote adjusted for dividends of 208.25 SEK. The yearly performance is thus the difference between the current and the most recent year. In this case the yearly performance amounts to 8.04 % ($\frac{208{,}25}{192{,}75} - 1 = 0.0804$).

3.3.2 Performance-Based index (index_2011_2016)

The performance index that we employ has been built on the yearly performance which was previously described. The index takes it starting point on the 31th of December 2010 which amounts to an index value of 1. To understand how the index has been built we provide the following example. In the case of AAK, the closing quotes at the last day of the year for the firm's shares adjusted for splits, new issues and dividends were 192.75, 208.25, 289.50, 430.75, 442.25, 659.00 and 638.75 for the years 2010, 2011, 2012, 2013, 2014, 2015 and 2016 respectively. To arrive at the index value for each year, each respective closing quote has been divided with the closing quote for 2010. For instance, in 2011 the index amounts to $\frac{208.25}{192.75} = 1.08$ and in 2016 it amounts to $\frac{638.75}{192.75} = 3.31$. In the first case it can be inferred that the share has gained 8 % in value over the course of 2011 whereas in the latter case it can be inferred that the share has gained 231 % in value over the course of 2011 to 2016.

3.3.3 Return on equity (re)

Return on equity is a financial performance measure which measures a firm's profitability in terms of profit generated in relation to the capital shareholders have invested. Return on equity is calculated according to the following formula:

$$Return\ on\ equity\ (re) = \frac{Net\ income}{Shareholder's\ equity}$$

In order to calculate the firms return on equity for each particular year (n) we have extracted data from Retriever Business and calculated it according to this formula:

$$re_n = \frac{Årets\ resultat_n}{S{:}a\ eget\ kapital_n}$$

3.3.4 Return on capital employed (roce)

Return on capital employed is a financial performance measure which measures a firm's profitability in terms of the efficiency with which its capital is utilized. Return on capital employed is calculated according to the following formula:

$$Return\ on\ capital\ employed\ (roce) = \frac{Earnings\ before\ interest\ and\ tax\ (ebit)}{Capital\ employed}$$

Where capital employed equals the sum of shareholder's equity and debt liabilities. It can be simplified as total assets less current liabilities. Due to the limitations of the data acquired by Retriever Business we have approximated the return on capital employed for each year (n) by utilizing the following formula:

$$roce_n = \frac{Rörelseresultat\ (ebit)_n + finansiella\ intäkter_n}{Sysselsatt\ kapital_n}$$

Finansiella intäkter = Ränteintäkter från koncernbolag (tkr) + Externa ränteintäkter (tkr) + Övriga finansiella intäkter (tkr)

Sysselsatt kapital = Totala tillgångar (tkr) - Leverantörsskulder (tkr) - Skulder till koncern- och intresseföretag, korta (tkr) - Övriga kortfristiga skulder (tkr)

Although there may be inconsistencies in regard to what constitutes a debt liability we base our calculations on the simplified model where we take total assets and extracts current liabilities. We assess that our calculation provides a sufficiently accurate approximation of return on capital employed for the purpose of conducting our research.

3.3.5 Change in revenue (revenue_change)

The change in in revenue can be utilized to assess if a firm has positive or negative growth. To calculate the change in revenue from one year to the next we have extracted the revenue for the years 2010 to 2015 from Retriever Business. The change in revenue for year n constitutes the following:

$$revenue\_change_n = \frac{Omsättning_n}{Omsättning_{n-1}}$$

3.3.6 Change in number of employees (employee_change)

The change in the number of employees can be utilized to assess if the firm is hiring more employees or scaling down, this in turn could be an indication if the firm will see positive or negative growth in the future. This measure, however, should be interpreted with care since a decrease in the number of employees could also indicate that the firm is either outsourcing or automating some of its production capacity. Because of this, a decrease in the number of employees may not necessarily mean that the firm will see negative growth in the future.

To calculate the number of employees from one year to the next we have extracted the number of employees for the years 2010 to 2015 from Retriever Business. The change in the number of employee's for year n constitutes the following:

$$employee\_change_n = \frac{Antal\ anställda_n}{Antal\ anställda_{n-1}}$$

3.3.7 Compensation excluding long-term incentive related compensation (ceo_comp_excl_lti)

This variable has been designed by taking the total sum of compensation to the CEO (ceo_comp_total) as stipulated in the annual report and deducted any compensation in the annual report that is related to long-term incentive programs (ceo_comp_lti). The total sum of compensation refers to the CEOs full compensation including pension and other benefits but less social fees (e.g. arbetsgivaravgift). Compensation which is related to long-term incentive programs has been defined as such if it appears in the annual report as "långsiktigt incitamentsprogram" including variations thereof or "aktierelaterade ersättningar" or variations thereof. It should be mentioned however that the name of these programs are usually only an indication of its content. The reason that this form of long-term compensation has been deducted is partly to avoid skewed results and partly to ensure consistency. Since this compensation can vary significantly over the years for certain firms, we have made the choice to exclude it to avoid misrepresentation of the CEOs salary. Moreover, since some firms report the salary which are related to long-term compensation directly under the salary statements for the executives in the annual report, whereas other firms report this form of compensation elsewhere, we are excluding it in order to ensure consistency.

3.3.8 Value of the CEOs shareholding (ceo_equity)

The value of the CEOs shareholding for each particular year has been calculated in the following way. First, the number of shares of various classes (e.g. A shares and B shares) have been added together when applicable (in those cases where the executive holds different classes of shares). Second, the total number of shares have been multiplied with the closing price of a proxy of the shares' value in order to arrive at the value of the executives' shareholdings for each particular year. This proxy constitutes the last quote of the unadjusted price of either A-shares or B-shares for each particular year. To determine whether A-shares or B-shares have been used as the proxy, the following rules have been applied. In the case the firm have had B-

shares available for trade on the market for the full period 2011 to 2016, B-shares have constituted the proxy. In all other cases, A-shares have constituted the proxy. The motivations for using a proxy instead of the actual price for each corresponding class of stocks is that at some instances, the price for certain stocks is either unavailable or unreliable due to the fact that only small volumes of shares of particular classes are traded on the market. This is particularly true for A-shares in certain companies which in some cases do not enter the market at all since the majority shareholders in the company choose to retain all A-shares in their possession in order to retain the voting power in the company. Although the use of a proxy instead of the actual price lead to a certain inaccuracy in the value of the executives' shareholding, this method is selected to avoid even larger discrepancies due to an absence of trade in certain stocks, which creates obstacles in valuing such shares correctly. Moreover, the inaccuracy this method entails is marginal at best, since the price of A shares and B shares in the investigated stocks just deviate to a certain degree from each other. In order to ensure consistency, the same method has been employed regarding the valuation of the shareholding for all companies.

3.3.9 CEO level of engagement (ceo_loe)

In order to estimate the level of engagement of the CEO, his shareholding in the company has been put in relation to his salary for each particular year. This variable has been calculated by dividing the value of the CEOs shareholding (as per the definition previously described) with his salary excluding long-term incentive related compensation (as per the definition previously described) for each respective year (n), according to the formula below:

$$ceo\_loe_n = \frac{ceo\_equity_n}{ceo\_comp\_excl\_lti_n}$$

This is better illustrated with the following example. In the case of Alfa Laval, the total compensation for the CEO Lars Renström for the year 2015 was 24.188 MSEK, his compensation related to long-term incentive programs for the same year was 1.895 MSEK, hence his salary excluding long-term incentive related compensation was 22.293 MSEK for 2015 (24.188 - 1.895 = 22.293). The value of the CEOs shareholding for this year was 6.262 MSEK (40,400 shares multiplied with the closing price of 155.0 SEK per share for the year 2015). To arrive at the CEO level of engagement for the year 2015, the value of his shareholding amounting to 6.262 MSEK has been divided with his salary excluding long-term incentive related compensation amounting to 22.293 MSEK in order to arrive at the value of 0.28 which is our CEO level of engagement for Alfa Laval in the year 2015 ($\frac{6.262}{22.293} = 0.281$). This constitutes one of our key variables in the analysis and its aim is to quantify the degree of commitment the CEO has to the firm.

3.3.10 CEO level of engagement on an aggregated level (ceo_loe_agg)

This variable has been constructed by taking the arithmetic mean of the ceo_loe variable for the years 2011 – 2015 for each firm. For instance in the case of AAK, the ceo_loe for the years 2011, 2012, 2013, 2014 and 2015 were 0.038, 0.052, 10.81, 10.18 and 12.05 respectively. This yields a ceo_loe_agg of 6.63. It has been necessary to construct an average of the ceo_loe variable for certain parts of the descriptive statistics in order to study the data on an aggregated level. It should also be mentioned that both the ceo_loe and the ceo_loe_agg are used in common logarithmic form (e.g. ceo_loe_log and ceo_loe_agg_log) to analyze certain data and present diagrams in the analysis chapter, due to the impracticalities of presenting data that range from fractions of one to more than ten thousand.

3.3.11 Categorization of level of engagement (cat_loe)

This variable has been constructed by categorizing the firms in different groups depending on their CEO level of engagement in a given year. The firms have been grouped into three categories depending on if their CEO level of engagement is considered low, medium or high and as such they have been given the letter A, B or C respectively. It should be noted that on the individual year level, a firm may fall into one category in one year and fall into a different category another year if the CEO level of engagement has changed. The groups have been constructed according to the following rule:

A (low): CEO level of engagement is less than 0.5

B (medium): CEO level of engagement range from 0.5 to 1.5

C (high): CEO level of engagement is more than 1.5

This variable has also been constructed on an aggregated level (cat_loe_agg). To assess which group the firms belong to on an aggregated level, the average have been calculated which is better illustrated with an example. In the case of Alfa Laval, the CEO level of engagement for the years 2011, 2012, 2013, 2014 and 2015 was 0.32, 0.30, 0.34, 0.26 and 0.28 respectively. Since this gives an average of 0.30 it means Alfa Laval should be categorized in group A since the average CEO level of engagement is less than 0.5. In those cases where the CEO level of engagement has been unavailable for certain years, the average has been calculated based on the years which were available. According to this categorization, 23 companies have fallen into group A, 14 companies have fallen into group B and 19 have fallen into group C on the aggregated level. To arrive at the limits for the various categories we have taken a starting point in the so called “pilot school” and the rule of thumb that the CEO should own at least one time his annual salary in shares (Aktiespararna, 2011). However, we also deemed it necessary to take into account the number of firms in each group and extend group B’s selection from 0.5 – 1.5. Partly, since this rule of thumb is ambiguous and not scientifically admitted and partly in order to avoid constructing a group which is too small to draw any inferences from.

3.3.12 Equity based long-term incentive programs (equity_based_ltip)

To assess if the firms in this study employ a long-term incentive program which sufficiently aligns the agent's welfare with that of the principal's. Three requirements have been stipulated. The first is that the firm should employ an equity based incentive program. That is, the participation in the program should tie the agent's personal wealth to the firm's performance on the stock market. The second requirement is that this alignment should be long-term. For the purpose of this thesis, long-term has been defined as a period of at least three years. The reason that three years has been selected is that three years is the most common vesting period for the researched firms which employ a long-term incentive program in this study. It would not be feasible to define long-term as five years, since only a handful of the firms examined in this study use five years as a vesting period, which means we would not have a sufficient amount of data to carry out the analysis. Third, the CEO should be allowed to participate in the program since our study focus on incentive plans for top management and not for other employees. Furthermore, an incentive program is deemed to be in place if it was instituted at a previous point in time as long as the program is still in effect. For instance, if a company started an incentive program based on synthetic shares in 2008 with a vesting period of five years, this means that this program is considered to be in effect also for 2011 and 2012, which are within our measurement period. Moreover, to determine if the company has an equity based long-term incentive program on the aggregated level (equity_based_ltip_agg) as opposed to for individual years. We have stipulated that the company needs to have a program that meets the requirement for at least three out of five years to fall into this category.

In the following section, the various incentive programs that we have encountered in the annual reports are presented together with a description how they have been categorized:

Matching shares (match_share)

Matching shares are shares which are issued to an employee if the employee follows certain conditions. The conditions are that the employee makes an own investment in the company's shares and hold these shares over a predefined vesting period. When the employee has held the shares for a vesting period which in many cases is three years but may vary between companies, the employee is issued a matching share for each share he has saved in the program. Although this is the guiding principle for defining a matching shares program. It should be noted, however, that at some instances and in certain companies, there may also be additional requirements to be issued matching shares, a common requirement is that the employee remains in employment at the time of the grant to be awarded matching shares. Since matching shares are aligning the welfare of the employee who participates in the program with the performance of the firm on the stock market as well as creating a clear incentive for an employee to invest in the firm, matching shares are deemed to be an equity based incentive program.

Performance shares (perf_share)

Performance shares are shares which are issued to an employee if the employee follows certain conditions, these conditions are however differing from the conditions of matching shares. The

general guideline to determine if a share should be considered a performance share is that the shares are only granted to the employee if the firm meets certain predetermined levels of performance within a specific period of time. The subsequent issuance of performance shares as well as the number of shares which are ultimately issued are thus dependent on how well the firm has performed according to various predetermined criteria. It should also be noted that at some instances there may also be other requirements for the issuance of shares according to a performance shares program in certain companies, such as a requirement to also invest in shares to be entitled to participate in the program. Performance shares are not considered an equity based incentive program for two reasons. The first reason is that only the reward is equity based, but not the criteria which lay the basis of the reward. The second reason is that at several occurrences, although a performance shares system is in place, there are ultimately no issuance of performance shares since the performance thresholds have not been met. Since this implies that employees who are part of the program will only receive shares under certain conditions, their welfare is not considered to be sufficiently well aligned with the performance of the firm on the stock market. The main difference between a matching shares program and a performance shares program is that under the first regime, the employees will receive their shares regardless as long as they adhere to requirements and conditions which are under their control, something that is not the case under the latter regime, since the performance of the company is not under their direct control. It should also be noted that several of the examined firms use a combined system of matching shares and performance shares. When this is the case, they are categorized as having an equity based incentive program since at least one of the programs which are employed are meeting the stipulated requirements.

Options (opt)

Are defined as such if they appear in the annual report as "optioner", "personaloptioner" or variations thereof. An option is a financial instrument that entitles the bearer to purchase a share for a certain price within a predetermined period of time. In the case where the underlying asset, the share, has or is deemed to have the potential to increase in price above the exercise price for the option within the predetermined time frame when the option may be used, the option is considered to have a value. In the case, where the underlying asset instead could be purchased for a lower price than the exercise price at the options expiry date, the option has lost its value. Options are deemed to be an equity based incentive system since they align the welfare of the employee who participates in the program with the performance of the firm on the stock market. However, the duration of time when the option may be called in vary between companies. To be able to assert that the options program is also a long-term program, the option program is required to have a vesting period of at least three years. Since some firms have not stipulated a vesting period regarding how long the options have to be held before they are used, but only when the options expire, these options are considered as not having a vesting period which effectively disqualifies them from being a long-term equity based incentive systems according to our requirements.

Synthetic options (synt_opt)

Synthetic options or "phantom options" are similar to options and what is stated in the section above about options also applies to synthetic options. The difference between a synthetic option and an option is that instead of entitling the bearer to purchase a share for a certain price within a predetermined period of time, the synthetic option entitles the bearer to receive a cash payment based on the appreciation of the market value of the underlying asset upon exercise of the synthetic option. Whereas the option entitles the bearer to purchase a share for a certain price, the synthetic option instead entitles the bearer to receive the cash difference between the market value of the firm's share and the exercise price of the synthetic option. Synthetic options are deemed to be an equity based incentive system for the same reason that an option is considered an equity based incentive system, since they align the welfare of the employee who participates in the program with the performance of the firm on the market.

Options (opt_spec)

Options with special conditions have been categorized as such if they required certain additional requirements in order to be exercised. This form of incentive system only applies to one company: Sandvik. In this case the participants in the program have been granted employee stock options which entitle the employees to acquire Sandvik shares after a vesting period of three years at a set exercise price. The exercise of the options is however subject to the condition that certain performance targets linked to Sandvik's growth in value are met. Due to this additional condition, option program such as this is not deemed to be an equity based incentive program for the same reasons that performance shares are not deemed to be an equity based incentive system. Since employees who are part of the program will only be able to receive shares under certain conditions, their welfare is not considered to be sufficiently well aligned with the performance of the firm on the stock market.

Salary in shares (sal_share)

This category only applies to one company: Securitas. In this case, the participants of the program have a variable remuneration based on performance. Two thirds of the variable compensation will in accordance to the incentive program be settled in cash whereas the remaining third will be used to purchase shares. These shares will be allotted to the employee approximately one year after they were purchased. Since such a program aligns the welfare of the employee with the performance of the firm on the stock market, it should be considered an equity based incentive system. However, this particular program is not deemed to be a long-term program since the allotment takes place only one year after purchase and there are no terms that refrain the employees from selling the share upon allotment.

Cash-based program (cash_based)

Cash-based incentive programs entitle the participants to receive a cash-payment upon the fulfilment of certain conditions related to the firm's financial performance. Since this payment is only dependent on financial performance put not allotted in either shares or a payment

corresponding to the market value of the firm's shares (as is the case with synthetic options) these programs are not deemed to sufficiently align the welfare of the employee with the performance of the firm's shares on the stock market. This implies that they should not be considered equity based incentive programs for the simple reason that the payment is neither in equity nor in the market value of the firm's equity.

Requirement to purchase shares (req_purch)

A requirement to purchase shares is at some instances a condition to be allowed to participate in the incentive program. This requirement also implies that the participant is also required to keep the purchased shares over a specific time period in order to receive his future allotment. Without the requirement to keep the shares, the employee would be able to purchase and then instantly sell his shares which would render the requirement to purchase purposeless. Although a requirement to purchase shares aligns the interests of the agent with those of the principal, this requirement is not an incentive system per definition but rather a part of an incentive system. For instance, in the case of matching shares, the requirement to purchase a share is only part of the condition to participate in the program and to be allotted matching shares in the future, and not an incentive program in itself.

Executives and key employees (exec_key)

This variable refers to who is eligible to participate in the incentive program and is often referred to in the annual reports as "ledande befattningshavare och nyckelpersoner". To fall into this category the requirement is that executives should be allowed to participate, whereas key employees may be allowed to participate depending on the program. Since our study focuses on how to incentivize the CEO and the management team of the firm we have required that the CEO should be allowed to participate to fall into this category. Moreover, we have also elected to not make a separate variable for key employees, partly since our study does not focus on key employees and partly since the definition of what constitutes a key employee is vague and may vary between firms.

Other employees (emp_oth)

In the case the firm has an incentive plan for the employees but not for the CEO and management team, it is indicated in this variable. Companies which have an incentive plan where the executives are not eligible to participate are disqualified from being categorized as having an equity based long-term incentive program, since this thesis focus on incentive programs for top management and not incentive system for other employees.

3.4 Data processing

3.4.1 Descriptive statistics

The data will be analyzed by employing descriptive statistical methods where we will examine the mean and median performance along with presenting our findings in diagrams such as

scatter diagrams. According to Bryman and Bell (2011) the use of diagrams is one of the most frequent methods for displaying quantitative data. Diagrams have the advantage of being relatively easy to interpret. The arithmetic mean is useful since we add all the values in the distribution and divide it with the number of values. By examining the arithmetic mean we can assess if firms on average are over-performing or underperforming depending on if certain conditions are met. However, since the arithmetic mean is sensitive to outliers we have elected to present data both including and excluding outliers. We will also study the median at certain occurrences since this measure is not as sensitive to outliers. To find the median we group the values in a distribution from highest to lowest. The median then corresponds to the mid-point value, or in the case there are two mid-point values, it corresponds to the average of these two values. We will also utilize scatter diagrams to present the data since these diagrams illustrate the correlation between two variables as well as displaying the dispersion of the data. By using scatter diagrams we are also able to visualize the effect that the outliers have on the data. If there is none or insignificant correlation between variables, the scatter diagram will reveal no pattern between variables. On the other hand, if there is a strong relationship between variables, a clear pattern will emerge in the scatter diagram (Bryman & Bell, 2011). To be able to examine the pattern, we have thus elected to include a trend-line in the scatter diagrams.

3.4.2 Regression analysis – random and fixed effects

To select an appropriate econometric model for analyzing the panel data we have discussed the topic with our supervisor and have come to the conclusion that random and fixed effects is an appropriate method for analyzing this data. To determine whether random or fixed effects should be used, we have calculated both random and fixed effects and carried out a Hausman test to assess which model is preferable. According to Wooldridge (2014), the fixed effects model allows for arbitrary correlation between the dependent and the independent variable, whereas the random effects model does not. Fixed effects is assumed by many researchers to be a more reliable tool for estimating ceteris paribus effects. However, in some situations, random effects may be a more appropriate choice. In the case where the key independent variable is constant over time, fixed effects is not deemed appropriate to estimate its effect on the dependent variable. In this situation, it would be necessary to employ a random effects model. While using a random effects model, it is also necessary to include as many time-constant control variables as possible, whereas with a fixed effects model, this is not necessary. Wooldridge (2014) goes on to state that random effects is preferred over pooled OLS since random effects in general is more efficient. It is a common practice among researchers to apply both random and fixed effects and then test for statistically significant differences in the coefficients for the independent variable which differ over time. The idea according to the Hausman test, is that random effects is suitable to use unless the Hausman test rejects. Nevertheless, in practice, when the Hausman test fails to reject, it implies that either the random effects or the fixed effects estimates are sufficiently close so that both models may be appropriately used, or that the variation in the sampling in the fixed effects estimate is so large that it is not possible to conclude that differences which are practically significant are statistically significant. In the latter case, there may be grounds for concern whether or not the data contains sufficient information to provide precise estimates of the coefficients. Thus, a

rejection with the Hausman test implies that the key assumptions of the random effects model are inaccurate, which calls for the fixed effects model as the suitable choice.

4. Findings

We will begin the analysis by studying the stock market performance on an aggregated level, which corresponds to the whole period of 2011 – 2016, this subchapter includes descriptive statistics and a regression analysis. Subsequently, we will study the stock market performance on an individual year level. On the individual year level, we will also extend the analysis into financial performance indicators, e.g. return on equity (re) and return on capital employed (roce). This subchapter includes descriptive statistics, a correlation analysis and an independent samples t-test.

4.1 Performance on an aggregated year level

In this subchapter, the data will be analyzed with descriptive statistics and with regression analysis. The performance of the firms will be examined in relation to the CEO level of engagement (ceo_loe) and the existence of equity based long-term incentive programs (equity_based_ltip). In this chapter, the CEO level of engagement (ceo_loe) is presented in common logarithmic form (ceo_loe_log) in the scatter diagrams employed due to the impracticalities of presenting data which range from a fraction of 1 to more than 10,000. For instance, a CEO level of engagement (log) of 1 infers that the value of the CEOs shareholding divided with his annual compensation is 10 on average between 2011 and 2015 ($10^1 = 10$). Moreover, since $10^0 = 1$ it can be inferred that all the dots less than zero in the scatter plots imply that the CEOs level of engagement is less than 1.

4.1.1 Stock market performance on an aggregated year level – descriptive

Figure 1 depicts the average stock market performance for the firms according to the performance-based index (index_2011_2016) which range from the end of 2010 to the end of 2016. In this chart, the firms have been grouped according to their Categorization of level of engagement on the aggregated level (cat_loe_agg). With category A having less than 0.5 ceo_loe on average, category B having 0.5 – 1.5 ceo_loe on average and category C more than 1.5 ceo_loe on average. It can be observed that the firms with the higher CEO level of engagement have over-performed relative to the others. It should also be noted that category C is heavily influenced by the Fingerprint stock and because of this, the data is also presented without the outliers of Fingerprint and SSAB. Even without the outliers, category C have over-performed on the stock market relative to category A with approximately 40 %.

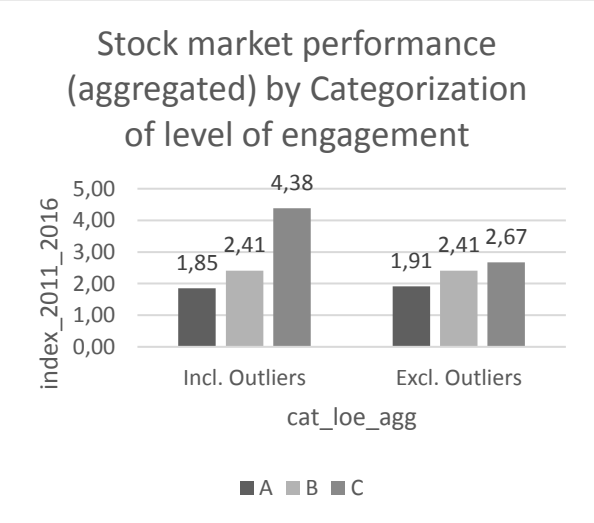

Figure 1 – Stock market performance (aggregated) by Categorization of level of engagement

Figure 2 depicts the average stock market performance for the firms that are categorized as having an equity based long term incentive program on the aggregated level (equity_based_ltip_agg) and those that do not. Also here, we observe that Finger Print which falls in the "Other" category infuence the results significantly. For this reason we have excluded the two outliers from each group. The new result is presented in the bars to the right. We observe a slight over performance for firms who have an equity based LTIP in place. However, due to the marginal effect, this finding does not provide adequate support for the theory that the practice of employing an equity based LTIP alone leads to over-performance on the stock market.

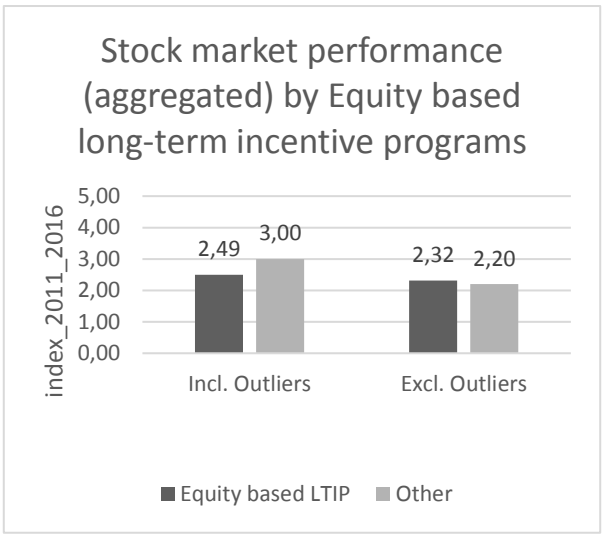

Figure 2 – Stock market performance (aggregated) by Equity based long-term incentive programs

The scatter plot presented below also displays the stock market performance for the firms according to the performance-based index. This scatter plot includes the performance of 54 firms in total since we have elected to exclude the outliers of Fingerprint and SSAB. These firms have been excluded partly to limit the outliers' influence on the results and partly to visualize the data more clearly. A trend line which is included in the scatter plot suggests a certain degree of correlation between the CEO level of engagement and the performance-based index.

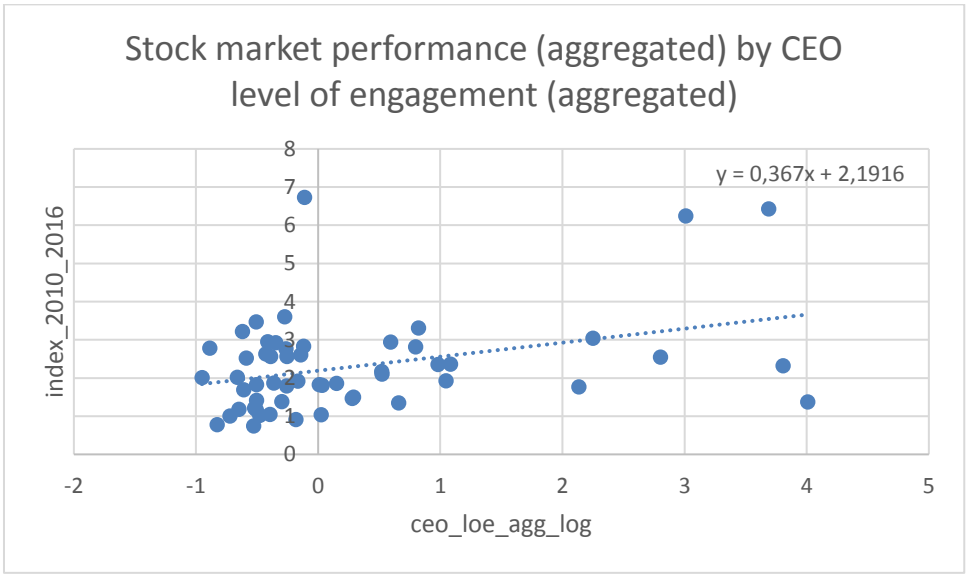

Figure 3 – Stock market performance (aggregated) by CEO level of engagement (aggregated)

It should be noted, however, that certain firms' in the upper interval on the performance-based index exert significant influence on the trend line. To illustrate this we have removed three additional outliers from both the highest and the lowest part of the performance-based index which is presented in the scatter plot below. These additionally excluded outliers are in descending order in terms of performance: Netent, Balder and Sagax from the highest performing firms. Together with Ericsson, Tele2 and MTG in descending order from the under-performing firms, these excluded outliers are marked as gray diamonds. This leaves us with 48 remaining firms. The trend-line presented below is still sloping upward and thus suggests a relationship, albeit significantly weaker. The altered slope of the trend-line indicates that the excluded firms in the high end of the performance-based index exert significant influence on the results.

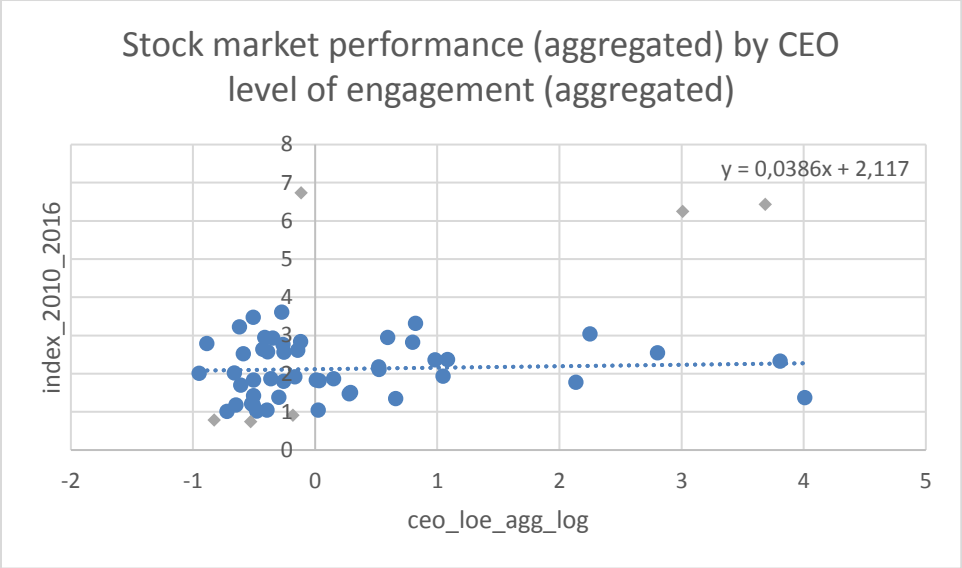

Figure 4 – Stock market performance (aggregated) by CEO level of engagement (aggregated) [excl. additional outliers]

The scatter plot presented below has the same form as the previous diagrams and includes the performance of 54 firms in total (excluding Fingerprint and SSAB). In this diagram, however, we have made a distinction between firms who have had an equity based long term incentive program in place for at least three out of five years. In this graph, it can be noted that firms in this category has a slightly steeper slope than the firms who do not fall into this category. The location of the red trend-line relative to the blue suggests that firms who have an equity based LTIP in place over-perform relative to firms who do not, at least for firms in the lower half of the CEO level of engagement spectrum.

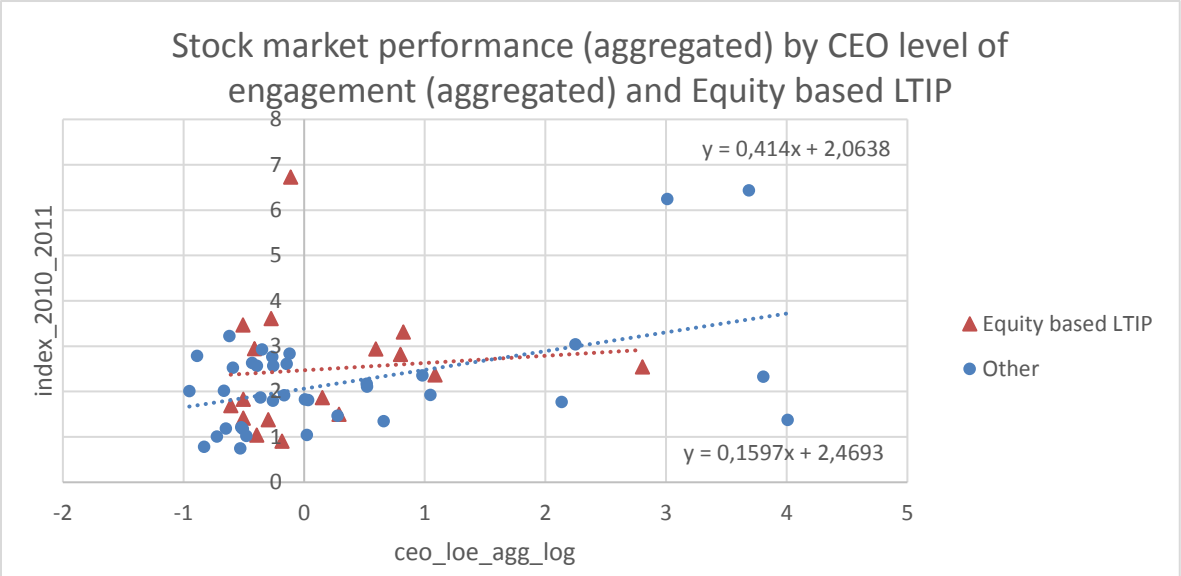

Figure 5 – Stock market performance (aggregated) by CEO level of engagement (aggregated) and Equity based LTIP

It should be noted, however, that the blue line has a steeper slope and intersects the red line in the upper half of the level of engagement spectrum. This is mainly an effect of certain high performing firms which exert significant influence on the trend-line. To illustrate this, these additional outliers have been removed from the selection and marked in gray, as presented in the scatter plot below. In this diagram, it can be noted that the slope of the trend-line is slightly negative for those firms who lack an equity based LTIP, which suggests that the CEO level of engagement alone has no effect on stock market performance, at least when the effect of the outliers are excluded from the results. It should be noted, however, that the red line is outlined above the blue line and is sloping upward. This suggests that firms who do have an equity based LTIP over-perform on the stock market relative to firms who do not, and that the effect is magnified if the CEO level of engagement is higher. However, it should be mentioned that the results are inconclusive due to the limited amount of data and that a more extensive study would be required to investigate this possible linkage further.

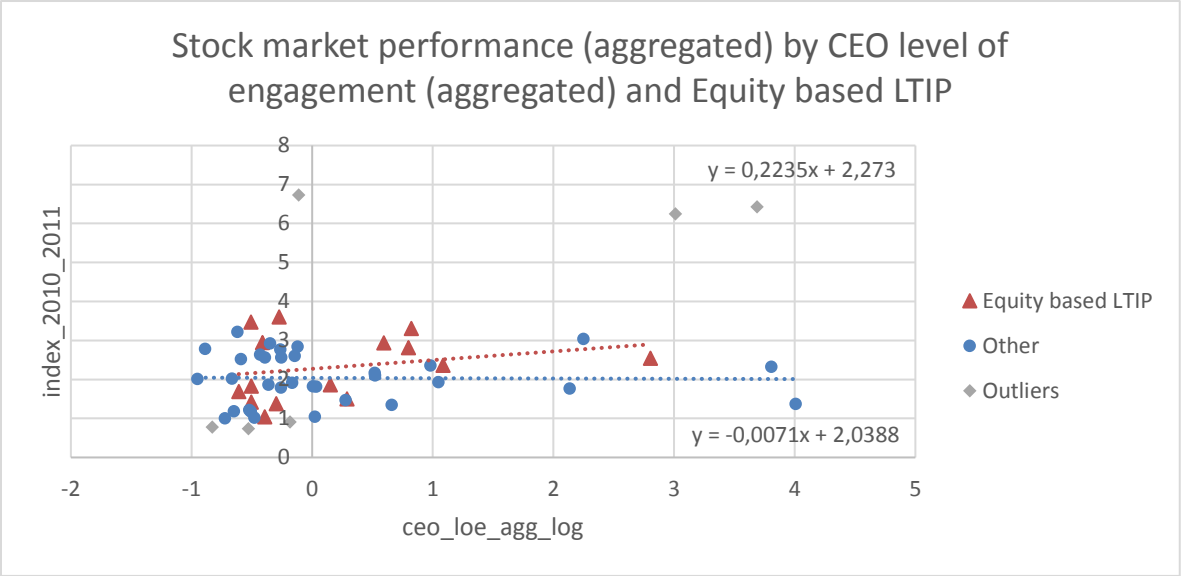

Figure 6 – Stock market performance (aggregated) by CEO level of engagement (aggregated) and Equity based LTIP [excl. additional outliers]

4.1.2 Stock market performance on an aggregated year level – regression analysis

In this section we have carried out a fixed effects and a random effects analysis which have been subject to a Hausman test to assess which model should be considered appropriate. We have included the additional variables: equity based LTIP, revenue and number of employees for each particular year as well as industry main group (where each main group has been assigned a number from one to eight) in an effort to control for more factors. CEO level of engagement, revenue and number of employees have been inserted in log form in the analysis due to the model resulting in errors when the original numbers were employed, likely an effect of the different scale of the data which is analyzed. For instance, the number of employees for Electrolux for 2011 was 52,916 this has yielded a log(no_employees) value of 4.7236. In this analysis we have not removed any outliers.

Below is the results from the analysis. It should be noted that industry main group has been omitted in the Fixed effects model because of collinearity which is due to the fact that it is assigned the same number in each group irrespective of each particular year since the Industry main group normally do not change over time.

Fixed effects

```
note: industry_main_group_no omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       278
Group variable: companynum                      Number of groups   =        56

R-sq:  within  = 0.5133                         Obs per group: min =         3
       between = 0.2698                                        avg =       5.0
       overall = 0.0075                                        max =         5

                                                F(4,218)           =     57.49
corr(u_i, Xb)  = -0.9451                        Prob > F           =    0.0000
```

yearly_perf	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ceo_loe_log	.3261217	.1034198	3.15	0.002	.1222911	.5299523
equity_based_ltip	-.0736697	.2883436	-0.26	0.799	-.6419677	.4946282
revenue_log	5.2796	.4490869	11.76	0.000	4.394492	6.164708
no_employees_log	-1.904546	.6960287	-2.74	0.007	-3.276353	-.532739
industry_main_group_no	0	(omitted)				
_cons	-30.64638	2.357407	-13.00	0.000	-35.29261	-26.00016
sigma_u	2.4725655					
sigma_e	.68166405					
rho	.92936326	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(55, 218) =     6.63             Prob > F = 0.0000
```

Table 1 – Fixed effects

Random effects

```
Random-effects GLS regression                   Number of obs      =       278
Group variable: companynum                      Number of groups   =        56

R-sq:  within  = 0.4217                         Obs per group: min =         3
       between = 0.0052                                        avg =       5.0
       overall = 0.0399                                        max =         5

                                                Wald chi2(5)       =     21.49
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0007
```

yearly_perf	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ceo_loe_log	.1388647	.0602845	2.30	0.021	.0207093	.25702
equity_based_ltip	-.0752264	.1678972	-0.45	0.654	-.404299	.2538461
revenue_log	.8095233	.2666379	3.04	0.002	.2869226	1.332124
no_employees_log	-.6549004	.2077571	-3.15	0.002	-1.062097	-.247704
industry_main_group_no	.1350394	.0561895	2.40	0.016	.02491	.2451687
_cons	-3.862001	1.344675	-2.87	0.004	-6.497515	-1.226487
sigma_u	.32035007					
sigma_e	.68166405					
rho	.18090246	(fraction of variance due to u_i)				

Table 2 – Random effects

Hausman test

```
                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
 ceo_loe_log |    .3261217     .1388647         .187257        .0840323
equity_bas~p |   -.0736697    -.0752264        .0015567        .2344196
 revenue_log |      5.2796     .8095233        4.470077        .3613631
no_employe~g |   -1.904546    -.6549004       -1.249646        .6642989
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      285.78
                Prob>chi2 =      0.0000
```

Table 3 – Hausman test

Since the Hausman test produces a prob>chi2 value of 0.0000 it suggests that the Fixed effects model should be employed since Prob>chi2 < 0.05.

Studying the data from the Fixed effects model we find a coefficient between yearly_perf and ceo_loe_log of 0.3261217 which suggests that the variables are positively correlated. Since the P>t value is 0.002 it indicates that the relationship is statistically significant. Moreover, also the Random effects model yields statistically significant results for this finding with a p>z value of 0.021.

4.2 Performance on an individual year level

In the following section we will proceed with our analysis by analyzing the relationship between firm performance with the CEO level of engagement and the use of equity based LTIP for individual years as opposed to on an aggregated level. Moreover, we will also extend the analysis to include financial performance measures, e.g. return on equity (re), return on capital employed (roce), change in revenue (revenue_change) and change in the number of employees (employee_change). We have excluded the data for Ica gruppen for the years 2011 and 2012 for all data which is studied on an individual year level. This is due to the fact that the data regarding the CEO level of engagement has been unavailable in ICA Gruppen's annual reports for those particular years, which has made it unfeasible to include these particular measure points in the study. Moreover, in the scatter plots, the data is presented both with the outliers included and excluded. In the case where the outliers have been excluded, we have excluded three outliers from each side of the spectrum for the highest and the lowest of yearly_perf, re, roce, revenue_change and employee_change. In this case, we have elected not to display the outliers in the diagrams since several of them fall outside of the presented data range. In total, this leaves us with 278 measuring points including outliers, and 272 measuring points excluding outliers. In five different measure points, the CEO did not own any shares in the company which equals a level of engagement of zero. Since zero is not suitable to display in a logarithmic scale since it amounts to an infinite negative number (e.g. log(0) = -∞) all zero values have been converted to 0.01 which equals ceo_loe_log = -2. The value of 0.01 has been selected since it is adequate to display in logarithmic scale and yet sufficiently small to assess that any motivational aspects of such a limited shareholding would be marginal at best.

4.2.1 Stockmarket performance

In the table below we have presented the median and the average yearly stock market performance (yearly_perf) of the firms on an individual year level. The variable n describes how many individual measure points each series have.

	Yearly performance			**Yearly performance (+1 year)**		
	median	average	n	median	average	n
A	0,035465	0,071894	126	0,191562	0,306767	126
B	0,218569	0,219297	64	0,195891	0,219062	64
C	0,228726	0,460257	88	0,187059	0,228004	88

Table 4 – Median and average stock market performance by Categorization of level of engagement

The table should be interpreted in the following way. All measure points of category A infer that the CEO level of engagement was less than 0.5 for a specific firm and a specific year. When all these measure points are averaged, they yield a stock market performance of 7.2 %. It should also be noted that a firm can belong to category A one year, and category B or C another year if the CEO level of engagement has changed within the different thresholds. Due to the existence of outliers significantly affecting the results, we will hereafter refer to the median when analyzing the table. The most distinctive feature is that firms in category A (cat_loe < 0.5) severely underperforms. Whereas firms in group B and C have a median stock market performance of 21.9 % and 22.9 % respectively. Group A, which have a CEO level of engagement of less than 0.5 only reach a median yearly performance of 3,5 %. This finding suggests that if executive ownership of shares is too limited, it may have an adverse effect on the firm's performance on the stock market, at least in the short-term. To control if this relationship is short-term, we have also studied the performance of the different categories for the following year in the table to the right. This table should be interpreted in the following way. All measure points for a specific category for year t have been paired with the yearly performance for year t+1. For instance AAK belonged to category C in the year 2013, hence this has been paired with AAK's yearly performance of 2014 which amounted to 2.7 %. All measure points in each series have then been averaged and the median have been extracted. Also here, we study the median since the average contains outliers which skew the result. In this case, we cannot observe any relationship since the median amounts to roughly 19 % regardless of the cat_loe in the previous year. Since we only observe a relationship between cat_loe and performance for the same year and not the following year, this could indicate that a CEO level of engagement of less than 0.5 acts as a signal to the market that the stock is not worth investing in, thus resulting in significant under performance of stocks where the CEO has a low level of engagement in a particular year.

The table below displays the median and average yearly performance of the firms depending on if they have an equity base long-term incentive program (equity_based_ltip) or not. Here, the over performance is not as drastic as in the previous case but still amounts to approximately 3.5 % percentage points. This is an indication that firms with an equity based LTIP yield higher performance on the stock market.

	median	average	n
Equity based LTIP	0,185971	0,188209	90
Other	0,150281	0,149903	188

Table 5 – Median and average stock market performance by Equity based LTIP

In the bar chart below, we have grouped all measuring points between 2011 and 2015 according to their CEO level of engagement to illustrate their yearly performance on the stock market. The bar called 0.00-0.25 implies that it includes all measure points where the CEO level of engagement was at least 0 but below 0.25. The bar called 1.50+ implies that it includes all measure point where the CEO level of engagement is at least 1.50. Although, the bar chart does not indicate a linear relationship, it illustrates a clear over-performance for firms in the higher CEO level of engagement spectrum.

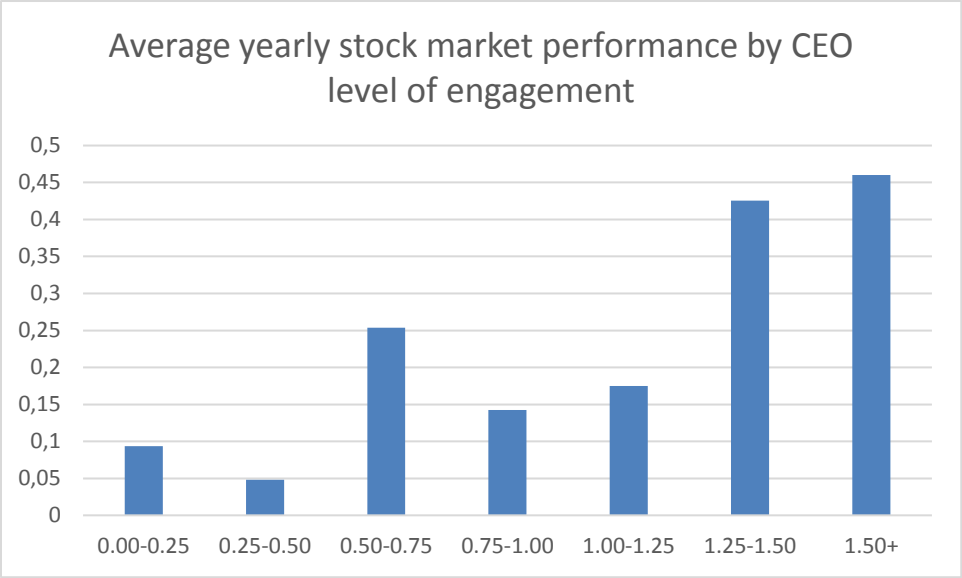

Figure 7 – Average yearly stock market performance by CEO level of engagement

Below we will present the findings using scatter plots. The scatter plot presented below is constituted by the same measure points as the bar chart, with the exception that the bar chart use ceo_loe instead of ceo_loe_log. The diagram displays a clear over-performance for firms with a higher CEO level of engagement, which is expected since our previous diagram on the aggregated level displayed similar results. The effect in this case is smaller, since this diagram does not include the accumulated over-performance over a longer time period but instead displays the effect for individual years.

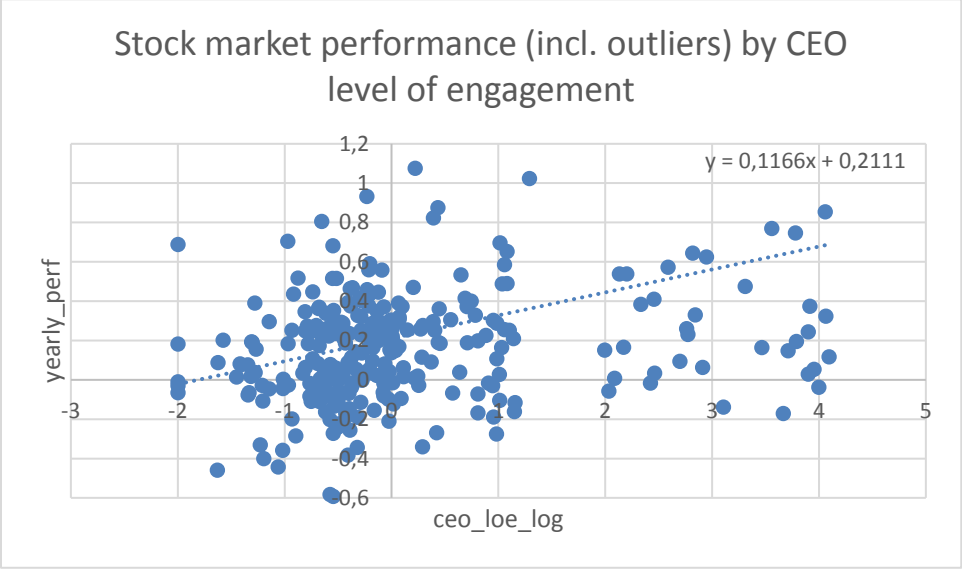

Figure 8 – Stock market performance (incl. outliers) by CEO level of engagement

It should be noted that the slope of the trend line is approximately 2.6 times steeper when the outliers are included (although) not visible in the diagram as opposed to excluded (in the

diagram below). Moreover, the slope is also similar to the slope on the aggregated level with the outliers excluded and amounts to 0.0445 on the individual year level as opposed to 0.0386 on the aggregated level. It should nevertheless be noted that the diagrams on the individual year level are not directly comparable to the diagrams on the aggregated year level, partly since the aggregated year level excludes a larger number of outliers and partly since the individual year level does not include the accumulated effect over several years.

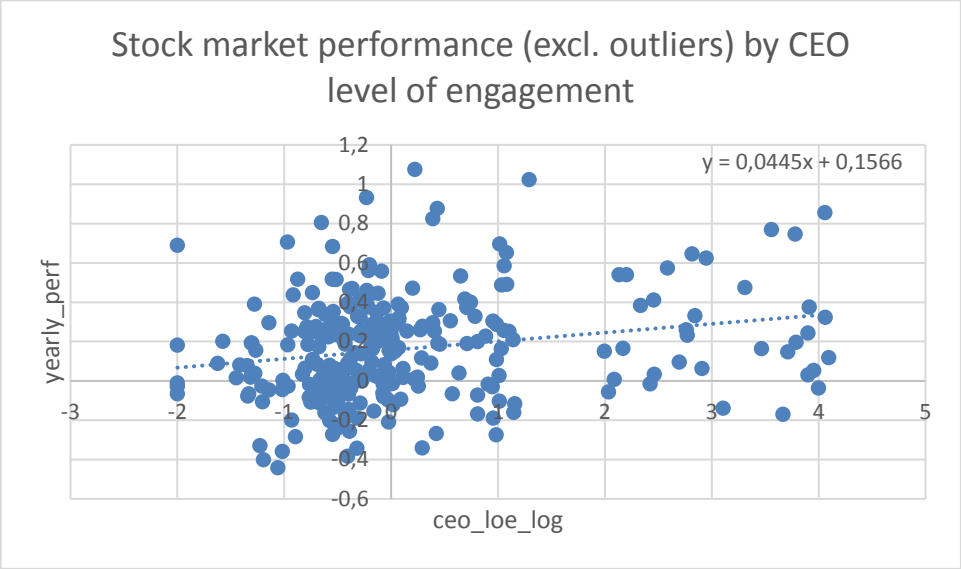

Figure 9 – Stock market performance (excl. outliers) by CEO level of engagement

In the diagrams presented below we have made a distinction between those firms who had an equity based LTIP in place for each individual year and those that did not. In this case, we see a clear over-performance of firms with an equity based LTIP in the higher end of the CEO level of engagement spectrum. These findings are similar to the findings on the aggregated level although the intersection of the trend lines occur at the lower point of the ceo_loe_log spectrum.

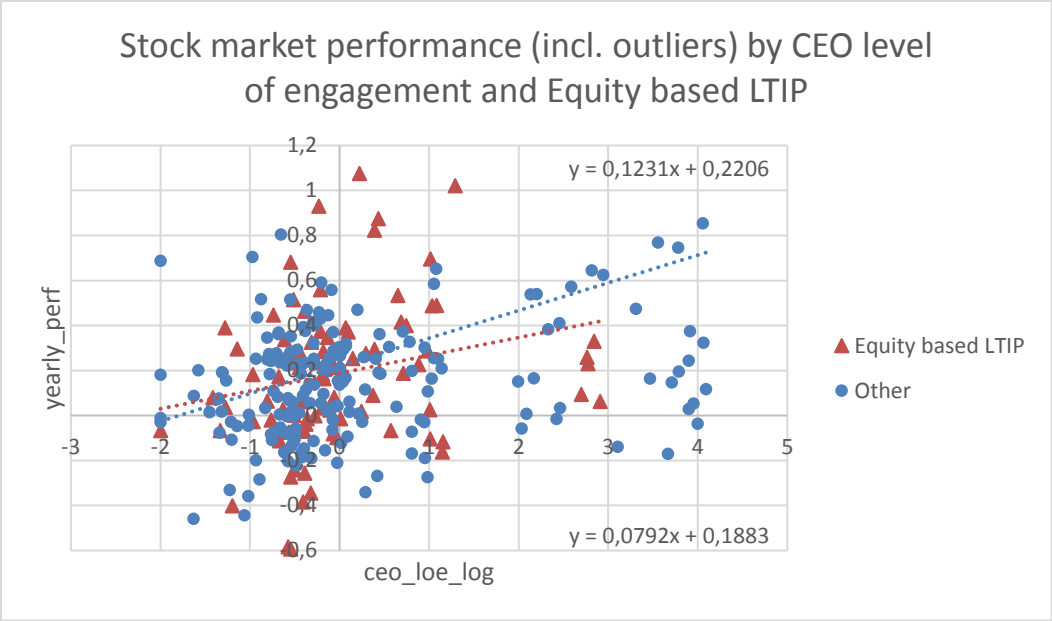

Figure 10 – Stock market performance (incl. outliers) by CEO level of engagement and Equity based LTIP

It should be noted that the outliers exert significant influence on the results which can be observed by comparing the upper diagram with the diagram below.

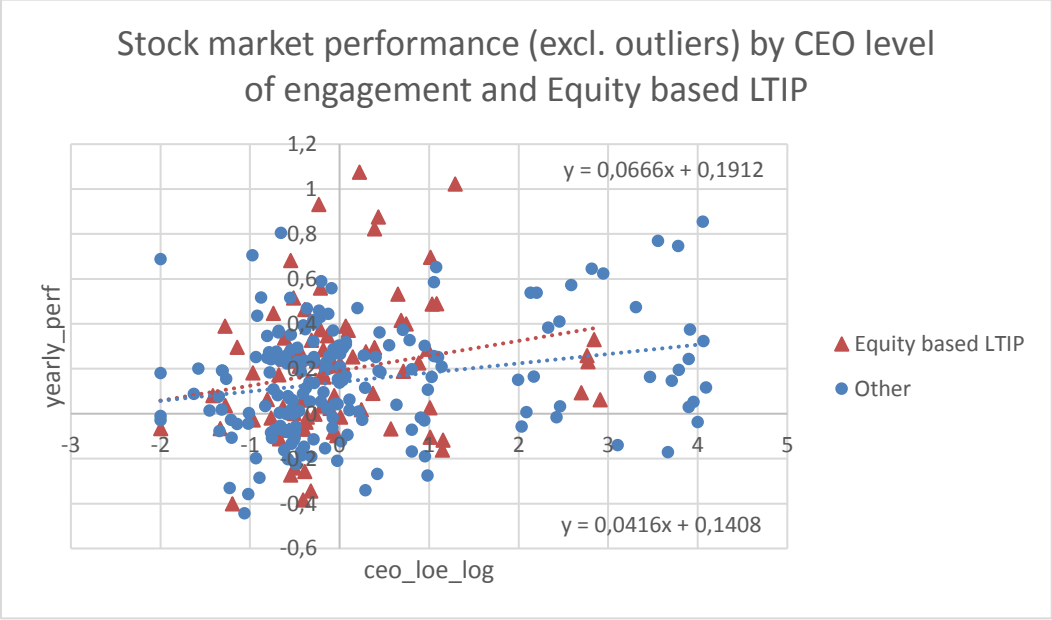

Figure 11 – Stock market performance (incl. outliers) by CEO level of engagement and Equity based LTIP

With the outliers excluded, the firms who have an equity based LTIP in place consistently over-perform relative to the firm's that do not, which is consistent with our findings on the aggregated year level. It should still be noted that the effect is larger in those cases where the CEO also has a higher level of engagement. This suggests that a combination of a higher CEO level of engagement together with an equity based LTIP is related to higher performance on the stock

market. It should be noted, however, that the firms who do not have an equity based LTIP in place still over-performs in the higher end of the CEO level of engagement spectrum on the individual year level, which was not the case on the aggregated year level where the slope of the trend-line was slightly negative. This is likely an effect of the exclusion of a larger amount of outliers on the aggregated year level than on the individual year level. In the former example eight firms over a five year observation has been excluded which amounts to 40 individual measure points. In the latter case, only six individual measure points have been excluded, which implies that the findings on the individual year levels are influenced to a higher degree of high performing firms than those on the aggregated level with outliers excluded.

4.2.2 Return on equity and return on capital employed

The bar chart below presents the same data as the scatter plots further on with the exception that the bar chart displays the ceo_loe instead of the ceo_loe_log. Moreover, all measure points for Swedish Match have been excluded in the bar chart since its return on equity has been negative for the years 2011 - 2013 despite showing a profit for those years. This is due to the reason that Swedish Match had a negative shareholder's equity for those years which effectively renders its return on equity misleading. The only distinguishing feature in the diagram is that the measure points in the ceo_loe 1.00-1.25 range over-performs on average. We attribute this to a likely effect of random variations since firms in the higher ranges do not over-perform. The findings does not indicate that firms with a higher CEO level of engagement would yield higher return on equity on average than firms with a lower level.

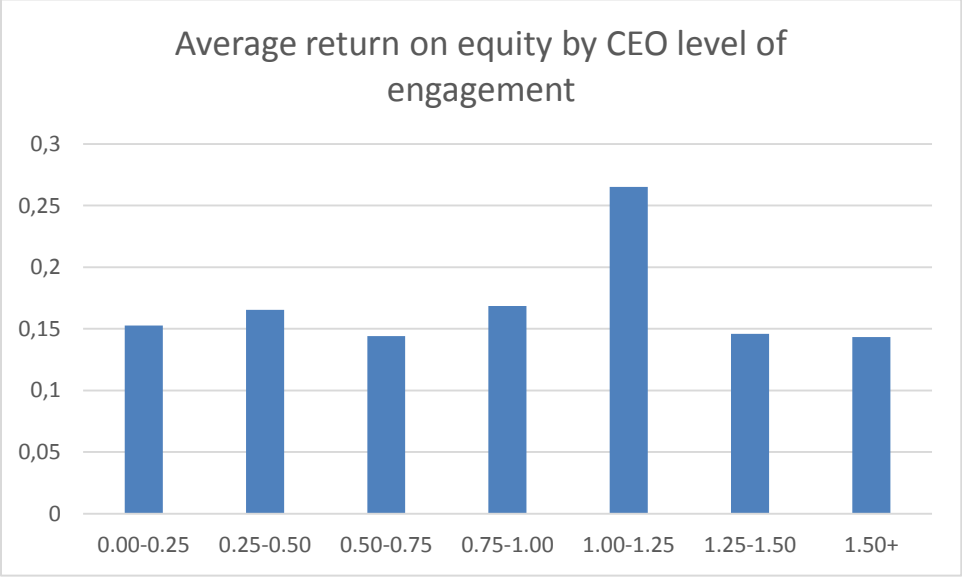

Figure 12 – Average return on equity by CEO level of engagement

To illustrate this in more detail we have presented the scatter plot below. The diagram illustrates the relationship between the return on equity and the CEO level of engagement. The slope of the regression line is shallow which suggests that such a relationship is either weak or insignificant.

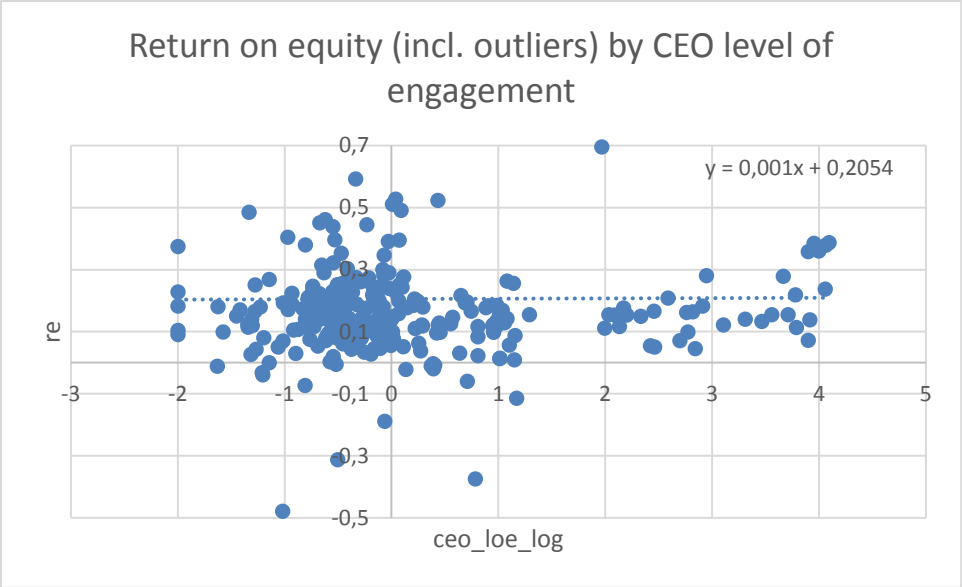

Figure 13 – Return on equity (incl. outliers) by CEO level of engagement

The diagram below presents the same data with the exclusion of outliers. In this case the slope is even shallower which suggests a marginal relationship at best.

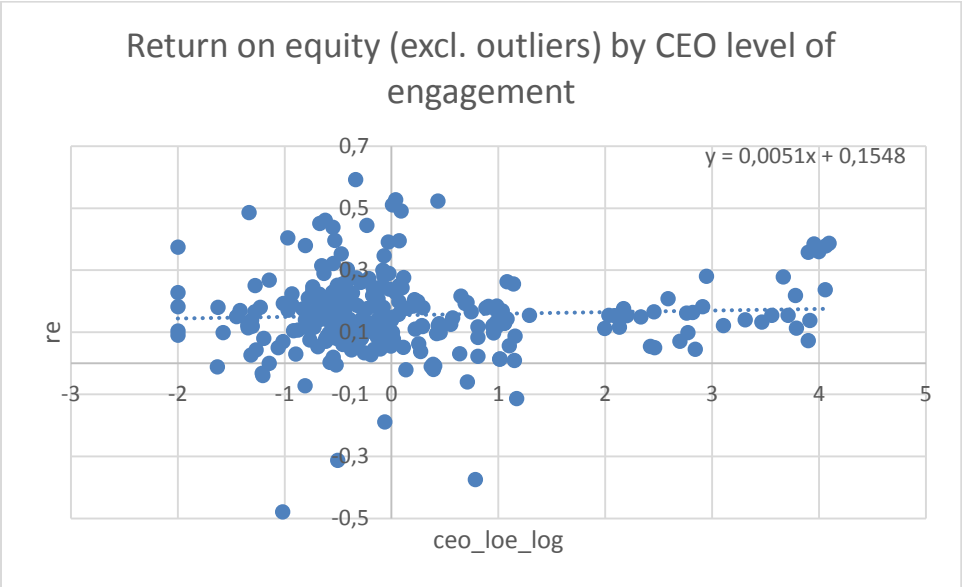

Figure 14 – Return on equity (excl. outliers) by CEO level of engagement

In the diagram below we have made a distinction between firms who have an equity based LTIP and those that do not. In this diagram we can observe that the relationship between the CEO level of engagement and the return on equity is negative for firms who do have an equity based LTIP and slightly positive for those firms that do not. The explanation for this is undetermined, it could suggest that management prioritize other factors than return on equity in firms where the CEO level of engagement is high and an equity based LTIP is in place. It could also be a

random effect due to the limited amount of data. We assess the latter to be the most probable explanation.

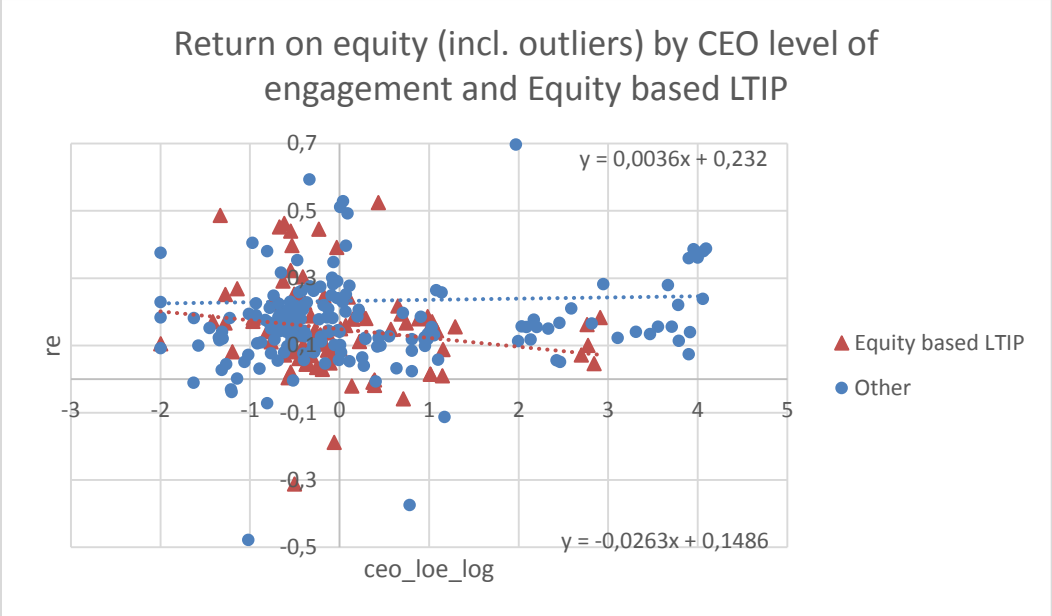

Figure 15 – Return on equity (incl. outliers) by CEO level of engagement and Equity based LTIP

In the diagram below, the outliers are excluded. This diagram is similar to the previous diagram with the exception that there is an intersection in the trend lines. The implications are, however, the same. The effect is due to either undetermined reasons or the limitations of the data.

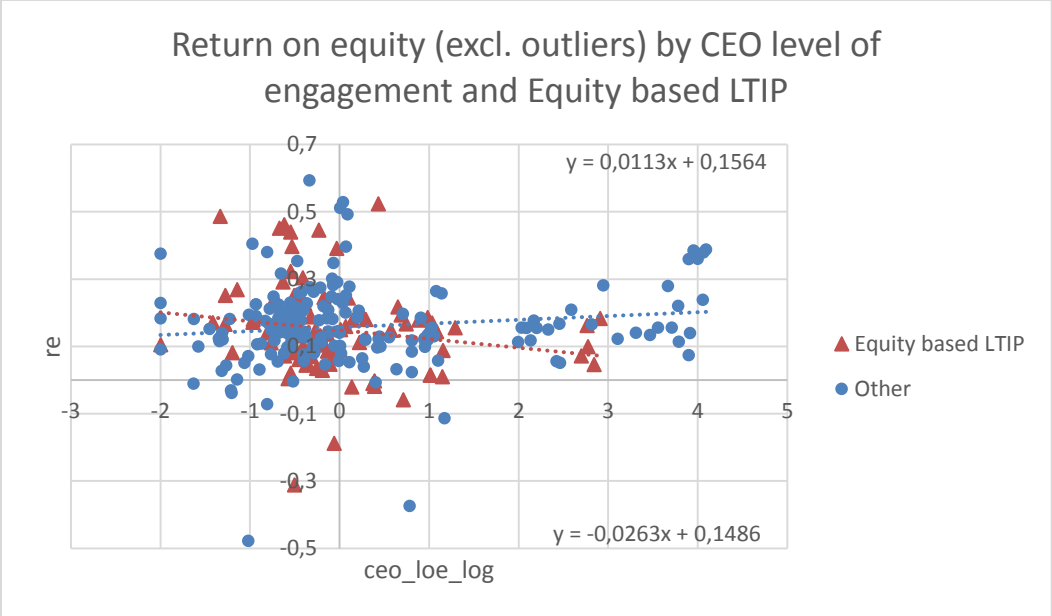

Figure 16 – Return on equity (excl. outliers) by CEO level of engagement and Equity based LTIP

The bar chart below presents the same data as the scatter plots further on with the exception that the bar chart displays the ceo_loe instead of the ceo_loe_log. The bar chart indicates that

the measure points in the ceo_loe 1.00-1.25 range over-performs on average. We assess this to be a probable effect of random variations since firms in the higher ranges do not over-perform. The findings does not indicate that firms with a higher CEO level of engagement would on average yield a higher return on capital employed than firms with a lower level.

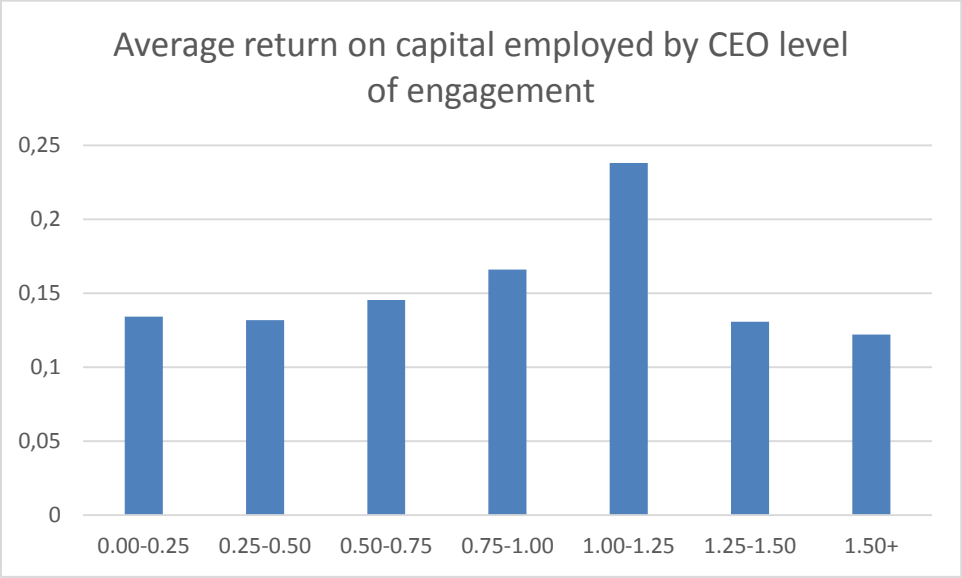

Figure 17 – Average return on capital employed by CEO level of engagement

In the scatter plot below, we provide a more detailed view of the findings. The diagram illustrates the relationship between the return on capital employed and the CEO level of engagement. The association between the two variables is weak which can be assessed by the shallow slope of the trend-line, which is similar in magnitude to the trend-line in the diagram for return on equity.

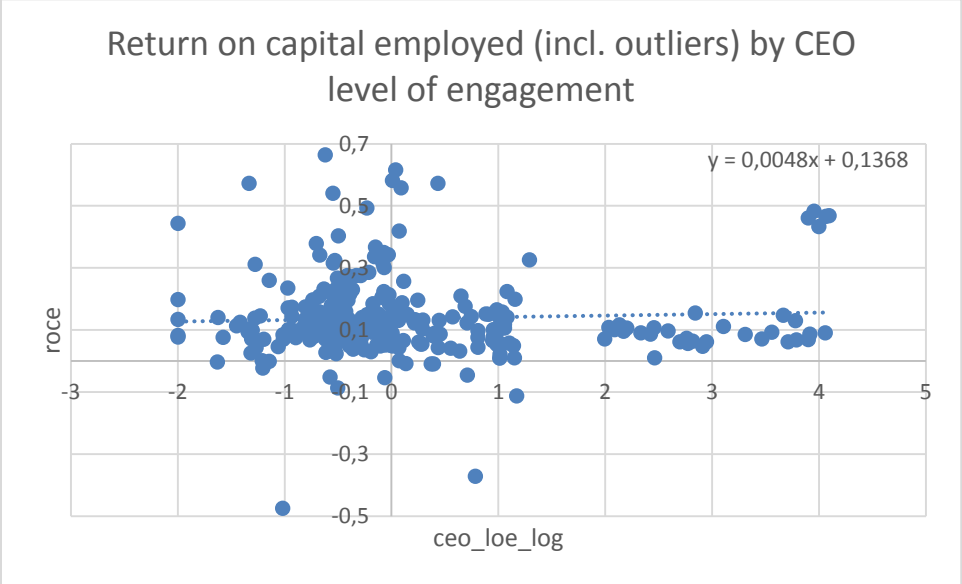

Figure 18 – Return on capital employed (incl. outliers) by CEO level of engagement

With the outliers removed, as presented in the diagram below, the slope is even shallower. This suggests that the association between the CEO level of engagement and the return on capital employed is marginal at best. The data does not provide any explanation for this, a possible explanation, however, is that CEOs with a higher level of engagement prioritize other factors than return on capital employed.

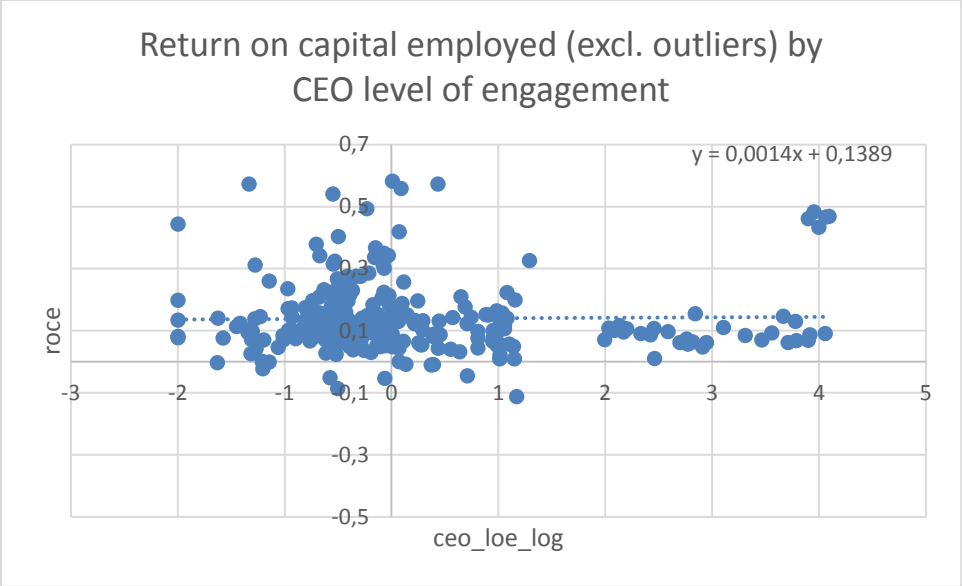

Figure 19 – Return on capital employed (excl. outliers) by CEO level of engagement

In the diagrams below, we have made a distinction between firms who do have an equity based LTIP in place and those that do not. The effect in these cases are similar to the effect that we observed in the previous diagrams that focused on the return on equity. In firms that both have a higher CEO level of engagement and have an equity based LTIP in place, the return on capital employed is lower. This is due to either unexplained reasons or the limitations of the data, nevertheless, these findings call for additional analysis of other factors.

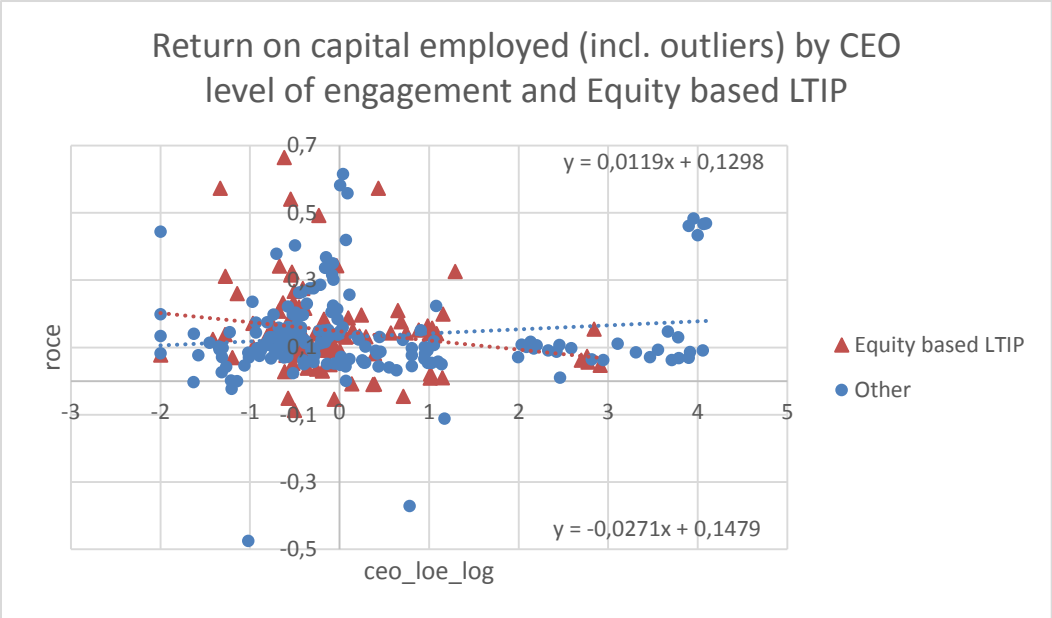

Figure 20 – Return on capital employed (incl. outliers) by CEO level of engagement and Equity based LTIP

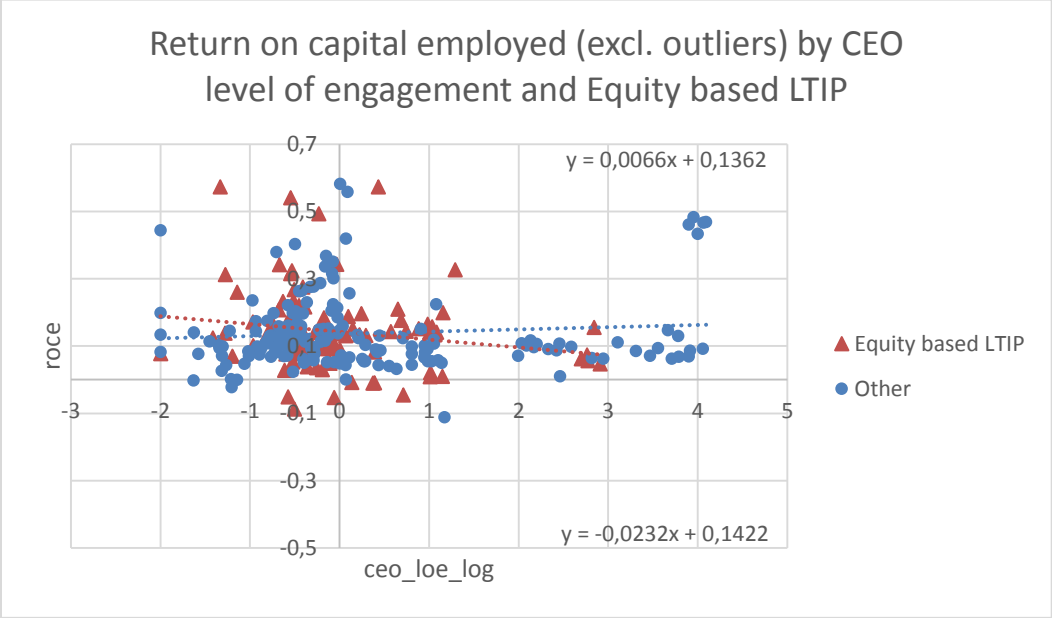

Figure 21 – Return on capital employed (excl. outliers) by CEO level of engagement and Equity based LTIP

4.2.3 Change in revenue and number of employees

In order to further investigate if the CEO level of engagement and equity based long-term incentive programs have an impact on other aspects, e.g. whether or not management with a higher degree of interest alignment with the shareholders prioritize other aspects such as growth. We have examined the relationship between these factors and the change in yearly revenue along with the change in the number of employees. In the diagrams below we present the relationship between the CEO level of engagement and the change in revenue from one year

to the next. The findings suggest a weak relationship, which can be inferred by the shallow slope of the trend-line.

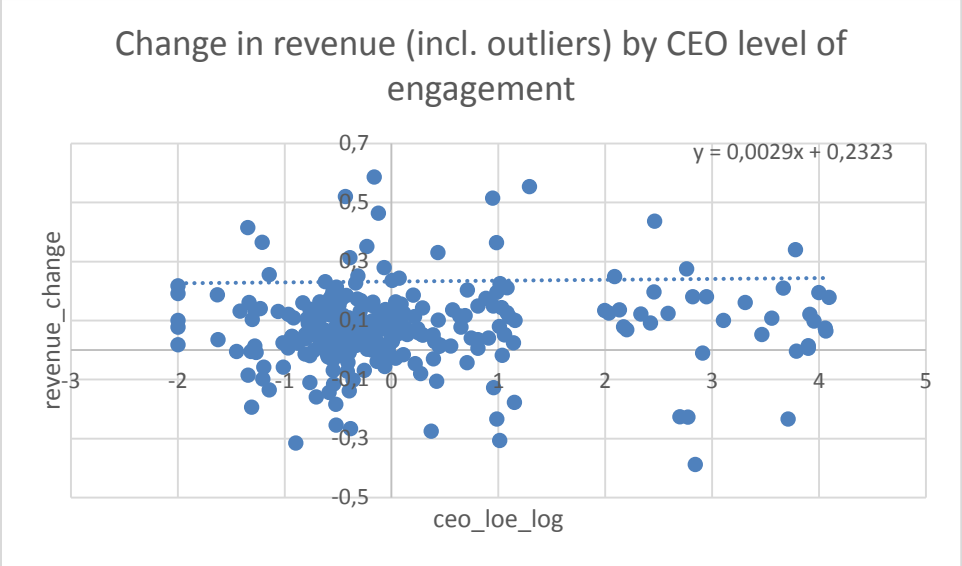

Figure 22 – Change in revenue (incl. outliers) by CEO level of engagement

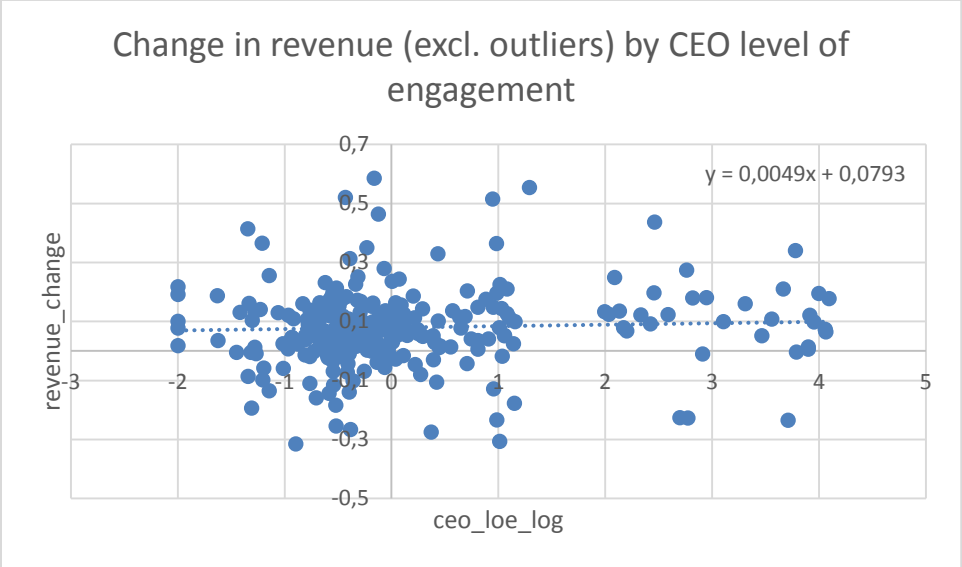

Figure 23 – Change in revenue (excl. outliers) by CEO level of engagement

Below we present the relationship between the CEO level of engagement and the change in number of employees from one year to the next. The first diagram suggests a weak negative relationship, this is however due to certain outliers which exert significant influence on the results. The second diagram suggests a weak positive relationship between the CEO level of engagement and the change in number of employees from one year to the next. Due to the inconclusive results, this data does not adequately support the hypothesis that the CEO level of engagement is related with the change in number of employees from one year to the next.

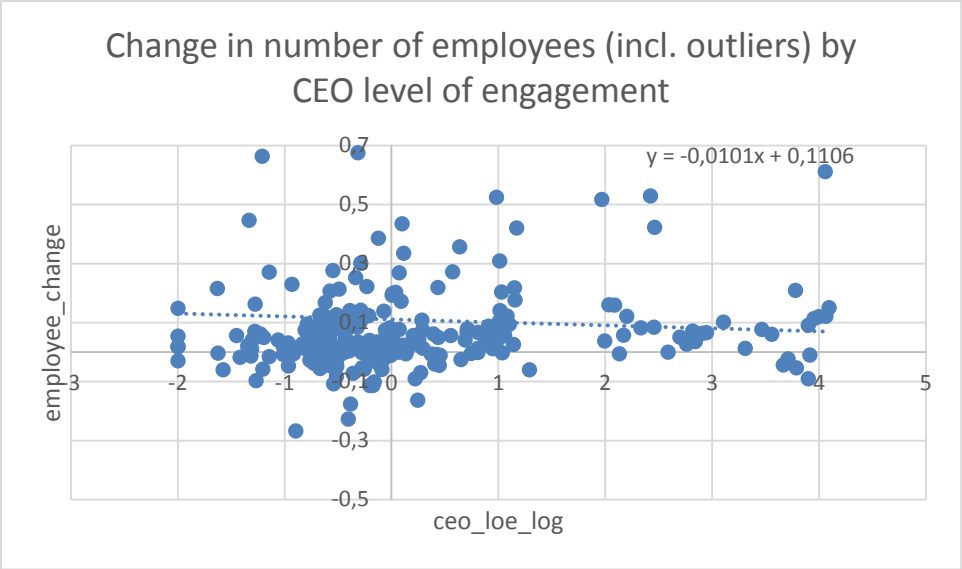

Figure 24 – Change in number of employees (incl. outliers) by CEO level of engagement

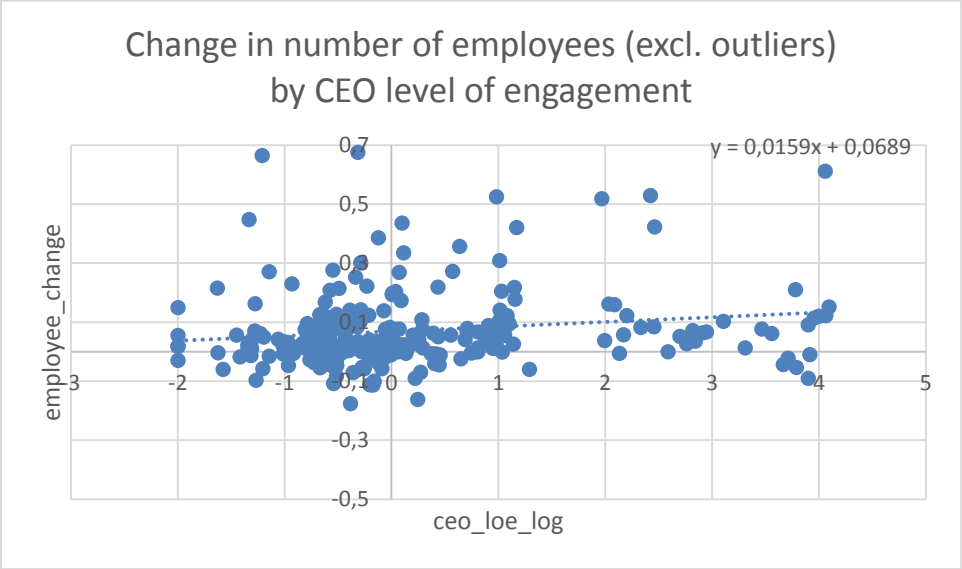

Figure 25 – Change in number of employees (excl. outliers) by CEO level of engagement

In the diagrams below, we have made a distinction between firms who have an equity based LTIP and those that do not.

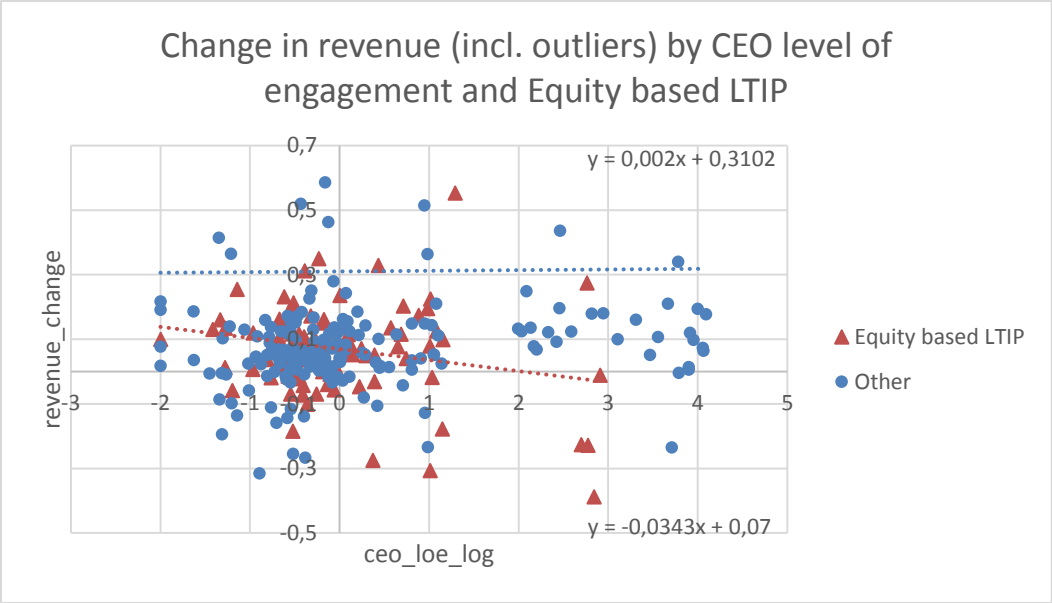

Figure 26 – Change in revenue (incl. outliers) by CEO level of engagement and Equity based LTIP

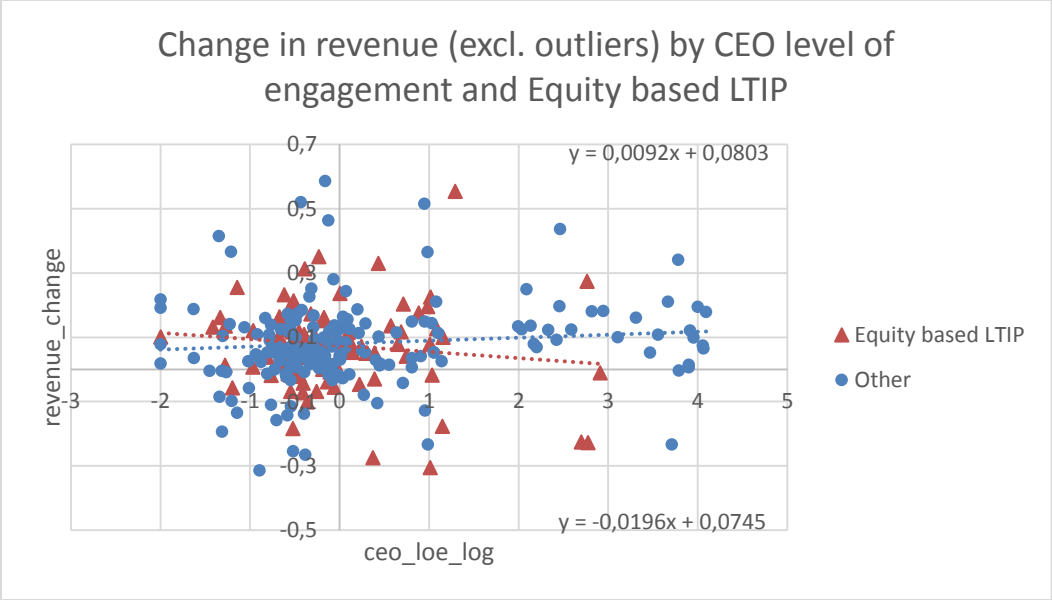

Figure 27 – Change in revenue (excl. outliers) by CEO level of engagement and Equity based LTIP

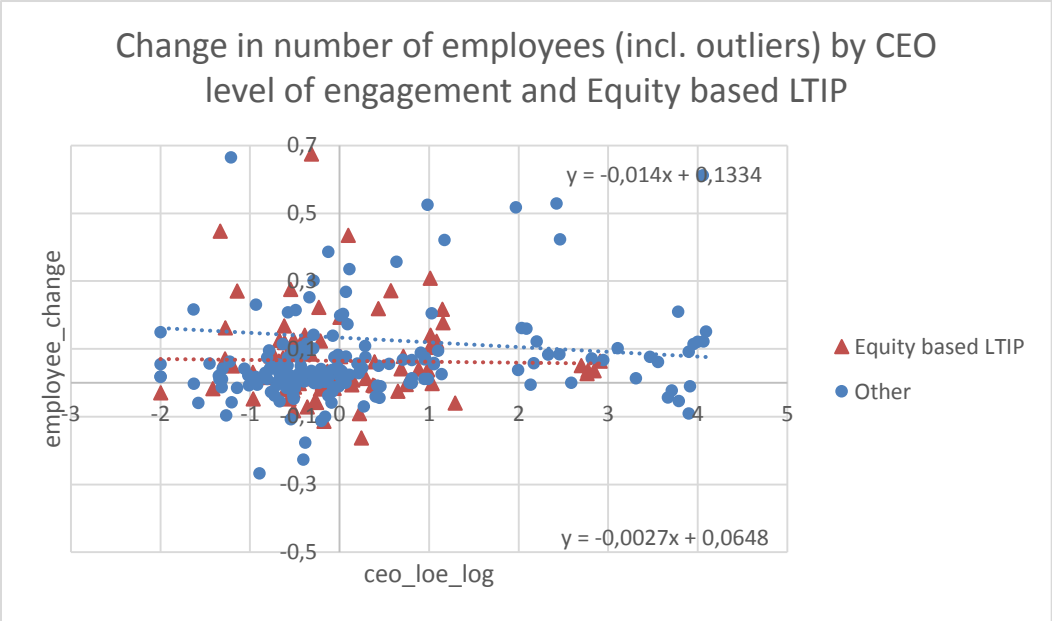

Figure 28 – Change in number of employees (incl. outliers) by CEO level of engagement and Equity based LTIP

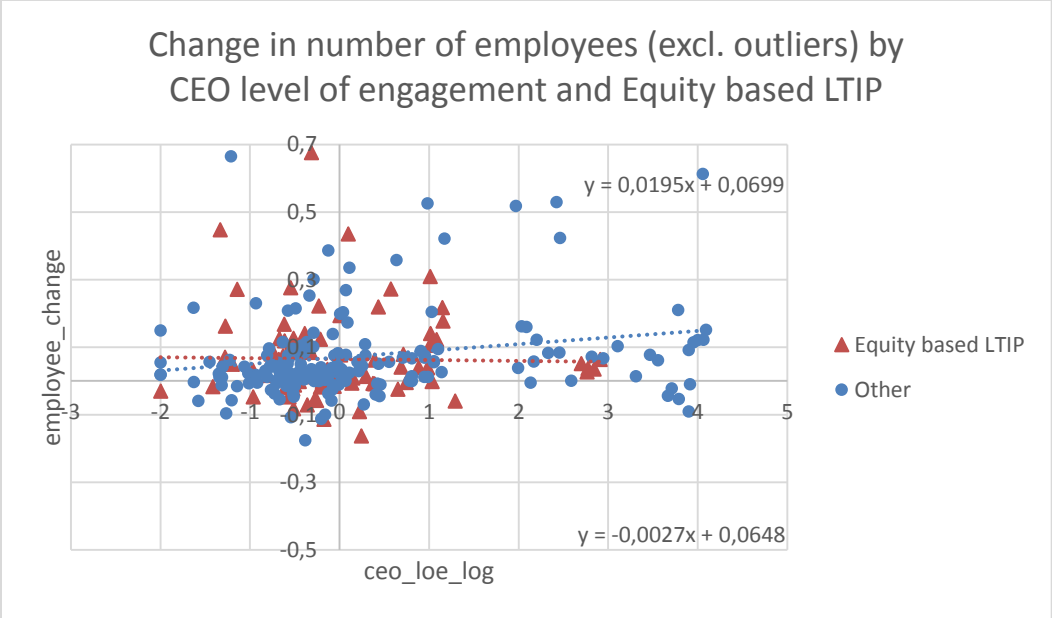

Figure 29 – Change in number of employees (excl. outliers) by CEO level of engagement and Equity based LTIP

By contrasting figure 26 with figure 27, it is clear that the outliers exert significant influence on the results. The large difference indicates that the limited data in regard to equity based LTIP alone is not sufficient to draw any general inferences from the results. However, it can be noted that firms who have an equity based LTIP in place combined with a CEO level of engagement in the higher spectrum have a negative or low growth in revenue as well as a lower growth in the number of employees, compared to firms that lack an Equity based LTIP. Hence, our findings do not suggest that firms with a higher CEO level of engagement that utilizes an Equity

based LTIP prioritize growth. This should nevertheless be interpreted with care since these findings may be influenced by undetermined factors due to the limited amount of data.

4.2.4 Correlation analysis

In the table below we have presented the Pearson product-movement correlation coefficient in a correlation matrix.

Correlations

		ceo_loe	yearly_perf	RE	ROCE	revenue_change	employee_change
ceo_loe	Pearson Correlation	1	,014	,013	,181**	-,018	,005
	Sig. (2-tailed)		,819	,826	,002	,767	,927
	N	278	278	278	278	278	278
yearly_perf	Pearson Correlation	,014	1	,042	,269**	,440**	,078
	Sig. (2-tailed)	,819		,490	,000	,000	,196
	N	278	278	278	278	278	278
RE	Pearson Correlation	,013	,042	1	,175**	,021	,003
	Sig. (2-tailed)	,826	,490		,004	,729	,957
	N	278	278	278	278	278	278
ROCE	Pearson Correlation	,181**	,269**	,175**	1	,115	,030
	Sig. (2-tailed)	,002	,000	,004		,055	,620
	N	278	278	278	278	278	278
revenue_change	Pearson Correlation	-,018	,440**	,021	,115	1	,865**
	Sig. (2-tailed)	,767	,000	,729	,055		,000
	N	278	278	278	278	278	278
employee_change	Pearson Correlation	,005	,078	,003	,030	,865**	1
	Sig. (2-tailed)	,927	,196	,957	,620	,000	
	N	278	278	278	278	278	278

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6 – Pearson correlation

In this table we find that only return on capital employed is positively associated with CEO level of engagement, which is inconsistent with our other findings presented further on. Due to the Pearson correlation coefficient being impractical to employ when the data is heavily influenced by outliers, we have only included it in order to be thorough. We will not go into detail analyzing the table further since we are aware of its limitations for this data.

Since our data is heavily influenced by outliers, we have presented the Spearman's rank correlation coefficient in a correlation matrix below since it is regarded as preferable when analyzing data with this limitation. Moreover, since Spearman correlation is also suitable for ordinal variables, it has allowed us to include the existence or non-existence of Equity based LTIPs in the matrix.

Correlations

			ceo_loe	equity_based_ltip	yearly_perf	RE	ROCE	revenue_change	employee_change
Spearman's rho	ceo_loe	Correlation Coefficient	1,000	-,003	,258**	,000	-,093	,112	,155**
		Sig. (2-tailed)	.	,959	,000	,997	,123	,061	,009
		N	278	278	278	278	278	278	278
	equity_based_ltip	Correlation Coefficient	-,003	1,000	,044	-,072	,034	-,025	-,025
		Sig. (2-tailed)	,959	.	,463	,234	,573	,684	,683
		N	278	278	278	278	278	278	278
	yearly_perf	Correlation Coefficient	,258**	,044	1,000	,196**	,126*	,142*	,039
		Sig. (2-tailed)	,000	,463	.	,001	,036	,018	,519
		N	278	278	278	278	278	278	278
	RE	Correlation Coefficient	,000	-,072	,196**	1,000	,756**	,339**	,267**
		Sig. (2-tailed)	,997	,234	,001	.	,000	,000	,000
		N	278	278	278	278	278	278	278
	ROCE	Correlation Coefficient	-,093	,034	,126*	,756**	1,000	,265**	,219**
		Sig. (2-tailed)	,123	,573	,036	,000	.	,000	,000
		N	278	278	278	278	278	278	278
	revenue_change	Correlation Coefficient	,112	-,025	,142*	,339**	,265**	1,000	,517**
		Sig. (2-tailed)	,061	,684	,018	,000	,000	.	,000
		N	278	278	278	278	278	278	278
	employee_change	Correlation Coefficient	,155**	-,025	,039	,267**	,219**	,517**	1,000
		Sig. (2-tailed)	,009	,683	,519	,000	,000	,000	.
		N	278	278	278	278	278	278	278

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 7 – Spearman correlation

In the table, we find that CEO level of engagement is positively correlated with yearly performance on the stock market and that the correlation is significant at the 0.01 level. This is in line with our expectations. Moreover, we also find that CEO level of engagement is positively correlated with the change in number of employees from one year to the next and that the correlation is significant at the 0.01 level. CEO level of engagement is also positively correlated with the change in revenue from one year to the next, although this relationship is not statistically significant. Moreover, we find that CEO level of engagement is negatively correlated with ROCE which is an unexpected finding, partly since our Pearson correlation coefficient showed a positive correlation in this regard. It should be noted however that this finding is not statistically significant and as such it would require additional data to investigate this possible relationship which is out of the scope for this study. It should be noted that the Spearman correlation coefficient does not display any statistically significant correlation between the utilization of equity based long-term incentive programs with our dependent variables.

4.2.5 Independent samples t-test

We have run an independent sample t-test to examine the relationship between our dependent variables and our independent variables of CEO level of engagement and the employment of equity based LTIP's. The results of the finding in relation to the CEO level of engagement are presented below. Since this test requires two grouping variables, we have made a distinction between firms with a CEO level of engagement of at least one and those with a ceo_loe of less than one (ceo_loe = 1 → ceo_loe_log = 0).

Group Statistics

	ceo_loe	N	Mean	Std. Deviation	Std. Error Mean
yearly_perf	>= 1,0000	105	,425971	1,5922921	,1553918
	< 1,0000	173	,109071	,2559025	,0194559
RE	>= 1,0000	105	,157467	,1389297	,0135582
	< 1,0000	173	,234702	1,1490101	,0873576
ROCE	>= 1,0000	105	,135674	,1591883	,0155352
	< 1,0000	173	,138572	,1417487	,0107770
revenue_change	>= 1,0000	105	,256071	1,3449804	,1312566
	< 1,0000	173	,218539	1,9286904	,1466356
employee_change	>= 1,0000	105	,102808	,1591119	,0155277
	< 1,0000	173	,112890	,7023842	,0534013

Table 8 – Group statistics for CEO level of engagement

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
yearly_perf	Equal variances assumed	5,106	,025	2,567	276	,011	,3169000	,1234732	,0738311	,5599690
	Equal variances not assumed			2,024	107,270	,046	,3169000	,1566051	,0064577	,6273424
RE	Equal variances assumed	2,658	,104	-,685	276	,494	-,0772350	,1127066	-,2991088	,1446388
	Equal variances not assumed			-,874	180,213	,383	-,0772350	,0884035	-,2516741	,0972041
ROCE	Equal variances assumed	1,145	,286	-,158	276	,875	-,0028981	,0183784	-,0390778	,0332817
	Equal variances not assumed			-,153	200,155	,878	-,0028981	,0189073	-,0401810	,0343849
revenue_change	Equal variances assumed	,050	,823	,175	276	,861	,0375316	,2142651	-,3842698	,4593330
	Equal variances not assumed			,191	270,668	,849	,0375316	,1968002	-,3499221	,4249853
employee_change	Equal variances assumed	1,095	,296	-,145	276	,885	-,0100821	,0696505	-,1471959	,1270317
	Equal variances not assumed			-,181	199,951	,856	-,0100821	,0556130	-,1197454	,0995812

Table 9 – Independent samples t-test for CEO level of engagement

In the Group statistics table, we observe that the mean yearly performance on the stock market is 0.425971 for the measure points with ceo_loe>1 and 0.109071 for ceo_loe<1. This difference

is statistically significant and in line with our expectation that firms where the executive has a larger stake in the firm will perform better on the stock market. According to the Levene's test with a sig. value that does not exceed 0.05 we should assess that equal variances are not assumed and study the second row for yearly_perf in the Independent Samples test above (Table 9). We find a sig. (t-tailed) value of 0.046, since sig. (2-tailed)≤0.05 we can reject the null hypothesis and accept H1.

-*H1: The ratio of executive owned equity to annual compensation is positively associated to the market performance of the firm's stock.* – supported

It should also be noted that the regression analysis on the aggregated year level in section 4.1.2 also found a statistically significant relationship in regard to the relationship between yearly performance and CEO level of engagement which provides additional evidence to strengthen our findings.

For the financial performance measures we have selected, there are also some notable differences. In the group statistics table, the distinguishing features we can observe is that mean return on equity is 0.157467 for ceo_loe>1 and 0.234702 for ceo_loe<1. This is not expected since our expectations is that a higher CEO level of engagement would have a positive impact on financial measures such as the return on equity. Another distinguishing feature is that the mean yearly change in revenue is 0.256071 for ceo_loe>1 and 0.218539 for ceo_loe<1. This is in line with our expectations and could be an indication that CEOs with a higher level of engagement is more prone to prioritize growth. However, with sig. (2-tailed) values of 0.494, 0.875, 0.861 and 0.885 for RE, ROCE, revenue_change and employee_change respectively, we cannot reject the null hypothesis for either measure since sig. (2-tailed)>0.05. The findings in regard to the relationship between CEO level of engagement and key financial performance measures in the independent samples t-test are not statistically significant. However, according to the Spearman rank correlation coefficient previously described, we found a statistically significant correlation between ceo_loe and employee_change. On the basis of this, we find H2 partly supported.

-*H2: The ratio of executive owned equity to annual compensation is positively associated to financial performance measures such as return on equity, return on capital employed, change in revenue and change in the number of employees.* – partly supported

The results of the findings in relation to the existence of Equity based long-term incentive programs are presented below. In this table, we have made a distinction between firms that do have an equity based LTIP (category 1), and those that do not (category 0).

Group Statistics

	equity_based_ltip	N	Mean	Std. Deviation	Std. Error Mean
yearly_perf	1	90	,188209	,3398795	,0358264
	0	188	,248178	1,2038410	,0877991
RE	1	90	,148598	,1359917	,0143348
	0	188	,232786	1,1027394	,0804255
ROCE	1	90	,147903	,1374629	,0144899
	0	188	,132487	,1533186	,0111819
revenue_change	1	90	,070009	,1654875	,0174439
	0	188	,310606	2,0966974	,1529174
employee_change	1	90	,064768	,1245953	,0131335
	0	188	,130297	,6775691	,0494168

Table 10 – Group statistics for Equity based LTIP

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
yearly_perf	Equal variances assumed	,285	,594	-,463	276	,643	-,0599685	,1294026	-,3147100	,1947730
	Equal variances not assumed			-,632	240,451	,528	-,0599685	,0948273	-,2467668	,1268299
RE	Equal variances assumed	1,934	,165	-,721	276	,472	-,0841887	,1167690	-,3140597	,1456822
	Equal variances not assumed			-1,031	198,649	,304	-,0841887	,0816930	-,2452856	,0769081
ROCE	Equal variances assumed	,290	,590	,810	276	,418	,0154163	,0190208	-,0220281	,0528606
	Equal variances not assumed			,842	193,848	,401	,0154163	,0183028	-,0206819	,0515144
revenue_change	Equal variances assumed	3,122	,078	-1,086	276	,278	-,2405966	,2215476	-,6767345	,1955412
	Equal variances not assumed			-1,563	191,830	,120	-,2405966	,1539091	-,5441681	,0629749
employee_change	Equal variances assumed	2,162	,143	-,909	276	,364	-,0655294	,0720624	-,2073912	,0763324
	Equal variances not assumed			-1,282	212,126	,201	-,0655294	,0511323	-,1663219	,0352631

Table 11 – Independent samples t-test for Equity based LTIP

We find that firms that do not have an equity based LTIP underperforms on all measures with the exception of ROCE. This is an effect of certain outliers which do not have an equity based LTIP which exert significant influence on the result. This can also be observed in that the standard deviation is significantly higher for category 0 than for category 1, for all measures with the exception of ROCE. This is an indication that firms who employ equity based LTIPs

do not perform better than other firms. A possible explanation for this finding is that the equity based long-term incentive programs which are employed are not effective at yielding the desired results (e.g. drive performance) or that there are other undetermined factors which impact the results.

However, with sig. (2-tailed) values of 0.643, 0.472, 0.418, 0.278 and 0.364 for yearly_perf, RE, ROCE, revenue_change and employee change respectively we cannot reject the null hypothesis for either measure since sig. (2-tailed)>0.05. The findings in regard to the relationship between the employment of equity based LTIP with both stock market performance and selected financial performance measures are not statistically significant.

-*H3: The utilization of equity based long-term incentive programs in firms is positively associated to the market performance of the firm's stock.* – not supported

-*H4: The utilization of equity based long-term incentive programs in firms is positively associated to financial performance measures such as return on equity, return on capital employed, change in revenue and change in the number of employees.* – not supported

Although this study finds evidence that support a relationship between the CEO level of engagement and the firm's performance on the stock market, the study has limitations in regard to other independent variables. Particularly in regard to the relationship between the utilization of equity based long-term incentive programs and performance. In this regard, the findings are inconclusive due to the limited amount of data. A larger study would be desirable to study this possible linkage. It should also be mentioned that although these incentive programs are designed to align the interests of the agent with those of the principal, it is not clear if they provide sufficient motivation. An enticing question in this regard is whether or not the programs are sufficiently well designed and provide an incentive large enough to motivate manager's to act more as "owners" as opposed to "agents".

5. Conclusions

In this chapter we begin with the theoretical and practical implications of our study. This is followed by the contributions and limitations of our study. Finally we conclude with making a few suggestions for further research.

5.1 Theoretical and practical implications

This paper investigates the relationship between executive shareholding and equity based long-term incentive programs with the performance of firms in a sample of 56 firms on Stockholm Large cap stock exchange in the period 2011-2016. The table below presents a summary of our findings:

Hypotheses	**Supported**
-H1: The ratio of executive owned equity to annual compensation is positively associated to the market performance of the firm's stock.	Yes
-H2: The ratio of executive owned equity to annual compensation is positively associated to financial performance measures such as return on equity, return on capital employed, change in revenue and change in the number of employees.	Partly
-H3: The utilization of equity based long-term incentive programs in firms is positively associated to the market performance of the firm's stock.	No
-H4: The utilization of equity based long-term incentive programs in firms is positively associated to financial performance measures such as return on equity, return on capital employed, change in revenue and change in the number of employees.	No

Table 12 – Hypotheses test summary

This study finds an interconnection between the CEO level of engagement (the value of the CEOs shareholding in relation to his salary) and a stronger performance on the stock-market, a relationship which is statistically significant. The implications of this are that firms where the CEO has a more substantial shareholding in relation to his salary attain higher performance on the stock market, relative to firms where the CEO has a less substantial shareholding in relation to his salary. On the other hand, this study does not find adequate support for the theory that the CEO level of engagement is related to other performance measures, such as return on equity, return on capital employed or revenue growth. A notable exception is the relationship between the CEO level of engagement and the change in the number of employees from one year to the next. In the latter case, the Spearman's rank correlation coefficient found a statistically significant relationship between these two variables whereas the independent sample's t-test did not find adequate support for such a relationship. Due to this inconsistency, we find this theory only partly supported.

In regard to the linkage between the CEO level of engagement and stronger performance on the stock market, this paper does not attempt to go into detail in explaining the nature of this relationship, but rather to determine its existence. As such, it is possible that CEOs with a larger stake in the company are taking more sound business decisions, leading to higher value creation

and ultimately a higher share price. On the other hand, it is also possible that the mere fact that the CEO has a larger stake in the company leads to expectations among shareholders that the firm will see higher value creation in the future. Expectations that in turn will lead to higher demand for the firm's shares and ultimately a higher stock price. Based on this possibility and also the inconclusive evidence in regard to the relationship between CEO level of engagement and financial performance (e.g. return on equity, return on capital employed and revenue growth) we cannot infer that a higher CEO level of engagement leads to higher value creation in the firm. We can, however, infer that a higher CEO level of engagement in a company leads to superior performance of the firm's shares on the market.

In regard to the utilization of equity based long-term incentive programs and their possible effect on performance. This study does not find adequate support for the theory that such a relationship exists. It should be noted however, that we cannot dismiss the possibility of such a linkage altogether. Merely that the evidence are not sufficiently strong. This could be a result of our sample being too limited to find general inferences on this particular aspect. It could also imply that the incentive programs are not sufficiently well designed or that other undetermined factors influence the results to a large degree.

5.2 Contribution

Although the field of management remuneration is a previously well-researched field. This study contributes in mainly three ways. First, since this is a study of Swedish firms, it provides findings relevant to management incentive structures in a Swedish context. This is important as it cannot be fully surmised that the findings from a study in the context of other countries could be fully applied to a Swedish context since there may be country specific variations. Second, although there has been previous efforts to analyze management remuneration in a Swedish context, e.g. Sahlin and Sakström (2009) and Kaleem and Siltanen (2009), this study contributes by providing contemporary findings based on the most recent data. Since several of the prior studies in a Swedish context are at least five years old, this study contributes by providing updated findings. Furthermore and more importantly, the hypotheses which have been tested in previous studies in a Swedish context have had dissimilarities with the hypotheses in this study and have mainly focused on accrual based performance measures, e.g. Kaleem & Siltanen (2009) as opposed to market performance of the firms' stock. This means that this study provides new insights and findings which have not previously been researched to a large extent. Third and lastly, this study also contributes in variable design since we have deemed it necessary to account for different executives' perception of the value of money. This is due to the notion that an investment of a particular sum of money may be regarded as high by some individuals and low by others as a result of factors such as different individuals' personal finances. Hence, in this thesis we have constructed a new variable which we call "CEO level of engagement" where we have put the value of the executives' shareholding in relation to his salary in an effort to account for this factor. As such, this study contributes by allowing other researchers to use or refine this variable for the purpose of conducting further studies.

5.3 Limitations

It should be noted that this study involves limitations. First, although a relatively large sample of Large cap is selected, the sample size is still limited to 56 firms and 280 individual measure points. Due to this limitation, we cannot confidently assess that our findings are generally applicable to firms selected on different selection criteria. Second, there may be other factors which may influence the results, such as Industry group or firm specific variations. We have not made any attempt to analyze the data depending on for instance, which industry group the firms belong to, since such an effort would make each sub-group too small to draw any generalizable inferences from. Even if this study would also include firms on OMX Stockholm Mid Cap, it is still uncertain if such an extended study would be sufficient to provide clear evidence of the existence of relationships which would be fully applicable to firms not included in the study. As such, this study provides finding which give clear indications of the existence of a relationship between certain variables, however, the results should still be interpreted with care.

5.4 Further research

Although this study finds evidence of a relationship between the CEO level of engagement and the performance of firms on the stock market. It should be noted that the existence of outliers influence the results significantly. For this reason, a further study could benefit from a larger sample and could possibly be expanded either into Mid Cap or even Small Cap, or even include firms from other countries which operate in a similar context as Swedish firms. To do this, however, would require careful considerations in certain regards since it would mix firms of varying sizes as well as firms governed by varying accounting practices, rules and regulations. The advantages would be a larger sample and possibly more robust findings, but could come at the expense of less conformity within the sample as well as possible challenges regarding the acquisition of data. Nevertheless, the results of an extended study would be advantageous for studying certain relationships. This is particularly true in regard to determining the possible linkage between the utilization of equity based long-term incentive programs and the performance of firms. By using a larger sample, it may be possible to study the relationship between firm performance and different categories of incentive programs as opposed to only one category. Moreover, the relationship between the CEO level of engagement and factors which could indicate value creation, such as growth and innovation, would likely benefit from further studies. In this study we partly found support for our theory that CEO level of engagement is related to growth, since we found partial evidence of a relationship between CEO level of engagement and the change in number of employees, a factor that can be related to growth. This possible relationship would likely benefit from further studies.

Another possibility of further research is to investigate if the higher performance on the stock market of firms with a higher CEO level of engagement is due to a higher degree of value creation or a result of investors' expectations of value creation. A possible method for investigating this could be to determine which impact the executives own trades (e.g. the purchases and sales) in the firm's shares have on the market performance of those shares. By investigating such a linkage, it may be possible to differentiate to which extent a higher market performance due to a higher CEO level of engagement is a result of either a higher degree of value creation or investor expectations of a higher degree of value creation.

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Appendix

Appendix 1

The list below has been used in our data selection. It has been extracted from Retriever Business and represents the firms that were listed on Large Cap Stockholm OMX on February 1, 2017. The firms which have been marked with dark gray have been excluded according to our selection criteria which are described in section 3.2.2.

Company	Listed since 31/12 2009	Parent company registration number	Industry sub-group	Industry main group	Parent company
AAK AB (publ)	Yes	-	Huvudkontor	Företagstjänster	-
AB Sagax	Yes	-	Huvudkontor	Företagstjänster	-
ABB Norden Holding AB	Yes	AAA0550112	Huvudkontor	Företagstjänster	ABB LTD
Ahlsell AB (publ)	No	AAA1075028	Huvudkontor	Företagstjänster	KERAVEL SA
Aktiebolaget Electrolux	Yes	-	Huvudkontor	Företagstjänster	-
Aktiebolaget Industrivärden	Yes	-	Investment- & riskkapitalbolag	Bank, finans & försäkring	-
Aktiebolaget SKF	Yes	-	Huvudkontor	Företagstjänster	-
Aktiebolaget Volvo	Yes	-	Motorfordonstillverkning	Tillverkning & industri	-
Alfa Laval AB	Yes	-	Holdingverksamhet i icke-finansiella koncerner	Bank, finans & försäkring	-
ASSA ABLOY AB	Yes	-	Huvudkontor	Företagstjänster	-
AstraZeneca AB	Yes	AAA0589464	Läkemedel, tillverkning	Tillverkning & industri	ASTRAZENECA PLC
Atlas Copco Aktiebolag	Yes	-	Huvudkontor	Företagstjänster	-
Atrium Ljungberg AB	Yes	-	Uthyrning & förvaltning av fastigheter	Fastighetsverksamhet	-
Attendo AB (publ)	No	-	Konsultverksamhet avseende företags org.	Juridik, ekonomi & konsulttjänster	-
Autoliv Holding AB	Yes	AAA0486393	Holdingverksamhet i icke-finansiella koncerner	Bank, finans & försäkring	AUTOLIV INC
Avanza Bank Holding AB	Yes	-	Förvaltning & handel med värdepapper	Bank, finans & försäkring	-
Axfood Aktiebolag	Yes	5560392226	Huvudkontor	Företagstjänster	AxRetail AB
Axis Aktiebolag	Yes	-	Datorer, program & kringutr, partihandel	Partihandel	-
Betsson AB	Yes	-	Spel- & vadhållningsverksamhet	Kultur, nöje & fritid	-
BillerudKorsnäs Aktiebolag (publ)	Yes	-	Huvudkontor	Företagstjänster	-
Boliden AB	Yes	-	Holdingverksamhet i icke-finansiella koncerner	Bank, finans & försäkring	-
Bonava AB (publ)	No	5560345174	Huvudkontor	Företagstjänster	NCC Aktiebolag
Bravida Holding AB	No	5569305625	Huvudkontor	Företagstjänster	Bravissima Holding AB
Castellum Aktiebolag	Yes	-	Huvudkontor	Företagstjänster	-
Collector AB	No	-	Finansiella stöd tjänster, övriga	Bank, finans & försäkring	-
Com Hem Holding AB	No	-	Huvudkontor	Företagstjänster	-
Comvik International Aktiebolag	Yes	AAA0605302	-	-	MILLICOM HOLDING BV
Dometic Group AB (publ)	No	-	Kontorstjänster	Företagstjänster	-
Elekta AB (publ)	Yes	-	Huvudkontor	Företagstjänster	-

Fabege AB	Yes	-	Huvudkontor	Företagstjänster	-
Fastighets AB Balder	Yes	5565725586	Uthyrning & förvaltning av fastigheter	Fastighetsverksamhet	Erik Selin Fastigheter Aktiebolag
Fingerprint Cards AB	Yes	-	Elektriska komponenter & kretskort, tillverkning	Tillverkning & industri	-
Getinge AB	Yes	-	Huvudkontor	Företagstjänster	-
H & M Hennes & Mauritz AB	Yes	5564235769	Huvudkontor	Företagstjänster	Ramsbury Invest AB
Hemfosa Fastigheter AB	No	-	Uthyrning & förvaltning av fastigheter	Fastighetsverksamhet	-
Hexagon Aktiebolag	Yes	-	Huvudkontor	Företagstjänster	-
HEXPOL AB	Yes	-	Finansiella stödtjänster, övriga	Bank, finans & försäkring	-
Holmen Aktiebolag	Yes	-	Huvudkontor	Företagstjänster	-
Hufvudstaden AB	Yes	-	Uthyrning & förvaltning av fastigheter	Fastighetsverksamhet	-
Husqvarna Aktiebolag	Yes	-	Maskiner, tillverkning	Tillverkning & industri	-
ICA Gruppen Aktiebolag	Yes	8020015577	Huvudkontor	Företagstjänster	Ica Handlarnas Förbund
Indutrade Aktiebolag	Yes	-	Huvudkontor	Företagstjänster	-
Intrum Justitia AB	Yes	-	Huvudkontor	Företagstjänster	-
Investmentaktiebolaget Latour	Yes	-	Investment- & riskkapitalbolag	Bank, finans & försäkring	-
Investor Aktiebolag	Yes	-	Investment- & riskkapitalbolag	Bank, finans & försäkring	-
JM AB	Yes	-	Byggverksamhet	Bygg-, design- & inredningsverksamhet	-
Kinnevik AB	Yes	-	Förvaltning & handel med värdepapper	Bank, finans & försäkring	-
Klövern AB	Yes	-	Uthyrning & förvaltning av fastigheter	Fastighetsverksamhet	-
Kungsleden Aktiebolag	Yes	-	Huvudkontor	Företagstjänster	-
L E Lundbergföretagen Aktiebolag (publ)	Yes	-	Huvudkontor	Företagstjänster	-
Lifco AB (publ)	No	5563790715	Huvudkontor	Företagstjänster	Carl Bennet AB
Loomis AB	Yes	-	Huvudkontor	Företagstjänster	-
Lundin Mining AB	Yes	AAA0540547	Utvinning, stödtjänster	Tillverkning & industri	LUNDIN MINING CORP
Lundin Petroleum AB	Yes	-	Utvinning, stödtjänster	Tillverkning & industri	-
Melker Schörling AB	Yes	5566092168	Förvaltning & handel med värdepapper	Bank, finans & försäkring	Melker Schörling Tjänste AB
Modern Times Group MTG AB	Yes	-	Huvudkontor	Företagstjänster	-
NCC Aktiebolag	Yes	5560001421	Byggverksamhet	Bygg-, design- & inredningsverksamhet	Nordstjernan Aktiebolag
NetEnt AB (publ)	Yes	-	Dataprogrammering	Data, it & telekommunikation	-
NIBE Industrier AB	Yes	-	Huvudkontor	Företagstjänster	-
Nobia AB	Yes	-	Huvudkontor	Företagstjänster	-
Nordea Bank AB	Yes	-	Monetär finansförmedling, övrig	Bank, finans & försäkring	-
Pandox Aktiebolag	No	-	Huvudkontor	Företagstjänster	-
Peab AB	Yes	-	Huvudkontor	Företagstjänster	-
Ratos AB	Yes	-	Investment- & riskkapitalbolag	Bank, finans & försäkring	-

Resurs Holding AB (publ)	No	AAA1080960	Huvudkontor	Företagstjänster	CIDRON SEMPER LTD
SAAB Aktiebolag	Yes	-	Transportmedelsindustri	Tillverkning & industri	-
Sandvik Aktiebolag	Yes	-	Metallindustri	Tillverkning & industri	-
Securitas AB	Yes	-	Huvudkontor	Företagstjänster	-
Skandinaviska Enskilda Banken AB	Yes	-	Monetär finansförmedling, övrig	Bank, finans & försäkring	-
Skanska AB	Yes	-	Huvudkontor	Företagstjänster	-
SSAB AB	Yes	-	Huvudkontor	Företagstjänster	-
Stora Enso AB	Yes	AAA0485624	Huvudkontor	Företagstjänster	STORA ENSO OYJ
SWECO AB (publ)	Yes	-	Huvudkontor	Företagstjänster	-
Swedbank AB	Yes	-	Monetär finansförmedling, övrig	Bank, finans & försäkring	-
Swedish Match AB	Yes	-	Huvudkontor	Företagstjänster	-
Swedish Orphan Biovitrum AB (publ)	Yes	-	Medicinsk utrustning & apoteksvaror, partihandel	Partihandel	-
Svenska Cellulosa Aktiebolaget SCA	Yes	-	Huvudkontor	Företagstjänster	-
Svenska Handelsbanken AB	Yes	-	Monetär finansförmedling, övrig	Bank, finans & försäkring	-
Tele2 AB	Yes	-	Huvudkontor	Företagstjänster	-
Telefonaktiebolaget L M Ericsson	Yes	-	Huvudkontor	Företagstjänster	-
Telia Company AB	Yes	-	Huvudkontor	Företagstjänster	-
Thule Group AB	No	-	Transportmedelsindustri	Tillverkning & industri	-
Tieto Sweden Professional Services Aktiebolag	Yes	AAA0529657	Holdingverksamhet i icke-finansiella koncerner	Bank, finans & försäkring	TIETO OYJ
Trelleborg Aktiebolag	Yes	-	Huvudkontor	Företagstjänster	-
Wallenstam AB	Yes	-	Uthyrning & förvaltning av fastigheter	Fastighetsverksamhet	-
Wihlborgs Fastigheter AB	Yes	-	Uthyrning & förvaltning av fastigheter	Fastighetsverksamhet	-
ÅF AB	Yes	-	Huvudkontor	Företagstjänster	-

Table 13 – Selection of companies

Appendix 2

The tables below present the random and fixed effects including both one and two year lags. These tables are put in the appendix instead of the findings chapter, since the application of lags decrease the number of observations.

Fixed effects including one year lag:

```
note: industry_main_group_no omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       222
Group variable: companynum                      Number of groups   =        56

R-sq:  within  = 0.6178                         Obs per group: min =         2
       between = 0.2467                                        avg =       4.0
       overall = 0.0044                                        max =         4

                                                F(5,161)           =     52.04
corr(u_i, Xb)  = -0.9220                        Prob > F           =    0.0000
```

yearly_perf	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ceo_loe_log						
--.	.436742	.1166129	3.75	0.000	.206454	.6670301
L1.	-.71401	.1263877	-5.65	0.000	-.9636014	-.4644186
equity_based_ltip	-.1555251	.3510059	-0.44	0.658	-.8486944	.5376442
revenue_log	5.146779	.4812997	10.69	0.000	4.196304	6.097253
no_employees_log	-1.987856	.8845479	-2.25	0.026	-3.734669	-.2410439
industry_main_group_no	0	(omitted)				
_cons	-29.26781	2.507116	-11.67	0.000	-34.21888	-24.31673
sigma_u	2.4872144					
sigma_e	.6552382					
rho	.93510205	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(55, 161) =     6.46             Prob > F = 0.0000
```

Table 14 – Fixed effects including one year lag

Random effects including one year lag:

```
Random-effects GLS regression                   Number of obs      =       222
Group variable: companynum                      Number of groups   =        56

R-sq:  within  = 0.3601                         Obs per group: min =         2
       between = 0.0090                                        avg =       4.0
       overall = 0.1578                                        max =         4

                                                Wald chi2(6)       =     72.31
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

yearly_perf	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ceo_loe_log						
--.	.7572257	.1161711	6.52	0.000	.5295345	.9849168
L1.	-.766428	.1193918	-6.42	0.000	-1.000432	-.5324243
equity_based_ltip	-.1880367	.2053618	-0.92	0.360	-.5905384	.214465
revenue_log	1.192179	.3118791	3.82	0.000	.5809068	1.80345
no_employees_log	-.9610219	.2457751	-3.91	0.000	-1.442732	-.4793116
industry_main_group_no	.1820052	.0687879	2.65	0.008	.0471833	.3168271
_cons	-5.649859	1.580889	-3.57	0.000	-8.748344	-2.551374
sigma_u	.43956325					
sigma_e	.6552382					
rho	.31036051	(fraction of variance due to u_i)				

Table 15 – Random effects including one year lag

Fixed effects including two year lag:

```
note: industry_main_group_no omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       166
Group variable: companynum                      Number of groups   =        56

R-sq:  within  = 0.7038                         Obs per group: min =         1
       between = 0.1625                                        avg =       3.0
       overall = 0.0102                                        max =         3

                                                F(6,104)           =     41.18
corr(u_i, Xb)  = -0.9456                        Prob > F           =    0.0000
```

yearly_perf	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ceo_loe_log						
--.	.5480208	.1637797	3.35	0.001	.2232395	.872802
L1.	-.7227931	.1678443	-4.31	0.000	-1.055635	-.3899516
L2.	-.0235592	.1673123	-0.14	0.888	-.3553457	.3082273
equity_based_ltip	-.3482908	.5794817	-0.60	0.549	-1.497425	.8008431
revenue_log	7.497906	.73344	10.22	0.000	6.043467	8.952345
no_employees_log	-2.524627	1.131887	-2.23	0.028	-4.769202	-.2800526
industry_main_group_no	0	(omitted)				
_cons	-44.14047	4.178819	-10.56	0.000	-52.42722	-35.85371
sigma_u	3.5905923					
sigma_e	.65474734					
rho	.96781829	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(55, 104) =     6.27             Prob > F = 0.0000
```

Table 16 – Fixed effects including two year lag

Random effects including two year lag:

```
Random-effects GLS regression                   Number of obs      =       166
Group variable: companynum                      Number of groups   =        56

R-sq:  within  = 0.4151                         Obs per group: min =         1
       between = 0.1001                                        avg =       3.0
       overall = 0.2547                                        max =         3

                                                Wald chi2(7)       =     81.59
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

yearly_perf	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ceo_loe_log						
--.	.8568835	.1524078	5.62	0.000	.5581697	1.155597
L1.	-1.188694	.1733058	-6.86	0.000	-1.528367	-.8490209
L2.	.3805542	.175843	2.16	0.030	.0359082	.7252002
equity_based_ltip	-.1534549	.2743727	-0.56	0.576	-.6912155	.3843057
revenue_log	1.159628	.4359574	2.66	0.008	.3051674	2.014089
no_employees_log	-.989826	.3313475	-2.99	0.003	-1.639255	-.3403969
industry_main_group_no	.2063085	.0882348	2.34	0.019	.0333714	.3792456
_cons	-5.38492	2.215682	-2.43	0.015	-9.727578	-1.042262
sigma_u	.57244751					
sigma_e	.65474734					
rho	.4332369	(fraction of variance due to u_i)				

Table 17 – Random effects including two year lag

Appendix 3

The annual reports from the following companies for the years 2011 – 2015 have been used in the data collection:

AAK
Alfa Laval
Assa Abloy
Atlas Copco
Atrium Ljungberg
Axfood
Axis
Balder
Betsson
BillerudKorsnäs
Boliden
Castellum
Electrolux
Elekta
Ericsson
Fabege
Fingerprint Cards
Getinge
H&M
Hexagon
Holmen
Hufvudstaden
Husqvarna
ICA Gruppen
Indutrade
Intrum Justitia
JM
Klövern
Kungsleden
Loomis
Lundbergsföretagen
MTG
Lundin Petroleum
NCC
Netent
Nibe
Nobia
Peab
SAAB
Sagax
Sandvik
SCA
Securitas
Skanska
SKF
SSAB
Sweco
Swedish Match
Swedish Orphan Biovitrum
Tele2
Telia
Trelleborg
Volvo
Wallenstam
Wihlborgs Fastigheter
ÅF