Abnormal Returns on Employee Stock Option Grants

An Event Study on Stockholm Stock Exchange

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Abstract

The objective of this thesis is to investigate if there exists a statistically significant abnormal return on employee stock option grants for Swedish listed firms. If so, this could be an indication of corporate insiders systematically using private information to manipulate the granting of employee stock options. The study complements previous research as it is conducted in a different institutional conext than the Anglo-American predominantly examined. Out of several discrepancies it can be mentioned that the Swedish market is characterized by a concentraded ownership structure and a different juristdictional tradition.

In addition to this our study will also test if there is any relation between six chosen corporate governance determinants and the cumulative abnormal return on the grants. The corporate governance determinants studied includes firm size, listing age, CEO tenure, technology intensity, prior stock performance and proportion of voting rights held by the largest shareholder. Further, we also investigate how the 2008 financial crisis has affected the cumulative abnormal return on employee stock options in Sweden.

The empirical findings are based on a data sample containting 517 stock option grants occurring between January 1st, 2006 and Decemeber 31th, 2015. The results show no significant findings of an abnormal return pattern on employee stock option grants for insiders in Swedish listed firms. However, our study does find a significant negative relationship between two corporate governance variables, voting rights and prior performance, and the cumulative abnormal return around the option grants. Supprisingly we also find a significant increase in abnormal returns after the financial crisis irrespective of increased regulations.

Keywords: Employee stock options, Timing of option grants, Backdating, Corporate governance, Insider trading, Agency costs, Option manipulation

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We would also like to address a thought to Ulf Persson at Nasdaq OMX who helped us with the historical composition of companies at each of the three main lists at the Stockholm Stock Exchange for the end of each year in our study.

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1. Introduction

This chapter will present the background of the selected subject of our thesis, which is the manipulation of employee stock option grants. We will discuss the purpose of our research, the specifications of the problem and its structure and delimitations.

1.1 Background

In 2009 James J. Treacy, the former chief operating officer of Monster Worldwide, one of the world's largest employment websites, was sentenced to two years in prison and a multi-million dollar forfeit for an option backdating scheme (Bloomberg News, 2011). The company itself admitted to overstating its earnings by a staggering $271.9 million over the period 1998 – 2006 because of improperly recorded employee stock option grants. Monster was just one of more than 140 firms that had to restate their earnings after the American federal authorities started to unravel what proved to be a common practice among many US listed companies (Quinn, 2009). Since then harder regulations have been enforced to ensure similar scandals are avoided. But due to the adverse effect these scandals have, both pecuniary and trust wise, for investors and the fact that research as Edelson & Whisenant (2009) indicates that many firms got away with their actions we find it meaningful to investigate if employee stock option manipulation still occurs. We are however to do it for the Swedish market as it has, to our knowledge, never been examined previously.

There exists a rich flora of literature on how the owners of a company can best motivate management to put forth their greatest effort to maximize the value of the company. One popular view is that it can be at least partly done by letting the compensation to management be contingent on the performance of the company. There are many ways in which compensation schemes can be structured according to this principle. One common approach among listed companies is to measure the performance by looking at the development of the stock price. A positive development in the stock thus gives the management a higher compensation. By granting management shares or stock options as part of their remuneration package owners hope to align management's interest with their own. However alongside the research papers advocating these types of compensation plans there has sporadically emerged studies showing that management sometimes abuse their position in connection to the granting of these contingent compensation tools, thus giving rise to agency costs for the firm and the rest of its stakeholders.

In our thesis we will focus on the times when companies are using employee stock options as a tool to align management's interest with those of the owners who wish to maximize their returns. Prior literature has suggested that executives can manipulatively influence the returns on granted stock options mainly through two channels: backdating and timing. The first channel, backdating can be described as managers artificially selecting the date with the lowest stock price in the recent past as the grant date. This benefits the managers as the strike price is conventionally set to be equal to the stock price at the day of the issue (Lie, 2006). By choosing a former date where the stock price was lower than the price on the actual grant date manager's award themselves a risk free profit (Lie, 2005). This type of conduct is illegal (Fried, 2008) and has been the source to several corporate scandals as discussed in the opening lines of this section.

Previous research, such as the study by Aboody and Kasznik (2000), finds indications that management also use the second channel by timing the announcement of news, which will affect stock prices, against when their stock options are granted. By delaying good news until after options are granted, while presenting the bad news before option grants, management can manipulate the return they will achieve. This type of behavior is without a doubt unethical, and may very well be illegal as well. Both methods could have severe impacts on the economy. Not only do they directly hurt the shareholders on whose expense management is earning extra money, but it might also be devastating for the long-term trust investors have for equity markets as an investment vehicle. Would the problem prove to be that extensive it could potentially have a negative effect on the whole society by depressing economic prosperity.

1.2 Purpose of research

Our research aims at clarifying whether insiders are using their superior insight to the operations of the company to grant themselves unjust rewards on the expense of other shareholders. We are specifically going to map if this occurs through manipulation of employee stock option grants. The purpose of our study is to shed light on the situation on the Swedish market to examine if further legislation or other public actions are needed to protect shareholders from this kind of adverse acts.

In contrast to most previous studies on employee stock option manipulation, which investigate the US market, we have decided to conduct our research on the Swedish market. The purpose of doing so is that the Swedish market is our native market but also that it is

less studied, thus making it an interesting research object. We expect to find some deviations from previous study results as they have predominantly been conducted in an Anglo-American institutional context which differs from the one prevalent in Sweden.

Our study also takes a slightly different approach by including all insiders and not only executives as common in previous academic studies. The purpose of this is to examine if other insiders besides just executives might be using their superior insight to the company to earn abnormal returns on employee stock options. When referring to insiders in our thesis we include executive management, board members and accountants.

1.3 Problem statement

The main hypothesis we wish to investigate in our thesis is stated as follows:

Insiders in firms listed at Nasdaq OMX Stockholm opportunistically manipulate employee stock option grants to earn positive abnormal returns

With this hypothesis we want to examine if Swedish insiders manipulate their employee stock option grants. We do this by measuring if they earn abnormal returns, returns beyond what could normally be expected, around their employee stock option grants. Positive abnormal returns would be an indication that insiders are using one of the two channels introduced in the background section: backdating or timing.

As tighter regulation, a subject that will be discussed more in depth in the literature review, demands option grants to be reported within a few days to the authorities it is believed backdating occurs much less frequently, if at all, these days. When it comes to timing it is harder for authorities to control as it is not always clear exactly when the news have arisen. When we talk about timing we refer to the timing of one out of the following two;

1) Timing of news announcements - so the announcement of good (bad) news is timed according to the scheduled grant dates in order to drive the stock price up after (down before) the option grants.

2) Timing of grant dates – so the issue date is set just before the announcement of good corporate news, allowing the recipients to get the benefit of the stock price increase included in their option value.

We believe that abnormal return on employee stock option grants is an important subject to research since manipulation through either of the two channels could be harmful to shareholders. Insiders would indirectly be rewarding themselves for results achieved prior to the grants. This is in contrary to the intended objective of grants which is to motivate management to work harder after being granted options. These types of actions, if prevalent and recurrent, could also harm one of the most important pillars of today's equity markets, namely trust. If investors cannot trust that financial statements are correct and that the agents hired to manage their investments are acting in the investors' best interest it might lead them to pull their funds and search for alternative investment opportunities outside of equity markets.

In order to closer analyze what impacts whether insiders earn abnormal returns on their employee stock option grants we will in addition to our main hypothesis also test seven sub-hypothesis. These will help us examine if the potential abnormal return on stock options are connected to factors related to corporate governance or time determinants of the firms. All seven sub-hypotheses will be presented, thoroughly discussed and justified by being linked to previous research in chapter three.

1.4 Structure of the thesis

Our thesis is organized in seven chapters, including this introductory section. Chapter two is going to give readers an introduction to relevant theory in order to build a foundation, which can facilitate the understanding of subsequent chapters. We believe that by starting out with the theory readers will better understand the result of previous studies and the methods we have used in our investigation of the Swedish market. The theory will be followed by a review of previous research in chapter three. By gaining insight to the studies that has been made before us, mainly on the US market but also on the European, it should become clear that our chosen topic is a relevant one. It will also serve as a section which provides the reader with a benchmark against which to compare the results from our study.

After the literature review we will devote chapter four to the formulation and justification of our hypotheses before we continue our paper with chapter five. There we introduce the methods and data actually used to conduct our examination of the Swedish market. In this section we will list all the necessary formulas and data sources needed to reconstruct our whole study. With the method and data in place the empirical results obtained will be

presented, discussed and analyzed in chapter six. We finish off our thesis with chapter seven containing conclusions and recommendation on further research questions within the topic.

1.5 Delimitations

With our study we should be able to tell if there is empirical evidence of an abnormal return pattern around employee stock option grants for Swedish listed firms. However we will not be able to distinguish if the abnormal return, if found, is a result of opportunistic timing of grant dates, timing of news announcements or backdating. This is due to data and time limits which have forced us to limit the scope of our research and thus omit further investigation of when news announcements were made in relation to option grants.

2. Theory

In this chapter we first briefly introduce agency theory before we review the concept of corporate governance and incentive based remuneration with the Swedish context in mind. This gives the reader an introduction to the environmental context in which the study is conducted.

2.1 The Principal-Agent problem

A principal agent relationship can be defined as a contract where a principal employs an agent to perform some service on his behalf which involves the agent getting some decision-making authority (Jensen and Meckling, 2000). The shareholder (the principal) wants the manager (the agent) to take on actions which maximizes the shareholders wealth, however sometimes the management has goals conflicting with the interest of the shareholders. This could be exemplified by empire building which is when a manager is trying to maximize the dollar value of assets under management, to boost his own control and influence, instead of maximizing shareholder value (Stulz, 1990: Hope & Thomas, 2008). This is by Jensen and Meckling (2000) referred to as the agency problem and is a consequence of the separation of ownership and control of the firm.

The root to the problem is the existence of asymmetric information, where the agent has an information advantage over the principle who has a hard time to distinguish if good (bad) performance is due to good (bad) luck or (lack of) hard effort, which gives rise to a moral hazard problem. One way to alleviate the problem is through monitoring of the management. Effective monitoring can be used to force managers to act in the interest of the shareholders to not risk losing their job. However, monitoring is expensive with the costs being borne solely by the part monitoring while the benefits are shared among all stakeholders. This free rider problem creates a cost-benefit issue where monitoring will only be conducted by stakeholders who have a large enough stake in the company to make it worth the cost. If firms have a dispersed ownership structure it may very well be that no single investor is large enough to be willing to bear the cost of monitoring (Rose, 2005). Instead investors rely on the firm, and the country in which the firm runs its operations, to have a well-established corporate governance system.

2.2 The corporate governance structure in Sweden

Corporate governance can be defined as a set of complementary mechanisms with the purpose of aligning the actions of managers with the interest of shareholders (Core et al,

2003). Corporate governance aims at setting a clear allocation of accountability between the firm's shareholders, the board of directors and the executive management. Thus, effective corporate governance should contribute to increase the company´s shareholder value and the trust of the stakeholders (OECD a, 2015).

Over the last decade the Swedish corporate governance system has altered from being discretionary judgment-based to rules-based. As a result the Swedish Companies Act (Aktiebolagslagen, ABL), The Swedish Annual Accounts Act (Årsredovisningslagen, ÅRL) and the Swedish Code of Corporate Governance (The Code) are today regulating the governance of Swedish listed firms (Hallvarsson & Halvarsson, 2015). The Companies Act (2005) includes general rules concerning the governance of companies and explains the main tasks and responsibilities of the main decision-bodies in a corporation. The Code complements the Act by placing higher requirements on listed firms and is applicable for all Swedish companies with shares traded on the Swedish stock market (Lekvall, 2014). The aim of The Code is to promote positive corporate governance in Swedish listed companies, however it is important to emphasize that the provided norms are not mandatory and that The Code only acts as a suggestion of good praxis of corporate governance for Swedish listed firms. If firms chose to deviate from The Code they are obliged clearly to state this, and the reason for doing so, in their financial statements (Hallvarsson & Halvarsson, 2015: OECD 2011).

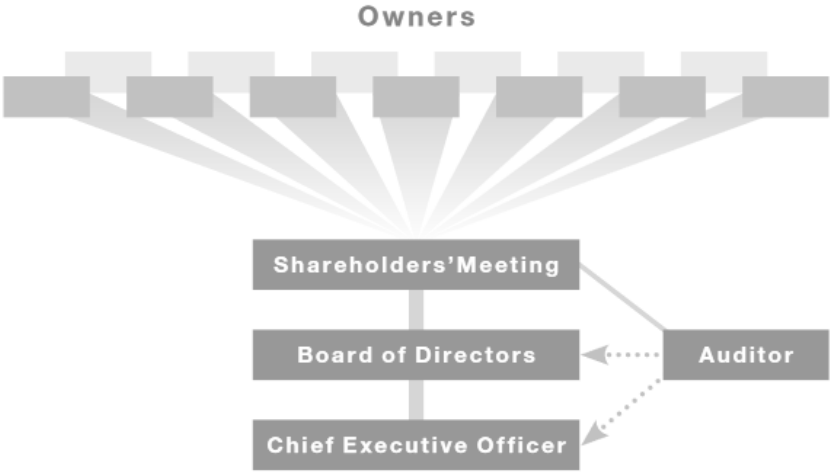
The Swedish Companies Act (2005) separates firms into two categories, private companies and public (listed) companies. From a historical perspective private investors held the majority ownership of Swedish listed companies and at the beginning of the 1950s almost as much as 75% of the market capitalization of Nasdaq OMX Stockholm was held by private investors through direct investments in shares. As a result of legislative changes in areas such as pension and taxation the percentage of private owners have decreased with the years and according to Lekvall (2014) institutional investors accounted for more than 85% of the market capitalization in year 2014 (Lekvall, 2014 p.248).

While the majority of listed companies in the US and UK often have a significant diverse ownership structure, listed companies in Sweden (and Scandinavia generally) are traditionally characterized with a high degree of ownership concentration (Lekvall, 2014). According to Lekvall (2014) 67% of the Swedish listed companies in 2014 had at least one shareholder controlling more than 20% of the capital and 17% of the listed companies had

shareholders with majority holdings of at least 50%. One explanation to the concentrated ownership structure in Sweden is the common use of dual share classes. Compared to other European countries such as Italy and Germany, which in 2003 had 47,3% and 17,6% respectively of their public companies using dual share classes, it is a much more common occurrence in Sweden where 66% of listed companies used dual class shares the same year (Becht, 2003). Typically dual class shares are denoted as A and B shares where the A shares have superior voting power. This allows owners to retain control of their company easier by holding class A shares and issuing class B shares when in need of equity capital infusions. This way controlling owners can maintain their majority voting power even if they are no longer holding the majority of the equity capital. Holding a substantial amount of the votes gives the shareholder ability to play an active role in the company's strategic decision making and take on responsibility for the firm. This can be done for instance by occupying a seat on the board of directors or being involved in the nomination of candidates for the board (Hallvarsson & Halvarsson, 2015).

The Swedish governance model is based on a strictly hierarchical chain of command consisting of four decision-making bodies, as illustrated in figure 1, the general meeting (GN), the board of directors (B.O.D), the chief executive officer (CEO) and a statutory auditor. The annual general meeting is the company´s highest governing body and has a sovereign role over the board of directors and chief executive officer. It is used as a forum where the shareholders can exercise their ownership rights and decide on important company matters. Decisions are generally made by majority votes, where each share equals one vote unless otherwise stated. However as mentioned, shares of different classes with different voting rights may be issued. According to the Companies Act the shareholders appoint the Board of directors at the general meeting (Lekvall, 2014, p. 260).

***Figure 1* - The Swedish Corporate Governance Model**



Source: Hallvarsson & Halvarsson, 2015, The Swedish Corporate Governance Code

The board system in Sweden is defined somewhere in between a one-tier and a two-tier board system (Kristiansson and Skog, 2003) and it is responsible for the management of the firm when it comes to long-term strategic decision making and the election and remuneration of the CEO (Hallvarsson & Halvarsson, 2015 p.13). In agreement with The Code the board should consist of at least three members, where one has to be chosen as the chairman with the responsibility of leading the board. It is also stated that at most one executive should be elected to the board, this spot is typically occupied by the CEO but it is also normal to have boards without any executives at all. The reason for this recommendation is due to the conflict of interest which would arise if the executives were to supervise themselves. Moreover, a majority of the board members must be independent of the company and its management and at least two of the board members must be independent of the firm's major shareholders[1] (Hallvarsson & Halvarsson, 2015 p.9).

At the bottom of the hierarchy we find the chief executive officer with the main responsibility of the day-to-day management of the company under the supervision of the board (Lekvall, 2014, p.273). Swedish companies must also have at least one statutory auditor. This position is also appointed at the general meeting. The auditor's main duty is to review the company´s accounts and the financial reports. They are therefore often thought of as the shareholders instrument for reviewing the work of the board and the management (Hallvarsson & Halvarsson, 2015, pp. 10-11).

[1] The firms major shareholders are defined by The Code as the shareholders controlling more than 10% of the company shares

2.3 The concept of incentive based compensation

As discussed in the opening section of this chapter one of the main challenges within corporate governance is the principal agent problem. The solutions presented so far was for the principals to either initiate close monitoring of management to ensure that they are running the firm in the best interest of the shareholders or to trust agents to follow the prevailing corporate governance practices. However, an alternative solution to this agency problem, which is somewhat intermediate to the aforementioned ones, is to ensure that the interests of the management are aligned with the interest of shareholders. It is believed that this is in part achieved through incentive programs, such as granting the management stock options, thereby letting them take part in potential stock price appreciations (Goergen and Renneboog, 2011; Hall and Liebman, 1997).

Employee stock options, which are the focus of our study, can be explained as a contract which gives the employee the right to purchase a specific number of shares of the company equity at a pre-specified exercise price during a pre-specified time interval. Employee stock options are typically issued at the money, meaning that their strike price is equal to the firm's current stock price at the grant date, and is normally fixed over the life of the option (Rubinstein, 1994). The advantage of issuing the options at the money is that it brings several tax benefits. For one, in the money options are not considered performance based compensation, thus they are not tax deductible in some scenarios (Fried, 2008). As Swedish tax laws are very complex when it comes to the issuance of employee stock options we will not delve further in to tax regulations since it is outside the scope of our study. Instead we will simply note that employee stock options in Sweden are more heavily taxed and thus not as beneficial as in the US (Billing, 2015).

The main difference between employee stock options and standard listed stock options is that the former are defined as non-transferable, meaning that the holder cannot sell forward the options (Huddart 1994). This restriction is set to retain the employees and to keep them from immediately re-selling their options. In addition, the listed stock options usually mature within one year from the date of issue, while employee stock options often have a life of five to ten years and a vesting period of typically one to five years (Sircar and Xiong, 2006). During the vesting period the employee cannot use his or hers exercise right. The vesting period is set as a constraint so that the employees are more likely to stay with the firm and therefore has a positive effect on the retention rate of employees. If the

employee still decides to leave the firm before the vesting period has come to an end he normally forfeits all his employee stock options (Damodaran, 2005).

In contrast to when traded stock options are exercised, the exercise of employee stock options leads to the company issuing new shares of its own stock and selling it to its employees at the strike price. When exercising a listed stock option the delivered stock is an already existing one and does therefore not affect the company's value or number of outstanding shares. Employee stock options are therefore viewed as a type of warrant (Hull, 2012, p: 209). One implication of this for the current shareholders is that their ownership share is diluted if employee stock options are exercised. The dilution could therefore be viewed as the cost of issuing these types of options, however it is to be noted that the money from the option exercise goes in to the company while money from the exercise of a normal traded option never gets in to the hands of the firm as it just leads to a transaction between two external investors.

Over the last two decades the use of equity-based compensation for employees has rapidly become an important tool in supplementing fixed wages for the entire western world. The trend can be explained by young cash poor technology firms entering the market as well as the incentive to align managerial interest with shareholder interests. The company allows the employee to buy company equity at a set price as an alternative to higher salary. Thus, for option packages to work the employees must expect that the market value of the company stock will increase for the options to not mature worthless but also to compensate for the lower fixed wage (Damodaran, 2005).

In the US, the use of equity-based compensation has become one of the most dominating parts of executive compensation. During its peak period in 2001, 90% of the largest American Corporations issued stock options accounting for 60% of the compensation packages for executives (Tyson, 2002: Carruth, 2011). The high use of equity-based compensation in the US can be explained by their dispersed ownership structure (Lekvall, 2014), using stock options as a replacement to large blockholders monitoring executives.

Although the shift towards a greater part of remuneration being based on equity related incentives started with the rapid growth of stock option awards to executives, companies have also evolved to structure similar remuneration programs for broader groups like

employees (Sesil et al, 2005). Employee stock options are believed to help create an ownership mentality among the employees and reduce the agency costs as a result of the shared long-term objectives of the management, the employees and the shareholders (Damodaran, 2005).

While the main argument in favor of using stock based compensation is that it aligns the interest of the executives with the shareholders, by linking their compensation to the stock price performance, the equity-based compensation plans have also been heavily criticized. Hall and Murphy (2003) find that there is a lack of equilibrium between costs and benefits of stock options, suggesting that options are a highly inefficient way of attracting, retaining and motivating employees. As an example they bring forward the scandals at Enron and WorldCom, which have been linked to excessive risk taking and an excessive fixation on stock prices. This is especially a problem when options are used since their inherent structure is that holders only have up-side potential making it tempting for managers to take on excessive risk.

Another critique against equity based compensation and increased managerial ownership is that it could lead to entrenchment among management. This could result in management getting so much influence that they block takeovers of their company even though it could be beneficial to the outside shareholders (Rose, 2005) but also make them risk-averse as it is hard to diversify their holdings. They are dependent of the firm for getting salary from an employment at the same time as they are usually reluctant to sell off their equity as it can send bad signals to the market when insiders start selling the firm's shares. An alternative solution, which does not use equity based incentives to solve the agency problem and opportunistic behavior by management which is suggested by Fama (1980) is that management should be disciplined by a competitive labor market.

Rose (2005) points out that most evidence to the hypothesis that increased managerial ownership decreases agency costs is based on data drawn from an Anglo-American context of dispersed ownership and common law. When he studies the situation on the Danish market, a country with an institutional structure much more reminiscent of the Swedish one, he finds no indication of increased managerial ownership being linked to improved firm performance. In fact he actually finds the causation to be the opposite with increased firm performance leading to a higher managerial ownership. To our knowledge there is no study

examining the same connection for Swedish firms. However, Randøy and Nielsen (2002) studied the effect of total CEO compensation and stock performance a few years earlier on the Swedish market. Their empirical results found no significant relation between stock performance and CEO compensation. A relation it did disclose was a significant negative relationship between CEO ownership and CEO compensation. The negative relationship could be explained by tax optimization since capital gains are taxed less than income in Sweden (NordiskeTax, 2016). However, it could possibly also be an indication that increased managerial ownership decreases the amount of perks and benefits executives award themselves.

Another drawback with the use of employee stock options which is discussed in several academic papers is the opportunistic timing of the grant date. This is a problem which arises from the information asymmetry between insiders and outsiders. With the help of the proprietary information insiders acquire through their position in the firm they can extract profits at the expense of other investors, one such example is as mentioned timing employee stock option grants to be before the announcement of good corporate news. This type of conduct is unethical and may well be illegal; however momentarily there are no precedential cases to refer to.

There are several mechanisms put in place to protect outside investors and reduce the information asymmetry. In general companies being publicly traded receive much attention, both from investors, analysts, competitors, the government and media. When a company goes IPO, it needs to adhere to a set of obligations and requirements of the stock exchange, the government and the investors. One of the main principles for listed companies is that new information which the company discloses needs to be published in a symmetrical manner. It is essential for confidence in the securities market that all market participants have equal access to the information and at the same time. It is also an important principle that the news should be announced as fast as possible to the market. This not only makes markets more efficient but is also a way to limit the possibility for insiders to buy or sell shares on the basis of inside information or use the proprietary information for other self-interests (Minilex.se, n.d; Finansinspektionen e, n.d). The issue of option manipulation will be further addressed later in the thesis.

2.4 The remuneration system in Sweden

Similar to the US, incentive programs have become increasingly common for Swedish listed companies in the recent years. The executive compensation packages have shifted from being dominated by bonus-based plans to also rely on employee stock option programs. Today all Swedish companies are required to include a binding resolution of the compensation policy on the agenda of the annual meeting – a so-called "say-on-pay" resolution (Lekvall, 2014, p. 275). The remuneration of executives and the management team are addressed in the Companies Act and the Corporate Governance Code, where the latter was significantly expanded with new rules applying from July 2010 (OECD, 2011).

The Annual Accounts Act of 1995 states that larger companies should disclose the total amount of salaries and other remuneration paid out to the senior executives, including the chairman of the board, the CEO and other corresponding officials during the fiscal year in their financial statement. Bonuses and comparable remuneration to the board of directors and corresponding executives must be specifically stated. Public companies must also disclose separately salaries and other benefits on an individual level for each of the directors and the CEO (Sveriges Riksdag, 1995 §40). In addition, a specific Act named "Lag om anmälningsskyldighet" requires directors to personally report all changes in their holdings of the company´s equity to a public register run by the Swedish Financial Supervisory Authority (Finansinspektionen, FI) within five working days (Rättsnätet, 2000. 6§). The law specifies that the provisions on shares also apply to equity related financial instruments, including stock options (Rättsnätet, 2000, 2§). The directors must report the options vesting period, exercise price and the quantity of the relevant option (Finansinspektionen a, n.d). Moreover, the senior executives in a public company are also prohibited from trading their company's equity 30 days prior to the publishing of quarterly and annual financial reports, including the day of announcement (Finansinspektionen b, n.d). This rule is introduced to reduce the possibilities of insiders to monetize the proprietary information they obtain through their position in the company.

2.4.1 Remuneration of the board of directors

Companies choosing to follow The Code are to have a nomination committee elected by the shareholders at the annual general meeting, with the responsibility of the election and remuneration of the board members and the chairman (Lekvall, 2014, p. 260-265: Hallvarsson & Halvarsson, 2015, p. 14). The Code requires the nomination committee to consist of at least three members, where the majority of the committee must be

independent of the company and its executive management (Hallvarsson & Halvarsson, 2015 p.7). Thus, the nomination committees normally consist of the three to five largest owners of the company, as well as the chairman of the board of directors. The suggested remuneration of the board requires the approval from the general meeting and if the packages involves share issues or buybacks, a 9/10 majority is required (Kristiansson and Skog, 2003, p.7).

2.4.2 Remuneration of the executive management

In addition to the nomination committee, The Code also states that the board should set up a remuneration committee. The remuneration committee is responsible for working out and suggesting a remuneration strategy for the executive management to the board of directors. This mission includes preparing the board´s decisions on all equity- and equity-related incentive plans for the executive management (Hallvarsson & Halvarsson, 2015, p. 22). The Code also stresses that variable compensation should be aimed at promoting the company's long-term value creation and that share-price related incentive programs should increase the alignment between the interest of the shareholders and the management (Hallvarsson & Halvarsson, 2015, p. 23).

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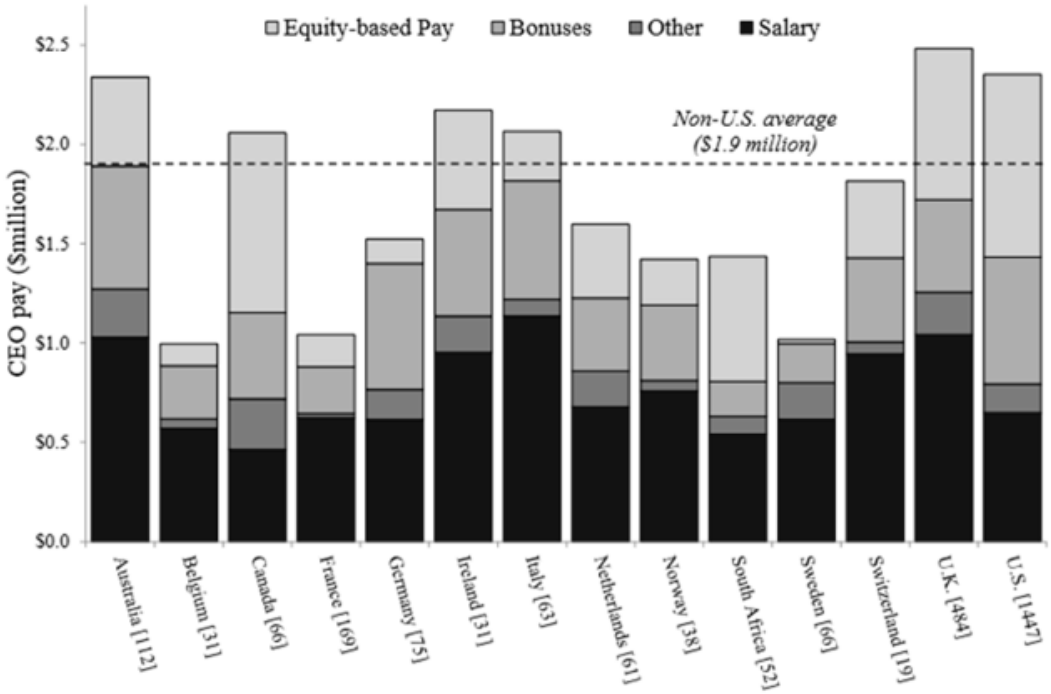
Figure 2 **– Composition of CEO pay per country 2006**



Source and illustration: Fernandes (2012) Figure 1B

Fernandes et al (2009) studied the differences in CEO compensation in 2006 for numerous countries. For Sweden they found the average CEO compensation to be $1,399,448 in their sample. They also found that equity based incentive compensation only made up 1.5% of the total CEO compensation in Sweden

Figure 2, which is collected from Fernandes et al (2012), shows the expected pay of a CEO in multiple countries when controlling for factors as sales, industry, ownership and board characteristics. The first striking feature is the relatively low CEO pay in Sweden compared to other countries. Randøy and Nielsen (2002) hypothesize that this is connected to the strong equalitarian culture in the country which has led to legislation and tax policies penalizing exceptionally high wage earners to counteract social inequalities. The figure also further illustrates the low proportion of Swedish CEO remuneration that is derived from equity based incentive compensation, including employee stock options. The difference between the composition of CEO compensation in Sweden and other countries is profound, especially when compared to the US where equity based compensation made up roughly 40% of total CEO compensation at the time of the study.

A couple of years later these findings where confirmed by Conyon et al (2011). From a sample of 51 Swedish firms, Conyon et al (2011) found that the average total pay of Swedish CEO´s in 2008 was $1,771,889, whereas 61% was in the form of base salary, 16% in bonuses and 1% in equity based pay (including stock options, restricted stocks and performance shares) and the remaining 22% in other payments. Compared to the other Europeans countries studied in the article, Sweden had the significantly lowest percentage of equity based payment, where on average CEOs in Europe received 19% of their total pay in the form of equity based pay.

There are probably several reasons for the comparatively low usage of equity based pay including employee stock options in Sweden. One that has been heavily discussed in Swedish media and among entrepreneurs is the tax level on employee stock options. To make a comparission an exercised employee stock option in Sweden can be taxed up to the hefty level of 68% while the same tax-level in the US would be 15% (Billing, 2015). There are however plans to review legislation to make it more beneficial for especially startups to use employee stock options to attract and retain employees (Ibin). But we will as previously stated not dig deeper into taxation issues.

3. Literature Review

In this chapter we discuss previous research on employee stock option manipulation, both in relation to timing and backdating. It is based on the literature in this chapter we form the majority of our hypotheses.

3.1 Prior literature on executive stock option manipulation

As previously mentioned executive stock options are used to align the interest of managers with those of the shareholders (Collins et al. 2008). In this way the manager is the residual claimant as his wealth is dependent on the firm's share price. However, prior literature has found that corporate managers sometimes influence their compensation contracts to increase their own wealth without exerting effort to benefit the firm's shareholders (Yermack, 1997). Employee stock options are normally granted at the money, with a fixed exercise price equal to the current stock price of the firm. It is therefore in the interest of the receiver to get an exercise price as low as possible to get a larger profit. By for instance timing the grant date of the employee stock option award to be just before the announcement of favorable company news, which will boosts the stock price, the executive can increase his profit on the options by other means than through increased effort (Ibin). Prior literature documenting an abnormal return pattern around employee stock options includes among others Yermack (1997), Aboody and Kasznik (2000), Chauvin and Shenoy (2001), Lie (2005), Collins, Gong and Li (2005a), Bebchuk et.al(2006) and Van der Goot (2007).

The literature on manipulation of employee stock options started its breakthrough with the study of Yermack (1997). While companies normally characterize stock options as an instrument to align the interest of shareholders and the manager, Yermack (1997) suggested an alternative motive to this type of executive compensation. By investigating the correlation between the timing of 620 CEOs stock option grants and the movements in company stock prices for the period 1992 to 1994 he found that companies awarding CEOs with stock options outperformed the market on a risk adjusted basis with more than two percent during a period of 10 weeks after the grant date. The result is consistent with the hypothesis of executives receiving a significant positive abnormal stock return after their option grants. Yermack (1997) argues that the abnormal returns occurred as a result of managers timing the option grants shortly in advance of favorable corporate news. Although Yermack found that timing of awards had significant correlation with company stock price movements, he found no evidence of stock prices moving downward in advance of option

grants, rejecting the hypothesis of stock option grants being delayed until after the disclosure of negative news.

Complementing the research of Yermack (1997), Aboody and Kasznik (2000) investigated if CEOs manage the timing of information disclosures to the market in order to maximize their stock option compensations. Consistent with Yermack (1997) they found positive abnormal returns after stock option grant dates. However, as the authors studied stock options grants at fixed schedules their result could not be interpreted as evidence of opportunistic timing of the grants. Instead the results suggested that CEOs had incentives to delay disclosure of positive news and rush negative news before the stock options grant dates.

Chauvin and Shenoy (2001) studied the abnormal change in stock prices prior to executive stock option awards. Their research found evidence of executives having incentives to manage the timing of news announcements prior to the date of stock option awards. The purpose of this manipulation was to reduce the strike price of the option so the option value would increase after the grant date. By using a sample of 783 stock option awards to CEOs in the period between 1981 and 1992 they found a significant decrease in stock prices 10 days prior to stock option grants.

In contrast to Yermack (1997), Lie (2005) documented low and negative abnormal stock returns prior to unscheduled award dates and high and positive returns afterward for the period 1992-2002. He also found that this pattern intensified over time. One explanation Lie discusses as the reason for the intensified abnormal returns is the possibility of executives becoming more experienced with the years in timing the awards in their advantage. However he further goes on to argue that the abnormal return pattern around unscheduled grants is so distinct that it is unlikely to be the result of CEOs ability to predict market returns for the near future. Instead Lie suggests the abnormal returns to be a consequence of CEOs choosing grant dates with the benefit of hindsight. In other words, the executives pick a previous date with a historically low stock price – which in turn becomes the strike price of their options. The act, which has later become referred to as Backdating, thus gives the holder a risk free profit. The concept of backdating is further discussed in the next section.

Papers looking at more recent time periods have also found evidence of stock option manipulation. Bebchuk et.al (2006) studied the timing of executive stock option grants

during the period 1996 to 2005 and found that approximately 12% of firms had one or more grants given at the lowest price of the grant month. The authors refer to these as lucky grants and believe this is due to opportunistic timing. Additionally they found that the lucky grants were more likely to occur when the CEO has greater influence, measured by CEO tenure and lack of board independence, on the company's executive compensation and governance process.

While all these studies investigate the employee stock option manipulation on the American stock market, a study by Van der Goot (2007) validates much of the previous research but with a focus on the Amsterdam Stock Exchange. By studying 363 listed firms for the period 1999-2004, he finds significant abnormal returns after the stock option grants. However, he does not find a significant abnormal return prior to the grant date. His study also finds evidence of manipulation of the timing of news announcements around the option grant date, negative news being released prior to the option grants and positive news being released afterwards.

3.2 Backdating and corporate governance

Like briefly mentioned above one alternative explanation for the abnormal return pattern around executive stock options is backdating (Lie, 2005). The act of backdating occurs when a document is falsely dated to a time before it was originally drawn up. This is an illegal act as it is deemed fraudulent (Fried, 2008). In our context of employee stock option backdating it is when the grant date is falsely set to be a historical date on which the stock price was low relative to today's price. By manipulating the date to include the period of the appreciation, after the fact it has already happened, management is in effect getting a risk free profit (Lie, 2005).

To prevent this kind of option manipulation legal changes have been made, including the Sarbanes-Oxley Act of 2002 (SOX) in the US. The act was introduced to increase corporate governance transparency and limit fraud among US listed firms. Prior to the SOX Act companies could report option grants at any time up to 45 days after the end of the company´s fiscal year, enabling executives to backdate stock option grants. However, following the Act, the recipients now needed to report the stock option grants to the Securities and Exchange Commission (SEC) within two business days after the grant date (Heron and Lie, 2007). Even though research has found that the abnormal return pattern was significantly weaker after the new requirements, it has also shown that many firms have

failed to meet the recording requirements and that backdating and camouflaged timing still appear to be a prevalent practice even after SOX (Narayanan and Seyhun, 2005b; Heron and Lie, 2007).

Various studies have documented that the abnormal stock price pattern around executive option grants still exists and many of the papers have also found that there is a greater likelihood of stock option backdating in firms with weaker corporate governance systems (Collins et al. 2008: Lee et al. 2010). Literature such as Bebchuk et al. (2006), Heron and Lie (2007), Bizjak et al. (2007), and Collins et al. (2008) have all found a significant link between backdating and a number of corporate governance determinants.

Bebchuk et al. (2006) examined the link between backdating and board characteristics during the period of 1996-2005. Through their study they were able to identify a number of corporate governance factors contributing to the manipulation of option grants. Their results found that backdating was more likely to occur within companies with greater CEO influence on the firm's governance and remuneration policy. This is in accordance with the findings of CEOs being more likely to receive positive abnormal returns after the grant date if the CEO has longer tenure and in companies with less independent boards (Bebchuk et al, 2006). Bizjak et al. (2007) also found evidence of governance characteristics being linked to backdating. Their result shows that the likelihood of a firm starting to backdate stock options is negatively correlated to the age of the CEO. They also found the probability of a firm backdating being higher if the company had a director who was linked to the board of another company already engaged with backdating. The paper also provided evidence of backdating being more likely for firms with smaller boards (Bizjak et al. 2007).

Collins et al. (2008) confirms the findings of both Bebchuk et al. (2006) and Bizjak et al (2007). In addition their research found that the probability of violating the SOX two-day reporting requirement was larger for firms with greater CEO power and influence. The article also found backdating being more likely when the other directors also got part of the benefits and that CEOs of backdating firms receive higher levels of compensation than their colleagues in non-backdating firms (Collins et al. 2008).

4. Hypotheses

This chapter outlines the hypotheses we wish to investigate. We have chosen to have one main hypothesis and seven sub-hypotheses, out of which six are linked to the relationship between corporate governance mechanisms and abnormal returns on employee stock options. The sub-hypotheses are divided into three categories: firm specifics, governance features, and other.

4.1 The main hypothesis

As our thesis builds on the previous findings of an abnormal return pattern around executive stock options, our main hypothesis of interest investigates if insiders in Swedish listed firms receive a similar abnormal return on their stock option grants. The hypothesis is stated as follows:

H1: Insiders in firms listed at Nasdaq OMX Stockholm opportunistically manipulate employee stock option grants to earn positive abnormal returns

The argument for finding an abnormal return pattern for insiders of Swedish listed firms is in line with previous research on stock option manipulation discussed in the literature review. Both Yermack (1997) and Aboody and Kasznik (2000) found evidence of an abnormal return pattern after executive stock options were granted in the US. The results suggest opportunistic timing since CEOs have incentives to delay disclosure of positive news to take place after the grant. Additionally Chauvin and Shenoy (2001) found evidence of statistically significant negative abnormal returns during the 10 days prior to the grant, indicating that executives also had incentives to manage the timing of news announcements prior to employee stock option grants. This further establishes the propensity of managers to manipulate option grants.

While previous research using insider trading data, such as Seyhun (1992), Lakonishok and Lee (2001), and Narayanan and Seyhun (2005a) found evidence of executives having the ability to forecast future market returns using private information, Lie (2005) presented a different reason to the results. He argued the distinct stock return pattern around employee stock options could be explained by the grants being retroactively timed, suggesting evidence of another type of fraudulent behavior - backdating. More recent studies, such as Van der Goot (2007) have also documented similar findings outside of the US. Similar to the other papers, Van der Goot finds evidence of significant positive abnormal returns after

option grants for executives on the Amsterdam Stock Exchange. In line with the other papers he explains the results by option grants being timed and backdated.

Based on previous research we find it very interesting to investigate the same relation but for all receivers of employee stock options and at the Stockholm Stock Exchange. To our knowledge this type of study has not been conducted previously for the Swedish market. Other than being our home market we also find it rewarding to use the Swedish market as it relies on a different institutional foundation than the one usually examined. Previous studies are almost exclusively conducted on the American market. There are several important differences between the two markets. One already discussed is the different types of ownership structure characterizing the two markets. While Anglo-American firms often have many smaller owners the Swedish market is known for its concentrated ownership structure (Lekvall, 2014). With regards to the free rider problem discussed for investors who decide to conduct monitoring of management it could be expected to be viable more often in Sweden where majority owners have proportionally larger stakes relative to their American counterparts. We therefore find it intuitive to believe the actions of Swedish insiders are monitored more intensely, thus possibly making them more vary of committing any fraudulent actions.

Two other noteworthy differences are the different legal systems and different accounting standards. As is typical for Anglo-American countries the US uses a common law system while the Swedish system is built on civil law traditions (Ortwein II, 2003). This could impact both how the rules are formulated but also enforced, after all any law no matter how detailed it might be is toothless if it is not enforceable. Insiders fearing sanctions will be brought upon them if they misbehave are probably more likely to abstain from manipulation with regards to the granting of employee stock options. One difference in regulation that is perhaps not related to the different heritage of jurisdictional traditions but most certainly relevant for our study is the time receivers of employee stock options have to report to the authorities. While the American rules state that notice should be given to the authorities within two days (Heron and Lie, 2007) Swedish receivers have up to five days to report the same transaction (Rättsnätet, 2000). This could thus give them a little wider window of opportunity to backdate.

The second major difference mentioned is the different accounting standards prevailing in the two markets. American firms are to follow the Generally Accepted Accounting Principles (GAAP) set by Financial Accounting Standards Board (FASB) while the accounting standards applied in Sweden are based on the International Financial Reporting Standards (IFRS) set out by the International Accounting Standards Board (IASB) (ifrs.org, 2016). Once again this makes for differences in how hard it is and which strategy insiders can take to disguise any potential fraudulent actions in financial statements.

To investigate if there is any indication of timing or backdating of employee stock options our main hypothesis will look for a statistically significant negative abnormal return prior to the stock option grant and a statistically significant positive abnormal return after the grant date. The incentive for manipulation prior to the grant is that a significant negative abnormal return before the issuance date can be viewed as positive for the receivers of the options. The reason being that all negative news are then already "blown" out when the options are granted and also that the strike price is pushed down, thus making it more likely to earn a positive abnormal return after the grant.

4.2 Sub-hypotheses

Six out of the seven following sub-hypotheses are testing the relation between different corporate governance determinants and abnormal stock returns around option grants. The last and eight hypothesis tests the effect the 2008 financial crisis has had on the return pattern around employee stock option grants. We find these hypotheses interesting as they allow us to break down the result from our main hypothesis and segment the observations into different firm-, governance and time characteristics to get a better understanding of what factors drive the results. In previous research Bebchuk et al. (2006), Bizjak et al. (2007), Collins et al. (2008), Fang and Whidbee (2013) and Wu (2012) have all found that there is a relationship between employee stock option manipulation and various corporate governance factors.

It can also be argued that option repricing has many similarities to option manipulation as both acts set, directly or indirectly, the strike price of a grant to be significantly lower than it would be in the case without manipulation. As a result of the shared characteristics it is suggested that the typical explanations for option repricing also could provide rational explanations for option manipulation and managerial self-dealing (Wu, 2012). We have

therefore also studied and compared papers investigating the relation between corporate governance determinants and stock option repricing.

Our study will differ from previous research as we investigate the relationship between corporate governance mechanisms and the abnormal stock return at the Stockholm Stock Exchange and as our study is conducted at a more up-to-date time period compared to studies on other foreign exchanges. With our thesis we want to examine if we obtain similar results as the previous research discussed, only with the focus on the Swedish stock market.

4.2.1 Firm-specific characteristics

This section discusses hypotheses concerning the association between firm-specific characteristics, such as firm size, firm age, prior firm performance and firm industry, and the cumulative abnormal return on employee stock options.

Firm size: *H2: Insiders in small sized firms are likely to earn higher abnormal returns on their employee stock option grants.*

With this hypothesis we wish to test the effect firm size has on the abnormal return pattern around employee stock options. We measure this by looking at the relation between option manipulation and smaller firms. We expect smaller firms to have a higher tendency for option manipulation as we believe they are less exposed to public scrutiny, leaving more room for self-dealing among insiders (Heron and Lie, 2006). In addition, normally less people are involved in the decision making process in smaller firms making it more likely for insiders to time the option grants without being detected (Bebchuk et al. 2006). Thus we assume there is a negative relation between firm size and abnormal stock option returns. This size effect is also confirmed by prior literature such as Heron and Lie (2009) who found evidence of smaller firms being more likely to backdate stock option grants as a result of less visibility and scrutiny. This is also consistent with the findings of Narayanan and Seyhun (2005b) who documented that the abnormal return on employee stock options decreased with firm size. Comparing this to prior research on executive stock option repricing, which is also related to agency problems, Chidambaran and Prabhala (2003) and Carter and Lynch (2001) also found similar results on option repricing and smaller companies.

The firm size of the companies will be estimated using a proxy variable measuring the firm's market capitalization. This will be established according to which of the three main lists on

Nasdaq OMX that the firm's stock was traded on at the end of the specific fiscal year the option was granted. We were able to sort all observations in this way thanks to historical data provided by Ulf Persson at Nasdaq OMX Stockholm. Nasdaq OMX categorizes the listed firms into three different size categories: Small Cap, Mid Cap and Large Cap. Firms with a market cap less than EUR 150M are classified as small, firms with a market cap between EUR 150M and EUR 1B are classified as mid, and those with a market capitalization larger than EUR 1B are classified as large. During the ten-year sample period 171 observations were classified as small cap.

Firm age: *H3: Insiders in younger firms are likely to earn higher abnormal returns on their employee stock option grants.*

This hypothesis is built on the assumption that younger firms often are more surrounded by asymmetric information and are more likely to have less developed routines of succession and less institutional investors. Similar to smaller firms, younger firms tend to have less extensive media and analyst coverage, and lower levels of institutional investors (Pedersen, 2015: ch.16) which in turn means insiders in these firms are less monitored. The hypothesis is consistent with the finding of Fang and Whidbee (2013) and Wu (2012), who found evidence of backdating firms usually being categorized as younger and fast growing. The same relationship is also confirmed for stock option repricing by Carter and Lynch (2001) and Chidambaran and Prabhala (2003).

When estimating firm age we have measured it in terms of the number of calendar years the firm has been traded at the Stockholm Stock Exchange. One of the main problems with our data when calculating the firm age was that as many as 42 observations were registered as granted the same date as the firm went public. To avoid the problem with firm age being equal to zero we have followed a similar approach as Pastor and Veronesi (2003) and calculated the firm age as the number of years listed plus one. The value of one is therefore assigned to the firm the same year as it goes public and the firm age increases by one for each subsequent year being listed (Pastor and Veronesi, 2003, p.17). All data on listing age is hand-collected through the firm's annual reports and from Skatteverket.se.

Firm performance: *H4: Insiders in firms with higher prior stock performance are likely to earn higher abnormal returns on their employee stock option grants.*

It could be argued that insiders in firms which have experienced higher stock performance during the prior year are likely to earn a higher abnormal return on their stock option grants. This assumption is based on the relation between backdating and higher stock performance, as it would only be profitable to backdate if the stock price has increased so the insider gets a lower strike price than the current stock price. Fang and Whidbee (2013) support these assumptions and have found that rather than experiencing poor stock performance as found on stock option repricing (Chidambaran and Prabhala, 2003), backdating firms tend to outperform matching firms in both the prior- and post-backdating years. It could be discussed if this has to do with good performers having their methods less questioned as other stakeholders are probably also satisfied with their result and thus monitor less intensely.

Prior firm performance will be measured by the firm's excess return over the market for the 12 months prior to the employee stock option grant date. It is calculated by subtracting each firm's return with the market return. All stock prices are downloaded from Datastream.

Industry: *H5: Insiders in firms within technology intensive sectors are likely to earn higher abnormal returns on their employee stock option grants.*

Equity-based remuneration is broadly used in young technology firms as they have less liquid assets (Damodaran, 2005) and use employee stock options to attract and retain highly competent employees. The hypothesis is based on the assumption of technology-based firms being more likely to manipulate the timing of stock options and news announcements thanks to asymmetric information. In technology driven firms it is much harder for an outside investor to get the same overview as an insider as the products and services produced are often surrounded by more classified information. These firms are also more dependent of intangibles and off-balance sheet assets which are harder to value, especially for outsiders. In addition it could also be argued that the degree of high complexity of technology intensive firms makes analysts coverage more complicated. Prior literature such as Heron and Lie (2009) has documented this relation, finding that grant manipulation was more prevalent among firms operating in the tech sector. If we again are to compare option

manipulation with option repricing, the papers of Carter and Lynch (2001) and Chidambaran and Prabhala (2003) have both documented that high technology firms are more likely to reprice than non-technology based firms. We therefore find it very interesting to test if a similar relationship is found between technology intensive firms and abnormal returns on employee stock options in Swedish listed firms.

When classifying firms as technology intensive we have followed a similar approach as in Daniel E. Hecker (2005) article on high-technology employment. The article defines high-technology firms as those "engaged in the design, development, and introduction of new products and/or innovative manufacturing processes through the systematic application of scientific and technical knowledge" (Hecker, 2005, p.57). Classified based on their four digit NAICS, an industry classification system, industries are considered high tech if employment in technology-based occupations in that specific industry is above a certain threshold. Hecker finds that the average proportion of tech-based employment is 4.9% for all industries. For an industry to be classified as technology intensive the criterion is that tech-employment in that industry accounts for a proportion at least twice the 4.9% average of all industries total tech-based employment. The group is divided into three levels of technology intensity, where level 1 includes industries that have a proportion of at least 5 times the average, level 2 industries have 3-4.9 times the average, and level 3 industries have a proportion of 2-2.9 times the average (Hecker, 2005, p.58). Any firms falling within one of these three levels are classified as technology intensive in our thesis. Based on this criterion 220 observations were made by firms active in industries which had a proportion of technology-based employment above the threshold and were therefore classified as belonging to the high-tech category.

4.2.2 Governance features

This section includes hypotheses linked to the relation between governance features, such as shareholder voting rights and the CEO tenure, and the abnormal return on employee stock options.

Shareholder voting rights: *H6: Insiders in firms with an owner holding a high fraction of the voting rights are likely to earn less abnormal returns on their employee stock option grants.*

Like previously mentioned, Sweden is known for its concentrated ownership structure with a small number of major shareholders, often with holdings of shares with greater voting

rights. The Swedish shareholders often play an active role in the firm and are known for their engagement in the daily operations and the nomination committee (Lekvall, 2014). We therefore find it interesting to investigate the effect a large shareholder in terms of voting rights has on the abnormal return on employee stock option grants. Holding the majority of the voting rights gives the owner a significant influence on the firm. It can also make it worth for them, despite of the free rider problem, to intensely monitor the management to decrease the likelihood of any manipulation, including on option grants. We thus assume that insiders in firms with a single shareholder holding a high fraction of voting rights are likely to earn less abnormal returns after the granting of employee stock options. To our knowledge the relation between large owners and abnormal returns on employee stock option grants has not been examined previously. However, large shareholders and their high level of monitoring and corporate control are covered in several empirical papers, including Shleifer and Vishny (1986).

To measure this relation we have identified the number of votes each firm´s largest shareholder held at the end of the fiscal year the option was granted. This approach is taken as owner structures for specific historic days were not available. However, we argue this is not a major issue as ownership structures are generally stable when it comes to the largest shareholders. The ownership structure was typically stated, and collected by us, from the company´s annual report for that same fiscal year. However, in some occasions where this information was not stated in the firm's annual report, or the annual report was not publicly available, we used data on the firm's historical ownership structure found in the database Orbis.

We found that the average proportion of voting rights held by the largest shareholder in each firm for the sample was 27% of the total voting rights. To test whether the abnormal return is lower for firms with a large shareholder we created a dummy variable including all observations where the current firms had a shareholder holding more than 30% of the firms total voting rights. This specific percentage was chosen based on the sample average and on Holmen and Knopf (2004) definition of a controlling shareholder owning at least 25% of the voting shares.

CEO tenure: *H7: Insiders in firms with a CEO with a longer tenure are likely to earn higher abnormal returns on their employee stock option grants.*

With this hypothesis we want to test if the strength and influence of CEOs has an impact on the abnormal return pattern around employee stock options. We approximate CEO strength using a variable for how long the CEO has held the position in the firm. We assume CEOs who have played an active role in the firm over a longer period to be more entrenched and to have a stronger influence on the firm, its pay settings and governance processes. This is also in line with the research of Hill & Phan (1991) who found that the relationship between CEO pay and stock returns decreased with the CEO tenure. Instead the pay becomes more dependent of the CEO's own preferences suggesting an increasing influence with tenure. With a strengthened position in the firm it is also possible fewer associates will feel the need or have the courage to question the CEO's decisions, thus making it easier for them to manipulate for instance employee stock option grants if they want to.

Based on this we expect there to be a positive relationship between the number of years the CEO has been active in his role, our proxy for CEO influence, and the abnormal return on employee stock option grants. This is also in line with the findings of Abrahamson and De Ridder (2010) who examine the relationship between executive compensations and ownership structure in the 30 largest firms listed at Stockholm Stock Exchange over the period 1999 to 2008. Their results show that there is a positive relationship between compensation levels and the strength of the CEOs. A similar but even more directly applicable result to our study has been documented by Bebchuk et al. (2006) who studied the relation between corporate governance and opportunistic timing of CEO stock option grants through backdating. In their study Bebchuk et al. found that so called "lucky grants", options issued with remarkably good timing, were more likely to occur when the CEO of the firm had a longer tenure.

The hypothesis will be measured by the number of years the CEO has served in his role at the company, regardless of whether the company had gone public at the time of inauguration. The information is found either in each company´s annual report, at its homepage or in public company announcements made through different media sources.

4.2.3 Other

This section includes the last hypothesis we are to investigate. As we cannot place the financial crisis in firm-specific characteristics nor governance features, this hypothesis fall under the sub-category "other".

Financial crisis*: H8: Insiders are likely to have a lower degree of abnormal returns on employee stock option grants after the 2008 financial crisis.*

The global financial crisis of 2008 brought new aspects to the compensation issue in to light, especially in the financial service industry. Large equity positions of executives were supposed to dampen risk appetite. However, as they also received very large compensation packages including short-term bonuses and options, with restricted downside, this more than offset any expected loss on their equity holdings and encouraged excessive risk taking behavior (OECD, 2009, p.17).

An extensive amount of papers and news media outlets covered the excessive risk taking behavior in especially the banking sector. It was found that American top-executives had been able to pocket large amount of compensation in collapsing firms. For instance Bebchuk et.al (2010) found that the executives of Bear Sterns and Lehman Brothers derived cash flows of approximately 1BN American dollars from equity sales during the period of 2000-2008. As a result new legislations and regulations required the elimination of such compensation structures and the European Commission came up with a number of international recommendations around compensation practices. The Swedish Supervisory Authority was also commissioned by the Swedish government to implement the recommendations (Finansinspektionen, 2010) and as a result the new regulations, FFFS 2009:6 and 2009:7, came to force, requiring several companies to make significant adjustments to their remuneration systems (Ibin). The new remuneration policy encourages effective risk management, not excessive risk taking. It also specifies that the remuneration policy has to be decided and monitored by the board, and that the company remuneration should be published and discussed in the annual report and on the general meeting (Finansinspektionen, 2010, p.23; Lekvall, 2014). With all this in mind we find it reasonable to believe that the decline in public trust of firm executives has led to all actions made by them being scrutinized more thoroughly after the financial crisis. It could be argued that this in turn can have made insiders more vary of engaging in any manipulation or other dubious

activities which would make us expect to find lower abnormal returns on employee stock options after the crisis.

Recent studies such as Barontini et al (2013) and Ersättningsakademin (2011 & 2014) have found evidence of a change in executive compensation after the financial crisis. Barontini et al. found that the variable remuneration of board members and CEOs in Europe has decreased significantly after the crisis for financial institutions. Specifically they notice a decrease in the granting of employee stock options due to the widespread criticism that options made executives take on excessive risks (Barontini et al, 2013). Similar result was found for the largest Swedish listed companies in a study implemented by the consulting firm Hallvarsson & Halvarsson at the request of Ersättningsakademin. They found that the executive compensation was lower under the economic downturn in 2008 than it had been before the crisis. As table 1 shows the variable and equity based remuneration made up an increasing proportion of executive compensation leading up to the crisis. However it made a sharp downturn as the financial crisis hit in 2008 and these types of remuneration faced harsh critique from the public. But judging from the table it seems as this critique was quickly forgotten as it only took a couple of years to get back to former levels of variable and equity based remuneration.

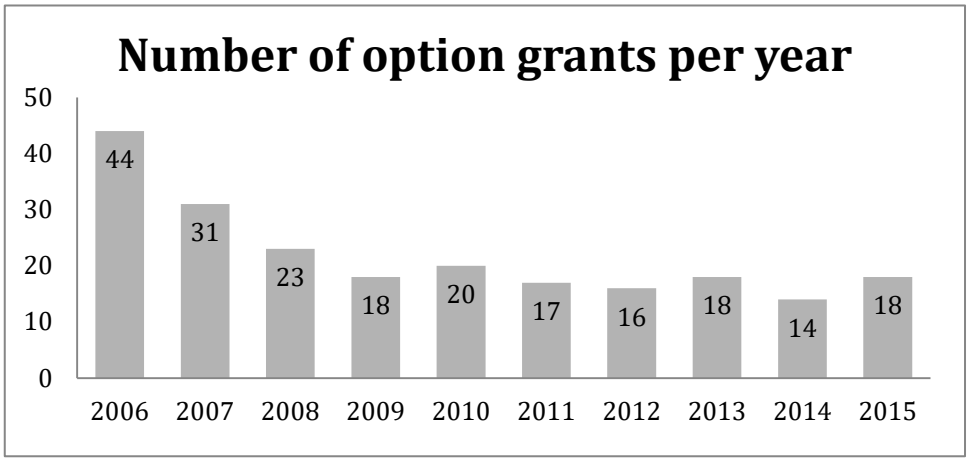
Table 1 **- Executive compensation for the 36 largest Swedish listed companies for the period 2006-2011**

Sweden	2006	2007	2008	2009	2010	2011
Base Salary	44%	43%	45%	48%	47%	48%
Variable and Equity Based Remuneration	27%	30%	20%	22%	28%	25%
Other Benefits	3%	2%	2%	2%	1%	2%
Pensions	26%	25%	33%	28%	24%	25%

Source: Ersättningsakademien (2011) and (2014)/Hallvarsson & Halvarsson (H&H).

Comparing this pattern to our data sample, we see from figure 3 that the number of stock option grants after the financial crisis has decreased sharply since our start year of 2006. We therefore find it interesting to test whether the new laws and legislations implemented after the crisis has affected the abnormal return on employee stock options in Sweden.

***Figure 3* - Distribution of stock options granted per year in Swedish listed firms during 2006-2015**



Note: The number of option grants per year refers to the number of observations used in our thesis. It is thus adjusted for firms not listed on Nasdaq OMX Stockholm as well as redundancies where the same firm is granting several insiders options on the same day.

If our hypothesis proves to be correct and we find a significantly lower abnormal return after the crisis it could serve as an explanatory factor to the decreased amount of option grants per year. The decrease could potentially be explained by insiders themselves preferring other types of remuneration as they face stiffer regulation making it harder to manipulate the option grants and thus making them less profitable. However it has to be stated this is only a hypothetical explanation which we will not be able to confirm in our study.

To investigate this hypothesis we have chosen to divide our data into two groups, 'pre-crisis' and 'post-crisis', where the former group includes the period January 1st, 2006 - December 31th, 2008 and the latter group includes January 1st, 2009 - December 31th, 2011. Out of our total number of observations, 372 stock options were granted in the examined period of January 1st, 2006 – December 31th 2011, whereas 226 observations were granted in the "pre-crisis" period and 146 observations in the "post-crisis" period.

5. Data and methodology

This chapter explains the methodology of the study in detail. The chapter is divided into four parts where our method for collecting data, the event study methodology, method for calculating abnormal returns and the methods used to test our hypotheses are explained while a fifth part discusses the validity and the reliability of the study.

5.1 Data collection

For our study we need data on three different areas; 1) option grants – the grants are the actual events we want to study and around which we want to investigate if insiders earn abnormal returns, 2) stock prices – we will measure abnormal returns using stock returns, 3) financial information and firm specifics – this will be the foundation of the corporate governance variables against which we will test our result of abnormal returns. What follows is a closer description on the data sources and how the data for each type has been collected.

5.1.1 Option grants

Data on option grants are collected from the Swedish Supervisory Authority's (Finansinspektionen) insider trade register. This makes the data highly credible as it is collected from a government agency with no self-interest in manipulating it. The register is public and contains data on all stock-related transactions made by persons registered as having a superior insight in a publicly listed company, either through their position in the firm or through their relation to someone who holds such a position. This is typically executives and board members including their closest family. Once an employee obtains such a position the company is required to report this to Finansinspektionen and the employee is subsequently added to the register. From there on Swedish regulation stipulates that the insider is required to report all transactions and changes in his or her holding of the company's stock, or stock-related products, to the Financial Supervisory Authority no later than five days after they materialize (Finansinspektionen c, n.d). The purpose of the register is to use it as a tool to monitor so insiders do not base investment decisions on private information they have acquired through their positions as insiders (Elofsson et.al, 2013). The need for the register stems from fear that outside investors would cease trading on the marketplace if they feel at an unfair disadvantage to other investors (insiders) due to asymmetric information. Bhattacharya & Daouk (2002) believe there would be a risk of markets becoming less liquid and thus less efficient if this would occur. By

prohibiting insiders from basing investment decisions on private information the asymmetric information gap between insiders and outsiders is tightened.

The raw data includes the name of the insider, his or her position or interest in the company, holdings, transaction date, publication date, transaction value, number of options granted, type of transaction and the possibility of a short comment about the transaction for insiders who want to clarify something regarding the trade.

We download all transactions for the period 01-01-2006 until 31-12-2015. We have chosen our start period to be the same as the start date of the insider register to get as many observations as possible. This gives us a raw material of insider transactions containing a total of 103 355 transactions over the ten years.

5.1.2 Stock prices

For the measurement of abnormal returns we can use stock prices and their corresponding returns, instead of data on option prices directly, since the options are derivatives on the stocks and therefore directly dependent of the stock price. We have chosen to use stock prices since there is reliable and generally more data for stock prices than option prices, especially since the employee stock options we are examining are not traded, which enables us to calculate daily returns.

All prices, including the ones for the market index, have been retrieved from Datastream. We use daily data and prices, which are adjusted for stock splits but not dividends. This is in contradiction to common practice where adjustments for dividends are usually made when looking at a firm's stock performance. The argument for dividend adjustments is that they are part of the total return an investor earns from holding the stock. However in the case of options the holder is not entitled to receive dividends, we therefore use unadjusted prices. The market index we use is the Stockholm-All Share Price Index (OMXSPI) which is a market weighted index including all shares listed on the Stockholm Stock Exchange. Just as the stock prices we download, the index numbers are also unadjusted for dividend payments. An alternative would have been to use the Stockholm OMX 30 Index which is perhaps more widely quoted than the All Share Index. However since it only tracks the performance of the 30 largest listed companies this could potentially have given rise to a bias if there is a size premium for investors in small companies.

The data period for the stocks is longer than for the option grants; it stretches between 2005-06-01 and 2016-05-01. The reason for the longer period is that we need data on returns prior to the option grant for our estimation window while we need returns after the grant to measure abnormal returns during the event window. The procedure with estimation and event windows are closer explained in section 5.2 on event study methodology.

5.1.3 Financial information and firm specifics

The majority of information needed to estimate the corporate governance variables for our hypotheses is retrieved manually from each firm's annual reports. This includes information on IPO date, ownership structure and CEO tenure. Additionally we use information on the market capitalization of firms listed at the Stockholm Stock Exchange during the period 2006-2015 received from Ulf Persson at Nasdaq Stockholm, the owners of the Stockholm Stock Exchange. Data used to segment firms between being technology or non-technology oriented is collected from the database Orbis. The methods used for collection of data for each specific hypothesis is described in detail in chapter 4.

5.1.4 Data filtering

As described in the data collection section the raw material of insider transactions is downloaded from Finansinspektionen and contains 103 355 observations for the period 01-01-2006 until 31-12-2015. However this dataset needs further processing to include only those observations relevant for our study. We start out by filtering so only transactions concerning call options are included. This brings our dataset down to 7797 transactions. We further narrow our set by filtering away all transactions that do not fall under one of the following categories; gift, bonus or grant. The decision to include transactions labelled as gifts or bonuses is taken after discussing the classification with the supervisory authority's support by which we were informed that some firms label option grants as bonus since they are part of performance based remuneration, while others label it as a gift and argue it is a reward for good performance. In all three occasions they are given from the firm to the employee. All three categories are therefore subject to possible manipulation with regards to the timing or backdating of the grant and thus included in our sample. This leaves us with 1837 transactions, however amongst these there is some redundancy since each insider has to report the change of their holdings individually while the grants are often given to several insiders at once. We believe including the same grant decision multiple times would give us

a bias where firms that grant options to a larger group of insiders have a larger impact on our result. We therefore filtrate to include only one observation per firm at a specific date in our dataset, at this stage our sample is down to 610 observations.

One decision we need to take is whether to include all companies traded on Swedish stock exchanges and trading platforms, such as Nasdaq OMX Stockholm, First North and NGM Equity, or only the ones listed on the main stock exchange, Nasdaq OMX Stockholm. First North, NGM Equity and Aktietorget are all simpler forms of marketplaces for securities called multilateral trading facilities (MTF). The companies whose shares are traded on MTF´s follow a simpler regulatory framework than those traded at stock exchanges (Finansinspektionen d, n.d). The argument for including stock options granted by these companies is that it would give us a larger sample size, which could increase the accuracy of our study. On the other hand, the drawback of including these observations is that these marketplaces are often less liquid, which could result in long periods of stale stock prices and thus less accurate measures of abnormal return and a potential bias in our data. In order for the observation to be included in our study we therefore require the granting firm to be listed on Nasdaq OMX Stockholm at the grant date. As the data retrieved from Finansinspektionen also includes option grants by firms listed on other marketplaces than Nasdaq OMX Stockholm an additional 89[2] observations are removed from our sample.

Table 2 **- Distribution of marketplace belonging for the 89 observations removed due to being traded on other marketplace than Stockholm Stock Exchange**

Exchange	Number of observations
Aktietorget	20
First North	12
NGM Equity	54
Other	3
Total	89

One final adjustment is made because four[3] out of the 521 grants left are made by firms listed so recently that there is no sufficient data to measure their performance. As a result these observations are dropped from our dataset. At the end of the screening process we

[2] See appendix 1 for detailed information on these observations
[3] See appendix 2 for detailed information on these observations

are therefore left with a total of 517 events to use for our study. Table 3 shows a summary with the number of observations screened out at each stage.

Table 3 **– Observations screened out at each stage**

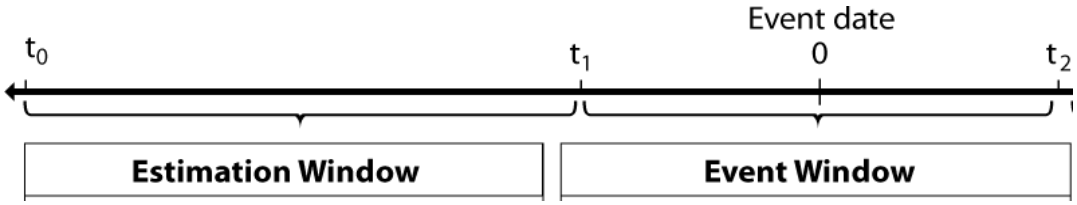
Screening stages	Number of observations screened out
Not call options	95558
Wrong transaction type	5960
Redundancies	1227
Listed on different stock exchange	89
Listed too recently	4
Observations left for regression analysis	517

5.2 Event study methodology

This section briefly presents the choice of study method and the steps involved making the event study. Our study primarily seeks to answer two questions; if insiders receive an abnormal return on their stock option grants and if there is a relationship between the abnormal return and the seven corporate governance and time variables we have chosen to study. To measure the abnormal return we argue that an event study is the most applicable method because of its simplicity and intuitiveness. It is also the method used in previous research on the same topic such as Van deer Goot (2007) and Yermack (1997). Although there is no official approach when making an event study they tend to follow a common pattern. When designing our event study we have followed the procedure outlined by MacKinlay (1997).

MacKinlay defines an event study as the usage of financial market data to measure the impact of a specific event on the firm value. Event studies are often illustrated by a timeline as the one seen in figure 4. The whole timeline is measured in days and relative to the event date, which is day 0. The timeline consist of two main fragments, an estimation window and an event window. The estimation window, which is between time t_0 and t_1 on the timeline, is the period during which we collect the information needed to specify a normal or expected return for the asset. The event window is the period we examine and it stretches from time $t_1 + 1$ to t_2 and it is during this timeframe the actual event takes place. We calculate abnormal returns for the event window by subtracting the predicted returns for the period, based on our calculations from the estimation window, from the actual returns realised. Both windows will be more carefully explained in the context of our study below.

***Figure 4* - Timeline of event study**



Source: eventstudytools.com

The first step of an event study is to define the event of interest and identify the period examined. The event of interest in our study is the announcement of employee stock options grants; this is therefore day 0 in our event study timeline in figure 4. It is based on this event we make an investigation where we look for indications that insiders on the Stockholm Stock Exchange use their superior insight to the operations of their company to serve themselves unjust rewards on the expense of other shareholders. We will investigate this by measuring for abnormal returns during the event window. Positive abnormal returns would be an indication of a form of insider trading or manipulation with regards to the grant dates or the news announcements in proximity to the grants. We base this statement on the efficient market hypothesis which states that one should only be able to beat the market consistently, when it is efficient on a semi-strong level, by using private information (Fama, 1970).

The estimation window is defined as the period prior to the event window. It is based on data from this period that we calculate the parameters needed to estimate the expected return for the event window. Our estimation window is set in accordance to the recommendation by MacKinlay (1997) and uses a 120-day estimation period of daily returns. This corresponds approximately to six calendar months since each month has roughly 20 trading days. Unless otherwise specified all time periods are measured in trading days. Since we want to include an examination of the return pattern leading up to the announcement of the option grant, negative abnormal returns prior to the announcement could indicate timing of news announcements, we will set our event window to start at earliest day -20. This is the same as $t_1 + 1$ on the timeline. To avoid getting biased parameters where the estimation of expected return is directly influenced by the actual return for that same period it is important that the two windows do not overlap. This is avoided by setting the last day of the estimation window to be day -21 or time t_1 on the timeline. To get the 120 days of observations we want during our estimation window we thus set it to span from day -141 to day -21.

We will vary the length of our event window to test a number of different intervals. At its earliest the event window will start at day-20 and at its latest end at day 20. We have chosen to only focus on short-term performance and do not attempt to measure long-term performance of the options as it would require a completely different econometric model and setup.

The intervals examined will be -20;0, -10;0, -5;0, 0;5, 0;10 and 0;20. In some instances firms grant options less than 20 trading days after they have been listed on Nasdaq OMX Stockholm, in this scenario we include the observation only in those intervals where the firm has been listed for the full interval. To exemplify if there is an employee stock option grant six days after IPO the observation will only be included in intervals starting at day -5 or later. An alternative would have been to include the observation also in earlier intervals such as -10;0 but let the cumulative abnormal return start from the first day we have data for that observation. We chose to not use this method since it would not give us the same clear result of the full interval.

Abnormal returns for all intervals are calculated using expected returns based on the parameters from the original estimation window. This is similar to the procedure used by Van deer Goot (2007) who also tests for several of the intervals. However our research differs from Van deer Goot in that we also try to explain our results using different corporate governance mechanisms. The advantage of testing for several intervals is that it will allow us to detect if there is a lag in how fast the market reacts to the information of option grants. If the markets are efficient and if insiders truly are manipulating the timing of their option grants the market should have learned this and react to announcements immediately by pushing the stock price up in anticipation of the good news to be announced by the firm.

5.3 Method for returns

As previously stated we are measuring for abnormal returns on employee stock options since we believe this will allow us to say something about the presence of manipulation in regards to the granting of the options. Abnormal returns can be defined as the difference between a share´s actual return over a specific period and the periods expected return (MacKinlay, 1997). In our study we have used daily returns, as we believe it will provide a more accurate picture of how the share price has moved during our sample period. The use of daily returns for event studies is also recommended by Fama (1970). The daily abnormal return for a share is measures according to equation 1:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \qquad (1)$$

Where $AR_{i,t}$ represent the abnormal return for company i at time t, $R_{i,t}$ is the actual return on the stock of company i for time t, and $E(R_{i,t})$ is the expected return for company i at time t. To calculate the actual returns we have used log-returns which is praxis in event studies since they are additive, thus making it easy to switch between different time horizons. We have calculated the actual realised daily returns for all stocks and the index in accordance to equation 2:

$$R_{i,t} = ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right) \qquad (2)$$

In order to say anything about the presence and potential magnitude of abnormal returns we need to estimate what the expected return was for the stock over that specific time period. This is in one sense perhaps the trickiest part of our study since past expected returns are not directly observable in the market. Our results are directly dependant on our estimate of expected returns being good in order to not get large errors in our measures of abnormal returns. This is a common issue for all studies looking at market efficiency or subjects related to the efficiency of the market. Since there exists no clear answer for exactly how to estimate expected returns, no finding of abnormal return is sufficient to conclude for certain that markets are inefficient. Advocates of efficient markets could always argue that the result is due to an error in the estimate of expected return rather than evidence of market inefficiency (Fama, 1991).

There are a few models commonly used to estimate expected returns, the two most common ones for event studies are CAPM and the Market Model. According to Banz (1981) an issue with CAPM is that the model tends to consistently underestimate the risk-adjusted returns of small caps while doing the opposite for large caps. The consequence this would have on our study is that we would get a bias where abnormal returns for small caps would tend to be positive while being biased downwards for large caps. Even if the bias turns out to be small on an individual level it might accumulate when used a large amount of times and added together.

To avoid this we conduct our study using the market model to estimate expected returns, this is also the method used by Yermack (1997) in his event study. The model is based on the assumption of a linear relationship between the return of a security and the return of the market index (Eventstudymetrics). In order to apply the market model three inputs are required; the market return for the period, a beta value against the market and an alpha. The beta measures the systematic risk of the stock or portfolio in relation to the total market. Alpha measures the risk adjusted excess return, one could say that alpha takes in to account all return that is not related to systematic market risk but to some other risk premium that is undefined in the model. Liquidity risk is an example of such a risk factor that is sometimes believed to carry a premium for investors who invest in illiquid assets.

Beta and alpha for every observation are estimated by running OLS regressions on the market and that firm's stock return during the estimation window, the 120 daily returns that occur from day -141 until day -21 prior to the option grant. The market index we are using for market returns is the Stockholm All Share Index as discussed in section 5.1.2. The market model is defined by equation 3:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (3)$$

Where $R_{i,t}$ is the specific firm return in period t, and $R_{m,t}$ is the return of the market portfolio in period t. β_i and α_i are the beta and alpha parameters we calculated based on the estimation window. $\varepsilon_{i,t}$ is defined as the error term and has an expected value of zero. One important takeaway from equation 3 is that neither alpha nor beta are dependent of the specific time period t we are looking at. Because of this we can also use equation 3 to estimate expected returns for the event window by plugging in the beta and alpha estimated from the estimation window.

One critique against the market model is that both parameters, but especially alpha, is varying with time making it sensitive to the exact estimation window we use. Dimson & Marsh (1986) also argue that there is a seasonal pattern in alpha. We try to mitigate this issue by estimating new parameters for each observation rather than re-using the same parameters for all observations in those instances we have multiple grants for the same firm. By using this approach we hope to avoid using out-dated parameters, which poorly reflect the current conditions of the firm. Since we have observations spread out during all times of a year we believe any seasonal patterns, if they exist, cancels out. Deciding the length of the estimation window is a trade-off between making it long enough to not be excessively sensitive to single days with extreme returns while still only including returns from recent and relevant periods. We believe 120 trading days meets both criteria.

An issue we encountered was that in some occasions firms granted options before they had been listed for 141 days on one of the ordinary lists of the Nasdaq OMX Stockholm Stock Exchange, rendering in too short history for us to calculate beta and alpha values. It is not desirable to first calculate an input to a model and then use the model to estimate the same time period used to calculate the input since it gives rise to a circular reference and a bias. To avoid this we use an alternative approach for calculating beta and alpha in these situations[4], we use the period from day 21 to 141 as the estimation period. Although this gives rise to another type of bias as we could not have known these returns at the start of our event window in reality, but for our purpose we believe this will not have any major impact on the result. Out of the 517 betas we estimate we find that 63 are statistically insignificant from zero. As this is still just a small proportion of the total sample we argue that our estimated betas can still be used to estimate future expected returns from which we can later infer results to our hypothesis tests.

As mentioned in section 5.1.4, on data filtering, four stock options grants were by firms that had been listed less than 120 trading days before the end of our sample period. As a result they were removed from our sample due to lack of data for the estimation period both before and after the grant date. None of the firms in the sample were delisted during our observation period.

Plugging in the betas and alphas together with the market return we can estimate the expected return for each day, for each observation, during the event window. This expected

[4] See appendix 3 for detailed information about these observations.

return is then subtracted from the actual return of the same day to get an abnormal return. The abnormal return can be both positive and negative and measures the deviation of the true realized return of the stock from the expected return.

5.4 Testing method for hypotheses

This section explains the two approaches used to test our eight hypotheses. We test our main hypothesis using a t-test while we use regression analysis to test our sub-hypotheses.

5.4.1 Testing our main hypothesis

With abnormal returns for each observation and each day of the event window in place we cumulate them in two different ways. First to test our main hypothesis, whether insiders earn abnormal returns on their employee stock options, we need to find the average abnormal return per day using equation 4:

$$AAR_t = \frac{1}{n}\sum_{i=1}^{N} AR_{i,t} \quad (4)$$

AAR $_t$ is the average abnormal return of all observations for time t. AR $_{i,t}$ represents the abnormal return for company i at time t and n is the sample size. Finally we cumulate the average abnormal returns using equation 5:

$$CAAR_{(t1,t2)} = \sum_{t=t1}^{t2} AAR_t \quad (5)$$

Where CAAR $_{(t1,t2)}$ represent the cumulative average abnormal return over the time period t1 to t2. We calculate CAARs for all the different intervals we are using. This measure shows us how much the return of firm i's stock over the full interval deviates from what should be expected based on the parameters from the estimation window and the market return for the relevant interval. Since the options are derivatives on the stock and their return depends directly on the stock price CAAR also shows us if insiders earn abnormal returns on their employee stock options during the time intervals we are studying.

After estimating the cumulative average abnormal return, a statistical test for significance can be performed. Amongst several test statistics available we follow MacKinlay's (1997)

recommendation of the t-test as the most suitable one. The t-test assesses whether the abnormal return is statistically different from zero. We use two-sided t-tests, which allow us to check for both statistically significant positive and negative abnormal returns. The t-test is considered to be quite robust for the assumption of normally distributed data, which means that in the case the data is not fully normally distributed, the test should still give us the same outcome (Snijders, 2011). The formula for the t-statistic is expressed in equation 6:

$$t = \frac{CAAR - H_0}{\frac{s}{\sqrt{n}}} \quad (6)$$

H_0 in our case is equal to zero since we expect the cumulative abnormal return to be zero by definition, otherwise the return would not be abnormal. The two variables in the denominator are s for the standard deviation of CAAR and n is the number of observations we take an average of. For the t-value to be statistically significant at a 5% level we need a t-value greater than 1.96 or smaller than -1.96.

5.4.2 Testing the sub hypotheses

To test our sub-hypothesises we need to cumulate the abnormal return for each firm on its own to find a CAR measure according to equation 7.

$$CAR_{i,(t1,t2)} = \sum_{t=t1}^{t2} AR_{i,t} \quad (7)$$

This is done for all relevant observations for each interval. CAR is very similar to CAAR but differs in that it shows the cumulative abnormal return insiders in one specific firm earn over the chosen interval while CAAR is the average for the full sample set. In other words, while we have one CAAR measure for each interval we have as many CARs as there are relevant observations for that specific interval. These CARs are then regressed against seven corporate governance and time variables to test if any of them has an explanatory value on the magnitude of a CAR.

To estimate the relationship between abnormal returns on employee stock option grants and corporate governance variables we perform a cross-sectional analysis using an Ordinary Least Square (OLS) regression model. We apply a simple regression model for each hypothesis to examine the effect and explanatory power each variable has on the

cumulative abnormal return. We also perform a robustness check by using a multiple regression model to investigate if the results of the simple regressions remain the same when regressing against all the explanatory variables at once. The multiple regression model can be expressed through equation 8.

$$CAR_i = \beta_0 + \beta_1 x_{1,i} + \beta_2 x_{2,i} + \ldots + \beta_n x_{n,i} + \epsilon_i \quad (8)$$

Where CAR_i is the cumulative abnormal return of observation i, β_0 is the constant, $\beta_1, \beta_2, \ldots \beta_n$ are the coefficients of the corporate governance variables, $x_{1,i,}\ x_{2,i}\ \ldots . x_{n,i}$ are the corporate governance determinants of observation i, and ϵ_i is the error term of the same observation. The simple regression is defined the same way with the single difference that the simple regression only has one coefficient, corresponding to the corporate governance variable examined in that specific regression.

5.4.3 Econometric issues

Before testing the statistical relationship between the abnormal return on employee stock option grants and the corporate governance and time variables the data sample needs to fulfil the assumptions of an OLS regression (Woolridge, 2013). First we need to identify if our data is normally distributed. Normally distributed errors are not required for OLS to yield unbiased estimates, however without normal residuals the standard errors and test statistics of the regression could be biased (UCLA a, 2016). We examine this assumption by applying the Shapiro-Wilks test for normality on our dependent and independent variables. The test results for the CARs imply that we are working with non-normal data, however after studying graphical distribution plots we find the dependent variables to be close to normal. We also encounter normality issues with the corporate governance variables. When viewing the distribution plots we see that several of the variables are positively skewed with excess kurtosis. There can be several reasons for the data not being normally distributed, but perhaps the most likely one in this case is that several of our variables have a minimum value of zero and contain many observations close to this value, resulting in the data distribution being skewed to the right.

A second reason for non-normality could be the presence of outliers in the data (UCLA a, 2016). This can be defined as observations, which to a large extent differ from the other observations in the dataset and solely drive the result of the regression analysis of that

hypothesis (Ibin). We identify outliers by calculating a "z-score" for each observation. The "z-score" is calculated as

$$Z_i = \frac{Y_i - \bar{Y}}{s} \quad (9)$$

where $\overline{Y}$ and s denotes the sample mean and the sample standard deviation. We use a threshold of +/- 3, so any observation in the dataset with an absolute z-score exceeding 3 is considered an outlier (Seo, 2006 p. 10). Generally, before removing an outlier from a dataset it should be identified as an extreme value in the sense that it is either believed to be a data error or a value that for some reason is very improbable to occur again. After closer investigation we find no compelling reason to exclude any of the observations singled out as outliers from our analysis as we do not see them as data entry errors or impossible to occur in the future. We argue that these events should be included in our analysis as it gives a more accurate picture of the actual abnormal returns earned and the corporate governance determinants. As an alternative solution to the problem we also apply a robust regression, a strategy compromising between excluding the outlier points from the analysis and including them and treating them the same as in an OLS regression. Thus the robust regression can be defined as a form of reweighted least square regression as it weighs the observations based on how well behaved they are (UCLA b, 2016). When comparing the robust regression results to the regular OLS result we find no improvements in the R-square measure. This suggests that our original model explains a higher fraction of the cumulative abnormal return and that the model parameters are only slightly influenced by outliers (Ibin). Thus we choose to proceed with our regular OLS regression model.

One way to make the distribution of variables closer to normal is to transform the data into its natural logarithm (Woolridge, 2013). Taking the natural logarithm of a skewed variable might improve the fit of the scale and make the variable closer to being normally distributed (Princeton University Library, n.d). As a result of our data not being entirely normally distributed some of our explanatory variables are presented in log form.

The next step is to check for heteroskedasticity; if the variance of the residuals is non-constant. The presence of heteroskedasticity would not affect the coefficient of our model, however the variance and the standard errors would be biased and the test statistics would no longer be valid (Woolridge, 2013). We check for heteroscedasticity in the residuals

through the White test for heteroscedasticity. The p-values of the White tests indicate that our models have signs of heteroskedasticity, rejecting the null hypothesis of the residuals variance being constant. To correct for this we report heteroscedasticity-robust standard errors in all our models.

The next OLS assumption to investigate is the problem with high multicollinearity. Multicollinearity can be described as the case when there is a high degree of correlation (linear relationship) between the predictors. The bare existence of multicollinearity does not violate any of the OLS assumptions, however the issue it creates is that the greater collinearity, the greater the standard errors. Thus with the presence of high multicollinearity the estimates of coefficients from the regression model become unstable and the standard errors tend to be inflated (Woolridge, 2013). We check for multicollinearity in our data by first constructing a correlation matrix for all the independent variables, presented in appendix 4. From the matrix we find that all the explanatory variables have low levels of correlation amongst each other. The two variables, not used for the same hypothesis, with the highest correlation are small cap and high-tech (0.26). However, this correlation is not surprising as many small firms on the Stockholm Stock Exchange are technology intensive (Nasdaqomxnordic.com). As of the low pair-wise correlations the matrix does not suggest that we have a problem with multicollinearity. However it is still possible for a strong linear relationship to exist among three or more variables. We therefore continue to estimate the variance inflation factor (VIF) for all the independent variables. As we find that all VIF values are lower than the rule-of thumb-threshold of 10 (Williams, 2015) we conclude that multicollinarity should not be an issue in our models. Finally the linearity assumption is also valid, as we find no clear non-linear pattern in our data.

As none of the discussed data assumptions of normality, heteroskedaticity, multicollinearity or linearity are violated we conclude that our method of using OLS is a valid one. We therefore follow the method previously described with simple OLS regressions for each hypothesis and a multiple regression in order to check the robustness of our results.

5.5 Validity and reliability

For our result to be credible and of value it is important to consider the validity and reliability of the study. The concept of validity refers to the extent to which the data and research method used manages to test and answer the stated hypotheses. Reliability

concerns the quality of our results, in other words if the study was to be repeated by someone else would they obtain the same result as we have (Greener, 2008).

We believe our results are valid as our research design follows the standard procedure used in previous studies on similar topics such as Yermack (1997) and Van der Goot (2007) that also use event study methodology to test for abnormal returns on employee stock option grants. Moreover, we believe we have made a clear connection with our initial discussion and our theoretical briefing why abnormal returns is a good way to measure the presence and extent of manipulation by insiders. However the validity of our conclusions is dependent on the data material being of high quality. The Financial Supervisory Authority's insider register, which is used as a source, is dependent on insiders actually following the regulations and reporting changes to their holdings. One risk with our data is that transactions which truly are based on private information might be undisclosed in an illegal attempt to hide it from the authorities. This could create a downward bias on our result since it would mean observations with positive abnormal return are left out of our study. Since the existence of these types of transactions is only hypothetical and undisclosed it is impossible to make any adjustments to correct for their possible absence in our study to give a more true answer to our hypotheses.

There are several aspects to reliability, one is the extent to which other researchers are able to follow our research method and repeat it. We believe our study is of high reliability in this aspect as we have carefully explained the data collection process and the formulas used for computing the results. This should mean that there are good opportunities for others to replicate our study and get the same results.

There is always a risk that we may have made mistakes in the processing of the data as we have used an extensive amount of data where we have collected stock option grants, daily returns and firm characteristics, which again has been processed in several stages to finally become the cumulative abnormal return measures and corporate governance variables. We have made use of both Excel and SAS as statistical tools to minimise the amount of manual error prone data processing. As we also control for outliers and use a relatively extensive dataset individual errors should have next to no impact on the overall result.

Since we use all employee stock option grants made by firms within our test population, firms listed at Nasdaq OMX Stockholm, we are not subject to the risk of performing our test on a misleading sample. Another aspect of reliability is how stable the measure is over time. As will be further discussed in the result and analysis chapter we do see variations in both the occurrence of option grants and their returns between different years. Our result is therefore not completely stable irrespective of the time period chosen to examine. We have chosen to use as long period as possible by starting our sample from the same year the first insider trades are reported and published by the Swedish Financial Supervisory Authority, which is 2006. By using as many as 10 consecutive years we have most likely succeeded in getting some of the fluctuations to cancel out to give a more reliable result.

5. Empirical results

This chapter presents and discusses the result from our study. We start off with a description of all the variables in use. Next the results of each simple regression is discussed in detail and then compared to the results of the multiple regression analysis. We finish of by summarising our results and discussion to answer our initial problem statement.

5.1 Variable definitions

The table below defines the variable used in our analysis.

***Table 4* - Variable definitions**

Variable	Definition
CARs -20-0	Abnormal returns -20 to 0 days before the option grant date
CARs -10-0	Abnormal returns -10 to 0 days before the option grant date
CARs -5-0	Abnormal returns -5 to 0 days before the option grant date
CARs 0-5	Abnormal returns 0 to 5 days after the option grant date
CARs 0-10	Abnormal returns 0 to 10 days after the option grant date
CARs 0-20	Abnormal returns 0 to 20 days after the option grant date
Small-cap	Dummy variable equal to 1 when the firm had a market cap less than 150M EUR
Mid-cap	Dummy variable equal to 1 when the firm had a market cap between 150M EUR and 1BN EUR
Log(Listed age)	Log of years listed at Stockholm Stock Exchange + 1 year
Prior performance	The firms excess return over the market during the 12 months leading up to the option grant
High-tech	Dummy variable equal to 1 when the firm industry is classified as level 1, level 2 or level 3 high-tech industries
Vrights 30% +	Dummy variable equal to 1 if the granting firm has an owner holding more than 30% of the firms total voting rights.
Log(CEO tenure)	Log of the number of years as the firm´s CEO
Post crisis	Dummy variable equal to 1 if the stock option was granted in the period January 1st, 2009 to December 31th, 2011 and 0 if granted January 1st,2006 to December 31th, 2010

As we have chosen to look at six different time intervals for measuring the cumulative abnormal return we also test for six dependent variables. However these are never used more than one at a time in a regression. Further we use eight explanatory variables. We only have seven sub-hypothesis but for the hypothesis regarding if insiders in small firms earn higher abnormal returns on their option grants we use the variable mid cap as a control variable. As discussed in section 5.4.2 'Testing the sub-hypotheses' one assumption of OLS is that variables should be normally distributed. Since we found the distribution of the explanatory variables "listing age" and "CEO tenure" to be non-normal they are both presented in natural log form.

5.2 Descriptive statistics

The summary statistics of all the corporate governance and time variables used in our study are presented in table 5 below.

Table 5 **- Descriptive statistics**

Variable	Mean	Stdev	Min	Max	N
Small cap	.369	.483	0	1	517
Mid cap	.410	.492	0	1	517
Log(Listed age)	2.12	1.09	0	4.748	517
Prior Performance	.102	.774	-1.02	8.416	474
High-tech	.424	.495	0	1	517
Vrights 30%+	.304	.461	0	1	517
Log(CEO tenure)	.838	1.604	-5.899	3.517	517
Post crisis	.392	.489	0	1	372

The "N" column shows the number of observations relevant for that category. As can be seen in the table the two variables 'Prior Performance' and 'Post Crisis' have fewer observations then the others. This is due to the fact that in 43 occasions it is not possible to calculate 1-year of prior performance leading up to the option grant while we have 144 observations that did not occur in either the prior or post crisis periods we have defined.

We see that 36.9% of the observed option grants are made by small caps. This is approximately in line with the distribution of small caps as a fraction of the total number of listed firms on the Stockholm Stock Exchange which is 332 (distributed as 105 large-caps, 117 mid-caps and 110 small-caps) as of 23rd of June 2016 (Nasdaqomxnordic.com). Mid cap firms have been the issuers 41% of the times while they make up 35% of the total amount of listed firms. Our sample indicates that large firms are the least likely ones to grant their insiders options. While 32% of the listed firms on Stockholm Stock Exchange are large caps they are the issuer of employee stock options in only 22% of the cases. An explanation for this pattern could be that Swedish firms use options to attract talent in situations where they have insufficient funds to offer high salaries. This could typically be in smaller firms where there is still high uncertainty in revenue streams. This pattern is in line with the findings by Damodaran (2005) for the US market. It can also be seen in Sweden's neighbour country Denmark where smaller firms use options as a tool to attract talented employees when they have insufficient liquidity to offer competitive salaries (Økonomi- og Erhvervsministeriet p.3, 2007). Another reason could be that there is a pecking order where

employees themselves prefer receiving fixed payments in large firms since they often have stable operations and low expected growth rates while preferring options in smaller firms with good growth opportunities (Filatotchev et al. 2006). This is in line with the Black-Scholes valuation model where an options value increases with uncertainty and volatility making it more attractive to receive options in small firms (Hull, 2012, ch.14).

When it comes to listing age, the sample average firm has been listed for 13.5 years at the Stockholm Stock Exchange. In its natural logarithm this number corresponds to 2.12. The mean value of high-tech is presented as 42.4%, since it is a dummy variable this means that approximately 2/5 of the granting firms were operating in high technology industries. As previously discussed it is not surprising that such a large fraction of the observations are derived from technology firms as similar observations have been made by Damodaran (2005). Another interesting statistics is the average value of the prior performance variable which is positive. It shows that the average observation in our sample has outperformed the market over the year prior to the option grant. However as seen from the maximum value we have a few really high performers which drive the result. The actual fraction of observations which has positive excess return versus the market is 46.7% so we have a balanced sample of both positive and negative prior performances.

The median time the CEO has been at his position when a stock option grant occurs is 3.2 years in our sample. This can be compared to the average time a company has the same CEO which is approximately 3.5 years in Sweden (Jensen, 2013). It therefore seems option grants are given relatively late in a CEO's average time at the position. This can be a sign that option grants in Sweden are used more often to encourage a sitting CEO to keep his motivation and dedication up rather than in connection with an attempt to attract and recruit a coveted CEO. Even though it is ultimately the board and not the CEO who decides whether the firm will issue employee stock options (Lekvall, 2014) it could also be a sign that CEO's get more influence with time and this way are more likely to convince the board of being awarded stock options. This is in line with our argument of CEO tenure being a valid proxy for CEO influence. It also matches with the findings of both Hill & Phan (1991) and Bebchuk et.al (2006) who found CEO influence over the firms compensation policy increased with the tenure. This should not be completely implausible since we know that CEO's in Sweden often also occupy a seat on the board of directors (Hallvarsson & Halvarsson, 2015).

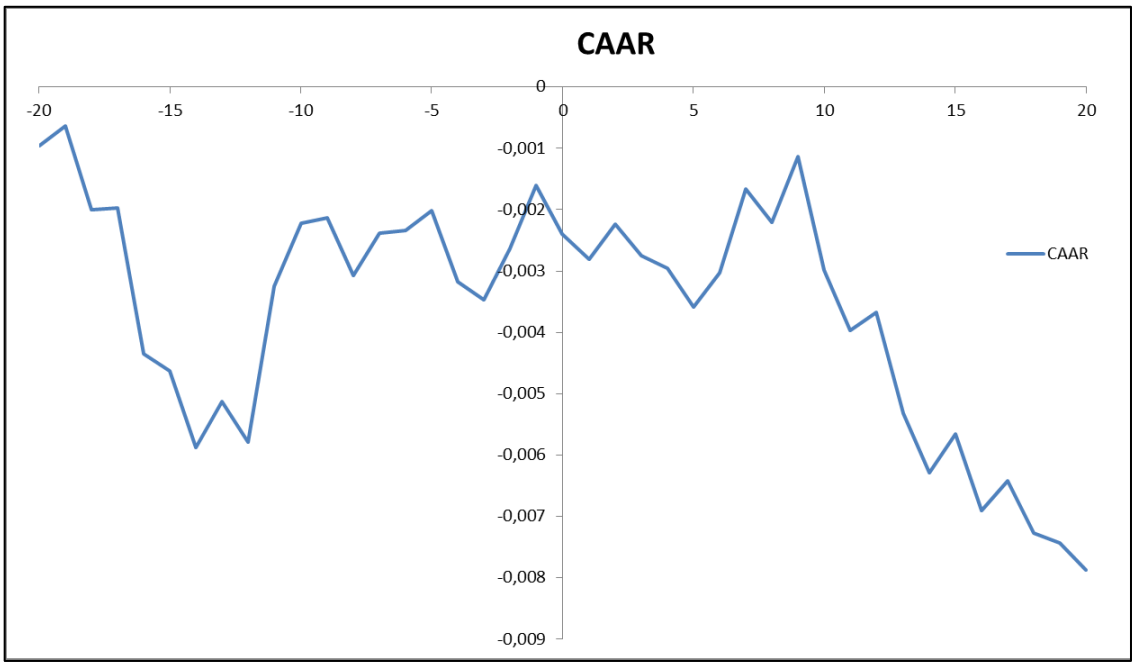
5.3 Result of main hypothesis

H1: *Insiders in firms listed at Nasdaq OMX Stockholm opportunistically manipulate employee stock option grants to earn positive abnormal returns*

Our main hypothesis tests the statement, and findings of previous research, that insiders manipulate employee stock option grants. For the hypothesis to be accepted we expect cumulative abnormal returns on employee stock options to be positive and significantly different from zero after the grant date and negative and statistically significant before the grant date.

Figure 5 shows the cumulative average abnormal return over the full interval we have used for measuring abnormal returns. The horizontal axis shows the days relative to the option grant date while the vertical axis is the cumulative average abnormal return. As the graph shows it seems as there is in general a negative relation between employee stock option grants and stock returns both before and after the issuance. This is in contradiction to what should be expected if our hypothesis is correct. In that case a negative pattern prior to the grant would be expected, however it should then be followed by positive abnormal returns after the issuance. In our graph we observe negative abnormal returns up to the issuance date, but we fail to see any distinct indications of positive abnormal returns afterwards. There are shorter periods of recoveries with positive abnormal returns but in total it seems as though the cumulative abnormal returns actually becomes even more negative after the option grants than during the days prior to them.

***Figure 5* – The Cumulative Abnormal Return between -20;20**



Even though figure 5 gives an intuitive graphical illustration of our findings we have to use statistical tests in order to truly examine our results to see if the cumulative abnormal return path is only due to randomness or if there is a statistically significant relation. Table 6 presents the cumulative average abnormal returns for the six time intervals, which run both before and after the stock option grants, and the t-tests conducted on them to test their statistical significance.

***Table 6* - Abnormal stock returns for firms listed at the Stockholm stock exchange during 2006-2015 before and after the option grant date**

	Mean	Stdev	T.val	P.val	N
CAARs -20 –0	-.003	.113	-.53	.597	471
CAARs -10 -0	.0007	.086	.18	.854	474
CAARs -5 -0	-.00019	.065	-.06	.950	474
CAARs 0-5	-.002	.060	-.75	.455	517
CAARs 0-10	-.001	.083	-.38	.707	517
CAARs 0-20	-.006	.113	-1.26	.209	517

For the intervals prior to the grant we have mixed results with two of them being negative in line with our hypothesis while the period -10;0 is actually positive. However, all of them are statistically very insignificant and therefore too unreliable to draw any conclusions from. In contrast to the studies by Yermack (1997), Aboody and Kasznik (2000) and Lie (2005) our

results of the post-grant intervals do not provide any evidence or indication of insiders manipulating the timing of employee stock option grants to earn positive abnormal returns. Based on the sign of the coefficient for the interval 0;20, which is closest to being statistically significant, it actually seems as insiders are on the contrary granted options with remarkably bad timing. However, since it is hard to find any logical explanation for insiders intentionally scheduling the timing of option grants to lose money we assume this is caused by randomness if the negative results are connected to the timing of the grant at all.

An alternative reason to the negative CARs could be that the market participants believe the cost of the option grants will be larger than the benefit they will entail and therefore trade the stock price down. As discussed in the theory chapter the intent of basing part of the remuneration on the stock performance is to align the interest of the employees with that of the shareholders. However, even though the options do not cost the firm any money at the grant date, in terms of cash outflows apart from the administrative issuance cost, the current shareholders' ownership stakes will be diluted if the options are exercised (Hull, 2012). Hence, if shareholders believe the cost of dilution will be greater than the economic benefit from having employees motivated through performance dependant pay they will trade down the stock already when the options are issued. This effect could also be an explanatory factor to the low level of equity-based compensation in Sweden compared to other European countries found by Conyon et al. (2011). If Swedish firms are punished by the market for using equity-based remuneration this could make them abstain from granting employee stock options. If existent this effect would occur irrelevant of the timing of the option grant and also serve as a more intuitive explanation, than insiders intentionally timing options to lose money, to the negative CARs found after option grants. However as all intervals are statistically insignificant it could also be that our results are simply due to randomness.

Based on none of the intervals in table 6 being statistically significant we reject our main hypothesis that insiders in Swedish listed firms opportunistically manipulate employee stock option grants to earn positive abnormal returns. This is despite Swedish insiders having a wider window, than American insiders, to backdate if they had chosen to. As we do not find any evidence of fraudulent behaviour by insiders we conclude that further legislation on the area is not needed at the moment since current regulations are proficient in protecting shareholders. The result is not very surprising as Sweden is already regulated by strict laws

and legislation forbidding self-dealing where private information is used by insiders to give themselves advantages at the expense of other market participants (Finansinspektionen, 2010).

Our results diverge significantly from previous studies discussed in our literature review and hypothesis chapters. The difference between previous studies and ours could lie in the different time periods from which we are drawing our data. Both Yermack (1997) and Aboody and Kasznik (2000) studies time periods before the implementation of the Sarbanes-Oxley Act of 2002, which could explain why they find such significant positive abnormal returns for periods after the option grants in their paper. As expressed in chapter 3, firms were allowed to report stock option grants at any time up to 45 days after the end of the fiscal year prior to the Act (Heron and Lie, 2007). This left them with a much wider window for manipulative acts. If these types of regulation are the complete answer to the discrepancy between our results we would probably have needed to conduct our study on Swedish data prior to 2000 as that is the year similar regulation was implemented for Swedish firms (Rättsnätet, 2000). However, Narayanan and Seyhun (2005b) and Heron and Lie (2007) documented that although there are significantly weaker abnormal returns after the introduction of SOX they still exist as many firms are not meeting the set requirements. We thus have to dismiss this as a sole source to why our results differ.

An additional argument regarding the time periods the different papers are conducted could be made in the fact our study is the only one where part of the sample period is after the financial crisis of 2008. As discussed in chapter 4 the financial crisis resulted in stricter legislation for compensation practises, both in Sweden and abroad. This could therefore potentially be the missing link explaining why our study finds no significant abnormal return on stock option grants. However, based on our results of hypothesis H8, which tests the effect the financial crisis has had on the abnormal return pattern around employee stock option grants, discussed in section 5.4 this does not provide the answer either. Another possibility is that our results are biased downwards since we examine the abnormal return for all insiders instead of focusing on only CEOs or executives. However as all persons who are obliged to report to the Swedish insider register and are included in our definition of insiders (board members, executives and accountants) have important and influential positions of the company we argue this is of low risk.

We therefore believe the answer is more likely to be found looking at other opposing factors between the studies. As previously discussed our study is conducted in a different institutional context than most previous studies which are based on data material from an Anglo-American setting. It does therefore not come as a complete shock that our results are different compared to those studies. A part from the different jurisdictional traditions and accounting standards discussed in chapter 4 we believe the difference in ownership structure may play a vital role in the explanation of the discrepancies. The more concentrated ownership structure observed for Sweden by Lekvall (2014) could arguably lead to an alleviation of the free rider problem discussed by Rose (2005). We therefore argue that the absence of positive abnormal returns in our study is an effect of insiders in Swedish firms being more intensely monitored, and thus abstaining from any fraudulent activities, by large blockholders than their American counterparts. This is also a plausible explanation for the divergence from the result of Van Der Goot (2007) as the Netherlands also have a relatively dispersed ownership structure, although not as much as Anglo-American countries (OECD b, 2015: p.14). We reason that investor monitoring has en especially important role as many of the granting firms are small and medium sized, thus they are facing less media and analyst coverage, increasing the importance of self-monitoring by investors.

However, we note from the research by Yermack (1997) that a large part of the abnormal return he discovers is realised during the period 20;120. It is therefore possible that a study looking at a longer interval would have come to a different conclusion than ours.

5.4 Result of sub-hypotheses

Even though we do not find any evidence of stock option manipulation amongst insiders on the Swedish market in general, it is still interesting to test if there are certain corporate governance or time factors that affect the magnitude of cumulative abnormal returns. What follows is the result from the tests of our seven sub-hypotheses presented in chapter 4. The relationship between the cumulative abnormal return and the individual corporate governance and time determinants are estimated using simple OLS regressions.

H2: *Insiders in small sized firms are likely to earn higher abnormal returns on their employee stock option grants.*

The second hypothesis measures the relationship between firm size in term of market capitalization and the cumulative abnormal return around stock option grants. The firm size is measured by a proxy where the firms are sorted according to which of the three lists, small, mid or large cap, on Nasdaq OMX Stockholm they belong to at the date of the grant. As can be deducted from table 5 (descriptive statistics) 190 of our 516 observations are small caps. We state in hypothesis H2 from chapter 4 that we want to test if insiders in smaller firms tend to earn higher abnormal returns on their employee stock options based on the belief that insiders in small firms could draw advantage of facing less intense scrutiny from the outside world than large companies (Heron and Lied, 2006). Thus, we expect the coefficient on "small cap" to be positive after the grant.

Table 7 **- OLS regression on the effect of firm size on the cumulative abnormal return**

	Model 1 CARs -20-0	**Model 2 CARs -10-0**	**Model 3 CARs -5-0**	**Model 4 CARs 0-5**	**Model 5 CARs 0-10**	**Model 6 CARs 0-20**
Small cap	.006 (.63)	.012 (.22)	.011 (.13)	0.000 (.96)	-.012 (.22)	-.011 (.39)
Mid cap	-.013 (.22)	-.013 (.09)*	-.006 (.28)	-.001 (.89)	-.008 (.20)	-.009 (.36)
Constant	.0001 (.99)	.002 (.75)	-.002 (.69)	-.002 (.61)	.006 (.30)	.002 (.82)

Note: Table 7 reports the estimated OLS regression result of cumulative abnormal return explained firm size for the six time intervals. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 5 for complete output

The result of the OLS regression analysis is presented in table 7. The output of the regressions shows no significant relationship between the abnormal return on stock option grants and smaller firms either before or after the grant. Our results thus contradict those of Heron and Lie (2009) who found that in America smaller firms were more likely to engage in backdating. The explanation could be connected to the more concentrated ownership structure in Sweden (Lekvall, 2014). As previously discussed larger owners have a greater incentive to monitor management. The difference in ownership structure might have an especially pronounced effect for small companies where the lack of media attention and analyst coverage (Heron and Lie, 2006) makes the monitoring role of the investors even more important. It might therefore be thanks to the more dispersed ownership on the

American market that insiders there have been able to get away with manipulation of employee stock option grants.

One remarkable takeaway from table 7 is the negative coefficient on Mid-cap in the time interval -10;0 which is statistically significant at a 10% level. The result indicates that mid-sized firms have significant negative abnormal return during the ten last days leading up to an option grant. This is a surprising result which we have a hard time to rationally explain. We have previously discussed that negative CARs prior to the grant date could be due to timing of news announcements in an attempt to push the exercise price of the option down. However, we fail to see any valid arguments for why this would be occurring specifically amongst mid-caps.

The absence of significant results for the small cap variable indicates that firm size measured by the proxy market cap has no explanatory power on the magnitude of CARs. Based on our result we have to reject hypothesis H2 for all intervals. We also notice that the coefficient of small cap has the opposite sign, in all intervals, of what would be expected if our hypothesis was true. Based on the two intervals 0;10 and 0;20 it actually seems more probable that being an insider in a large firm has a positive impact on the CAR of your employee stock options.

H3: *Insiders in younger firms are likely to earn higher abnormal returns on their employee stock option grants.*

Our third hypothesis investigates the relationship between the firms listing age and the cumulative abnormal return around stock option grants. Table 8 show no statistically significant results, indicating that the firm size has minimal to no effect on the abnormal return on stock option grants. Comparing the sign of the coefficients on listing age we see that our regression on the cumulative abnormal return after the stock option grant is small and negative for all intervals. This is in accordance to our hypothesis of insiders in younger firms having higher abnormal returns. However, the closest we get to statistical significance ex-post of the grant is the time interval 0;10 which has a p-value of 22.8%, which is still a bit high to be able to draw any conclusions from.

Table 8 **- OLS regression on the effect of firm listing age on the cumulative abnormal return**

	Model 1 CARs -20-0	**Model 2 CARs -10-0**	**Model 3 CARs -5-0**	**Model 4 CARs 0-5**	**Model 5 CARs 0-10**	**Model 6 CARs 0-20**
Log(listing age)	-.000 (.96)	.002 (.50)	.003 (.17)	-.001 (.60)	-.004 (.23)	-.001 (.86)
Constant	-.003 (.79)	-.005 (.61)	-.008 (.23)	.001 (.89)	-.007 (.41)	-.005 (.70)

Note: Table 8 reports the estimated OLS regression result of cumulative abnormal return explained by firm age for the six time intervals. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 6 for complete output

One reason for the absence of significant results could be that we have too many firms which have already been listed for a substantial amount of time. The differences, if any, were expected to be found between relatively newly listed firms and more mature ones rather than between two mature firms of different age. We have therefore also tested the robustness of our result by using a dummy variable called *'young'* with a threshold of one year as a listed company. Firms listed for a shorter period were assigned the value of 1 while older firms were assigned the value of 0. The results are shown in appendix 7. There is a positive relation between young firms and abnormal return after the stock option grants. Additionally the coefficients on the constant, which on this occasion includes the abnormal return for all firms being listed for more than two years, are all negative. These results are consistent with the findings of table 8 and indicate that younger firms have a higher abnormal return on stock options than older firms. However, as the findings of the alternative method are also statistically insignificant we cannot make any inferences from the result.

Based on our result we therefore have to reject hypothesis H3 for all intervals, we were unable to find any evidence that the time a firm has been listed affects the cumulative abnormal return insiders earn on their employee stock options.

H4: *Insiders in firms with higher prior stock performance are likely to earn higher abnormal returns on their employee stock option grants.*

Table 9 presents the result from our fourth hypothesis, investigating the relationship between a firm's prior stock performance during the year leading up to the option grant and the cumulative abnormal return on the employee stock option grant. In contrast to previous

tables the intervals prior to the option grant are excluded. This is because the days leading up to the option grant are included in the prior performance variable which would give a biased result for those intervals.

Table 9 **- OLS regression on the effect of prior performance on the cumulative abnormal return**

	Model 4 **CARs** **0-5**	**Model 5** **CARs** **0-10**	**Model 6** **CARs** **0-20**
Prior performance	-.002 (.22)	-.011 (.09)*	-.024 (.00)***
Constant	-.007 (.41)	-.001 (.81)	-.005 (.34)

Note: Table 9 reports the estimated OLS regression result of cumulative abnormal return explained by prior stock performance for the three post grant date time intervals. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 8 for complete output

We find a negative and statistically significant relation between the two variables for two out of three time intervals ex post of the grant date. A negative relationship means that insiders in firms which have outperformed the market in the prior year will earn a lower cumulative abnormal return on their stock options. Based on our result we cannot reject that there is a relationship between prior stock performance and the cumulative abnormal return on employee stock option grants, however it is in the opposite direction of what we expected in the hypothesis.

One reason for the result could be that it is hard for previous winners to outperform already high set expectations by the market. It is important to remember that we are measuring abnormal returns and not direct returns, thus meaning prior winners could still be doing well, just not as good as the market expects based on their previous performance. It could be argued that the result is in line with the basic principle of employee stock option grants since they are used to entice the beneficiaries to exhaust extra effort to deliver good results. If we start by making the bold assumption previous bad performers were only due to management not delivering up to their full capacity, while good performers were due to management performing at the top of their ability to deliver the best results possible. As the market believes that management of good performers are already exhausting their greatest effort they also expect that there is no room for improvement regardless of increased incentives. Instead the granted options just become an extra cost, thus having a negative impact on the stock price all else equal. On the other hand as we blame the poor

performance of previous losers on the lack of effort from the management we also expect there to be opportunities of improvement. Thus when they are granted options they get stronger incentives to put in more effort which in turn will be interpreted by the market as good news and push the stock price up in anticipation of better future performance.

Even though we argue our previous explanation is plausible and intuitive it is not possible to reject that the results could also be explained by the theory of mean reversion, studied amongst others by Fama & French (1988). They found that good performance in one period is expected to be followed by a drawback in future periods, thus keeping the asset close to its long-run average. If this is the reason for the significant results we have obtained it means that insiders do not have to manipulate the timing of their grants in any illegal manner, they can simply just grant options after their stock has experienced below average returns. The stock returns are available for the public to follow and therefore not private information. However, it might still not be as easy as it can first seem to profit from the effect since you still need to know when the period of bad performance will end. This is something we will not go much further in to in this paper but we can just note that if markets are efficient you should not be able to make abnormal returns on completely predictable patterns.

H5: *Insiders in firms within technology intensive sectors are likely to earn higher abnormal returns on their employee stock option grants.*

In hypothesis H5 we want to test if insiders active in high technology intensive industries have a higher cumulative abnormal return around employee stock option grants. The regression analysis presented in table 10 shows no statistically significant results. We can note from the table that the coefficient for the intervals after the option grant starts out positive and then decreases until it turns negative for the longest interval. We also see the same pattern with the significance being very close to significant at the 10% level for the shortest interval, then decreasing for the longer ones. The closest we get to significance is time interval 0;5 which has a positive coefficient and a p-value of 11.7%. This is consistent with the hypothesis and close to, but still not significant. We must therefore reject the hypothesis that there is a significant relation between firms being technology intensive and the abnormal return on stock options. One reason can be that current regulation, which require firms to report earnings quarterly (Malmqvist, 2015), gives the rest of the market so

frequent updates on the operations of a firm that the information gap between insiders and outsiders is reduced even for firms in more opaque industries.

Table 10 **- OLS regression on the effect of high-tech firms and the cumulative abnormal return**

	Model 1 CARs -20-0	Model 2 CARs -10-0	Model 3 CARs -5-0	Model 4 CARs 0-5	Model 5 CARs 0-10	Model 6 CARs 0-20
High-tech	.003 (.78)	.005 (.57)	-.001 (.84)	.007 (.12)	.005 (.47)	-.006 (.58)
Constant	-.004 (.56)	-.001 (.80)	.000 (.91)	-.005 (.21)	-.004 (.45)	-.004 (.55)

Note: Table 10 reports the estimated OLS regression result of cumulative abnormal return explained by technology intensive industries for the six time intervals. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 9 for complete output

H6: *Insiders in firms with an owner holding a high fraction of the voting rights are likely to earn less abnormal returns on their employee stock option grants.*

The next hypothesis looks at the effect of large shareholders, in terms of voting rights, on the cumulative abnormal return around employee stock option grants. If our hypothesis is correct we would expect there to be a negative relationship between the abnormal return and firms having a large shareholder as a result of a higher fraction of monitoring.

Table 11 presents the result from the simple regression on the different time intervals. There is a negative relation between having a majority shareholder holding more than 30% of the firms voting rights and the abnormal return prior and post the option grant date. This is in line with our hypothesis and could be a confirmation of expectations that larger shareholders put more money and effort into monitoring resulting in less option manipulation. Even though we previously found that insiders in general on the Swedish market do not earn abnormal returns on their employee stock option grants our result for H6 suggest that the likelihood decreases even further if they work for a firm with a large majority owner.

Table 11 **- OLS regression on the effect of large shareholders on the cumulative abnormal return**

	Model 1 CARs -20-0	Model 2 CARs -10-0	Model 3 CARs -5-0	Model 4 CARs 0-5	Model 5 CARs 0-10	Model 6 CARs 0-20
Vrights 30% +	-.019 (.08)*	-.012 (.11)	.000 (.96)	-.005 (.36)	-.015 (.05)*	-.019 (.05)*
Constant	.003 (.65)	.004 (.37)	-.000 (.94)	-.000 (.90)	-.003 (.50)	-.000 (.93)

Note: Table 11 reports the estimated OLS regression result of cumulative abnormal return explained by the majority owners voting rights for the six time intervals. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 10 for complete output

However, what is harder to explain based on this argument is the significant negative abnormal return that occurs during the 20-day period prior to the option grant. We have previously introduced the concept of rushing bad news announcements before option grants to push the stock, and hence strike price, down and increase the possibility to get a higher return after the grant (Aboody and Kasznik, 2000). This could be an explanation despite our belief insiders in these firms are more intensely monitored as it is arguably hard to prove fast announcements of news are made with fraudulent intentions. However we find it hard to justify why this would occur in a larger scale for firms with a concentrated ownership structure as we did not observe the same patterns when examining our main hypothesis.

Since all intervals have negative coefficients it has to be questioned whether there is some other underlying reason that makes a firm with a large shareholder underperform. One explanation could be that firms with large majority owners underperform compared to their peers due to the absence of takeover threats which is suggested to keep management alert in fear of being replaced. This is also found be Holderness (2003) who states that hostile takeover attempts cannot succeed for firms with shareholders controlling more than 30% of the voting rights (Holderness, 2003, p. 53). However as the ownership structure among the largest shareholders is usually stable any effect of this kind should already be weighed in to expectations, thus leaving the question of what causes the significant negative abnormal return prior to the grant open.

H7: *Insiders in firms with a CEO with a longer tenure are likely to earn higher abnormal returns on their employee stock option grants.*

The seventh hypothesis discusses the effect the CEO tenure has on the abnormal return. As previously discussed we view the variable to be a proxy for CEO power and influence. From table 12 we have that the coefficient on the CEO tenure is negative for the time intervals after the stock option grant date. This means that as the firm has had the same CEO for a longer time the abnormal return on employee stock option decrease. This relation is surprisingly opposite to what we expected as previous studies such as Bebchuck et al. (2006) have found a positive correlation between abnormal return and CEO tenure for the American market. However our results are statistically insignificant, even though the p-value of CEO tenure in the time interval 0;10 is almost statistically significant at a 10% level. This means that it is hard to conclude anything based on the regression.

Table 12 **- OLS regression on the effect of CEO tenure on the cumulative abnormal return**

	Model 1 CARs -20-0	**Model 2 CARs -10-0**	**Model 3 CARs -5-0**	**Model 4 CARs 0-5**	**Model 5 CARs 0-10**	**Model 6 CARs 0-20**
Log(CEO tenure)	.002 (.61)	.000 (.81)	-.000 (.71)	-.002 (.19)	-.004 (.11)	-.003 (.29)
Constant	-.004 (.50)	.001 (.95)	.000 (.92)	-.000 (.91)	.002 (.71)	-.004 (.51)

Note: Table 12 reports the estimated OLS regression result of cumulative abnormal return explained by CEO tenure for the six time intervals. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 11 for complete output

One reason to the absence of a negative relation before and positive after the grant date could possibly be if a large majority of our observations are scheduled option grants. Collins, Gong and Li (2005a) documented that unscheduled option grants allowed CEOs to greater influence the grant date of the stock option, leading to a lower strike price. Thus if many of the firms which granted options in our sample use scheduled grants it might be hard for the CEO to have any real impact on the return pattern of the options regardless of how influential he usually is. However, as also found by the same researchers CEOs with a higher degree of influence over compensation committees are also more likely to issue employee stock options on an unscheduled basis. Thus it is intuitive to believe that if CEO influence does increases with the tenure then option grants made by the firms of established CEOs

should already be unscheduled if they are willing to manipulate option grants and it provides them with better opportunities for high returns.

To test the robustness of our result we have also tested the hypothesis using a dummy for CEO's that has held the same position for a long time. We classify a CEO who has been executive officer for the same firm longer than the median of our sample, 3.2 years, as being there a long time. The alternative approach reduces the impact single observations, from firms having the same CEO for a remarkably long time, have on our result. We justify this approach suggesting that there might be a limit to how much a CEO's influence will ever increase over time. Following this argument it would therefore not give a fair result using our original method as the "implied" or expected influence a CEO is supposed to have after being at the position for many years is simply overestimated. The results from the alternative method are presented in appendix 12. To the contrary from our original test we now find a positive relation between firms with a CEO who have been executive officer for more than 3.2 years and the abnormal stock return. However, even though the result is in line with our hypothesis and the findings of Bebchuck et al. (2006) the result is not statistically significant leaving us with the conclusion of rejecting the hypothesis.

H8: *Insiders are likely to have a lower degree of abnormal returns on employee stock option grants after the 2008 financial crisis.*

Our last hypothesis focuses on the effect the 2008 financial crisis has had on the cumulative abnormal returns on employee stock options in Sweden. As shown in table 13, two out of six time intervals show a statistically significant positive relationship between the two variables. The results therefore indicate that abnormal returns on employee stock options significantly increased after the financial crisis of 2008. This is the opposite of what we hypothesised as we expected the abnormal returns to decrease after the financial crisis as a result of strengthened legislation (Finansinspektionen, 2010, p.23; Lekvall, 2014) and increased awareness of previous manipulation.

Table 13 **- OLS regression on the effect of the financial crisis on the cumulative abnormal return**

	Model 1 CARs -20-0	Model 2 CARs -10-0	Model 3 CARs -5-0	Model 4 CARs 0-5	Model 5 CARs 0-10	Model 6 CARs 0-20
Post crisis	.012 (.36)	.017 (.08)*	.008 (.20)	.008 (.20)	.009 (.33)	.029 (.02)**
Constant	-.009 (.30)	-.008 (.20)	-.004 (.30)	-.006 (.17)	-.009 (.08)*	-.019 (.02)**

Note: Table 13 reports the estimated OLS regression result of cumulative abnormal return explained by the 2008 financial crisis for the six time intervals. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 13 for complete output

Investigating the robustness of our result, we run an additional regression to see if the result is dependent on any specific year during the period included in the two groups prior and post crisis. This test has been conducted the same way as the initial one but this time the CARs have been divided into year categories instead of prior or post crisis.

Table 14 **- Cumulative abnormal return between 2006-2011**

	Model 2 CARs -10-0	Model 6 CARs 0-20
2006	.002 (.83)	-.006 (.66)
2007	-.011 (.35)	-.019 (.12)
2008	-.039 (.01)**	-.021 (.33)
2009	.031 (.09)*	.032 (.19)
2010	-.015 (.11)	.013 (.29)
2011	-.011 (.31)	-.008 (.58)
Constant	.006 (.38)	-.004 (64)

Note: Table 14 reports the estimated OLS regression result of cumulative abnormal return explained by years for the two time intervals. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 14 for complete output

As seen in table 14 the significant result for the -10;0 interval seems to depend to a large extent on the specific years 2008 and 2009, which are prior respective post crisis, rather than some lasting change that has occurred after the crisis since the two other post crisis years both have negative coefficients for the interval. The result for interval 0;20 looks like it could be more stable irrespective of any specific year since all years prior to the crisis have negative coefficients while two out of three are positive after the crisis, in addition it is these two which are closest to significance post crisis. It therefore seems as the significant result from table 13 for interval 0;20 could be more long-lasting. We can therefore not reject that

there is a difference between CARs before and after the financial crisis of 2008, however surprisingly the results indicate that there is an increase in CARs after the crisis rather than a decrease which is something we lack an intuitive explanation for.

As stated in H1 we can, based on our findings, dismiss the argument that the absence of abnormal returns in our study is due to part of the sample period being after the financial crisis. As discussed by ourselves in chapter 4 it could otherwise be intuitive to expect the financial crisis to have a negative effect on abnormal returns due to increased regulations and a general increase in public scrutiny by sceptical reporters and investors. However our result is actually providing evidence of the opposite effect.

5.6 Multiple regression analysis

In this section the results from the simple regressions will be compared to the result of the multiple regressions. Because many of the same traits recur between the different time intervals we have decided to focus on the result from the models witch fits the data best.

***Table 15*- Multiple regression analysis**

	Model 1 **CARs -20-0**	**Model 2** **CARs -10-0**	**Model 3** **CARs -5-0**	**Model 4** **CARs 0-5**	**Model 5** **CARs 0-10**	**Model 6** **CARs 0-20**
Small cap	.013 (.53)	.018 (.24)	.015 (.15)	-.004 (.64)	-.027 (.04)**	-.019 (.35)
Mid cap	-.012 (.47)	-.008 (.52)	.001 (.87)	.001 (.91)	-.014 (.25)	-.009 (.64)
Log(listed age)	-.003 (.66)	.002 (71)	.003 (.47)	.002 (.63)	-.003 (.43)	.004 (.51)
Prior performance	-	-	-	-.021 (.00)***	-.024(.00)***	-.037 (.00)***
High-tech	-.004 (81)	-.004 (.75)	-.006 (.42)	.008 (.21)	.015 (.12)	.008 (.60)
Vrights 30% +	-.013 (.42)	-.004 (.69)	.006 (.45)	-.009 (.25)	-.020 (.05)**	-.025 (.07)*
Log(CEO tenure)	.001 (.75)	.002 (.60)	.000 (.93)	-.001 (.92)	-.002 (.59)	-.002 (.49)
Post crisis	.009 (.45)	.015 (.13)	.005 (51)	.004 (.46)	.006 (.51)	.019 (.11)
Constant	.003 (.91)	-.015 (.44)	-.015 (.27)	-.006 (.64)	.028 (.25)	-.006 (.80)
R-squared	.012	.024	.016	.071	.059	.063
F-statistics	.859	.459	.726	.002***	.008***	.005***

Note: Table 15 reports the estimated OLS regression result of cumulative abnormal return explained by different corporate governance variables. The numbers in the parentheses are the significance levels. Statistically significance is reported as: *p<0.1, **p<0.05, ***0<0.01. See appendix 15 for complete output

Comparing the goodness-of-fit of the multiple regression models from table 15 we have that the regression analysis on the time interval post to the stock option grants presents the models with the highest R-squares and significant F-statistics (Woolridge, 2013). Moreover in addition to having the highest fit we also notice that the post grant time intervals are the only multiple regression models presenting statistically significant results. Therefore our comparison between the simple regression and the multiple regressions will mainly focus on these three time intervals.

From table 15 we see that the coefficients on the variable small cap for the time intervals 0;5 and 0;20 are still negative and statistically insignificant as in the simple regression analysis presented in table 7. However in contrast to the simple regression the negative result for the time interval 0;10 has now become statistically significant. This confirms that our initial hypothesis, that insiders in small caps earn higher abnormal returns on their stock option grants, is rejected but we fail in coming up with an intuitive explanation to the significant negative result.

Hypothesis H3 on listing age was rejected for the simple regression analysis as we did not find any significant results for any of the time intervals during the simple regressions even though all post grant intervals had a negative coefficient as predicted by the hypothesis. The multiple regression results confirm our decision to reject the hypothesis, both since none of the intervals find a significant relationship but also since the sign is changing between intervals which indicate that the results are not particularly stable.

Similar to the simple regression analysis we find a statistically significant negative relation between a firm´s prior stock performance and its cumulative abnormal return on employee stock options in the multiple regression analysis for the post grant time intervals. However, now we also find the shortest interval to be statistically significant which further confirms our previous results.

When testing the relation between CARs and firms being technology intensive using simple regressions we found no significant relationship, although it was close to a positive significant result for the interval 0;5. The results obtained using multiple regressions are similar; this time around the coefficients have signs in accordance with our hypothesis for all

intervals both prior and post the grant. However we still do not have any significant results, meaning we have still have to reject the hypothesis.

One of the corporate governance variables we found statistically significant in the simple regression analysis was the proportion of voting rights the major owner holds, which had a negative relationship with CAR. For the time interval 0;5 we see that the coefficient on voting rights 30%+ is still negative in table 15, but not statistically significant. However, we did not find a significant negative relation for the simple regression on the time interval 0;5 either. The significant results were only found for the longer time intervals post to the grant date. Comparing these to the multiple regressions on the same time intervals, we see that both models still find a significant negative relationship between voting rights and cumulative abnormal return on employee stock options. This confirms our findings from H6.

We see from the multiple regression results that the coefficient of CEO tenure is once again negative for all post grant time intervals; the same pattern is observed in the simple regressions as well. As neither yields any significant results we must stay with our previous conclusion to reject hypothesis H7.

In the simple regression analysis we found that the cumulative abnormal return on employee stock option grants was significantly higher after the financial crisis. This relation is however not confirmed by any of the multiple regressions. All time intervals find a positive coefficient on the variable post crisis, but none are statistically significant. It could be mentioned that the coefficient on post crisis in the multiple regression for the time interval 0;20 have a p-value of 11,3%, but this again is not statistically significant at a 10% level.

5.6 Summary of results and discussion

Previous research by Fernandes et al (2009) and Conyon et al (2011) on CEO compensation found that equity based remuneration, including employee stock options, is very rarely used in Sweden compared to many other countries. Our sample proved to be in line with previous research such as Damodaran (2005) finding that it is mostly tech-firms and small caps issuing employee stock options. We also see a sharp decline in the number of option grants per year from our first observation year 2006 until 2015. There can be several reasons to the low usage of employee stock options in Sweden. However it is especially surprising as Sweden is seen as one of the global centers for tech startups (Davidson, 2015), thus fitting perfectly in to the template of the typical firm to use employee stock options. One reason discussed

heavily in media is the unfavorable taxation of the incentive vehicle in Sweden (Billing, 2015). Another reason could be that insiders themselves prefer other types of remuneration as our results, although not statistically significant, indicate that they actually receive negative abnormal returns on their employee stock option grants. It could also simply be that the incentive tool is used although grants from these tech-firms do not show up in our data because many of them are still not mature enough to be listed, are being acquired by larger firms[5], are listed on foreign exchanges[6] or choose to stay private companies.

Our findings differ from the previous studies conducted by Yermack (1997), Aboody and Kasznik (2000) and (Lie, 2005) who all found evidence of various kinds of manipulation in regards to the granting of employee stock options. We argue it is because those studies were conducted on the US market. They are thus conducted in an Anglo-American institutional context which differs on several areas from the one prevalent in Sweden. One such area is the difference in ownership structure, while American firms tend to be characterized by dispersed ownership, Swedish firms are known for the opposite (Lekvall, 2014). Concentrated ownership is believed to alleviate the free rider problem in regards to monitoring. Swedish insiders are thus likely to be monitored more intensely by large blockholders making them cautious of committing any fraudulent acts. This is especially important since granting firms are often small or medium sized firms facing less media and analyst coverage.

To conclude we do not find any evidence of insiders in Swedish listed firms opportunistically manipulating employee stock option grants to earn themselves higher returns. Based on our result we thus come to the conclusion that reinforced legislation is not needed momentarily as the current one is proficient in protecting shareholders from fraudulent behavior with regards to employee stock option grants.

[5] One example being Mojang AB, the swedish computer game developer of Minecraft being acquired by Microsoft Corp (Owen, 2014)

[6] One example being the developer of the mobile game Candy Crush Saga, King Digital Entertainment Plc which chose to go IPO on New York Stock Exchange instead of Nasdaq OMX Stockholm (Svärd, 2014)

***Table 16* - Summary of empirical results**

Hypothesis	Accepted/rejected
H1: Positive abnormal return earned by insiders	Rejected
H2: Abnormal return decreasing with firm size	Rejected
H3: Abnormal return decreasing with firm age	Rejected
H4: Abnormal return higher for prior winners	Rejected*
H5: Abnormal return higher for high tech firms	Rejected
H6: Abnormal return lower for firms with large majority owners	Accepted
H7: Abnormal return increasing with CEO tenure	Rejected
H8: Abnormal return higher prior to the financial crisis	Rejected*

Note: An asterisk (*) means we found statistically significant results for the hypothesis; however they are of the opposite direction than expected. We thus have to reject the hypothesis but not that the variable has an impact on CARs

To further dissect our result we have also looked at six sub-hypotheses involving corporate governance determinants to see if any of these have an effect on the magnitude of the cumulative abnormal return. Our decision to accept or reject each hypothesis is summarized in table 16. Contrary to previous findings by Bebchuk et al. (2006) and Heron and Lie (2009) we do not find any evidence of insiders in small firms earning higher abnormal returns. We argue the difference in ownership structure can have an especially pronounced effect here as small firms tend to have less media and analyst coverage, thus making monitoring even more reliant on investors. Our results are also not revealing any evidence of insiders in young firms earning higher abnormal returns. In our regression models we find the coefficients to be consistently in the right direction for all intervals; however none of the results are statistically significant.

One factor that we do find to have a statistically significant effect, although in the opposite direction than expected, is prior stock performance. Our result indicates that insiders in firms which were the prior year's winners are likely to earn less abnormal return on their employee stock option grants. One explanation could be that it is harder for previous winners to deliver above already high set expectations. A different one can be that the market believes management is already performing at their best ability, therefore not expecting any increase in effort or result due to increased incentives instead just viewing the options as a cost. However, we can also not exclude the possibility that the result is due to the effect of mean reversion of prices.

The fourth corporate governance determinant tested was if insiders in tech firms earn higher abnormal returns. Contrary to Heron and Lie (2009) we find no evidence of grant manipulation being more prevalent in technology intense firms. However, we do find statistically significant evidence suggesting that the likelihood of insiders manipulating employee stock option grants decreases even further when they are employed by a firm with a concentrated ownership structure. This is in line with our hypothesis and also with the arguments of the more concentrated ownership structure in Sweden being one of the reasons we do not, in contrast to previous foreign studies, find evidence of any manipulation in relation to the grants. What we also find is a puzzling result of firms with a large majority owner experiencing a statistically significant negative abnormal return during the 20 days leading up to an option grant. The concept of insiders rushing negative news announcements prior to grant dates to push down stock and strike prices could be suggested as an explanation, however we find it hard to justify this occurring more frequently in firms with a concentrated ownership.

The last corporate governance variable examined is the impact of CEO tenure, which is a proxy of CEO influence, on abnormal returns. Contrary to a previous study by Bebchuck et al. (2006) we do not find any evidence of the variable having any significant impact on abnormal returns around employee stock option grants. Finally we investigate if the 2008 financial crisis has had any impact on abnormal returns around employee stock option grants. In contradiction to what could be expected with increased regulation and fewer firms using employee stock options, potentially because insiders themselves are opting for other compensation methods, we find statistically significant evidence of higher abnormal returns after the crisis. However we fail to come up with an intuitive explanation to the result and believe it needs further research from additional sampling periods to confirm our findings. After checking the robustness of all our results by performing a multiple regression we find that all our conclusions regarding the acceptance or rejection of hypotheses stands.

6. Conclusions and recommendations

In this final chapter we summarize our conclusions and propose a few topics we have come across during our study which we would find interesting to read more about in future research

6.1 Conclusion

In our study we find no evidence of insiders in Swedish listed firms opportunistically manipulating the granting of employee stock options. We thus conclude that there is currently no need for reinforcement of legislation to protect shareholders from fraudulent behavior by insiders in regards to employee stock option grants.

We dismiss the argument that our study result is divergent from previous literature on the area due to the more recent time period we have used. This is justified by the fact that there have been studies in the US finding abnormal return patterns also after the introduction of stiffer regulations, such as the Sarbanes-Oxley act in 2002, combined with findings in our study of CARs actually increasing after the 2008 financial crisis. Instead we suggest an alternative explanation arguing that the different institutional context between the studies is the main cause of the discrepancies. Especially we argue the concentrated ownership structure characterizing the Swedish market to be the missing link. Previous studies almost exclusively draw their data from an Anglo-American setting with dispersed ownership, thus giving rise to the free rider problem in regards to monitoring by investors. As Swedish majority owners hold a proportionally larger stake than their American counterparts the problem is alleviated. We therefore argue Swedish insiders are monitored more intensely by blockholders, thus making them abstain from fraudulent acts. Monitoring by investors makes a big difference as granting firms are predominantly small and medium sized firms with less media and analyst coverage thus making monitoring reliant on the investors themselves.

We have also dissected our result by testing the impact six different corporate governance determinants have on abnormal returns. We can conclude that contrary to previous studies we find no evidence of firm size, firm age, technology intensity or CEO tenure having any effect on the abnormal return pattern around employee stock option grants in Sweden. However we do find that insiders in firms which were the previous year's winners on the stock market are likely to earn less abnormal return. We argue this could be because markets believe management is already performing to the top of their ability, thus not

expecting any increase in effort albeit the increased incentives, instead viewing the options purely as costs.

We also find evidence of the likelihood for abnormal returns decreasing when the firm has a large majority owner. This is in line with our argument of the larger blockholders monitoring more intensely. Finally we find that contrary to what could intuitively be expected abnormal returns have actually increased significantly after the financial crisis of 2008 despite increased regulations. We find it hard to find a suitable explanation for our last finding.

6.2 Proposals for further research

During our study we have come across several topics and findings which we believe could be valuable complements to current literature if studied. We would therefore like to end our thesis with a few proposals for further research on the area of manipulation of employee stock option grants.

First of we believe our findings, showing an increase in abnormal returns after the financial crisis, are a very relevant topic to investigate further. In our study we failed to come up with an intuitive explanation to the result. If future research is able to confirm our findings it becomes a question of whether increasing CARs are becoming a trend and if this has the potential to grow to actually become evidence of grant manipulation.

Both Randøy and Nielsen (2002) and Abrahamson and De Ridder (2010) found a positive correlation between foreign ownership and CEO pay for the Swedish market. We would therefore be interested to know more about how foreign ownership affects CARs. Higher pay could arguably be linked to owners being slacker in their monitoring. This combined with foreign owners not having the same geographical proximity to the company could potentially indicate more room for insiders to self-deal.

We would finally have liked to see our study method being applied to a couple of the other Scandinavian countries which have similar institutional contexts to the Swedish one to see if the results are resembling since our sample size was rather limited. This could confirm or reject our argument of the institutional context being a decisive factor to our results differing from previous studies on the American market.

7. Reference list

Abrahamson, Martin and de Ridder, Adri, 2010, Executive Compensation Contracts and Ownership Structure, *Gotland University*. Available at: https://www.researchgate.net/publication/268013697_Executive_Compensation_Contracts_and_Ownership_Structure (24-03-2016)

Aboody, David and Kasznik, Ron, 2000, CEO Stock Option Awards and the Timing of Corporate Voluntary Disclosures. *Journal of Accounting and Economics, 2000, Vol. 29(1), pp. 73-100.*

Banz, Rolf W. 1981, 'The relationship between return and market value of common stocks', *Journal of Financial Economics, 1981, Vol.* 9(1), pp. 3-18

Barontini, Roberto, Bozzi, Stefano Ferrarini, Guido and Ungureanu, Maria Cristina. 2013, Directors´ Remuneration before and after the crisis: Measuring the impact of reforms in Europe. *Cambridge University Press, 2013.* Available at SSRN: http://ssrn.com/abstract=2250677 (24-03-2016)

Bebchuk, Lucian A. Grinstein, Yaniv and Peyer, Urs, 2006, Lucky CEO´s. *National Bureau of Economic Research, NBER Working paper*

Bebchuk, Lucian A. Cohen, Alma and Spamann, Holger, 2010, The wages of failure: Executive compensation at Bear Stearns and Lehman 2000-2008 (November 24, 2009), *Yale Journal on Regulation, Vol. 27, 2010, pp. 257-282.* Available at SSRN: http://ssrn.com/abstract=1513522 (25-04-2016)

Becht, Marco, 2003, Reciprocity in Takeovers, *ECGI - Law Working Paper No. 14/2003.* Available at SSRN: http://ssrn.com/abstract=463003 (10-07-2016)

Bhattacharya, Utpal and Daouk, Hazem, 2002, 'The World Price of Insider Trading', *Journal Of Finance*, 57, 1, pp. 75-108

Billing, Mimmi, 2015, Regeringens utredare vill förenkla optionsregler för startups. Available at: http://digital.di.se/artikel/regeringens-utredare-vill-forenkla-optionsregler-for-startups (01-08-2016)

Bizjak, John, Lommon, Michael and Whitby, Ryan, 2007, Option backdating and board interlocks, *The Review of Financial Studies, Vol. 22(11), pp. 4821-4847*

Bloomberg News, 2011, Appeals Court Cuts Forfeiture From Ex-Officer at Monster*, New York Times (March 9). Available at:* http://www.nytimes.com/2011/03/10/business/10monster.html (29-07-2016)

Carruth, Paul, J. 2011, Accounting For Stock Options: A Historical Perspective*. Journal of Business And Economics Research Vol. 1(5), pp. 9-14.*

Carter, Mary Ellen and Lynch, Luann J. 2001, An examination of executive stock option reprising. *Journal of Financial Economics 61 (2001) 207-225.*

Chauvin, Keith and Shenoy, Cathrine, 2001, Stock price decreases prior to executive stock option grants, *Journal of Corporate Finance, Vol. 7, pp. 53-76.*

Chidambaran, N. K. and Prabhala, Nagpurnananand R. 2003, Executive stock option reprising, internal governance mechanism, and management turnover, *Jourznal of Financial Economics, vol 69 (1), pp 153-89*

Collins, Daniel W. Gong, Guojin and Li, Haidan, 2005a, The timing of CEO stock option grants: Scheduled versus Unscheduled Awards. Available at SSRN: http://ssrn.com/abstract= 696982 (21-05-2016)

Collins, Daniel, W. Gong, Guojin and Li, Haidan, 2008, Corporate Governance and Backdating of Executive Stock options*. *Contemporary Accounting Research, 2009, Vol. 26(2), pp. 403-445.*

Conyon, Martin J. Fernandes, Nuno, Ferreira, Miguel, A. Matos, Pedro, and Murphy, Kevin, J. 2011, The Executive Compensation Controversy: A Transatlantic Analysis. Available at: http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1004&context=ics (01-04-2016)

Core, John .E. Guay, Wayne .R. Larcker, David .F. 2003, Executive Equity Compensations and Incentives: A Survey. *FRBNY Economic Policy Review, Vol. 9(1), April 2003.* Available at SSRN: http://ssrn.com/abstract=794806 (23-03-2016)

Damodaran, Aswath, 2005, Employee Stock Options (EPOPs) and Restricted Stock: Valuation Effects and Consequences, *Stern School of Business.* Available at: http://people.stern.nyu.edu/adamodar/pdfiles/papers/esops.pdf (21-03-2016)

Davidson, Lauren 2015, How Sweden became the startup capital of Europe, The Telegraph. Available at: http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/11689464/How-Sweden-became-the-startup-capital-of-Europe.html (14-04-2016)

Dimson, Elroy & Marsh, Paul 1986, 'Event study methodologies and the size effect: The case of UK press recommendations', *Journal of Financial Economics, Vol. 17(1), pp. 113-142*

Edelson, Rick & Whisenant, Scott 2009, A study of companies with abnormally favorable patterns of executive stock option grant timing, *Bauer College of Business, University of Houston.* Available at: http://online.wsj.com/public/resources/documents/backdate-08182009.pdf (27-07-2016)

Elofsson. S, Engstedt. R, Falck. M, Ljung. F 2013, 'Insiderinformation: Hantering och kontroll', Stockholm: *Nordstedts Juridik*

Ersättningsakademine, 2011, VD-ersättningar I de 30 största storföretag 2010. *Hallvarsson & Halvarsson*. Available at: http://ersattningsakademien.hhtest.se/wp-content/uploads/2013/08/HH_Ersattn-debatt-VD-10_Maj2011_PA15.pdf (02-04-2016)

Ersättningsakademien, 2014, VD-ersättningar I de 36 största svenska börsföretagen 2013. *Hallvarsson & Halvarsson*. Available at: http://www.ersattningsakademien.se/wp-content/uploads/2014/11/HH_Ersattn-debatt-VD-14.pdf (02-04-2016)

Eventstudymetrics, Event Study Methodology, Available at: http://eventstudymetrics.com/index.php/event-study-methodology/ (05-05-2016)

Fama, Eugene, 1970, Efficient Capital Markets: A review of theory and empirical work, *Journal Of Finance, Vol. 25 (2), pp. 383-417*

Fama, Eugene, 1980, Agency Problems and the Theory of the Firm, *The Journal of Political Economy, Vol. 88, No. 2, pp. 288-307*

Fama, Eugene, 1991, 'Efficient Capital Markets: II', *The Journal of Finance, vol. 46, No. 5, pp. 1575–1617*

Fang, Hongyan and Whidbee, David, 2013, The Economic Rationale for Option Backdating: Incentive-based explanations, *Managerial Finance, Vol. 39(1), pp. 1004-1031.*

Fernandes, Nuno, Ferreia, Miguel A. Matos, Pedro and Murphy, Kevin, J. 2009, The Pay Divide: (Why) are U.S Top Executives Paid More? *Working Paper No 225.* Available at: http://rady.ucsd.edu/faculty/seminars/2010/papers/matos.pdf (21-05-2016)

Fernandes, Nuno, Ferreia, Miguel A. Matos, Pedro and Murphy, Kevin, J. 2012, Are US CEOs Paid More? New International Evidence* *The review of Financial Studies.* Available at SSRN: http://ssrn.com/abstract=2159119 (21-05-2016)

Filatotchev, Igor, Toms, Steve and Wright, Mike 2006, The firms strategic dynamics and corporate governance life-cycle, *International Journal of Managerial Finance, Vol.2 (4), pp.256-279*

Finansinspektionen a, n.d, Hur du anmäler. Available at: http://www.fi.se/Rapportering/Insynshandel/Fragor-och-svar/Hur-du-anmaler/ (18-05-2016)

Finansinspektionen b, n.d, Handelsförbud. Available at: http://www.fi.se/Rapportering/Insynshandel/Fragor-och-svar/Handelsforbud/ (18-05-2016)

Finansinspektionen c, n.d, This shall be reported. Available at: http://finansinspektionen.se/Folder-EN/Startpage/Regulations/Market-information/Insider-position/This-shall-be-reported/ (05-06-2016)

Finansinspektionen d, n.d, Börser och aktiehandel. Available at: http://www.fi.se/Folder-SE/Konsument/Fragor-och-svar/Spara/Borser-och-aktiehandel1/ (01-06-2016)

Finansinspektionen e, n.d, Börsinformation. Available at: http://www.fi.se/Regler/Borsbolag/Borsinformation/ (07-06-2016)

Finansinspektionen, 2010, Tillsynsrapport: Erfarinheter av tillsyn och regelutveckling. Available at: http://www.fi.se/upload/43_Utredningar/20_Rapporter/2010/tills_rapp_2010-05-18ny.pdf (10-06-2016)

Fried, Jesse M 2008, Option Backdating and Its Implications, Washington and Lee Law Review, Vol. 65, Issue 3 pp.853-886. Available at: http://scholarlycommons.law.wlu.edu/wlulr/vol65/iss3/2/

Georgen, Marc and Renneboog, Luc, 2011, Managerial Compensation, *Journal of Corporate Finance 17, pp. 1068-1077.*

Greener, Sue, 2008, Business Research Methods, Vol. 1, *Bookboon.com*

Hall, Brian J. Liebman, Jeffrey B. 1997, Are CEOs Really Paid Like Bureaucrats?. *National Bureau of Economic Research, NBER Working Paper.*

Hall, Brian J. and Murphy, Kevin J, 2003, The Trouble with Stock Options, *Journal of Economic Perspectives, 2003, Vol. 17 (3), pp. 49-70.*

Hallvarsson & Halvarsson, 2015, The Swedish Corporate Governance Code. Available at: http://www.corporategovernanceboard.se/media/69763/svenskkodbolagsstyrn_eng_2015_151124.pdf (18-03-2016)

Hecker, Daniel E, 2005, High-Technology employment: a NAICS-based update. *Monthly Labor Review, pp. 57-72.*

Heron, Randall A. Lie, Erik, 2007, Does backdating explain the stock price pattern around executive stock option grants? *Journal of Financial Economies 83: pp. 271-295.*

Heron, Randall A. Lie, Erik, 2009, What Fraction of Stock Option Grants to Top Executives Have Been Backdated or Manipulated? *Management Science 55 (4): pp. 513-525*

Hill, Charles, W. and Phan, Phillip, 1991, CEO tenure as a Determinant of CEO Pay. *The Academy of Management Journal, vol. 34, No. 3, pp. 707-717.* Available at: http://www.jstor.org/stable/256413 (28-05-2016)

Holmen, M. and Knopf, J. D. 2004, Minority Shareholder Protections and the Private Benefits of Control for Swedish Mergers, Journal of Financial and Quantitative Analysis, Vol. 39(1), pp. 167-191

Hope, Ole-Kristian & Thomas, Wayne B., 2008, Managerial Empire Building and Firm Disclosure, Journal of Accounting Research, Vol. 46, No.3. Available at: http://www.jstor.org.esc-web.lib.cbs.dk/stable/pdf/40058147.pdf?_=1470655466227 (05-09-2016)

Huddart, Steven, 1994, Employee Stock Options. *Journal of Accounting and Economics, 1994, Vol. 18(2), pp. 207-231*

Hull, John C. 2012, Options, futures, and other derivatives, *8th ed, Boston: Prentice Hall*

Ifrs.org, 2016, IFRS application around the world Jurisdictional profile: Sweden. Available at: http://www.ifrs.org/Use-around-the-world/Documents/Jurisdiction-profiles/Sweden-IFRS-Profile.pdf (29-07-2016)

UCLA a, 2016, Regression with SAS: Chapter 2- Regression Diagnostics. Available at: http://www.ats.ucla.edu/stat/sas/webbooks/reg/chapter2/sasreg2.htm (04-08-2016)

UCLA b, 2016, SAS data analysis examples, Robust regression. Available at: http://www.ats.ucla.edu/stat/sas/dae/rreg.htm (20-06-2016)

Jensen, Michael C, Meckling, William H. 2000, Theory of the firm: Managerial Behavior, Agency costs and ownership structure, *Journal of Financial Economics, Vol. 3(4), pp. 305-360.*

Jensen, Michael C, Murphy, Kevin J. Wruck, Erik, 2004, Remuneration: Where we´ve been, how we got to here, what are the problems, and how to fix them. *ECGI -Finance Working Paper no 44/2004.* Available at SSRN: http://ssrn.com/abstract=561305 (05-05-2016)

Kristiansson, Björn and Skog, Rolf, 2003, Directors´ Remuneration in Listed Companies – Sweden, *European Corporate Governance Institute.* Available at: http://www.ecgi.org/remuneration/questionnaire/sweden.pdf (05-05-2016)

Lakonishok, Josef and Lee, Inmoo, 2001, Are Insider Trades Informative? *Review of Financial Studies Vol. 14 (1), pp. 79-111.* Available at: http://www.insiderslab.com/knowledge/areInsiderTradesInformative.pdf (20-05-2016)

Lee, HY. Mande, V. and Son, M. 2010, Corporate Governance Characteristics of Firms backdating stock options, *Quarterly Journal of Finance and Accounting vol. 49 (1): pp. 39-60.*

Lekvall, P. 2014, The Nordic Corporate Governance Model, *SNS Förlag.* Available at: http://www.sns.se/sites/default/files/the_nordic_corporate_governance_model_0.pdf (20-05-2016)

Lie, Erik, 2005, On the timing of CEO stock option awards, *Management Science Vol. 51 (5), pp. 802-812.* Available at: https://www.biz.uiowa.edu/faculty/elie/Grants-MS.pdf (21-03-2016)

Lie, Erik, 2006, Backdating of Executive Stock Option (ESO) Grants. *University of Iowa.* Available at: https://www.biz.uiowa.edu/faculty/elie/backdating.htm (10-05-2016)

MacKinlay, A.Craig, 1997, Event studies in Economics and Finance, *Journal of Economic Literature, Vol. 35, pp. 13-39.* Available at: http://www1.american.edu/academic.depts/ksb/finance_realestate/rhauswald/fin673/673mat/MacKinlay%20(1997),%20Event%20Studies%20in%20Economics%20and%20Finance.pdf (30-05-2016)

Malmqvist, Peter, 2015, Hoten mot kvartalsrapporterna, Balans. Available at: http://www.tidningenbalans.se/kronika/hoten-mot-kvartalsrapporterna/ (01-08-2016)

Minilex, n.d, Börsbolags informationsskyldighet. Available at: http://www.minilex.se/a/b%C3%B6rsbolags-informationsskyldighet (23-07-2016)

Narayanan, M.P. and Seyhun, H. Nejat, 2005a, Do Managers influence their pay? Evidence from stock price reversals around executive option grants. *Ross School of Business Working Paper Series, Working Paper No. 927.* Available at: https://deepblue.lib.umich.edu/bitstream/handle/2027.42/39167/927.pdf?sequence=1 (24-05-2016)

Narayanan, M.P and Seyhun, H. Nejat, 2005b, Effect of Sarbanes-Osxley Act on the influencing of executive compensation. Available at SSRN: http://ssrn.com/abstract=852964 (01-06-2016)

Nasdaqomxnordic.com, n.d, Aktier – Aktiekurser för bolag listade på nasdaq nordic. Available at: http://www.nasdaqomxnordic.com/aktier (10-08-2016)

NordiskeTax, 2016, Skattesatser – 2016. Available at: https://www.nordisketax.net/main.asp?url=files/sve/sve/i07.asp (05-08-2016)

OECD, 2009, Corporate Governance and the Financial Crisis: Key Findings and Main Messages. Available at: http://www.oecd.org/corporate/ca/corporategovernanceprinciples/43056196.pdf (18-03-2016)

OECD, 2011, Board Practice: Incentives and governing risk, Corporate Governance, *OECD Publishing*. Available at: http://dx.doi.org/10.1787/9789264113534-en (18-03-2016)

OECD a, 2015, G20/OECD Principles of Corporate Governance. Available at: https://www.oecd.org/daf/ca/Corporate-Governance-Principles-ENG.pdf (18-03-2016)

OECD b, 2015, OECD Corporate Governance Factbook. Available at: http://www.oecd.org/daf/ca/Corporate-Governance-Factbook.pdf (02-08-2016)

Ortwein II, Bernad, M. 2003, The Swedish Legal System: An Introduction. Indiana International & Comparative Law Review, Vol. 13:2, pp. 405-445. Available at: http://mckinneylaw.iu.edu/iiclr/pdf/vol13p405.pdf (01-08-2016)

Owen, 2014, Yes, We're being bought by Microsoft. Available at: https://mojang.com/2014/09/yes-were-being-bought-by-microsoft/ (24-07-2016)

Pastor, L and Veronesi, P. 2003, Stock Valuation and Learning about profitability. *NBER Working paper No. 8991.*

Pedersen, Lasse 2015, Efficently Inefficient: How Smart Money Invests and Market Prices Are Determined, *New Jersey: Princeton University Press*

Princeton University Library, Log transformation. Available at: http://dss.princeton.edu/online_help/stats_packages/stata/log.html (17-04-2016)

Quinn, James 2009, Monster boss James Treacy facing 25 years for share options fraud, The Telegraph (May 13). Available at: http://www.telegraph.co.uk/technology/5319591/Monster-boss-James-Treacy-facing-25-years-for-share-options-fraud.html (17-07-2016)

Randoy, Trond and Nielsen, Jim, 2002, Company Performance, Corporate Governance and CEO Compensation in Norway and Sweden. *Journal of Management Governance, Vol. 6(1), pp. 57-81.*

Rättsnätet, 2000, Lag (2000:1087) om anmälningsskyldighet för visa innehav av finnansiella instrument. Available at: https://www.notisum.se/rnp/sls/lag/20001087.htm (05-04-2016)

Rose, Caspar, 2005, Managerial Ownership and Firm Performance in Listed Danish Firms: In Search of the Missing Link. *European Management Journal, Vol.23, No.5, pp. 542-553.*

Rubinstein, Mark, 1994, On the Accounting Valuation of Employee Stock Options, *Journal of Derivatives.* Available at: http://www.haas.berkeley.edu/groups/finance/WP/rpf241.pdf (02-04-2016)

Sesil, James C, Kroumova, Maya K. Kruse, L.D and Blasi, J.R. 2005, Broad-Based Employee Stock Options in the US: Company Performance and Characteristics. *Working paper, Human Resource Management.*

Seo, Songwon, 2006, A Review and Comparison of Methods for Detecting Outlier in University Data Sets*, University of Pittsburgh.* Available at: http://d-scholarship.pitt.edu/7948/1/Seo.pdf (17-04-2016)

Seyhun, H. Nejat. 1992, Why does aggregate insider trading predict future stock returns? *Quarterly Journal of Economics, Vol. 107(4), pp. 1303-1331.*

Shleifer, Andrei and Vishny, Robert, W. 1986, Large Shareholders and Corporate Control. The Journal of Political Economy, Vol. 94, Issue 3, Part 1, pp. 461-488.

Sircar, Ronnie, Xiong, Wei, 2007, A General Framework for Evaluating Executive Stock Options, *Journal of Economic Dynamics and Control*, *Vol. 31 (7), pp. 2317-2349*

Snijders, Tom A.B. 2011, Statistical Methods: Robustness, *University of Oxford. Available at:* http://www.stats.ox.ac.uk/~snijders/SM_robustness.pdf (15-04-2016)

Stulz, René M., 1990, Managerial discretion and optimal financing policies, Journal of Financial Economics, Vol. 26, pp. 3-27. Available at: http://www.sciencedirect.com.esc-web.lib.cbs.dk/science/article/pii/0304405X9090011N (01-08-2016)

Sveriges Riksdag, 1995, Årsredovisningslag (1995:1554). Available at: https://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/rsredovisningslag-19951554_sfs-1995-1554/ (15-05-2016)

Svärd, Jakob, 2014, Svenska speljätten börsnoteras I USA. Available at: http://www.aftonbladet.se/nojesbladet/spela/article18408111.ab (2014-07-24)

Tyson, Laura D´Andrea, 2002, Don't Throw Out Options Because Investors Took a Bath. *Business Week (April 29). Available at:* http://www.bloomberg.com/news/articles/2002-04-28/dont-throw-out-options-because-investors-took-a-bath (24-04-2016)

Van der Goot, Tjalling, 2007, Is it Timing of the Date, of the News or is it Backdating of Option Grants? *Working paper, University of Amsterdam. Available at SSRN:* http://ssrn.com/abstract=1015245 (03-04-2016)

Woolridge, Jeffey M. Introductory Econometrics: A Modern Approach, South-Western Educational Publishing, 5th ed. 2013.

Williams, Richard, 2015, Multicollinearity. University of Notre Dame. Available at: http://www3.nd.edu/~rwilliam/stats2/l11.pdf (01-05-2016)

Wu, Betty, 2012, Stock Option Backdating or Otherwise Manipulation Another Form of Option Reprising? *School of Business, Yonsei University. Available at:* http://www.cass.city.ac.uk/__data/assets/pdf_file/0004/127480/FINAL-Paper_Wu.pdf (03-04-2016)

Yermack, D. 1997, Good Timing: CEO Stock Option Awards and Company News Announcements. *Journal of Finance Vol. 52, pp. 449-476*

Økonomi- og Erhvervsministeriet, 2007, Kortlægning af den aktuelle brug af aktiebaserede incitamentsordninger i børsnoterede selskaber

Appendices:

Appendix 1

Observations removed from sample as listed on alternative stock exchanges

Option grant date	Company	Stock exchange listed
01.03.2007	24H Poker Holding AB	First North
15.09.2006	Alphahelix Molecular Diagnostics AB	Aktietorget
31.07.2006	Arcam AB	NGM Equity
20.05.2008	Avalon Innovation AB	NGM Equity
15.05.2009	Betting Promotion Sweden AB	NGM Equity
18.05.2009	Betting Promotion Sweden AB	NGM Equity
22.06.2006	Biosensor Applications Sweden AB	Aktietorget
26.06.2009	Brio AB	NGM Equity
05.12.2007	C2sat Holding AB	NGM Equity
18.07.2007	Central Asia Gold AB	NGM Equity
12.05.2006	Confidence International AB	NGM Equity
12.12.2006	Countermine Technologies AB	NGM Equity
13.12.2006	Countermine Technologies AB	NGM Equity
15.09.2006	Countermine Technologies AB	NGM Equity
31.01.2006	Curera Sverige AB	Aktietorget
25.01.2006	El & Industrimontage Svenska AB	Aktietorget
05.11.2007	Enaco AB	NGM Equity
12.12.2006	Eurocrine Vaccines AB	Aktietorget
31.01.2007	Fasttv Net AB	Aktietorget
07.01.2008	Generic Sweden AB	NGM Equity
17.08.2007	Generic Sweden AB	NGM Equity
13.04.2010	Ginger Oil AB	NGM Equity
21.02.2008	Ginger Oil AB	NGM Equity
07.09.2006	Homemaid Hemservice AB	Aktietoget
04.11.2009	Immune Pharmaceutical inc	First North
08.04.2009	Immune Pharmaceutical inc	First North
10.10.2013	Immune Pharmaceutical inc	First North
11.01.2006	Immune Pharmaceutical inc	First North
17.07.2006	Immune Pharmaceutical inc	First North
23.03.2007	Immune Pharmaceutical inc	First North
25.08.2013	Immune Pharmaceutical inc	First North
26.05.2006	Immune Pharmaceutical inc	First North
01.02.2007	Innate Pharmaceuticals AB	Aktietorget
28.06.2006	Jello AB	Aktietorget
14.01.2011	Lifeassay AB	NGM Equity
21.02.2014	Lifeassay AB	NGM Equity

05.05.2006	Mertiva AB	NGM Equity
08.11.2006	NCS Nordic Camping & Sport AB	Aktietorget
22.12.2009	Obducat AB	NGM Equity
26.03.2005	Oscar Properties Holding AB	First North
05.11.2007	Pan Alarm AB	NGM Equity
20.11.2007	Pan Alarm AB	NGM Equity
24.04.2008	Pan Alarm AB	NGM Equity
08.10.2015	Paynova AB	NGM Equity
09.03.2011	Paynova AB	NGM Equity
09.10.2007	Paynova AB	NGM Equity
23.07.2007	Paynova AB	NGM Equity
26.03.2007	Paynova AB	NGM Equity
30.06.2006	Paynova AB	NGM Equity
13.10.2006	Relation & Brand AB	Aktietorget
14.12.2006	Relation & Brand AB	Aktietorget
31.07.2006	Relation & Brand AB	Aktietorget
02.11.2007	SBC Sveriges Bostadsrättscentrum AB	NGM Equity
12.11.2007	Scandinavian Clinical Nutrition AB	NGM Equity
07.12.2006	Scirocco AB	Aktietorget
19.01.2007	Scirocco AB	Aktietorget
01.06.2007	Shelton Petroleum AB	NGM Equity
21.05.2007	Shelton Petroleum AB	NGM Equity
21.06.2007	Shelton Petroleum AB	NGM Equity
04.06.2010	Sotkamo Silver AB	NGM Equity
16.06.2010	Sotkamo Silver AB	NGM Equity
12.10.2006	TMG International AB	NGM Equity
19.10.2006	TMG International AB	NGM Equity
15.03.2007	Transferator	Aktietorget
07.10.2008	Tretti AB	NGM Equity
09.05.2007	Tretti AB	NGM Equity
20.12.2006	Tretti AB	NGM Equity
22.03.2006	Tretti AB	NGM Equity
04.12.2006	Trig Media Group AB	Aktietorget
18.10.2006	Viatech Systems AB	Aktietorget
02.02.2007	Vita Nova Ventures AB	Aktietorget
07.12.2008	Wayfinder Systems AB	NGM Equity
15.05.2006	Wiking Mineral AB	Aktietorget
02.01.2007	Novacast Technologies AB	NGM Equity
16.06.2009	Black Earth Farming LTD	First North
24.05.2010	Arcam AB	NGM Equity
15.08.2011	Betting Promotion Sweden AB	NGM Equity
25.02.2010	Commodity Quest AB	NGM Equity

28.12.2012	Crown Energy AB	NGM Equity
15.04.2010	Ginger Oil AB	NGM Equity
01.02.2011	Lifeassay AB	NGM Equity
20.06.2012	Obducat AB	NGM Equity
28.10.2010	Paynova AB	NGM Equity
01.05.2010	Paynova AB	NGM Equity

Appendix 2

Observations removed as a result of lack of data for estimation period

Option grant date	Company	IPO date
16.12.2015	Wise Group AB	16.12.2015
18.12.2015	Hexatronic AB	18.12.2015
02.11.2015	Hansa Medical AB	02.11.2015
30.11.2015	Attendo AB	30.11.2015

Appendix 3

Observations estimated with alternative period for alpha and beta

Opting grant date	Company	IPO date
08.10.2007	Sagax AB	08.10.2007
15.06.2007	Aerocrine AB	15.06.2007
12.12.2006	Allenex AB	12.12.2006
23.05.2007	Alliance Oil Company LTD	23.05.2007
19.06.2014	Bactiguard Holding AB	19.06.2014
12.06.2014	Besqab AB	12.06.2014
07.05.2007	Björn Borg AB	04.05.2007
21.02.2014	Bufab Holding AB	21.02.2014
18.05.2006	Catena AB	26.04.2006
09.11.2009	Coastal Contacts inc	09.11.2009
17.06.2014	Com Hem Holding AB	17.06.2014
12.05.2015	D. Carnegie & Co AB	12.05.2015
16.06.2008	DGC One AB	16.06.2008
11.03.2015	Dustin Group AB	13.02.2015
13.02.2015	Dustin Group AB	13.02.2015
10.06.2014	G5 Entertainment AB	10.06.2014
28.03.2006	Gant Company AB	28.03.2006
03.10.2008	GHP Specialty Care AB	03.10.2008
19.10.2007	HMS Networks AB	19.10.2007
25.03.2015	Hoist Finance AB	25.03.2015
29.05.2015	Invisio Communications AB	29.05.2015
13.03.2006	Ica Gruppen AB	08.12.2005
01.01.2006	Indutrade AB	05.10.2005
01.01.2006	Invik & Co AB	26.08.2005

08.07.2008	Itab Shop Concept AB	08.07.2008
06.12.2006	Melker Schörling AB	06.12.2006
07.05.2009	Loomis AB	09.12.2008
04.03.2008	Morphic Technologies AB	04.03.2008
10.04.2013	Neurovive Pharmaceutical AB	10.04.2013
15.01.2008	Nordic Service Partners Holding AB	15.01.2008
27.08.2007	Novacast AB	11.04.2007
30.08.2007	Novacast AB	11.04.2007
02.07.2013	Opus Group AB	02.07.2013
18.05.2008	Sportamore AB	18.05.2008
15.09.2006	Swedish Orphan Biovitrum AB	15.09.2006
12.10.2007	Systemair AB	12.10.2007
14.02.2007	Tanganyika Oil Company LTD	14.02.2007
20.04.2007	Tanganyika Oil Company LTD	14.02.2007
26.11.2014	Thule Group AB	26.11.2014
08.01.2007	Tilgin AB	15.12.2006
15.12.2006	Tilgin AB	15.12.2006
24.04.2015	Tobii AB	24.04.2015
01.11.2006	Uniflex AB	01.11.2006
09.12.2013	Victoria Park AB	09.12.2013
22.08.2011	Vitec Software Group AB	04.07.2011
14.06.2007	Vostok Nafta Investment LTD	04.07.2007
27.05.2011	Transmode AB	27.05.2011
20.10.2011	Semafo Inc	20.10.2011
31.12.2011	Semafo Inc	20.10.2011
13.06.2012	Seamless Distribution AB	13.06.2012
26.05.2011	Moberg Pharma AB	26.05.2011
15.04.2011	Karolinska Development AB	15.04.2011
19.01.2010	Formpipe Software AB	19.01.2010
18.02.2010	Ework Scandinavia AB	18.02.2010
08.07.2010	Ework Scandinavia AB	18.02.2010
06.11.2012	Blackpearl Resources Inc	06.11.2012
24.03.2010	Arise Windpower AB	24.03.2010

Appendix 4

Correlation matrix

	Small	Mid	Llage	Prior perf	Hightech	Vrights 30+	LCEOt	Post crisis
Small	1							
Mid	-.638	1						
Llage	-.098	-.156	1					
Prior perf	-.047	.078	-.044	1				
Hightech	.257	.006	-.151	.057	1			
Vrights 30+	-.096	-.055	.088	-.095	-061	1		
LCEOt	-.069	-.021	.106	-045	-.011	.116	1	
Post crisis	-.078	.056	-.147	-095	.103	.051	-.096	1

Small = Small cap, Mid = Mid cap, Llage = Log(listing age), Prior perf = Prior performance, LCEOt = Log(CEO tenure)

Appendix 5

Detailed regression model presented in table 7

CARs -20-0	Coefficient	Standard error	T-value	P-value
Small cap	.006	.013	.47	.635
Mid cap	-.013	.010	-1.23	.2185
Constant	.0001	.007	.01	.988
CARs -10-0	Coefficient	Standard error	T-value	P-value
Small cap	.012	.010	1.22	.224
Mid cap	-.013	.008	-1.71	.088*
Constant	.002	.005	.31	.753
CARs -5-0	Coefficient	Standard error	T-value	P-value
Small cap	.011	.007	1.52	.129
Mid cap	-.006	.006	-1.048	.279
Constant	-.002	.004	-.40	.691
CARs 0-5	Coefficient	Standard error	T-value	P-value
Small cap	0.000	.006	.05	.957
Mid cap	-.001	.006	-.14	.886
Constant	-.002	.004	-.39	.605
CARs 0-10	Coefficient	Standard error	T-value	P-value
Small cap	-.012	.009	-1.23	.218
Mid cap	-.008	.008	-1.05	.204
Constant	.006	.006	1.04	.301
CARs 0-20	Coefficient	Standard error	T-value	P-value
Small cap	-.011	.013	-.86	.388
Mid cap	-.009	.010	-.91	.363
Constant	.002	.008	.22	.824

Appendix 6

Detailed regression model presented in table 8

CARs -20-0	Coefficient	Standard error	T-value	P-value
Log(listing age)	-.000	.005	.05	.961
Constant	-.003	.012	-.27	.787
CARs -10-0	Coefficient	Standard error	T-value	P-value
Log(listing age)	.002	.004	.68	.499
Constant	-.005	.010	-.51	.611
CARs -5-0	Coefficient	Standard error	T-value	P-value
Log(listing age)	.003	.003	1.37	.173
Constant	-.008	.007	-1.19	.233
CARs 0-5	Coefficient	Standard error	T-value	P-value
Log(listing age)	-.001	.003	-.52	.602
Constant	.001	.007	.13	.894
CARs 0-10	Coefficient	Standard error	T-value	P-value
Log(listing age)	-.004	.003	-1.21	.228
Constant	-.007	.009	.83	.409
CARs 0-20	Coefficient	Standard error	T-value	P-value
Log(listing age)	-.001	.005	-.18	.861
Constant	-.005	.012	-.39	.695

Appendix 7

OLS regression on the effect of young firms on cumulative abnormal return

CARs 0-5	Coefficient	Standard error	T-value	P-value
Young	.010	.009	1.04	.297
Constant	-.003	.003	-1.24	.217
CARs 0-10	Coefficient	Standard error	T-value	P-value
Young	.017	.013	1.34	.182
Constant	-.004	.004	-1.02	.309
CARs 0-20	Coefficient	Standard error	T-value	P-value
Young	.012	.017	.72	.473
Constant	-.008	.005	-1.55	.122

Appendix 8

Detailed regression model presented in table 9

CARs 0-5	Coefficient	Standard error	T-value	P-value
Prior performance	-.002	.006	-1.24	.215
Constant	-.007	.003	-.83	.409
CARs 0-10	Coefficient	Standard error	T-value	P-value
Prior performance	-.011	.006	-1.69	.091*
Constant	-.001	.004	-.24	.811
CARs 0-20	Coefficient	Standard error	T-value	P-value
Prior performance	-.024	.006	-3.93	.000***
Constant	-.005	.005	-.95	.342

Appendix 9

Detailed regression model presented in table 10

CARs -20-0	Coefficient	Standard error	T-value	P-value
High-tech	.003	.011	.28	.779
Constant	-.004	.007	-.59	.555
CARs -10-0	Coefficient	Standard error	T-value	P-value
High-tech	.005	.008	.57	.572
Constant	-.001	.005	-.25	.804
CARs -5-0	Coefficient	Standard error	T-value	P-value
High-tech	-.001	.006	-.20	.839
Constant	.000	.003	.11	.914
CARs 0-5	Coefficient	Standard error	T-value	P-value
High-tech	.007	.006	1.26	.117
Constant	-.005	.003	-1.57	.209
CARs 0-10	Coefficient	Standard error	T-value	P-value
High-tech	.005	.007	.73	.465
Constant	-.004	.005	-.76	.449
CARs 0-20	Coefficient	Standard error	T-value	P-value
High-tech	-.006	.010	-.55	.583
Constant	-.004	.007	-.60	.548

Appendix 10

Detailed regression model presented in table 11

CARs -20-0	Coefficient	Standard error	T-value	P-value
Vrights 30% +	-.019	.011	-1.74	.082*
Constant	.003	.006	.46	.647
CARs -10-0	Coefficient	Standard error	T-value	P-value
Vrights 30% +	-.012	.008	-1.58	.114
Constant	.004	.005	.89	.373
CARs -5-0	Coefficient	Standard error	T-value	P-value
Vrights 30% +	.000	.006	.05	.957
Constant	-.000	.004	-.07	.941
CARs 0-5	Coefficient	Standard error	T-value	P-value
Vrights 30% +	-.005	.006	-.93	.355
Constant	-.000	.003	-.13	.897
CARs 0-10	Coefficient	Standard error	T-value	P-value
Vrights 30% +	-.015	.008	-1.95	.052*
Constant	-.003	.005	.68	.496
CARs 0-20	Coefficient	Standard error	T-value	P-value
Vrights 30% +	-.019	.009	-1.94	.053*
Constant	-.000	.006	-.09	.925

Appendix 11

Detailed regression model presented in table 12

CARs -20-0	Coefficient	Standard error	T-value	P-value
Log(CEO tenure)	.002	.003	.51	.613
Constant	-.004	.006	-.68	.498
CARs -10-0	Coefficient	Standard error	T-value	P-value
Log(CEO tenure)	.000	.002	.23	.817
Constant	.001	.005	.07	.947
CARs -5-0	Coefficient	Standard error	T-value	P-value
Log(CEO tenure)	-.000	.002	-.37	.711
Constant	.000	.003	.09	.925
CARs 0-5	Coefficient	Standard error	T-value	P-value
Log(CEO tenure)	-.002	.001	-1.33	.186
Constant	-.000	.003	-.11	.911
CARs 0-10	Coefficient	Standard error	T-value	P-value
Log(CEO tenure)	-.004	.002	-1.58	.114
Constant	.002	.005	.37	.713
CARs 0-20	Coefficient	Standard error	T-value	P-value
Log(CEO tenure)	-.003	.003	-1.06	.289
Constant	-.004	.006	-.66	.511

Appendix 12

OLS regression on the effect of CEO tenure >3.2 on cumulative abnormal return

CARs 0-5	Coefficient	Standard error	T-value	P-value
CEO tenure>3.2	.004	.005	.83	.408
Constant	-.004	.004	-1.06	.292
CARs 0-10	Coefficient	Standard error	T-value	P-value
CEO tenure>3.2	.005	.007	.63	.527
Constant	.002	.005	-.60	.550
CARs 0-20	Coefficient	Standard error	T-value	P-value
CEO tenure>3.2	.016	.009	1.60	.110
Constant	-.014	.008	-1.72	.085

Appendix 13

Detailed regression model presented in table 13

CARs -20-0	Coefficient	Standard error	T-value	P-value
Post crisis	.012	.013	.91	.363
Constant	-.009	.009	-1.05	.296
CARs -10-0	Coefficient	Standard error	T-value	P-value
Post crisis	.017	.010	1.75	.081*
Constant	-.008	.006	-1.28	.202
CARs -5-0	Coefficient	Standard error	T-value	P-value
Post crisis	.008	.007	1.08	.281
Constant	-.004	.004	-1.03	.304
CARs 0-5	Coefficient	Standard error	T-value	P-value
Post crisis	.008	.006	1.29	.198
Constant	-.006	.004	-1.36	.174
CARs 0-10	Coefficient	Standard error	T-value	P-value
Post crisis	.009	.009	.99	.325
Constant	-.009	.005	-1.75	.082*
CARs 0-20	Coefficient	Standard error	T-value	P-value
Post crisis	.029	.013	2.31	.021**
Constant	-.019	.008	-2.32	.021**

Appendix 14

Detailed regression model presented in table 14

CARs -10-0	Coefficient	Standard error	T-value	P-value
2006	.002	.011	.21	.834
2007	-.011	.011	-.94	.348
2008	-.039	.015	-2.54	.011**
2009	.031	.018	1.69	.091*
2010	-.015	.009	-1.59	.113
2011	-.011	.011	-1.03	.306
Constant	.006	.007	.89	.376

CARs 0-20	Coefficient	Standard error	T-value	P-value
2006	-.006	.014	-.44	.662
2007	-.019	.013	-1.57	.118
2008	-.021	.021	-.98	.328
2009	.032	.024	1.32	.188
2010	.013	.012	1.07	.285
2011	-.008	.015	-.56	.575
Constant	-.004	.008	-.47	.639

Appendix 15

Multiple regression analysis from table 15

CARs -20-0	Coefficient	Standard error	T-value	P-value
Small cap	.013	.021	.63	.529
Mid cap	-.012	.016	-.72	.469
Log(listed age)	-.003	.007	-.44	.663
Vrights 30% +	-.013	.016	-.81	.417
Log(CEO tenure)	.001	.005	.32	.753
Prior performance	.004	.009	.40	.692
High-tech	-.004	.015	-.25	.805
Post crisis	.009	.013	.75	.453
Constant	.003	.025	.11	.909
R-squared	.012			
F-statistics	.859			

CARs -10-0	Coefficient	Standard error	T-value	P-value
Small cap	.018	.015	1.17	.242
Mid cap	-.008	.012	-.64	.520
Log(listed age)	.002	.005	.37	.709
Vrights 30% +	-.004	.011	-.40	.690
Log(CEO tenure)	.002	.003	.53	.595
Prior performance	.002	.006	.38	.703
High-tech	-.004	.011	-.32	.746
Post crisis	.015	.010	1.53	.128
Constant	-.015	.019	-.77	.441
R-squared	.024			
F-statistics	.459			

CARs -5-0	Coefficient	Standard error	T-value	P-value
Small cap	.015	.010	1.43	.154
Mid cap	.001	.008	.16	.874
Log(listed age)	.003	.003	.72	.471
Vrights 30% +	.006	.008	.76	.450
Log(CEO tenure)	.000	.002	.09	.929
Prior performance	-.003	.004	-.80	.423
High-tech	-.006	.008	-.82	.415
Post crisis	.005	.007	.67	.506
Constant	-.015	.013	-1.11	.266
R-squared	.016			
F-statistics	.726			

CARs 0-5	Coefficient	Standard error	T-value	P-value
Small cap	-.004	.009	-.47	.639
Mid cap	.001	.009	.11	.914
Log(listed age)	.002	.003	.48	.629
Vrights 30% +	-.009	.008	-1.16	.246
Log(CEO tenure)	-.001	.002	-.10	.921
Prior performance	-.021	.005	-4.20	.0001***
High-tech	.008	.006	1.26	.207
Post crisis	.004	.006	.73	.464
Constant	-.006	.012	--47	.638
R-squared	.071			
F-statistics	.002			

CARs 0-10	Coefficient	Standard error	T-value	P-value
Small cap	-.027	.014	-2.02	.044**
Mid cap	-.014	.012	-1.16	.247
Log(listed age)	-.003	.004	.79	.427
Vrights 30% +	-.020	.010	-2.00	.047**
Log(CEO tenure)	-.002	.003	-.53	.594
Prior performance	-.024	.006	-3.96	.0001***
High-tech	.015	.009	1.55	.1219
Post crisis	.006	.009	.66	.511
Constant	.028	.016	1.15	.250
R-squared	.059			
F-statistics	.008			

CARs 0-20	Coefficient	Standard error	T-value	P-value
Small cap	-.019	.019	-.93	.351
Mid cap	-.009	.016	-.49	.637
Log(listed age)	.004	.006	.67	.505
Vrights 30% +	-.025	.014	-1.81	.071*
Log(CEO tenure)	-.002	.004	-.68	.494
Prior performance	-.037	.008	-4.64	.0001***
High-tech	.008	.014	.53	.599
Post crisis	.019	.012	1.59	.113
Constant	-.006	.025	-.25	.802
R-squared	.063			
F-statistics	.005			