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Master Thesis
BI Norwegian Business School

Share-based payment and IFRS-2

Stock options performance and the effects of implementing IFRS-2

in Norwegian publicly traded firms

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Date of submission:
02.09.2013

Program:
Master of Science in Business and Economics
with Major in Finance

Acknowledgement

We would like to thank our supervisor Salvatore Miglietta for his guidance, support and important feedback in the process of completing the master thesis at BI Norwegian Business School.

Oslo, September 2nd 2013

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Abstract

This study looks at share-based payment in Norwegian publicly traded firms. A review of the history of stock options and the development of accounting and taxation legislations is presented. The paper is divided into two main parts where we first look at whether the implementation of IFRS-2 has caused any change in the use of stock options to CEOs and employees. Our findings show a drop, presumably in stock option grants, in most industries after the implementation, and we conclude that accounting legislation is one important exogenous variable that affects the use of stock options. The second part examines the relationship between stock options and company performance and we find both significant negative and insignificant relationships. We conclude that the relationship is indeterminable.

Content

1. Introduction

In this paper we are looking at what motivates the use of stock options as compensation to executives and employees in Norwegian publicly traded firms. Executive compensation is a subject that has received a great amount of attention for many years, especially in the US where executive pay has been higher than anywhere else (Nielsen and Randoey 2002). People have different opinions on whether executive compensation creates value for a firm, or if it is just a way of paying the executives even more. Some argue that most executives receive a high enough payment with their base salary and that this remuneration should be enough without them demanding more incentive-based compensation to take the actions shareholders request.

Earlier studies have focused primarily on the US and many of them lack to identify the political and other socioeconomic factors that are relevant for executive stock option compensation (Hall and Murphy 2002). In our study we are looking at executive and employee stock options based on data from Norwegian companies listed on the Oslo Stock Exchange. Additionally we show that non-option based factors also affects the use of stock options as a compensation-tool (Oxelheim and Randoey 2008). We are looking at what we believe is the most important government regulation that has occurred within the last fifteen to twenty years that relates to stock options. Additionally we review other legislations proposed by the Norwegian Government, such as tax and accounting regulations.

There have been major changes in regulations for firms listed on the Oslo Stock Exchange with respect to stock options. The era of stock options started in the beginning of the 1990s, but had a downturn because of changes in accounting legislations towards the end of the decade (NOU 2000:21, "Lønninger og opsjoner"). In this period, Scandinavian firms remarkably started to use stock options as a form of compensation, but in a much smaller scale than the US pioneers (Oxelheim and Randoey 2008). This was an inexpensive way for firms to grant stock options since there were no clear accounting regulations for stock options (Sellaeg and Johansen 2005). Some have described this period as a "black economy". The only regulation firms had to follow was the tax legislations. This practice has also changed over the past two decades. The entry of International

Financial Reporting Standard (IFRS) in 2005 for publicly traded firms on Oslo Stock Exchange, IFRS-2 for share-based payment, changed the way publicly traded firms had to report their accounting (Sellaeg and Johansen 2005).

The data used in this thesis contains information about the 50 largest companies listed on the Oslo Stock Exchange in 2012 based on market value, which accounts for approximately 95 % of the total market value on the exchange. The year of interest is 2005 when IFRS-2 became effective, but we also want to examine the effects prior to and after this year. Thus, we investigate if this exogenous variable has affected the use of options in any way. Our data, ranging from 2001 until the end of 2012, should be sufficient to capture any effect.

This thesis contributes with newly updated data from companies listed on the Oslo Stock Exchange until the end of 2012, with the latest annual report used in this thesis published June 21st 2013. This provides the newest information about the use of stock options and other remuneration practices on the Oslo Stock Exchange. Thus, we enlighten an important topic which has been much written about in other countries, but has received very little attention in Norway.

1.1 Structure

The thesis is structured into eight sections, each with subsections. The first contains the introduction and the hypotheses that will be tested. The next section provides the literature review that the thesis builds its framework upon, and what the hypotheses aim to reveal. The literature review leads back to the US from where the Norwegian option history relates and ends up where the stock options practice is today. The third and fourth sections address what we believe are the main exogenous variables that affect the use of stock options, namely the accounting rules and taxation legislations respectively. The paper provides a brief description of past and present practices of these rules and legislations. The fifth and sixth sections describe the methodology and the data used. The results and interpretation of the results are found in section seven. The last section covers the summary and conclusion in addition to identifying limitations within this study and suggestions for future research.

1.2 Hypotheses

The fundamental research question we seek to answer is: **What influence the use of option-based remuneration in Norwegian publicly traded firms?** More specifically our hypotheses are as follows:

Government legislations

During the past two decades the Norwegian Government has increased its focus on incentive-based payment and over the years new regulations have been developed with constraints on how to use stock options and other types of share-based payments. Murphy (2012) illustrates this with the US accounting law, APB Opinion 25 *Accounting for stock issued to employees*, which imposes among other things a higher accounting charge for options that are issued *in-the-money* but not options issued *at-the-money*, known as "backdating". The Government's objective has been to avoid improper use of stock options, i.e. share-based payment is not supposed to be used just as a remuneration supplement, especially for the executives, with no means other than additional pay. To avoid these negative implications the government continuously changes the regulations concerning incentive-based payment, the change from Norwegian Generally Accepted Accounting Principles (NGAAP) to IFRS-2 is an example of this. Our first hypotheses seek to answer whether or not the Norwegian Government's regulations have changed the use of these instruments from companies´ side and thus changed the use of stock options for executives and employees.

$H_{A,1}$*: Change in Government legislations (accounting, taxation and others) leads to change in the use of stock options.*

Our main focus is the IFRS-2 legislation on share-based payment; a more specific hypothesis is therefore:

$H_{A,2}$*: The change from NGAAP to IFRS-2 changed the number of stock option grants in Norwegian companies.*

Performance

The basic theory of why companies issue stock options to their employees is that the more a company's stock price increases, the greater the profit from exercising

those options, in turn creating incentives that will motivate employees to focus on making the company more successful and more profitable. If employees and executives receive incentive payments, the companies' aim is to get something in return. Hence, Board of Directors issue options as a mean for improved company performance. The third and fourth hypotheses concern the second part of our thesis - the linkage between stock options and performance. The first performance hypothesis seeks to answer if options drive performance. When firms are granting options to employees and executives, their intention is that performance will increase through aligning the interests between the company and its employees. One can also say that when performance is enhancing, companies afford to grant more options.

$H_{A,3}$: There is a positive relationship between options outstanding/granted and performance.

Even if results show no change or negative change in performance the year options were granted, it could be that there are some delayed effects and that the change in performance on options granted cannot be seen until e.g. the year after the granting. We therefore add another performance hypothesis, which states:

$H_{A,4}$: There is a positive relationship between last year's options granted and the following year's performance.

Both hypotheses are connected to agency theory; stock options are used to align the interest of the shareholders and employees. Based on this theory the relationship between stock options and performance should be positive. That is, as stock option grants increase, performance increases. Conversely, managerial power theory states that there is no significant relationship between compensation and performance (Murphy 2012). Hall and Murphy (2002) among others have found support for this theory in their studies. If we do not find support for our hypothesis that there is a positive relationship between options and performance, the results might support the managerial power theory that compensation is a result of managerial power and not an incentive-based contract.

2. Literature review

Our thesis is based on previous work within the field of executive and employee compensation. In this review we will go through the history, theories and accounting legislations that have led to the share-based compensation policy we have today and we will start from the 1990s in the US. Subsequently we reflect upon the Scandinavian countries and identify which factors Norwegian companies build their compensation plan upon.

2.1 Stock Option Theory

An executive stock option is an option given to executives as an incentive to increase the company's market value. Unlike for regular options there exists no external capital market for these options (Lai 2010). Through executive stock options the underwriter (shareholder) issues options to the recipient (executives), and if the stock price goes up both parties will benefit as the shareholder wants to maximize the stock price and the executive will receive greater pay (Lai 2010). Firms that use options as executive compensation typically issue them each year with the strike price set equal to the prevailing stock price. While maturities vary across firms, these options are typically long term. Firms usually restrict when and how these options can be exercised (Damodaran 2005). There are several varieties of stock options available, where the incentive stock option is the one relevant to us. An incentive stock option is subject to additional regulations designed to minimize taxes, e.g. in the US they are not taxed to the shareholder when granted or exercised, under the regular tax; tax is imposed only when the stock is sold (Bickley 2012).

2.2 Why stock options as an executive compensation instrument?

There are several arguments that support the use of stock options as executive compensation. We will mention four in particular that play a significant role when a firm chooses to grant stock options as an instrument for compensation. These four purposes for stock options are referred to as attract, retain, motivate and recognize (Hall and Murphy 2003). The companies want to *attract* the best executives, *keep* the best executives in the company, *motivate* them to work harder and to *recognize* their contribution to the company. Hall and Murphy (2002) discuss similar issues where highly skilled executives receive non-tradable options to stay in the firm until the options expire. The arguments are also stated

in the article of Drobetz et. al. (2007). The first argument is that stock options attract executives that are relatively less risk-averse and highly skilled, because they will see an upside in the firm. The second argument is that executives will remain in the firm when they receive non-tradable stock options. Thirdly, by giving stock options to executives it will make them think like owners when they become owners. The last argument is from an accounting perspective, stating from the firm perspective, that stock options will be regarded as a relatively cheap way of compensating executives.

2.3 Methods of Pricing Stock Options

To estimate the fair value of a stock option there are several conditions to account for. These include: market conditions, expected stock price volatility, risk-free rate, expected dividend, exercise price, underlying stock price, non-vesting conditions and option lifetime (Berner and Mikalsen 2009).

The most common used models for valuing stock options is the Black-Scholes model (developed by Black and Scholes 1973) and the Binomial pricing model (developed by Cox, Ross and Rubenstein 1979). Both models are built upon the same theoretical assumptions and foundations, such as price behavior and the risk-neutral valuation. Even though the two models acts under similar assumptions the Black-Scholes is in continuous time while the binomial model provides a discrete-time approximation.

2.4 Principal-Agent Theory

Principal-agent theory is the main theory that forms the basis for implementation of incentive systems. It considers how the principals delegate their interests to the agents, which is equivalent to the relationship between shareholders and employees. In agency relationships, the principal's objective is typically to maximize the difference between the value received as a result of the agent's actions and any compensation it makes to the agent. The theory predicts a negative relation between risk and incentives, or alternatively, a positive relation between risk aversion and incentives (Murphy 2012). Problems arise when the principal and agent do not share the same goal and/or there is asymmetric information. In the absence of some mechanism to align the interests of the two parties, the executives and/or employees do not care about the value generated for the shareholders (Besanko et.al. 2010). Stock options help ensure accountability

of employees' actions and provide incentives to align the interests of shareholders and employees, thereby reducing or eliminating principal-agent problems according to Jensen and Meckling (1976).

2.5 Optimal Contracting

Efficient contracting concerns how to mitigate or eliminate the conflicts of interests between the principals (shareholders) and the agents (executives). The efficient contracts will be the ones that maximize shareholder value and at the same time are paying the executives an amount of compensation that convince him or her to take or remain in the job. In addition, the contracts have to recognize that executives are responding to the incentives specified (Murphy 2012).

Holmstroem (1979) describes the optimal incentive contracts in a principal–agent setting where the principal knows exactly what actions he or she wants the agent to take, but the agent's action is unobservable so he or she will not be able to say whether or not the agent in fact took that action. Holmstroem shows that the optimal contract will include any performance measure that is useful in determining what action the agent took and that any imperfect information about actions or states of nature can be used to improve the contracts. This is, however, not applicable in the realistic case where the shareholders do not know precisely what actions they want the executives to take, and they have to trust their money to self-concerned executives specifically because they have superior skill or information in making investment decisions (Holmstroem 1992).

2.6 CEOs' pay from the 1980s until present

The US has been pioneers for CEO pay the last century and our thesis will be based on the developments in the US and the entry into Norway. Further we will elaborate important events that have led up to where we are today considering CEO pay and compensation.

Murphy (2012) states that the attempt of "explaining" the CEO pay without considering the causes and consequences of government interventions over the last century with regards to executive compensation is futile. During the 1990s there was an "explosion" in the use of stock options and Murphy (2012) describes six factors he believes contributed to this explosion. The subsequent paragraphs explain these factors.

It started with the pressure from shareholders for equity-based pay in the 1980s. Institutions, inefficient firms and shareholders encouraged that pay should be more linked to performance. In 1991, the US Security and Exchange Commission (SEC) came up with a new holding period rule. The six-month holding rule was reformed into no holding period, meaning that exercising options could immediately be sold after exercised.

In 1992, SEC issued a new regulation called the SEC option disclosure rule. This disclosure rule stated that only the number of options granted and not the value of granted options, needed to be disclosed. One year later the Clinton administration decided on a new bill; a $1 million deductibility cap. This was probably one of the main outcomes that led to the increase in use of stock options. The purpose of this bill was not met since the intention was to reduce the amount of executive compensation. In 1995 the Financial Accounting Standard Board (FASB) tried to issue a new accounting rule that granted options should be expensed at fair market value, without any success.

During the 1990s the NYSE came up with a listing requirement. Top executives needed to get approval of their equity plans from shareholders. To avoid this regulation and bypass shareholders' votes, options were given to lower level employees and lower level executives instead. After the scandals in firms like Enron, WorldCom, Freddie Mac, Fannie Mae, Arthur Andersen and others in the start of the 21st century, the Congress in the US passed the Sabanes-Oxley act in 2002 (Murphy 2012). Even though the primary intention behind this act was to regulate accounting firms, auditors and Board of Directors of publicly traded firms, the Congress also made it effective for executive pay.

In 2005 "option backdating" became a known practice to the public. The principle behind this was backdating of option agreements. This means that companies set the grant date to a date when the stock price was lower, making the option *in-the-money* instead of *out-of-the-money*. Companies that performed backdating falsified the option agreement and also committed accounting fraud (Murphy 2012). The accounting regulations change in 2002 aimed to stop the illegal

backdating of options. By 2010 the SEC had finally managed the struggle against backdating completely.

Because of these changes in the first decade of the new century, a shift in the composition of CEO pay and regulations led to a downturn in stock option grants to CEOs from 2001 to 2011, the first decrease of its kind since 1970 (Murphy 2012). With the decline in stock option grants in 2001, the increase in stock grants as a combination of restricted stocks and performance shares became a fact towards and during 2011. The Internet Bubble in the early 2000s and the stock market crash were reasons for the drop in option grants and a rise in the use of restricted stocks. Murphy (2012) also states that over the last 60 years, during every recession, the use of stock options has dropped substantially.

On June 15th in 2005 an accounting bill was finally issued for stock options, obliging companies to expense the granted stock options at fair value. During the financial crisis in 2007-2008, Lehman Brothers went bankrupt as one of many huge banks. "Limiting executive pay, however, was a long-time top priority for Democrats and some Republican congressmen, who viewed the *Wall Street bonus culture* as a root cause of the financial crisis" (Murphy 2012). In 2010-2011 the Dodd-Frank Act was among other things, a reform act of executive compensation. Its overall purpose was to regulate pay for all financial institutions (Murphy 2012).

The regulations above concern US companies, but there are also international regulations that affect the use of executive stock options in Norway. Accounting legislations for share-based payments in Norway did not follow any specific accounting rules before the international standard, IFRS-2, was implemented in 2005 (Sellaeg and Johansen 2005). This legislation affected how to use stock options for Norwegian firms listed on the Oslo Stock Exchange.

In Scandinavia and Europe stock option compensation plans became common by the end of the 1990s (Oxelheim and Randoey 2008). In the late 1990s and beginning of the 2000s, the status for CEO compensation in Norway and Sweden was small compared to other European countries and substantially smaller than in the US. This may be due to the degree of egalitarianism in these countries and that

the CEOs total compensation follow the domestic tendency rather than that of international companies (Randoey and Nielsen 2002). It follows that the Scandinavian countries are characterized by economic transparency, high taxes and a huge public sector. In 1999 Swedish CEOs made twelve times as much as the average employee and the difference was even smaller in Norway. Conversely, the CEOs of the S&P500 companies earned on average 475 times more than the average employee (Randoey and Nielsen 2002). Randoey and Nielsen (2002) argue that there are four main characteristics why CEO pay is at such a low level in Scandinavia. The first argument states that CEO pay is higher in the US because their position is more demanding and not because the position is important. The second argument regards the strong social democratic influence of union representation in the boards of most publicly traded firms in Scandinavia. The third argument states that the openness of CEO compensation to the public has forced boards to set the level of compensation at a decent level. The final argument states that the stockholders minority rights in Scandinavia have resulted in opposition of a high level of CEO pay.

From 1995 to 1998 the use of options fell from 19,600 to 1,000 in Norway. It is said that more rigorous tax legislations may have been the cause of this change (NOU 2000: 21, "Lønninger og opsjoner"). The report we are referring to also states that option plans not only come from small IT start-ups, but that the majority of reported firms with these programs in fact are large and established firms within the industry and business services. Since 1998 the number of IT start-ups has increased. In 2000 the Norwegian Government proposed a softening in taxation legislation for options, a reversal of the taxation rules prevailing in 1996. They argued that this change would increase the use of options, when they look at practices from other countries. The development of taxation legislation will be discussed further in section 4.

With the complexity and continuous changes in the structure of stock options, regulations and accounting rules also change continuously, which IFRS-2 is an example of. In 2005 the International Accounting Standards Board (IASB) released the IFRS-2, in which provided new rules and regulations to the use of stock options (IASB 2012). The most important change in Norway was the regulation that firms on the Oslo Stock Exchange needed to expense these stock

options. After January 1ˢᵗ 2005 the IFRS-2 and NGAAP are more or less the same (Berne and Mikalsen 2009) and due to this our focus concerning accounting rules will be based on IFRS-2 from this date. The IFRS-2 has the objective to specify the financial reporting by a firm when it undertakes a share-based payment transaction (IASB 2012).

After the financial crisis in 2007-2008, the European Union introduced a directive for financial institutions called Capital Requirements Directive III (CRD III)[1]. The objective of this directive was to create specific policies concerning requirements for variable remuneration regarding share-based deferred payment. Development of certain performance criteria was subject to accounting rules in IFRS-2. This directive proposes among other things that it should be a balanced ratio and limitation between fixed and variable remuneration in order to account for all types of risk, both current and future. CRD III also states how long the variable remuneration must be deferred and specific rules regarding how fast vesting of such instruments shall be succeed. New regulations demand more advanced knowledge in order to handle these share-based payment engagements.

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[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:329:0003:0035:EN:PDF

3. Accounting principles

This section looks into the main differences between Norwegian GAAP and IFRS.

3.1 NGAAP vs. IFRS: The transition

The Norwegian GAAP has its core focus on the income statement and the main attention is given to measure the result for the prevailing period. The respective balance sheet under this legislation is of second importance. IFRS in general emphasizes the balance sheet and use definitions of assets and liabilities to structure the balance and the income statement. Only those that fulfilled the definitions of the IFRS will be a part of the balance sheet. The rest is placed on the income statement (Fardal 2007).

3.2 NGAAP and the intrinsic value method

The intrinsic value method is used in the Norwegian GAAP. The intrinsic value on the granting date is allocated as an expense over the vesting period. To avoid any of these respective costs, companies have set the intrinsic value equal to zero. The companies accounting profit will then be higher than the fair value, which is accounted for in the IFRS-2 regulation.

The right to use the intrinsic value method disappeared after 2005 for publicly traded firms when IFRS-2 became effective. Companies responded negatively to this change and argued that firms' results would become poorer due to this. Some have hypothesized it would cause a bad signal to the market and thus a fall in share prices, and that it would also be more difficult to acquire equity. Still, these arguments seem to be quite vague in terms of market efficiency and the transition seems to have no impact on companies' cash flows. There is only an accounting related cost involved (Hole 2006).

3.3 IFRS-2 and fair value

The Norwegian GAAP is based on a transaction based historical cost model. This means that transactions have to be finalized before anything can appear in the accounts, according to Norwegian Accounting Act §4-1(1) (appendix 1). IFRS-2 values a significant part of assets and liabilities at fair value, cf. Norwegian Accounting Act §5-9a (appendix 1). This means that when valuing at fair value, the transaction does not need to be completed in order to go into the accounts,

according to this legislation. Thus, unrealized profits would to a greater extent be allocated to the operating results using IFRS-2 instead of the Norwegian GAAP. Due to the different use of fair value, one will see a higher fluctuation in accounts using IFRS compared to the NGAAP (Fardal 2006). IFRS-2 do not specify how to value stock options or which valuation model should be used, it only specifies that one has to use a *well-known* model taking all of the different qualities of the stock option into consideration (Haugnes et al. 2011).

3.4 Share-based payment

One of the main focuses of the IFRS-2 is share-based payment and the main purpose is how to value options. With IFRS-2 the options for employees are valued at fair value and the costs are accrued over the vesting period. After 2005 when the IFRS became effective, NGAAP was also forced to account share-based payment at fair value (Fardal 2007).

The requirements of IFRS-2 with regards to share-based payment were not applicable to equity instruments granted on or before November 7th 2002. In light of the transition from NGAAP to IFRS, we demonstrate the challenge by quoting from an annual report of Nordic Semiconductor (year 2006, page 49):

"Termination of the Current Options Program"
"In light of the change in attitude toward options as a suitable compensation element, and the special problems the Company has with regard to cost accounting for payroll taxes on options in relation to showing accurate value creation for the Company, the Company decided to terminate the current options program in accordance with the decision at the extraordinary general meeting on December 7, 2005 and all current options were redeemed on February 21, 2006."

DNB's annual report from 2005 also contains a statement, which could be interpreted as them refraining from continuing their incentive program or establish any new option based programs because of IFRS-2:

"Subscription rights issued prior to 7 November 2002 and vested as at 1 January 2005 have not been restated according to IFRS 2 - Share-based Payments. The DnB NOR Group has not issued subscription rights or established option schemes after 7 November 2002 and has thus been able to use the exception rule".

From a review of the dataset we see that a total of six companies (listed below) used a stock option program, but terminated their program a year or two after the IFRS-2 regulation became effective. Nordic Semiconductor clearly state in their annual report from 2006 that they find it unmanageable to continue with their stock option program and as a result they dismissed the program. In addition, DNBs annual report from 2005 states that they will not issue any subscription rights that needed to be accounted for by the IFRS-2 regulations and that they did not subscribe any new option schemes after November 7th 2002 when the IFRS-2 would apply. This could also be a determining factor why the other companies quit their option programs as well. Another argument against IFRS-2 is that it is too hard to determine the fair-value, thus expensive consultants are needed to manage this task (Hole 2006).

Arguments that support IFRS-2 are among others, openness and transparency. Due to for instance the accounting scandals in 2001 in the US, as mentioned in the literature review, it is important to show every remuneration detail in the accounting statement. It is important for investors to see the compensation history for managers and employees in a firm, as this is part of the total costs for a company.

Termination of stock option program:
- Cermaq, year 2006 (annual report, page 41)
- DNO, year 2006 (annual report, page 55)
- Fred Olsen Energy, year 2006 (annual report, page 40)
- Kongsberg Group, year 2006 (annual report, page 42)
- Hydro, year 2007 (annual report, page 33)
- Telenor, year 2007 (annual report, page 72)

4. Taxation history

4.1 The taxation history of stock options in Norway from the 1990s

From 1991 to 1995 an option that was sold or exercised *in-the-money* for management or employees was taxable to income tax. Options were taxable when exercised or sold and not at the time of granting. From 1996 the taxation legislation changed so that the receiver of an option had to pay tax on the option benefit when granting the options. This meant that employees had to pay tax on future gains in the year the option was granted, thus many believed it became too expensive to grant options (Ministry of Finance 2000).

In 1999 employees received tax exemption when granting if the option benefit did not exceed NOK 600.000 p.a. and when it fulfilled certain other criteria. The same rules did not apply for publicly traded firms. In June 2000 the taxation exemption when issuing disappeared. Instead the gain when exercising or selling the option was taxed as income and should also be the base of payroll tax. The rule of transition for taxation on options for the fiscal years for 1996 until 2001 is described in the Norwegian Tax Law, cf. § 19-2 (5) (appendix 1).

In 2002 the Government suggested that publicly traded firms would have to pay tax when exercising or selling options, instead of paying tax when granting them, cf. the Norwegian Tax Law § 5-14 (3) (appendix 1), when the underlying asset is an existing share, a right to subscribe for shares or a right to acquire shares (Ministry of Finance 2000). The general tax rule prevailing at present when exercising or selling an option, is stated in the Norwegian Tax Law cf. § 5-10, which refers to §5-14 (3) with regards to options (appendix 1). There have also been issued other regulations by the Government concerning the use of stock options, e.g. the "Active and Long-term Ownership" from 2006/2007. This regulation states that partly government-owned companies should not use options as incentive-based payment for managers and other employees.

4.2 "Active and Long-term Ownership" from the Norwegian Government

The Norwegian Government released a government-ownership parliamentary report called "Eierskapsmeldingen" in St.meld 13 in 2006-2007, "Active and Long-term Ownership". This report laid the standard for how the Government

should act relative to its ownership in partly government-owned companies and in our case, publicly traded firms. The report's main statement is that the Government will play an active role in these companies and focus on industrial development with a long-term view on their investments. Through this statement the Government wants to contribute to a positive and stable development for the Norwegian economy and healthy corporate governance within these companies.

It is important to consider the high ownership share the Norwegian Government has in several of the largest companies listed on the Oslo Stock Exchange. This obviously affects how these companies are governed. The "Active and Long-term Ownership" – report states that the Government has high expectations of the Board of Directors and the ambitions and performance of each company they have stakes in. Additionally, the compensation policy for the management and employees is affected by the company's corporate governance and by the company's respective boards. In appendix 2 the ownership shares in these companies are presented and in appendix 3 the market value relative to all the companies in our sample are shown.

The report described above and an updated report from 2010-2011 state that options and similar option-based instruments should not be used in companies with government-owned shares. Even though the Government has different ownership stakes in companies listed on the Oslo Stock Exchange and not a majority vote in all general meetings, this statement sends a clear signal to these companies. This is a factor that might explain the declining trend of granted options in these publicly traded firms and the beginning of long-term incentive programs which will be reviewed below.

4.3 Long-term incentive programs

The Government released in 2006-2007 a report called "Active and Long-term Ownership" as mentioned above. Its objective was to change the practice of incentive pay. They did not find enough support for the use of stock options in government-owned companies and wanted to see an end to these types of incentives. They also wanted a general "cap" on how high incentive pay could be relative to fixed salary. This could also explain the entry of a new incentive program called "long-term incentive" (LTI) programs for government-owned

publicly traded firms. These types of programs are different from stock option programs because LTI-programs are needed with fewer shares than options and it is also a cheaper way to pay with generally lower accounting charges. Shares in an LTI-program will always have some value even though the share price drops significantly; hence the incentive share will always have some value. Options that are considerably *out-of-the-money*, on the other hand, will not be a good incentive because it is harder to receive any return from the incentive.

An LTI-program can also be seen as more aligned with the interests of the shareholders and those involved in the program because it can be less challenging to reach the goals of the incentive program. In 2010-2011 the Norwegian Government again published a parliamentary report, St. meld no.13 "Active Ownership", stating their opposition to stock options. They did however describe a share-based remuneration that is similar to the LTI-programs mentioned above. Here, the owner of the shares that have a binding period of minimum three years cannot sell the shares until the end of the binding period and this program can only be used in listed companies. Appendix 4 contains an overview of the partly government-owned companies and other companies that started using LTI-programs between 2001 and 2012.

Now that we have set the framework for our thesis we will subsequently look at the methodology.

5. Methodology

Our thesis is divided into two different analyses in terms of stock option compensation. First there are the graphical analyses and statistical tests of these analyses regarding the effect IFRS-2 has had on the number of stock options granted and outstanding in Norwegian companies. Then there are regression analyses of how options affect performance and vice versa.

5.1 Estimation window

We have chosen to look at the 50 biggest companies, based on market value, listed on the Oslo Stock Exchange as of December 31st 2012 in the period between 2001 and 2012. The time period is chosen to capture the effect of IFRS-2 by analyzing pre- and post- 2005. These 50 companies account for a total of approximately 95% of the total market value on the Oslo Stock Exchange at this date. In terms of this we believe that our data will provide reasonable results. A list of the selected companies, which industries they operate in and their market shares are shown in appendix 3. The companies are divided into different subsamples depending on when they were listed on the stock exchange; details are given in the next section.

5.2 IFRS-2

Accounting regulations play an important role in how companies structure stock options for CEOs and other employees as well as their motivation of using such instruments (Murphy 2012). Thus, accounting regulations will be seen as an explanatory variable when changes in the compensation structure occur. The accounting regulations may affect whether or not companies see stock options given to management and employees, as an expensive way of compensating based on how it should be accounted for (Haugnes et al. 2011). An example from the US of why accounting economically should matter is the transition from the voluntary accounting rules called FAS123 before 2005 to FAS123R (equivalent to IFRS-2) in 2005, where it became mandatory to report the expenses of stock options on the accounting statement (Murphy 2012). Murphy (2012) also elaborates that option expensing leveled the field between stock and options from an accounting perspective in the US. The result of this was that the number of granted options to top executive and other employees was significantly reduced while the use of

restricted stock increased. IFRS-2 was initiated in 2005 and led to changes in how publicly traded companies in Norway had to report their compensation plans, see details in the section "Accounting Principles". The effect of IFRS-2 on stock options is analyzed by conducting graphs and running regressions of the number of stock options granted and outstanding pre-and post- 2005.

5.3 Compensation and performance

The linkage between compensation and performance has been studied comprehensively throughout the years and some of the theories and findings of other authors are discussed in the literature review and hypotheses sections. We will perform similar analyses as other authors; we analyze the linkage between options and performance by running different simple and multiple linear regressions. Multiple linear regressions attempt to model the relationship between several explanatory variables and a response variable by fitting a linear equation to observed data. The performance, compensation and control variables included are discussed in the next section. The Newey-West HAC method is used when running the statistical regressions in Eviews. The Newey-West produces consistent standard errors that corrects for both autocorrelation and heteroscedasticity that may be present in the regressions (Brooks 2008). As tested for below, we find autocorrelation in the majority of our regressions and this method will give more robust results. The Newly-West deflates the t-values to a more accurate level (Brooks 2008).

5.4 Statistical testing of the regression models

We perform different statistical tests of the regression model to determine its robustness (Brooks 2008). We check for multicollinearity, which means that at least two of the explanatory variables are highly correlated. If multicollinearity exists it does not reduce the predictive power of the model as a whole, but it may result in spurious results about individual predictors. In addition we have applied the Breuch-Pegan's test to detect heteroscedasticity, meaning that there exist a collection of random variables in the data. This can lead to spurious significant results and thereby result in wrongly rejecting or accepting the models null hypotheses, which is a major concern when performing regressions in general (Brooks 2008). Heteroscedasticity and kurtosis are explained in the next section when discussing the descriptive statistics. In order to improve the robustness of

the statistical analyses it would be optimal to cluster the residuals of the variables on an industry level, which means allowing the error terms of the variables to correlate between the companies in the same industry. Due to resource limitations we are not been able to do this, but we will perform regression analysis on an industry level in order to capture industry fixed effects. In addition we have looked at the correlation between the residuals of our regression models based on industry (appendix 5). From these results it seems that there exists some correlation between the residuals of the companies within the same industry even without clustering the residuals of the models.

Next we will perform diagnostic tests of the OLS estimators of our regression models and check for presence of multicollinearity.

5.5 Linear regression (OLS-assumptions)

Assumption 1: The error terms have zero mean.

This assumption is fulfilled since we have a constant term in all of our regressions (Brooks 2008). If the constant term is left out, the consequences could be a negative R-squared, biased slope coefficients and meaningless R-squared/ adjusted R-squared.

Assumption 2: Homoscedasticity. Breuch-Pegan test

We have used Breusch-Pegan test instead of the White test to check for heteroscedasticity, since the White test is more suited for larger samples (Brooks 2008). The results in section seven show no sign of heteroscedasticity except model 2b – "risk-adjusted return". The consequence of heteroscedasticity is that the standard errors could be wrong and this could lose precision in the hypothesis testing (Brooks 2008). To deal with this issue we have used log variables which will be discussed in the next section and applied the Newey-West HAC method.

Assumption 3: No autocorrelation

The third (OLS) assumption states that the disturbance terms should be uncorrelated with one another over time (Brooks 2008). We have tested our main regressions from the analysis running the Durbin Watson test for first order autocorrelation. We find that the majority of our main regressions are affected by positive autocorrelation (appendix 6). The result of this could be incorrect

inference of the variables in the regression, but still the coefficients will be unbiased (Brooks 2008). Positive autocorrelation will give OLS standard errors to be biased downward relative to the true value standard errors and the OLS will understate their true variability (Brooks 2008). Further it is possible to check for higher levels of autocorrelation using the Breusch-Godfrey test. We test for second order autocorrelation and receive the same conclusions of autocorrelation as with Durbin Watson test. In this study we use yearly data because stock options are only given once a year and this might cause the issue. The small sample size may also be a reason for the presence of autocorrelation.

Assumption 4: Non-stochastic explanatory variables
There should be no correlation between the residuals and the explanatory variables (Brooks 2008).

Assumption 5: The residuals follow a normal distribution
The purpose of this assumption is to enable normal inference and since our sample size is fairly small we need a test to make sure this assumption is not violated. As can be seen from appendix 7, the residuals follow a normal distribution meaning the assumption is not violated.

Multicollinearity:
As mentioned above we have tested for multicollinearity to check if it exists in our regressions. We have run the variance inflation factor (VIF) test to measure the multicollinearity among the explanatory variables in the regressions. Since none of them exceed a high value (not above ten) and the R-squared in every regression is not significantly high, we do not regard multicollinearity as a problem.

6. Data

This section contains a description of the data and the data collection. The compensation data and company specific information regarding IFRS-2 are retrieved from companies' annual reports, sector and market value is collected from the Oslo Stock Exchange webpage and all other data are obtained from the software Datastream.

6.1 Data collection

The compensation data consist of CEO salary, companies' total salary, CEOs' granted stock options and year-end outstanding stock options, management year-end outstanding stock options and companies' total granted stock options and year-end outstanding stock options. All of this data is manually collected from companies' annual reports, a total of 600 reports, and may therefore consist of typing errors. This could weaken our results, however by having invested months in this process we hope to have a dataset that minimizes such errors.

The company specific information regarding IFRS-2 from the annual reports is information on how companies implemented the new regulation, the difference in their accounting policy because of it and if provided, their opinions on it. Some companies, mainly the ones using stock options, provide detailed information on all of these aspects, while some barely mention IFRS-2 at all.

The Oslo Stock Exchange webpage provide specifications on which sectors the different companies operate in, allowing us to perform analyses on industry level. Both in terms of IFRS-2 and on the regressions relative to performance, analyses on industry-level are performed to consider industry fixed effects.

All other data, which are obtained from Datastream, are yearly numbers based on the last day of each year. A description of the variables collected from Datastream that are included in the regressions is presented below.

6.2 Variables

The use of stock options is analyzed by performing several simple and multiple regressions. The variables included in these analyses are divided into three

categories, as Adelaziz et. al. (2011) did in their analysis of compensation and performance on French companies: *compensation variables, performance variables* and *control variables*. The descriptive statistics of the variables are presented at the end of this section.

Compensation variables

- Total salary: companies' salary excluding pension costs etc.
- CEO salary and bonus: the majority of the companies report their CEOs' salary and bonus as one post without specification of what it includes. Therefore it is not possible for us to say anything about the salary without the bonus and furthermore nothing about what the bonus includes.
- Total outstanding options.
- Total outstanding options management: here management includes both the board of directors and the executive management.
- Total outstanding options CEO.
- Total granted options.
- Total granted options CEO.

Performance variables

We have included several performance measures in order to achieve more conclusive results; all of them are commonly used as measures of performance in literature. Return on assets (ROA) and return on equity (ROE) are measures of *accounting* performance, while companies' risk-adjusted return is the main performance variable in terms of equity compensation in general.

- *ROA:* operating income divided by total assets.
- *ROE:* net income divided by total equity.
- *Risk-adjusted return / Sharpe Ratio:* log daily returns of each firms' annualized minus log risk free rate annualized, divided by the standard deviation*√252. The risk free rate is a ten-year Norwegian Government bond. The standard deviation is the standard deviation of the log return times the square root of 252 business days of each year. In terms of compensation, this is our main performance variable.

Control variables

The control variables are included in the analyses to control for firm size, growth opportunities and the companies' financial risk.

- *Size:* measured by the logarithm of total assets. The reasoning behind controlling for companies' size is that size is seen as a major determinant of executive compensation and compensation in general. Bigger companies usually have greater internal funds and can more easily generate external funding that allows them to take on more projects and generate higher profits. In addition they have economies of scale that allows them to benefit from higher performance. In terms of compensation, especially when looking at number of stock options granted or outstanding, it is important to control for the size of the firm because bigger companies have the resources to grant a higher number than smaller companies.

- *Price to book value (PTBV):* risk-adjusted return divided by the book value of share. We have chosen the PTBV to control for the companies' growth opportunities. Some use this variable as a measure of performance however it can also be an indicator of growth within a company.

- *Debt ratio:* total debt divided by total assets. This variable controls for creditors' influence on company performance.

6.3 IFRS-2

To analyze the effects on the use of stock options in terms of IFRS-2, we have conducted graphs showing the granted and end-year outstanding stock options pre- and post- 2005 and a regression analysis on the same data. The numbers of options are adjusted to account for firm size.

6.4 Subsamples

The companies in our total sample were listed on the stock exchange in different years; hence when performing the analysis we have focused on the companies that existed on the exchange the entire period from 2001 to present. An alternative would be to create subsamples with different timeframes as companies were listed, however by e.g. creating a subsample with the companies that existed between 2002-2012 would only increase the sample with two companies, hence it does not significantly improve our analyses. By creating subsamples we get 27 companies in the period 2001-2012, 29 companies in the period 2002-2012 and finally 34 companies between 2004 and 2012. Having chosen the period from 2004 to 2012 would increase the number of companies analyzed from 27 to 34,

but we would not be able to capture the effect of IFRS-2. Even though companies did not have to implement the new regulations until 2005, they were aware of it years before and may have started preparing for it.

The relatively small sample is also justified by the availability of stock option data in the companies' annual reports, e.g. we had to remove two companies completely due to lack of available information. Frontline and Stolt-Nielsen did not provide necessary information within their annual reports, which we are assuming is because they are based abroad where there are different requirements. Additionally, the Oslo Stock Exchange and the Norwegian market is small compared to other countries' stock exchanges' and financial markets so performing studies on Norwegian companies instead of e.g. US companies provide less available data and information. Since the Norwegian market is small, the 27 companies in our main time period constitute almost 77% of the market value on Oslo Stock Exchange as of December 31st 2012, which makes the data sufficient to provide valid results (appendix 3). The remaining 14 companies that were listed in 2005 or later are of less interest since IFRS-2 was initiated in 2005. A viable alternative would be to look at all companies that at some point in these 12 years was listed on the exchange, however given time and resource constraints we are not able to do this.

The companies vary significantly in terms of size and to account for this we have normalized the data by size, in our case, the logarithm of the companies' total assets. We do this in order to conduct a notionally common scale.

6.5 Descriptive statistics

The descriptive statistics from the dataset described above is viewed at the end of this section in table 1. The table is divided into three sections with regards to the variable groups of compensation, performance and control variables.

The compensation variables are those interesting to investigate in this matter, and we will look further into the CEO salary and bonus variables. The mean salary and bonus for CEOs is NOK 4.311.082. These two variables are not separated because a majority of the companies only report them together, as mentioned earlier. A graph of the CEO salary can be seen in appendix 8. The minimum

salary and bonus is zero and one example of this is the CEO in Norwegian Air Shuttle. He only receives shares as remuneration some years in our dataset. The maximum salary and bonus equals to NOK 20, 6 million for CEOs.

The skewness measures to which degree a distribution is symmetric about its mean value. Optimally the distribution being observed should have the same probability of observing values above or below the mean. The skewed distribution will have longer tails, while a normal distribution is symmetric about its mean (Brooks 2008). From our results we can see that the majority of the variables below have positive skewness, which means that the mean is higher than the median. The variable CEO salary and bonus illustrate this well, as there will be more companies that give the CEO a higher salary and bonus than the median company (appendix 9).

The kurtosis measures the amount of volume in the tails. In a normal distribution the coefficients of kurtosis have the value of three and are called mesokurtic. A leptokurtic distribution has the value of one and has a fatter tail and a higher peak at its mean than a normal distribution variable. The last type of kurtosis is called platykurtic distribution. It has a less peak to the mean, and has more of the distribution in the shoulders and thinner tails (Brooks 2008). From our result we can see that most of the variables have values that lie within the boundary of being normal distributed, while some variables have extreme values. This may be due to the large differences between companies in our dataset e.g. company size, and this will affect our results (appendix 9).

Looking at the histograms in appendix 9, where the most important variables are included, we see that all variables are fairly normal distributed (tend to be somewhat negatively skewed) except the stock price variable (log year-end stock price). This variable is not included in any of the above regressions, but is included in appendix 9 to illustrate why we use risk-adjusted return and not stock price as a performance variable. The risk-adjusted return variable follows a normal distribution, while the stock price variable is positively skewed and leptokurtic. This is one of the reasons why we use risk-adjusted return and hopefully this may also lead to more proper results when running the regressions.

Descriptive Statistics

| Variables	Mean	Std. Deviation	Minimum	Maximum	Skewness	Kurtosis	Observations
Compensation							
CEO GRANTED OPTIONS (in amount)	109465,805	674317,403	0,000	7350000,000	8,432	74,425	323
CEO OPTIONS (in amount)	195536,923	706573,599	0,000	7350000,000	7,128	57,785	324
CEO SALARY (in thousands)	2972,376	1670,512	0,000	10763,780	1,012	3,320	324
CEO SALARY AND BONUS (in thousands)	4330,085	2898,596	114625,000	20600,000	2,233	7,572	324
LOG GRANTED OPTIONS	13,237	1,410	10,000	17,000	,306	-,439	93
LOG TOTAL OPTIONS	14,178	1,632	7,000	17,000	-,550	1,306	152
LOG CEO GRANTED OPTIONS	11,429	1,701	4,828	15,810	,065	3,134	72
LOG CEO OPTIONS	11,984	1,606	4,800	15,800	-,870	3,413	132
LOG EMPLOYEE OPTIONS	14,013	1,689	7,196	17,319	-,586	1,399	118
LOG OPTIONS MANAGEMENT	13,116	1,783	6,609	17,077	-1,041	1,989	135
LOG TOTAL SALARY	20,445	1,916	14,110	23,846	-,731	,533	324
GRANTED TOTAL OPTIONS (t-1)	13,237	1,410	10,000	17,000	,306	-,439	93
Performance							
RISK ADJ RETURN	,05	1,140	-3	4	,174	,083	324
ROA	10,49	10,475	0	63	1,656	2,957	324
ROE	39,41	257,035	0	4483	16,342	279,742	324
DIVIDEND PER SHARE	2,36	3,492	0	25	2,719	10,511	323
Control							
SIZE	16,35	2,139	10	22	-,140	,303	324
PTBV	2,53	2,490	0	20	3,238	13,834	324
DEBT RATIO	26,26	19,532	0	100	,608	-,055	324

Table 1 - Descriptive Statistics

The control variables and performance variables were thoroughly described above and will be discussed further in the next section.

7. Results

7.1 Part 1: IFRS and compensation

The results from our collected data are reviewed below in different types of graphs. We believe that the most illustrating graphs of the development of the use of stock options are those represented with the number of granted options and the total options outstanding for CEOs, management and employees. We will try to find reasoning behind our hypothesis concerning Government legislations by looking at the development in the estimated timeframe.

Looking at the level of granted options to CEOs, the graph show a relatively stable level until 2005 when IFRS-2 became effective. In 2005, graph 1 shows a peak in granting of options for CEOs and employees. The following year a drop in the number of options granted is quite clear. This drop supports our hypotheses that a change in government legislations leads to a change in the use of options. Reviewing annual reports, some firms are straightforward in their opinion of the new accounting legislation; especially one comment is worth noting from Nordic Semiconductor, see section 3.4. In addition, six other companies chose to terminate their stock option program as a result of the new IFRS-regulations. They find it too challenging to continue using options as an incentive instrument for their management and employees.
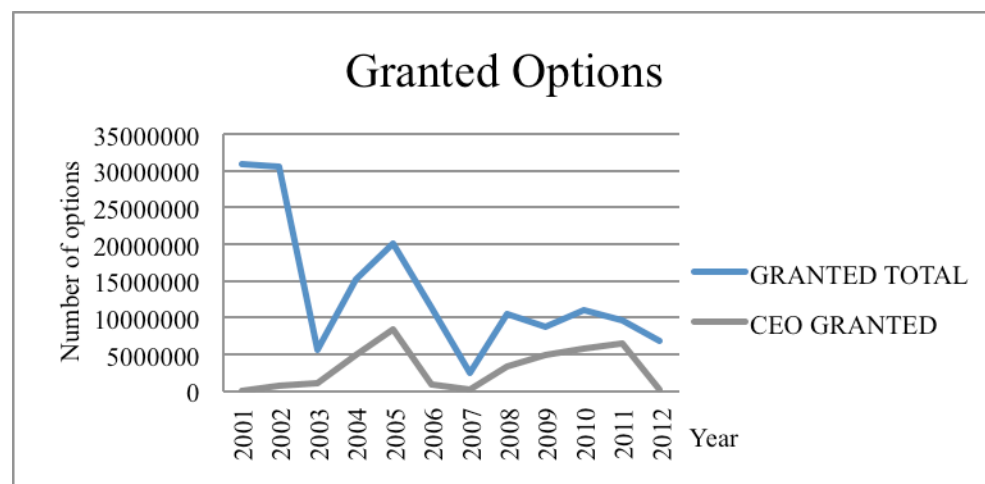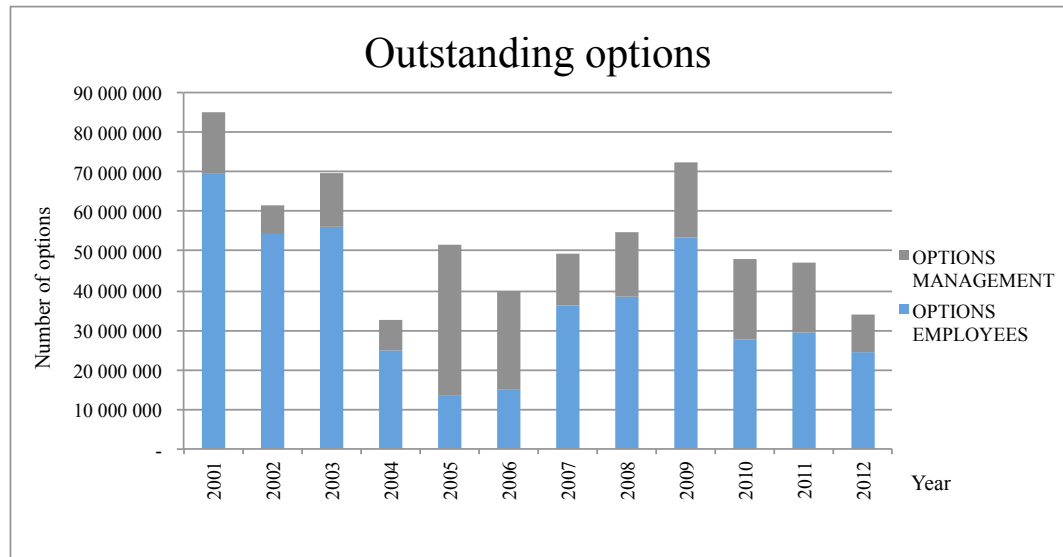

Graph 1- Granted Options from 2001 to 2012

For granted options in total it looks to be a significant decrease from 2002 to 2003 and one could argue that maybe the companies were aware of the new regulation at this point. Additionally, as mentioned in section 3.4 the IFRS-2 was not applicable to stock options granted before November 7th 2002 and this may be a

reason for the drop between 2002 and 2003. Granting of options had a peak in 2005, and it seems like firms significantly decreased the granting of options, at least compared to the previous pace, when the IFRS-2 became effective in 2005. Statistical analysis with the introduction of IFRS-2 as an explanatory endogenous variable that receives the value 1 in 2005 and 0 otherwise shows that for granted options to the CEO the variable IFRS-2 is positive but not statistically significant as the significance level is 0.296. This implies that the change in options granted to CEO's is with a 29.6 % probability not due to the introduction of IFRS-2. We therefore keep the null hypotheses, as we cannot prove the effects of IFRS2 on compensation. Previous studies by Damodaran (2005) among others find that companies that issue options to executives usually issue them every year. With the granting of options to CEOs experiencing a drop after 2005, this could imply that something is causing companies to suddenly stop issuing options, which may be the new regulation. The analysis for the total number of options granted shows that the variable capturing the introduction of IFRS-2 is negative but again statistically insignificant giving the same conclusion as for CEO grants however with a probability of 87.9 %. It should be emphasized that the p-value of the models exceed 0.05, meaning that there is a high probability that other factors are affecting the number of options granted to both CEOs and in total. See appendix 10 for details.

The level of options outstanding, shown in graph 2, did not change significantly, although we can see a minor decrease in level options outstanding between 2004 until 2006. The reason may be that for the level of options the firms granted until 2005 and IFRS-2, the vesting period remained even after the new regulations took effect, so that the options are not exercised until several years after 2005. From the statistical tests presented below graph 2, one can see that the variable for the introduction of IFRS-2 is negative and significant at the 5%-level, implying that the decrease in the number of options outstanding to employees excess of management is due to the application of the new regulation. This is consistent with our hypothesis, $H_{A,1}$ in section 1, that a change in Government legislations leads to change in the use of stock options and we therefore reject the null hypotheses. As for management the variable IFRS-2 is not significant. It seems that the number of options outstanding for the management was not affected by the implementation of IFRS-2. These results are also presented below the graph.

As argued earlier, companies were aware of IFRS-2 before 2005 so that the change in the levels of outstanding options before 2005 may have been caused by adapting to the forthcoming regulation.

Graph 2 - Outstanding Options from 2001 to 2012

$OPTIONS\ EMPLOYEES_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t$, where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.154332	0.116579	1.587616	4.087935	0.001905***
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	9.295019	2.118419	4.387715	0.0000
IFRS 2	-0.916794	0.399302	-2.295990	0.0235**
PTBV	0.033510	0.062896	0.532784	0.5952
SIZE	0.302895	0.146082	2.073454	0.0404**
DEBT RATIO	-0.005387	0.018316	-0.294084	0.7692
RISK ADJ RETURN	-0.226067	0.133767	-1.690003	0.0938*
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 2 - Options Employees from 2001 to 2012

$OPTIONS\ MANAGEMENT_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t$, where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.045212	0.008205	1.775564	1.221705	0.302623
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	15.40520	2.084502	7.390351	0.0000
IFRS 2	-0.386120	0.607396	-0.635698	0.5261
PTBV	0.043085	0.056606	0.761137	0.4480
SIZE	-0.138989	0.127123	-1.093341	0.2763
DEBT RATIO	-0.004634	0.009008	-0.514439	0.6078
RISK ADJ RETURN	-0.114161	0.147701	-0.772917	0.4410
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 3 - Options Management from 2001 to 2012

The highest peak of outstanding options and granted options after the implementation of IFRS-2 was in 2009. This may be due to the new regulations issued by the Norwegian Government mentioned above, where partly government-owned companies in our database were highly recommended to stop using options-programs and start using LTI-programs instead. The upward trend from 2005 to 2009 might have been caused by companies not implementing the new accounting regulation at once. Companies may have needed to train staff first in order to incorporate the new system and understand if the use of options with the new legislating still was an economically good idea for the different companies. In addition, companies may have granted stock options with a vesting period over many years, and IFRS-2 did not apply to the options granted before November 7th 2002.

Other graphs we find interesting, displayed below, are options outstanding to CEOs, options outstanding to management and total options outstanding, all divided by industries. The financial and IT industry especially reveal a decrease in options used by firms in our dataset in 2005. In the financial industry which accounts for 10% of the companies in our sample options to management and employees stop after 2004. The trend is also similar for the IT industry in graph 3, accounting for 8% of the companies in our sample. Here, options to every employee in the organization in the IT industry drop significantly and stay at a lower level after 2005.
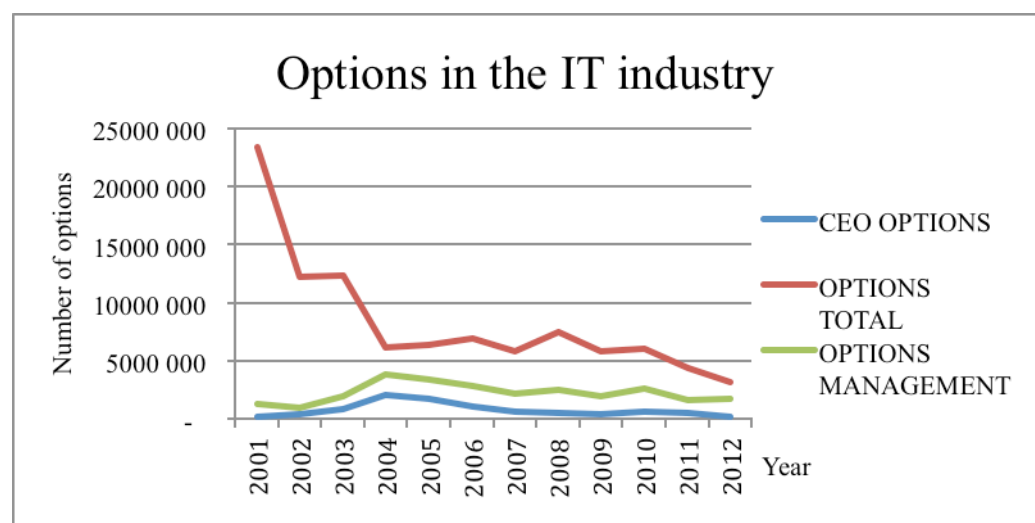
Graph 3 - Options in the IT industry from 2001 to 2012
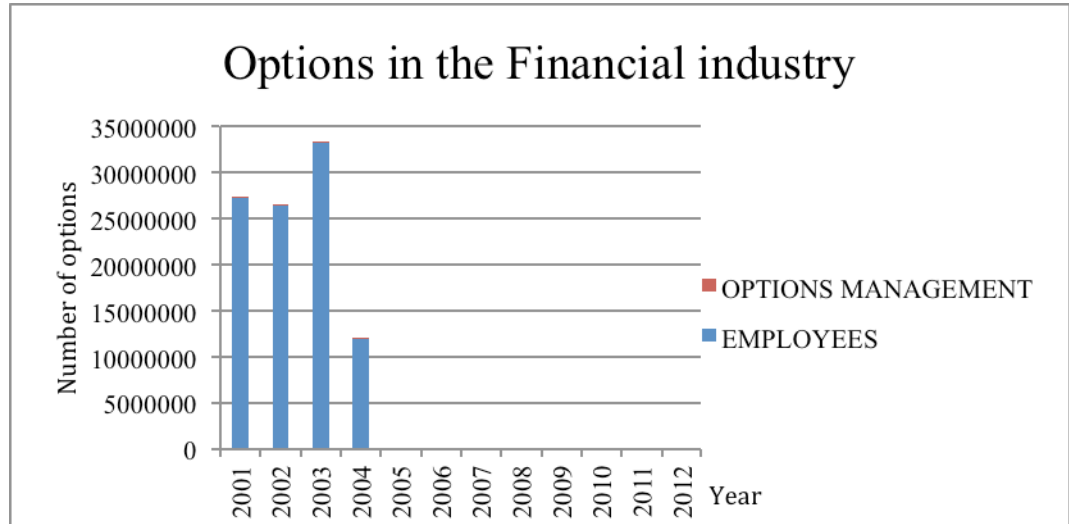
Graph 4 - Options in the Financial industry from 2001 to 2012

Statistical analyses for the different industries are shown in appendix 10. For the IT industry the introduction of IFRS-2 is not significant, however neither is the model, thereby we cannot conclude whether the new regulation affected the options outstanding for the companies in this industry. The same is found for the financial sector, see graph 4.

The Energy industry, shown in graph 5, does not give us the same clear view about the discontinuing of using stock options after IFRS-2. This might be because this industry, more than others, approves and implements the new accounting legislation. We assume that these companies are working more directly towards an international market and that this influences them to continue using share-based payment as incentive payment. It is also reasonable to assume that these firms are not bound by any domestic knowledge and that the companies can attract foreign skilled employees by offering incentive payment contracts. From the statistical analysis in appendix 10, the results are the same as for other industries; it seems as the change in stock options is not affected by the new regulation, but the variable capturing the implementation of IFRS-2 is not significant and the model has a p-value that exceeds 0.05. At the industry level we cannot state with certainty that the change in options outstanding is affected by the new regulation, hence keeping $H_{0,1}$.

Other explanations could be, as we see a drop in stock options around 2007, that there is a delayed response to IFRS-2 or that the financial crisis affected the use of stock options. Murphy (2012) found in his studies on US companies that during every recession stock option grants decrease, which could also be the case for the companies in Norway. Even though Norway was not among the countries that were harmed the most by the financial crisis, many companies were affected to some extent. None of these explanations can be stated with certainty as we have not tested with IFRS-2 as an exogenous variable in years after 2005, and the recession-theory has not been tested in this thesis. However, they are both fair assumptions.
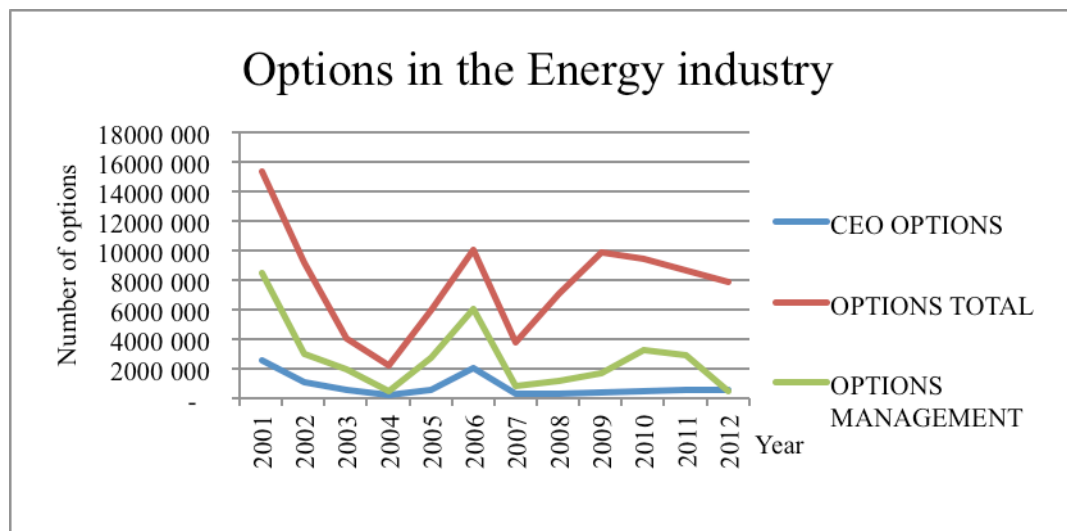
Graph 5 - Options in the Energy industry from 2001 to 2012

The majority of the total outstanding options are given to the employees according to graph 2. This graph indicates that low-rank employee options are affected more than management and CEO options, particularly when looking at year 2004 and 2005. Looking at the statistics, we can see that the overall model in graph 2 for "options management" is not significant while the overall model for "options employees" is significant at a 1%-level. This may indicate that the number of options given to employees is more statistically robust.

One explanation can be the cost for firms at granting options when the entry of IFRS-2 for options became effective in 2005 (Murphy 2012). We show in graph 1 and 2 above that higher amount of options are usually given to lower level

employees in total numbers than to management and CEOs and this could be a matter of increased costs for firms.

Firms are granting options to low-level employees instead of cash compensation when the firm is facing financial constraints (Core and Guay 2001). Graph 1 indicates that the total amount of options granted is increasing after the financial crisis in 2007. Furthermore it is argued that when employees are irrationally optimistic about the performance of the company, it will be optimal to grant options instead of cash (Oyer and Schaefer (2005) and Bergman and Jenter (2007)). Regarding this argument we can assume that employees are less informed about the firm's financial state than its management and CEO.

We find it interesting to discuss the option compensation contracts for CEOs and top management versus low-rank employees. CEOs and top management would probably have more flexibility and bargaining power in terms of negotiating job descriptions than low-rank employees with standardized contracts applicable to many employees. CEOs and top management have more knowledge in the overall state of the company than low-rank employees and will be more informed when negotiating terms of the contract.

In addition there is also a difference between *investors* and employees in terms of financial leverage. Increased financial leverage increases the volatility of the company's stock price, which is good news for an investor who in theory is well diversified. An undiversified employee is overinvested in the company when holding stock options and cannot sell these options immediately meaning that increased volatility of the stock price might be bad news due to the increased risk. Investors might try to convince the company to take on more debt in order to increase the volatility of the stock. For the overall employees this means that the options with a greater probability end up *out-of-the-money*. With this increased risk the stock options given to employees with the intention of motivating and enhancing their performance might not work. This is one of the concerns companies and its employees have to consider before entering a stock option program. LTI-programs, discussed in section 4, do not have this challenge to the same extent.

7.2 Part 2: Compensation and performance

The second part of our thesis concerns the relationship between stock options and performance. To analyze this we have performed several multiple regressions and lagged simple regressions. The most important results are presented below, while the remaining is shown in appendix 11.

The regressions are divided into three categories; (1) multiple linear regression where compensation is regressed on performance variables, (2) multiple linear regression where performance (risk-adjusted return) is regressed on compensation variables and (3) simple linear regressions in which current compensation is based upon last periods risk-adjusted return, and opposite.

(1) Compensation and performance. *Dependent variable: compensation.*

First total outstanding options, which is estimated to account for size, is measured against different performance variables and the control variables for growth (PTBV), company size (SIZE) and creditors influence on company performance (DEBTRATIO). The regression equation is:

(1a)

$TOTAL\ OPTIONS_t = \alpha_t + \beta_1 ROE_t + \beta_2 SIZE_t + \beta_3 PTBV_t + \beta_4 DEBT\ RATIO_t + \beta_5 ROA_t + \beta_6 RISK\ ADJ\ RETURN_t + \beta_7 DIVIDEND\ PER\ SHARE_t + \varepsilon_t,$

where t equals time and α is the intercept

The results displayed in table 4 show that the model as a whole is significant at a 1%-level, indicated by a low p-value, however not all of the explanatory variables are significant independently. Dividend per share is significantly different from zero at a 1%-level and debt ratio and size is significant at a 5%- and 10%-level, meaning that these variables explain the variance in the number of options with a high probability. Their coefficients are -0.314, -0.023 and 0.273 respectively. Company size is positively related to the number of options, which is consistent with previous studies e.g. Baker and Hall (2004) showing that bigger companies have greater opportunities to have a higher number of options within the company. Between options and companies' debt ratio and dividend per share there exists a negative relationship, e.g. if the dividend per share increases with one unit, this means that the number of options will decrease with 0.314. This relationship does not support our hypothesis of a positive relationship between

compensation and performance, section 1, so in this case we keep the null hypothesis. There is no significant relationship with risk-adjusted return and compensation, which is inconsistent with previous studies and agency theory, however it is consistent with the managerial power theory. This theory states that there exists no significant relationship between performance and compensation and that compensation is a result of managerial power and not an incentive-based contract. The R-squared is 20.4%, indicating that the explanatory variables are able to explain approximately 20% of the variance in total outstanding options.

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.204214	0.165530	1.487764	5.279022	0.000022***
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	10.86559	2.560471	4.243588	0.0000
ROE	0.028570	0.019074	1.497827	0.1364
SIZE	0.273905	0.162516	1.685404	0.0941*
PTBV	0.028248	0.044734	0.631458	0.5287
DEBT RATIO	-0.023050	0.011197	-2.058646	0.0413**
ROA	-0.942870	1.406564	-0.670336	0.5037
RISK ADJ RETURN	-0.146762	0.109063	-1.345663	0.1805
DIVIDEND PER SHARE	-0.314884	0.094454	-3.333728	0.0011***
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 4 - Total Options from 2001 to 2012

The second regression on compensation is based on the number of options granted to the CEO, again estimated to account for size. The performance- and control variables are the same. The regression equation is:

(1b)

$CEO\ GRANTED\ OPTIONS_t = \alpha_t + \beta_1 ROE_t + \beta_2 SIZE_t + \beta_3 PTBV_t + \beta_4 DEBT\ RATIO_t + \beta_5 ROA_t + \beta_6 RISK\ ADJ\ RETURN_t + \beta_7 DIVIDEND\ PER\ SHARE_t + \varepsilon_t,$
where t equals time and α is the intercept

The model displayed in table 5 has a p-value of 0.28 meaning that there is a probability all of the coefficients are zero and therefore the model cannot capture whether or not the explanatory variables are able to explain the variance in the number of stock options granted to the CEO. Thus, we cannot conclude about the relationship between granted options to the CEO and performance.

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.121588	0.025512	1.678954	1.265541	0.281577
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	11.43445	2.438388	4.689349	0.0000
ROE	-0.154349	0.585865	-0.263455	0.7930
SIZE	0.006607	0.138731	0.047628	0.9622
PTBV	0.031638	0.085352	0.370682	0.7121
DEBT RATIO	0.011286	0.017352	0.650392	0.5178
ROA	-0.600331	2.439708	-0.246067	0.8064
RISK ADJ RETURN	0.118484	0.173288	0.683741	0.4966
DIVIDEND PER SHARE	-0.234458	0.079798	-2.938157	0.0046**
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 5 - CEO granted options from 2001 to 2012

(2) Compensation and risk-adjusted return. *Dependent variable: performance (risk-adjusted return).*

The first regression with risk-adjusted return as the dependent variable is connected to the companies' total outstanding and granted options and total salary, while the second one is connected to the CEOs' outstanding and granted options and CEO salary. The control variables are included in both. The first regression equation is:

(2a)

$RISK\ ADJ\ RETURN_t = \alpha_t + \beta_1 DEBT\ RATIO_t + \beta_2 PTBV_t + \beta_3 SIZE_t +$
$\beta_4 TOTAL\ OPTIONS_t + \beta_5 GRANTED\ OPTIONS_t + \beta_6 TOTAL\ SALARY_t + \varepsilon_t,$
where t equals time and α is the intercept

The model displayed in table 6 has a low p-value and four of the explanatory variables are significantly different from zero at a 10%-level or better. Growth, measured by the price to book value, and company size are not significant and positively related to the risk adjusted return, while there is a significant negative relationship between the risk-adjusted return and the companies' debt ratio. The compensation variables except for companies' total salary are all insignificant. Salary is significant and negatively related to the risk-adjusted return, which does not support our hypothesis of a positive relationship between compensation and performance. In terms of salary we therefore keep the null hypothesis. Furthermore, in contrast to our hypotheses our analysis indicates a negative relationship. For the other compensation variables we are not able to state anything about their relationship with performance as they are insignificant. The

model is able to capture almost 22% of the variance in the risk-adjusted return, measured by R-squared.

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.272542	0.219313	1.116115	5.120207	0.000164***
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	-1.592910	1.694543	-0.940023	0.3500
DEBT RATIO	-0.015300	0.007362	-2.078256	0.0408**
PTBV	0.214070	0.042760	5.006360	0.0000***
SIZE	0.306482	0.090058	3.403163	0.0010***
LOG TOTAL OPTIONS	0.061704	0.113906	0.541708	0.5895
LOG GRANTED OPTIONS	-0.082549	0.109984	-0.750554	0.4551
LOG TOTAL SALARY	-0.154542	0.083483	-1.851173	0.0677*
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 6 – Risk-adjusted return from 2001 to 2012

The second regression regards CEO compensation with the following regression equation:

(2b)

$$RISK\ ADJ\ RETURN_t = \alpha_t + \beta_1 DEBT\ RATIO_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 CEO\ SALARY_t + \beta_5 CEO\ OPTIONS_t + \beta_6 CEO\ GRANTED\ OPTIONS_t + \varepsilon_t,$$

where t equals time and α is the intercept

The model displayed in table 7 has an R-squared of 0.343 which means that approximately 34% of the variance in the risk-adjusted return can be explained by the compensation- and control variables included in the model. Three control variables and total options outstanding to the CEO are significantly different from zero. In this model, CEO granted options are positively related to the risk-adjusted return which supports our hypothesis; however it is not significant, meaning that there is a probability that a negative relationship exists thereby inconsistent with the hypothesis. Options outstanding to the CEO are negatively related to performance in this case and significant at a 10%-level. This is inconsistent with our alternative hypothesis and we therefore keep the null hypothesis.

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.343065	0.280500	1.112968	5.483326	0.000129***
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	-4.439949	3.707764	-1.197474	0.2356
DEBTRATIO	-0.022443	0.008083	-2.776566	0.0072***
PTBV	0.215080	0.057818	3.719959	0.0004***
SIZE	0.230213	0.092564	2.487057	0.0155**
LOG CEO SALARY	0.106467	0.272935	0.390080	0.6978
LOG CEO OPTIONS	-0.281600	0.158325	-1.778621	0.0801*
LOG CEO GRANTED OPTIONS	0.236854	0.148108	1.599203	0.1148
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 7 – Risk-adjusted return and CEO from 2001 to 2012

(3) Granted options and risk-adjusted return. *Lagged.*

In addition to performing analysis based on compensation and performance from 2001 to 2012, we want to look at how the previous year's granted options affects the current year's risk-adjusted return, and opposite. This is to account for a potential delayed effect on the return by the number of options granted. The regression equation is:

(3a)

$$RISK\ ADJ\ RETURN_t = \alpha_t + \beta_1 GRANTED\ OPTIONS_{t-1} + \varepsilon_t,$$
where t equals time and α is the intercept

The model displayed in table 8 is insignificant with a significance level of 0.63. This means that there is a 63% probability that last year's granting of options does not affect this year's risk-adjusted return. The variables are positively related which means that if the company issues more options the company's risk-adjusted return increases, which are consistent with the intention of the management to grant options in the first place. When issuing stock options, a company hopes to motivate employees and retain them, which may work well; however, the hope is that this motivation also leads to an increase in company performance. This relationship supports our hypothesis that there is a positive relationship between performance and compensation. The relationship is not significantly different from zero, so we cannot state the relationship with certainty. We therefore keep the null hypothesis stating that compensation does not influence performance, as we cannot prove otherwise.

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.002557	-0.008404	1.300456	0.233269	0.630271
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	-0.413012	1.305282	-0.316416	0.7524
LOG GRANTED OPTIONS (t-1)	0.047297	0.095094	0.497365	0.6201
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 8 - Risk-adjusted return

We also checked for the inverse relationship, namely how the performance of the company affects the following year's number of granted options. The regression equation is:

(3b)
$$\text{GRANTED OPTIONS}_t = \alpha_t + \beta_1\ RISK\ ADJ\ RETURN_{t-1} + \varepsilon_t,$$
where t equals time and α is the intercept

As can be seen in table 9, there is a positive relationship which indicates that if the risk-adjusted return has increased one year, the company issues more options to its employees the following year. This might be so because the company sees an increased performance by having issued stock options to its employees previously and thereby continue granting options hoping to increase performance further. The positive relationship supports our hypothesis, as presented in section 1. However the model is not significant so we cannot state the relationship between last year's return and this year's option grants with certainty. The model has an R-squared of 0.000051 so the return one year explains only 0.005% of the variance in the stock option grants the following year. The model has a significance level of 0.945 meaning that there is a 94.5% probability that last year's performance do not affect this year's granted options and we therefore keep the null hypothesis.

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.000051	-0.010937	1.392072	0.004639	0.945847
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	13.22704	0.214094	61.78143	0.0000
RISK ADJ RETURN (t-1)	0.008519	0.120756	0.070550	0.9439
***,**, and * denote a significane level of 1%, 5% and 10%.				

Table 9 - Granted Options

7.3 Summary of findings

One finding is that IFRS-2 led to a decrease in the number of stock options, which is consistent with findings by Murphy (2012) on US companies that reduced their grants when the regulation APB Opinion 25 was introduced. However even though many companies decreased the number of options due to the new regulation, many did not stop using incentive-based payment, some just shifted to LTI-programs and other types of remuneration. From part 1 the majority of the results are insignificant, therefore an overall conclusion regarding our first two hypotheses is to keep $H_{0,1}$ and $H_{0,2}$. From part 2 we find that the relationship between stock options and performance is negative. This is inconsistent with agency theory that shareholders and employees' interests are aligned. It is also inconsistent with findings by Abdelaziz et. al. (2011); they find that performance and stock options in French companies are positively related; however, they use stock price as their performance measure while we use risk-adjusted return. When we performed our analysis with stock price as performance measure, we got the same results - a significant positive relationship. Our sample sizes were approximately the same. The negative relationship results may still be due to the small sample size and it could also be that a positive relationship would be found on other performance measures, e.g. stock price. The findings of no relationship between compensation and performance are consistent with the managerial power theory, which states that there exists no significant relationship between compensation and performance and that compensation is only a result of managerial power and not performance. The multiple insignificant results in general might also be due to our small sample size, so by increasing the number of companies in our study, the results might have been both supporting our hypotheses and significant.

8. Summary and conclusion

In this two-part thesis stock options relative to both IFRS-2 and performance were analyzed. The objective of the thesis was to examine what influences the use of option-based remuneration in Norwegian companies listed on the Oslo Stock Exchange with a focus on IFRS-2 and performance variables (mainly the companies' risk-adjusted returns).

The sample in this paper consisted of the 50 biggest companies based on market value, but after revising due to lack of available information and which companies existed during our analysis period from 2001 to 2012, the final sample consists of 27 companies. These companies account for 77% of the stock exchange, again based on market value. The full analysis is based on 324 observations. Part one of the analyses concerning the number of stock options granted and outstanding to CEOs and employees before and after the introduction of IFRS-2 in 2005, are conducted graphically and the analyses are tested statistically. These analyses are performed on the total sample and on industry-level. In the second part we analyze the relationship between compensation and performance by running simple and multiple regressions.

The first-part analyses concerning stock options and IFRS-2 seeks to answer the hypothesis of whether or not government legislations affect the use of options as remuneration in Norwegian companies. The results show that the number of stock options decreased after the introduction of IFRS-2, consistent with the studies of Murphy (2012) on the legislation APB Opinion 25 in the US that led to a decrease in stock option grants. The analyses at industry-level showed that, e.g. in the finance and IT sector the number of stock options decreased after 2005. However, in the energy sector the use of options remained fairly the same until 2007. This might be a delayed effect of IFRS-2 implementation in 2005, or it may have nothing to do with IFRS-2 at all. Murphy (2012) finds that during every recession, the number of stock option grants decreases in the US, hence this might also have been the case for the energy companies in Norway during the financial crisis that started in 2007. Neither of these explanations can be stated with certainty since the analyses with IFRS-2 as an exogenous variable provide insignificant results

except in one case and we have not tested the recession-theory. Still we believe they are fair assumptions.

The second part of the analyses identifies the relationship between stock options and performance and whether or not the relationship is positive. In addition to multiple regressions on the total sample, a simple regression of last year's granted options relative to following year's company performance is performed. Some of the results show that there is a significant negative relationship between compensation and performance. This is inconsistent with our hypotheses and agency theory, which states that there is a positive relationship between company performance and remuneration because the interest of the shareholders and employees should be aligned when using incentive-based pay. Other results show a negative but *insignificant* relationship between compensation and performance, indicating that there is a probability that a positive relation exists. A positive relationship between compensation and performance is consistent with studies by Murphy (2012).

Additionally, we found that last year's granted options have a positive effect on the following year's performance and that last year's performance has a positive effect on following year's granted options, which is consistent with agency theory and findings of Murphy (2012) on US companies. Again the results are insignificant, meaning that we have to keep the null hypotheses that last year's performance do not affect this year's granted options and vice versa.

The conclusion of our findings suggests that IFRS-2 led to a decrease in the number of stock options in most of the Norwegian companies analyzed and that the relationship between stock options and performance is negative. The latter results are in many cases insignificant and the relationship might therefore be positive. Even though many companies decreased the number of options due to the new regulation, many did not stop using incentive-based payment; they just shifted to LTI-programs and other types of remuneration. The insignificant results of the analysis of performance and stock options may be due to the small sample size and also it could be that different results would be found on other performance measures.

One relevant limitation is the small sample size, which is caused by studying a small market with limited availability on compensation data. In addition more than one performance measure could have been used to test the relationship between performance and compensation. Oslo Stock Exchange is a very small exchange compared to exchanges in other countries such as the US, France, the UK and Germany. Testing our hypotheses in one of these countries might give more robust results due to larger sample size.

Suggestions for further research are to include not only companies that exist on the stock exchange today, but throughout the entire timeframe. Other legislations, especially tax legislations could be tested relative to the use of share based payment and the effect of the financial crisis in 2007 could be implemented in the analyses.

9. Reference

Abdelaziz, El Marzougui, Amine, Lahiani and Lanouar, Charfeddine. "Stock-Options and the Performance of Cac40 Listed Companies." *International Journal of Economics and Finance* 3 (2011): 218-28.

Baker, George P. and Hall, Brian J. "CEO Incentives and Firm Size." *Journal of Labor Economics* 22 (2004): 767-98.

Bergman, Nittai, and Dirk Jenter. "Employee Sentiment and Stock Option Compensation." *Journal of Financial Economics* 84 (2007).

Berner, Peggy T. and Mikalsen, David M. "Fokus på IFRS, Aksjebasert Betaling." (2009). http://www.kpmg.no/arch/_img/9563721.pdf

Besanko, David and Dranove, Davidand and Shanley, Markand Schaefe, Scott *Economics of Strategy*. John Wiley & Sons, Inc. , 2010.

Bickley, James M. . "Employee Stock Options: Tax Treatment and Tax Issues." Congressional Research Service, 2012.

Brooks, Chris 2008. *Introductory Econometrics for Finance.* 2nd edition. Cambridge University Press.

Core, John, and Wayne Guay. *Stock Option Plans for Non-Executive Employees*. Journal of Financial Economics, 61. 2001.

Damodaran, Aswath "Employee Stock Options (ESOPs) and Restricted Stock: Valuation Effects and Consequences." Stern School of Business, 2005.

Drobetz, Wolfgang, Pensa, Pascal and Schmid, Markus M.,. "Estimating the Cost of Executive Stock Options: Evidence from Switzerland." *Working paper series* (2007): 31.

Fardal, Arnfinn. "IFRS og Norske Regnskapsregler." (2007). Published electronically March 2007. http://www.magma.no/ifrs-og-norske-regnskapsregler

Hall, Brian J. and Murphy, Kevin J. "Stock Options for Undiversified Executives." *Journal of Accounting & Economics* 33 (2002).

Hall, Brian J. and Kevin J. Murphy. "The Trouble with Stock Options." *Journal of Economic Perspectives* 17, no. 3 (2003): 49-70.

Haugnes, Torkild et al. . *IFRS i Norge*. Tema- og Bransjeartikler. Edited by Ernst & Young. 6 ed. 2011.

Hole, Inger Karin. "Brede Oppsjonsordninger Blant Selskaper På Oslo Børs." Master Thesis, Norwegian School of Economics, 2006.

Holmstroem, Bengt. "Moral Hazard and Observability." *The Bell Journal of Economics,* 10 (1979): 19.

Holmstroem, Bengt and Nalebu, Barry. "To the Raider goes the Surplus? A Reexamination of the Free-Riderproblem." *Journal of Econoinics & Management Strategy* (1992): 37-62.

IASB, IFRS Foundation and. "International Financial Reporting Standard 2, Share-Based Payment." edited by International Accounting Standard Board and IASB. http://www.ifrs.org, 2012.

Jensen, Michael C. and Meckling, William H. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics* 3 (1976): 78.

Lai, Fu, Chang, Eugene "An Investigation into Optimal Stock Option Compensation." *A thesis presented in fulfillment of the requirements for the degree of Doctor Philosophy in Finance at Massey University* (2010): 157.

Ministry of Finance. "Skatteregler for Opsjoner i Arbeidsforhold." 2000.

Murphy, Kevin J. "Executive Compensation: Where We Are, and How We Got There." *Forthcoming in Handbook of the Economics of Finance* (2012): 179.

Oyer, Paul, and Scott Schaefer. "Why Do Some Firms Give Stock Options to All Employees: An Empirical Examination of Alternative Theories." *Journal of Financial Economics* 76 (2005): 99-133.

Oxelheim, Lars and Randoey, Trond. "The Anglo-American Financial Influence on Ceo Compensation in Non-Anglo-American Firms." *Journal of International Business Studies* 36 (2005): 470-83.

"The Effects of Internationalization on Ceo Compensation." *Journal of International Business Studies* 36 (2005): 470-83.

"European Corporate Governance Guidelines and CEO Pay – the Case of Norway and Sweden." *Emerald Group Publishing* 24 (2008): 183-99.

Randoey, Trond and Nielsen, Jim. "Company Performance, Corporate Governance, and Ceo Compensation in Norway and Sweden." *Journal of Management and Governance* 6 (2002): 57-81.

Sellaeg, Finn Espen and Johansen, Pål André. "Opsjoner Til Ansatte - Regnskap Og Skatt." Revisorforeningen.no, http://revregn.no/index.php?seks_id=26917&element=kapittel - top.

10. Appendix

Appendix 1: Accounting Legislations and Tax Laws

The Norwegian Accounting legislation (in Norwegian)

§ 4-1. *Grunnleggende regnskapsprinsipper*

Årsregnskapet skal utarbeides i samsvar med følgende grunnleggende regnskapsprinsipper:

1. Transaksjoner skal regnskapsføres til verdien av vederlaget på transaksjonstidspunktet (transaksjonsprinsippet).

2. Inntekt skal resultatføres når den er opptjent (opptjeningsprinsippet).

3. Utgifter skal kostnadsføres i samme periode som tilhørende inntekt (sammenstillingsprinsippet).

4. Urealisert tap skal resultatføres (forsiktighetsprinsippet).

5. Ved sikring skal gevinst og tap resultatføres i samme periode.

Små foretak kan fravike de grunnleggende prinsippene om opptjening og sammenstilling, jf. første ledd nr. 2 og 3, når dette kan anses som god regnskapsskikk for små foretak. Små foretak kan fravike det grunnleggende prinsippet om sikring, jf. første ledd nr. 5.

Regnskapspliktig som nevnt i § 1-2 nr. 9, 10 eller 11 og som ikke har økonomisk vinning som formål, kan fravike de grunnleggende prinsippene om transaksjon, opptjening og sammenstilling, jf. første ledd nr. 1, 2 og 3, når dette kan anses som god regnskapsskikk for slike regnskapspliktige.

§ 5-9a. *Aksjeverdibasert betaling*

Aksjeverdibasert betaling skal regnskapsføres til virkelig verdi på transaksjonstidspunktet.

Små foretak kan unnlate å kostnadsføre aksjeverdibasert avlønning.

Source: http://lovdata.no/all/tl-19980717-056-004.html#4-1, http://lovdata.no/all/tl-19980717-056-007.html#5-9a

The Norwegian Tax Law (in Norwegian)

§ 5-14 (3). *Særlig om aksjer og opsjoner m.v. i arbeidsforhold*

(3) For fordel ved opsjon m.v. i arbeidsforhold gjelder:

a. Fordel ved innløsning eller salg av rett til erverv av eller salg av aksje eller grunnfondsbevis i arbeidsforhold, regnes som fordel vunnet ved arbeid etter § 5-10. Som slik rett anses både rett til erverv av eksisterende aksje eller grunnfondsbevis og rett til å tegne aksje eller grunnfondsbevis ved en senere emisjon. Dette gjelder også dersom retten er knyttet til fordring eller verdipapir. Fordelen fastsettes slik:

1. Ved innløsning av rett til erverv av aksje eller grunnfondsbevis settes fordelen til differansen mellom aksjens eller grunnfondsbevisets omsetningsverdi og innløsningsprisen, fratrukket skattyters kostpris for retten. Ved innløsning av rett til salg av aksje eller grunnfondsbevis settes fordelen til differansen mellom innløsningsprisen og aksjens eller grunnfondsbevisets omsetningsverdi, fratrukket kostprisen.

2. Ved salg av retten settes fordelen til differansen mellom salgssum og kostpris. Overføring av slik rett til nærstående regnes ikke som salg etter denne bokstav. Som nærstående regnes i alle tilfelle personer som skattyteren er i slekt eller svogerskap med i opp- eller nedstigende linje, samt første og andre sidelinje. Innløsning fra den nærstående til annen ikke nærstående regnes som innløsning eller salg fra skattyteren.

b. Departementet gir forskrift om tidfesting av og beregning av det enkelte års skattepliktige inntekt etter bokstav a.

c. Departementet kan gi forskrift til utfylling og gjennomføring av skattlegging etter dette ledd.

§ 19-2 (5). *Overgangsbestemmelser*

(5) Til bestemmelsen i § 5-14 tredje ledd bokstav a, gjelder følgende overgangsregler for rett til erverv eller salg av opsjoner ervervet i inntektsårene 1996-2001:

a. Ved innløsning av retten settes fordelen til den del av differansen mellom aksjens eller grunnfondsbevisets omsetningsverdi og innløsningsprisen som

overstiger skattyterens kostpris for retten og skattlagt fordel ved ervervet av retten.

b. Ved salg av retten settes fordelen til den del av differansen mellom salgssum og kostpris som overstiger skattlagt fordel ved ervervet av retten.

c. Beløp som er skattlagt ved ervervet, kan fradras i inntekt ved senere bortfall av retten. Ved utnyttelse av retten i form av innløsning til lavere verdi enn ervervsbeløpet gis slikt fradrag for differansen mellom ervervsbeløpet og innløsningsverdien. Med innløsningsverdi menes her omsetningsverdien av den underliggende aksjen eller grunnfondsbeviset på innløsningstidspunktet, fratrukket innløsningsprisen. Ved utnyttelse av retten i form av salg til lavere pris enn ervervsbeløpet, gis slikt fradrag for differansen mellom ervervsbeløpet og salgssummen.

Source: http://www.lovdata.no/cgi-wift/wiftldles?doc=/app/gratis/www/docroot/all/nl-19990326-014.html&emne=SKATTELOV*&&

Appendix 2: Partly Government owned companies, 2006 and 2012

Government ownership in companies listed on Oslo stock exchange		
Year 2006:	Comany name:	Government ownership
	Cermaq ASA	43,54 %
	DNB Nor ASA	34,00 %
	Kongsberg Group ASA	50,00 %
	Norsk Hydro ASA	43,82 %
	Raufoss ASA	50,27 %
	SAS AB	14,28 %
	Statoil ASA	70,90 %
	Telenor ASA	54,00 %
	Yara International ASA	36,21 %
Year 2012:	Cermaq ASA	44,00 %
	DNB ASA	34,00 %
	Kongsberg Group ASA	50,00 %
	Norsk Hydro ASA	34,00 %
	SAS AB	14,00 %
	Statoil ASA	67,00 %
	Telenor ASA	54,00 %
	Yara International ASA	36,00 %
Source: St. Meld.nr.13 2006-2007 and Statens Eierberetning 2012		

Appendix 3: 50 biggest companies in Oslo Stock Exchange, sorted by MV

Year (end of year)	Company	Market value in NOK 1000	Of the total %	Sector
2012	Statoil	443 221 800	32,65 %	Energy
2012	Telenor	175 026 000	12,89 %	Telecommunication services
2012	DNB	114 667 400	8,45 %	Financials
2012	Yara International	77 815 810	5,73 %	Materials
2012	Norsk Hydro	57 683 640	4,25 %	Materials
2012	Orkla	49 418 110	3,64 %	Consumer Staples
2012	Gjensidige Forsikring	39 700 000	2,92 %	Financials
2012	Aker Solutions	30 934 590	2,28 %	Energy
2012	Schibsted	25 434 840	1,87 %	Consumer discretionary
2012	Petroleum Geo-Services	20 767 210	1,53 %	Energy
2012	Marine Harvest	19 191 490	1,41 %	Consumer Staples
2012	TGS	18 772 800	1,38 %	Energy
2012	Fred. Olsen Energy	16 126 650	1,19 %	Energy
2012	Aker	15 343 430	1,13 %	Financials
2012	Kongsberg Gruppen	14 940 000	1,10 %	Industry
2012	Storebrand	12 066 580	0,89 %	Financials
2012	Det norske oljeselskap	11 608 350	0,86 %	Energy
2012	Wilh. Wilhelmsen	10 934 000	0,81 %	Industry
2012	DNO International	9 531 840	0,70 %	Energy
2012	SpareBank 1 SR-Bank	9 513 930	0,70 %	Financials
2012	Olav Thon Eiendomsselskap	9 473 630	0,70 %	Financials
2012	Cermaq	7 746 880	0,57 %	Consumer Staples
2012	Tomra Systems	7 438 000	0,55 %	Industry
2012	Stolt-Nielsen	7 375 380	0,54 %	Industry
2012	Lerøy Seafood Group	7 067 770	0,52 %	Consumer Staples
2012	Algeta	6 583 210	0,48 %	Health care
2012	Atea	6 075 060	0,45 %	Information Technology
2012	Hafslund	5 973 390	0,44 %	Utilities
2012	Veidekke	5 883 020	0,43 %	Industry
2012	Austvoll Seafoods	5 777 440	0,43 %	Consumer Staples
2012	Salmar	5 064 500	0,37 %	Consumer Staples
2012	Norwegian Air Shuttle	5 059 830	0,37 %	Industry
2012	Norwegian Property	4 661 790	0,34 %	Financials
2012	Opera Software	3 778 560	0,28 %	Information Technology
2012	Ekornes	3 406 470	0,25 %	Consumer discretionary
2012	Bakkafrost	2 955 910	0,22 %	Consumer Staples
2012	EMGS	2 597 370	0,19 %	Energy
2012	Nordic Semiconductor	2 369 890	0,17 %	Information Technology
2012	EVRY	2 352 580	0,17 %	Information Technology
2012	ABG Sundall Collier	1 844 150	0,14 %	Financials
2012	Golden Ocean	1 786 790	0,13 %	Industry
2012	BWG Homes	1 640 260	0,12 %	Consumer discretionary
2012	Odefjell	1 576 560	0,12 %	Industry
2012	Songa Offshore	1 502 570	0,11 %	Energy
2012	Frontline	1 440 380	0,11 %	Energy
2012	Eltek	1 303 650	0,10 %	Information Technology
2012	Q-free	1 298 270	0,10 %	Information Technology
2012	Kongsberg Automotive	602 020	0,04 %	Consumer discretionary
2012	Bionor Pharma	512 200	0,04 %	Health care
2012	Clavis Pharma	263 290	0,02 %	Health care
Sum market value and in percent in Oslo stock exchange		1 288 109 290	94,89 %	

Source:

http://www.oslobors.no/ob_eng/markedsaktivitet/sectors?newt__menuCtx=1.1.3

http://www.oslobors.no/ob_eng/Oslo-Boers/Statistics/Annual-statistics

Appendix 4: Overview of companies using LTI-programs

Summary of partly government owned companies and LTI-program transition:

- Cermaq ended their options program in 2008, and no options were granted after June 2008 (annual report 2012, page 75).

- Kongsberg Gruppen ended its options program in 2006, but continued with its share-based program that is still in progress as of 2012, (annual report 2008, page 34) and (annual report 2012, page 88).

- Norsk Hydro ended its option program in 2007, but stated a LTI-program in 2010 for its CEO and executive management, (annual report 2007, page 33 and annual report 2010, page 53)

- Statoil introduced in 2004 when they implemented FAS 123 (R) (IFRS-2 from January 1. 2007) a share-based program, and they still use the share-based payment program as of 2012, (annual report 2005, page 101) (annual report 2012, page 42).

- Telenor ended its options based incentive program in 2007, and stated a long-term incentive program instead for its key personnel (annual report 2007, page 72) and it still exists in 2012 (annual report 2012, page 87)

- Yara International established in 2004 a share-based incentive program, the same year they were listed on Oslo Stock exchange (annual report 2004, page 58). And in 2008 the board of directors approved a long-term incentive program for management and top executive, which applies today as well (annual report 2012, page 91).

Summary of other companies using LTI-programs:

- Schibsted changed their use of stock options until a "LTI"-program in 2010, using the same accounting rules as IFRS-2 (annual report 2010, page 189).

- Gjensidige was listed on Oslo Stock Exchange in 2010 and offer share incentive program for every employee from 2011 (annual report 2011, page 130)

- Storebrand started to use LTI-programs for executives in 2008, but did not use stock options program previous to that year (annual report 2008, page 89).

- TGS changed the form of using options until using a form of LTI-program as they call, Stock Appreciation Rights (SARs) in 2010 (annual report 2012, page 41).

- Tomra Systems established in 2010 a Long-Term Incentive Plan, but already in 2006 it was established a Long-Term cash-based incentive plan for management (annual report 2012, page 62).

- Wilhelm Wilhelmsen started in January 2011 a share-price-based incentive program for management (annual report 2012, page 38), while earlier they used options as incentive payment.

- EVRY established in 2011 a long-term share based system, after using an options program until that year (annual report 2012, page 93)

- Opera Software approved in 2011 a new long-term equity based incentive program, which they called a "new stock repurchase program" (annual report 2012, page 116)

Appendix 5: Correlation of residuals

Correlation resduals: IT-industry				
Companies:	Atea	Eltek	EVRY	Nordic Semiconductor
Atea	1			
Eltek	0,16	1		
EVRY	0,09		0,53	1
Nordic Semiconductor	-0,25		0,19	0,38	1

Table 10 - Correlation of residuals in the IT-industry

Correlation resduals: Energy industry				
Companies:	DNO	Fred Olsen Energy	PGS	TGS
DNO	1			
Fred Olsen Energy	-0,26	1		
PGS	0,66		-1,00	1
TGS	0,67		-0,73	0,48	1

Table 11 - Correlation of residuals in the Energy industry

Correlation resduals: Financial industry					
Companies:	DNO	Fred Olsen Energy	PGS	TGS	ABG Sundall Collier
DNO	1				
Fred Olsen Energy	-0,26	1			
PGS	0,66		-1,00	1	
TGS	0,67		-0,73	0,48	1	
ABG Sundall Collier	0,76		0,82	0,67	0,69	1

Table 12 - Correlation of residuals in the Financial industry

Appendix 6: Autocorrelation, Durbin Watson

| Testing for autocorrelation with Durbin Watson test				
Regression:	DW stat:	dL:	dU:	Number of variables:	Conclusion:
1a, part 1	0,45177	1,441	1,647	5	Positive autocorrelation
1b, part 1	0,26794	1,557	1,693	5	Positive autocorrelation
1a, part 2	0,36633	1,530	1,722	7	Positive autocorrelation
1b, part 2	0,87938	1,603	1, 746	7	Positive autocorrelation
2a, part 2	2,24593	1,362	1,657	6	No autocorrelation
2b, part 2	1,99479	1,283	1,645	6	No autocorrelation
3a, part 2	1,75627	1,496	1,541	1	No autocorrelation
3b, part 2	0,58187	1,496	1,541	1	Positive autocorrelation

Table 13 – Durbin Watson test
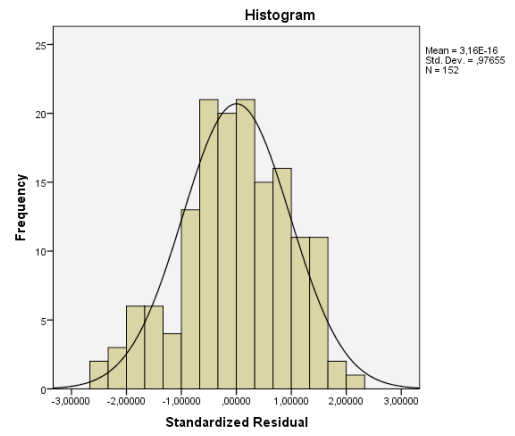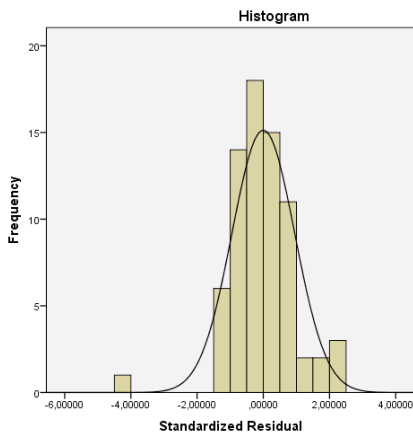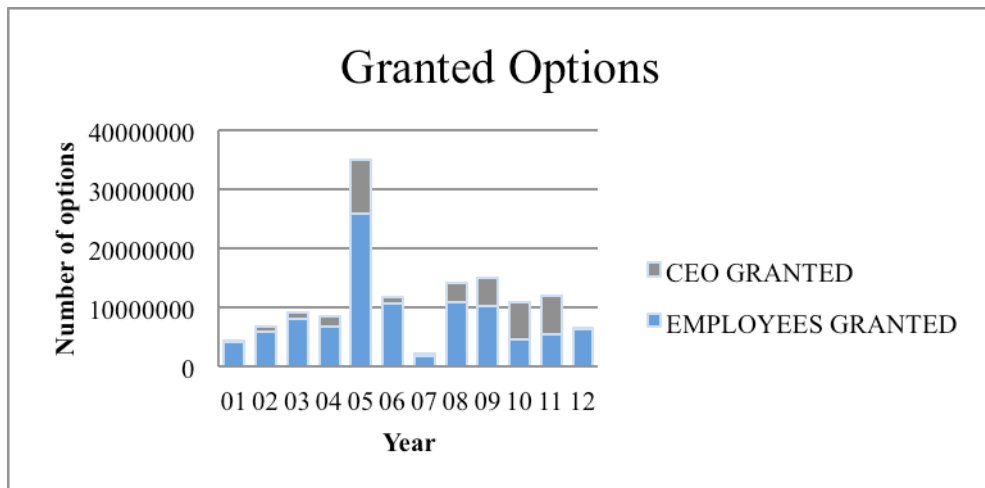
Appendix 7: Normality of residuals

Part 1: Graph and regression analyses
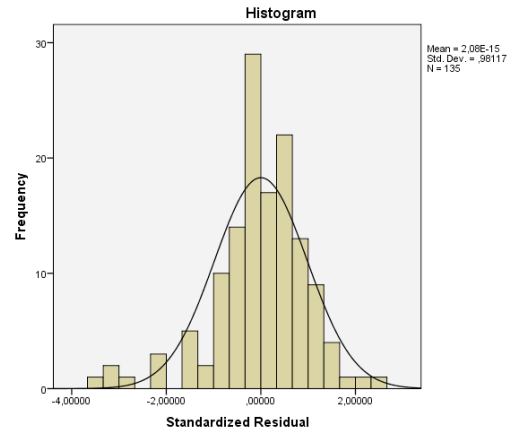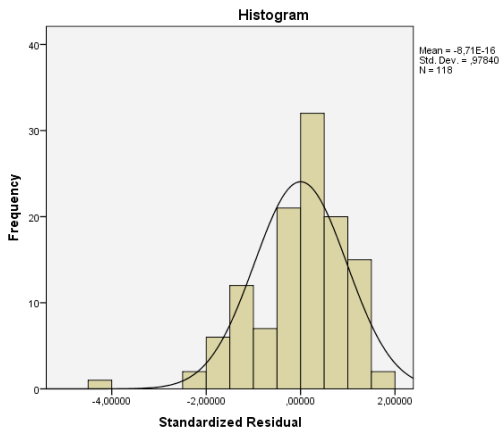
Part 2: Regression analyses
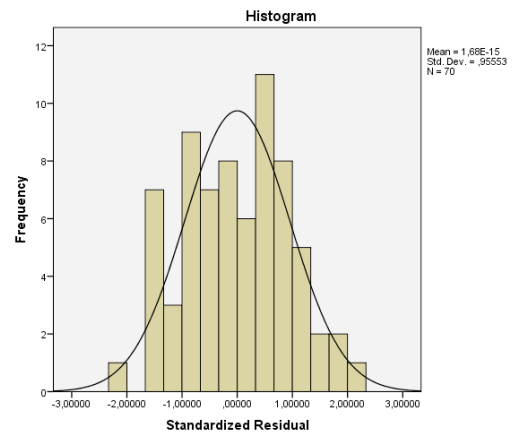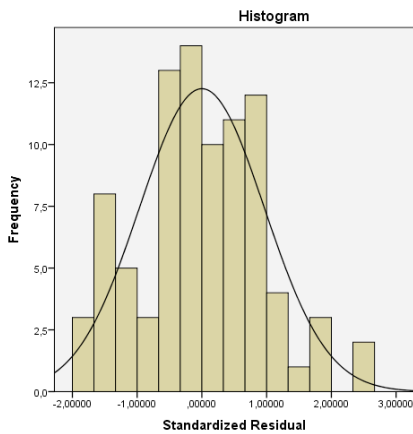
Appendix 8: Graphs from dataset
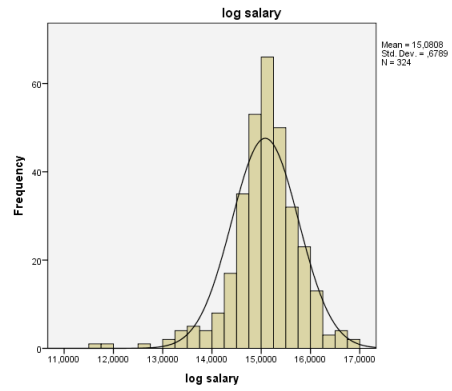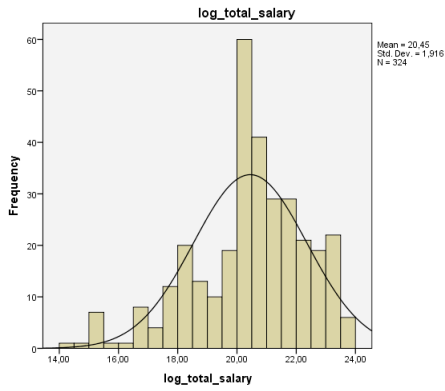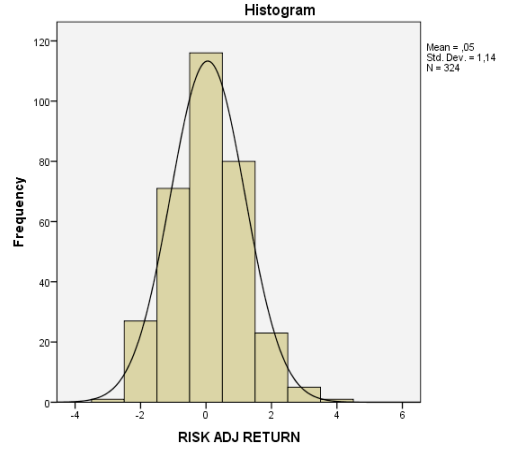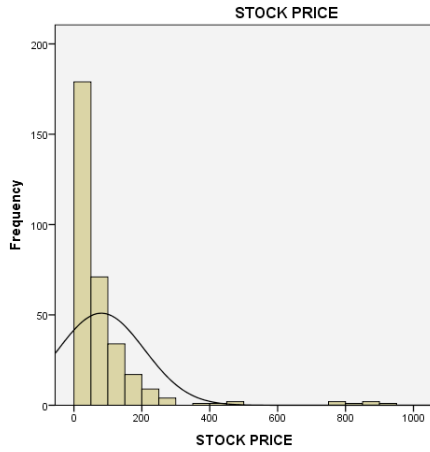

This graph below illustrates granted options to CEOs as in the main text, but also includes a separated graph with granted options to employees that we find interesting thus wanted to include here.

Appendix 9: Skewness and Kurtosis
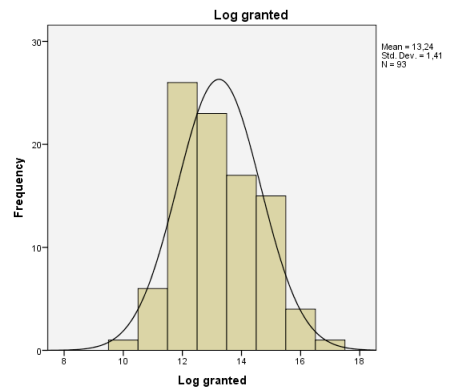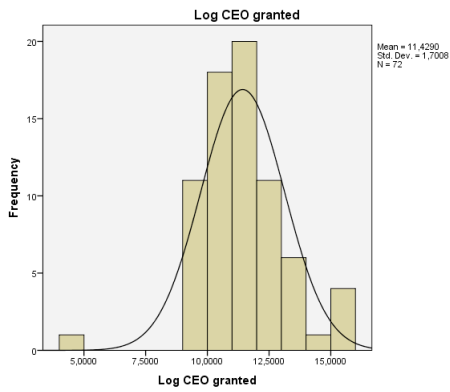
Appendix 10: Regressions and results from part 1 of the results section

Graph 1: CEO GRANTED OPTIONS & TOTAL GRANTED OPTIONS

$CEO\ GRANTED\ OPTIONS_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t$, *where t equals time and α is the intercept*

Model Summary					
	R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
	0.039677	-0.033075	1.728687	0.545376	0.741212
Coefficients					
Model	Coefficient	Std. Error	t-statistics	Sig.	
(Constant)	11.77069	2.075386	5.671565	0.0000	
IFRS 2	0.854323	0.812443	1.051548	0.2968	
PTBV	0.033204	0.082531	0.402314	0.6888	
SIZE	-0.042282	0.129274	-0.327073	0.7446	
DEBT RATIO	0.006406	0.012086	0.529986	0.5979	
RISK ADJ RETURN	0.018263	0.161775	0.112892	0.9105	
***,**, and * denote a significane level of 1%, 5% and 10%.					

$TOTAL\ GRANTED\ OPTIONS_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t$, *where t equals time and α is the intercept*

Model Summary					
	R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
	0.058628	0.004526	1.381384	1.083657	0.375148
Coefficients					
Model	Coefficient	Std. Error	t-statistics	Sig.	
(Constant)	14.48135	1.960900	7.385052	0.0000	
IFRS 2	-0.078809	0.515978	-0.152737	0.8790	
PTBV	0.052835	0.044624	1.184024	0.2396	
SIZE	-0.072898	0.128759	-0.566157	0.5727	
DEBT RATIO	-0.011162	0.012138	-0.919600	0.3603	
RISK ADJ RETURN	-0.016704	0.092315	-0.180952	0.8568	
***,**, and * denote a significane level of 1%, 5% and 10%.					

Graph 2: IT - INDUSTRY

$CEO\ OPTIONS_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t$, *where t equals time and α is the intercept*

Model Summary					
	R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
	0.313375	0.181332	0.906868	2.373274	0.066926*
Coefficients					
Model	Coefficient	Std. Error	t-statistics	Sig.	
(Constant)	8.102314	1.550461	5.225746	0.0000	
IFRS 2	0.124536	0.308020	0.404313	0.6893	
PTBV	0.121445	0.033844	3.588319	0.0014***	
SIZE	0.289540	0.105493	2.744638	0.0108**	
DEBT RATIO	-0.028419	0.013402	-2.120404	0.0437**	
RISK ADJ RETURN	-0.105300	0.100786	-1.044785	0.3057	
***,**, and * denote a significane level of 1%, 5% and 10%.					

$TOTAL\ OPTIONS_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t,$ where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.208937	0.085333	0.963661	1.690378	0.165354
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	8.057895	2.038953	3.951977	0.0004
IFRS 2	-0.317138	0.211011	-1.502946	0.1427
PTBV	0.084470	0.028458	2.968264	0.0056***
SIZE	0.440405	0.137815	3.195615	0.0031***
DEBT RATIO	-0.021583	0.012230	-1.764788	0.0871*
RISK ADJ RETURN	-0.042442	0.087355	-0.485853	0.6304
***,**, and * denote a significane level of 1%, 5% and 10%.				

$OPTIONS\ MANAGEMENT_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t,$ where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.164425	0.025162	1.312423	1.180682	0.341833
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	9.050686	3.419721	2.646616	0.0128
IFRS 2	0.188963	0.776640	0.243308	0.8094
PTBV	0.073291	0.084478	0.867572	0.3925
SIZE	0.295505	0.226218	1.306286	0.2014
DEBT RATIO	-0.030154	0.020738	-1.454057	0.1563
RISK ADJ RETURN	0.119936	0.185319	0.647186	0.5224
***,**, and * denote a significane level of 1%, 5% and 10%.				

Graph 3: FINANCIAL INDUSTRY

$OPTIONS\ MANAGEMENT_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t,$ where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.066509	-0.019925	4498.011	0.769476	0.575897
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	-9401.859	8139.463	-1.155096	0.2531
IFRS 2	-1193.577	1152.854	-1.035323	0.3051
PTBV	403.1538	405.2419	0.994847	0.3242
SIZE	533.8761	454.8291	1.173795	0.2456
DEBT RATIO	13.84364	19.28155	0.717973	0.4759
RISK ADJ RETURN	-239.0022	435.8406	-0.548371	0.5857
***,**, and * denote a significane level of 1%, 5% and 10%.				

$OPTIONS\ EMPLOYEES_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t,$ where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.069501	-0.016656	6588452.	0.806678	0.549973
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	-14212152	12197502	-1.165169	0.2491
IFRS 2	-1861087.	1811657.	-1.027284	0.3089
PTBV	586341.9	590118.8	0.993600	0.3248
SIZE	806789.4	681449.8	1.183931	0.2416
DEBT RATIO	20569.59	28627.14	0.718535	0.4755
RISK ADJ RETURN	-193732.0	589014.1	-0.328909	0.7435
***,**, and * denote a significane level of 1%, 5% and 10%.				

Graph 4: ENERGY INDUSTRY

$CEO\ OPTIONS_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t,$ where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.225060	0.063614	0.827955	1.394024	0.261857
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	15.07857	3.825681	3.941409	0.0006
IFRS 2	-0.697304	0.396984	-1.756503	0.0918*
PTBV	0.068564	0.065609	1.045042	0.3064
SIZE	-0.199089	0.246293	-0.808344	0.4268
DEBT RATIO	0.008990	0.010246	0.877427	0.3890
RISK ADJ RETURN	-0.163241	0.104770	-1.558094	0.1323
***,**, and * denote a significane level of 1%, 5% and 10%.				

$TOTAL\ OPTIONS_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t,$ where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.089829	-0.078722	1.728427	0.532948	0.749407
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	8.926033	4.463044	1.999988	0.0557
IFRS 2	-0.037930	0.792488	-0.047862	0.9622
PTBV	0.067524	0.084724	0.796987	0.4324
SIZE	0.369880	0.292544	1.264359	0.2169
DEBT RATIO	-0.020170	0.013388	-1.506570	0.1435
RISK ADJ RETURN	-0.270281	0.169898	-1.590842	0.1233
***,**, and * denote a significane level of 1%, 5% and 10%.				

$OPTIONS\ MANAGEMENT_t = \alpha_t + \beta_1 IFRS2_t + \beta_2 PTBV_t + \beta_3 SIZE_t + \beta_4 DEBT\ RATIO_t + \beta_5 RISK\ ADJ\ RETURN_t + \varepsilon_t,$ where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.133702	-0.039558	1.079011	0.771686	0.579125
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	12.48479	4.962115	2.516023	0.0187
IFRS 2	-0.381774	0.919738	-0.415090	0.6816
PTBV	0.116489	0.083437	1.396137	0.1749
SIZE	0.052002	0.315186	0.164989	0.8703
DEBT RATIO	-0.006114	0.008178	-0.747526	0.4617
RISK ADJ RETURN	-0.209261	0.129434	-1.616739	0.1185
***,**, and * denote a significane level of 1%, 5% and 10%.				

Appendix 11: Regressions and results from part 2 of the results section

Model 1: GRANTED OPTIONS (2001-2012)

$GRANTED\ OPTIONS\ TOTAL_t = \alpha_t + \beta_1 ROE_t + \beta_2 SIZE_t + \beta_3 PTBV_t + \beta_4 DEBT\ RATIO_t +$

$\beta_5 ROA_t + \beta_6 RISK\ ADJ\ RETURN_t + \beta_7 DIVIDEND\ PER\ SHARE_t + \varepsilon_t,$

where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.165020	0.096256	1.316201	2.399827	0.027306**
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	14.01030	2.331456	6.009249	0.0000
ROE	-0.044252	0.237385	-0.186415	0.8526
SIZE	-0.016965	0.153099	-0.110813	0.9120
PTBV	0.040130	0.042125	0.952628	0.3435
DEBT RATIO	-0.011820	0.011940	-0.989890	0.3250
ROA	-0.786654	1.177588	-0.668021	0.5059
RISK ADJ RETURN	0.029636	0.108807	0.272371	0.7860
DIVIDEND PER SHARE	-0.207301	0.068893	-3.009047	0.0034***
***,**, and * denote a significane level of 1%, 5% and 10%.				

Model 2: CEO OPTIONS (2001-2012)

$CEO\ OPTIONS_t = \alpha_t + \beta_1 ROE_t + \beta_2 SIZE_t + \beta_3 PTBV_t + \beta_4 DEBT\ RATIO_t + \beta_5 ROA_t +$

$\beta_6 RISK\ ADJ\ RETURN_t + \beta_7 DIVIDEND\ PER\ SHARE_t + \varepsilon_t,$

where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.111130	0.060952	1.562249	2.214710	0.037334**
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	12.41870	1.567769	7.921252	0.0000
ROE	-0.291881	0.439589	-0.663986	0.5079
SIZE	-0.012097	0.092269	-0.131107	0.8959
PTBV	0.087870	0.055833	1.573814	0.1181
DEBT RATIO	-0.007204	0.009638	-0.747492	0.4562
ROA	0.502415	1.479399	0.339607	0.7347
RISK ADJ RETURN	-0.261684	0.124388	-2.103776	0.0374**
DIVIDEND PER SHARE	-0.148709	0.069959	-2.125663	0.0355**
***,**, and * denote a significane level of 1%, 5% and 10%.				

Model 3: RISK ADJ RETURN (2001-2012)

$RISK\ ADJ\ RETURN_t = \alpha_t + \beta_1 PTBV_t + \beta_2 SIZE_t + \beta_3 DEBT\ RATIO_t + \beta_4 CEO\ SALARY_t +$

$\beta_5 CEO\ GRANTED\ OPTIONS_t + \beta_6 CEO\ OPTIONS_t + \beta_7 DIVIDEND\ PER\ SHARE_t + \varepsilon_t,$

where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.362818	0.290878	1.104912	5.043355	0.000144***
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	-4.300411	3.576186	-1.202513	0.2337
PTBV	0.215235	0.058576	3.674469	0.0005***
SIZE	0.192578	0.089526	2.151070	0.0354**
DEBT RATIO	-0.021506	0.008100	-2.655214	0.0101**
LOG CEO SALARY	0.094804	0.270997	0.349835	0.7276
LOG CEO GRANTED OPTIONS	0.239128	0.141050	1.695347	0.0950*
LOG CEO OPTIONS	-0.245137	0.152722	-1.605118	0.1135
DIVIDEND PER SHARE	0.095388	0.046837	2.036612	0.0460**
***,**, and * denote a significane level of 1%, 5% and 10%.				

Model 4: RISK ADJ RETURN (2001-2012)

$$RISK\ ADJ\ RETURN_t = \alpha_t + \beta_1 PTBV_t + \beta_2 SIZE_t + \beta_3 DEBT\ RATIO_t + \beta_4 TOTAL\ SALARY_t +$$

$$\beta_5 GRANTED\ OPTIONS_t + \beta_6 TOTAL\ OPTIONS_t + \beta_7 DIVIDEND\ PER\ SHARE_t + \varepsilon_t,$$

where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.278511	0.216160	1.118367	4.466824	0.000303***
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	-1.976902	1.865017	-1.059991	0.2923
PTBV	0.213790	0.043252	4.942903	0.0000***
SIZE	0.268291	0.100911	2.658689	0.0095***
DEBT RATIO	-0.014338	0.007615	-1.882782	0.0633*
LOG TOTAL SALARY	-0.128808	0.096820	-1.330386	0.1871
LOG GRANTED OPTIONS	-0.070476	0.115177	-0.611892	0.5423
LOG TOTAL OPTIONS	0.076732	0.112417	0.682562	0.4968
DIVIDEND PER SHARE	0.054033	0.043228	1.249955	0.2149
***,**, and * denote a significane level of 1%, 5% and 10%.				

Model 5: CEO GRANTED OPTIONS (2001-2012)

$$CEO\ GRANTED\ OPTIONS_t = \alpha_t + \beta_1\ RISK\ ADJ\ RETURN_{t-1} + \varepsilon_t,$$

where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.004839	-0.009377	1.708745	0.340389	0.561480
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	11.41693	0.289987	39.37048	0.0000
RISK ADJ RETURN (t-1)	0.095276	0.155729	0.611804	0.5426
***,**, and * denote a significane level of 1%, 5% and 10%.				

Model 6: RISK ADJ RETURN

$$RISK\ ADJ\ RETURN_t = \alpha_t + \beta_1 TOTAL\ OPTIONS_{t-1} + \varepsilon_t,$$

where t equals time and α is the intercept

Model Summary				
R Square	Adjusted R Square	S.E. of regression	F-statistic	Prob(F-statistic)
0.007426	0.000809	1.157987	1.122211	0.291146
Coefficients				
Model	Coefficient	Std. Error	t-statistics	Sig.
(Constant)	1.029107	0.659561	1.560291	0.1208
LOG TOTAL OPTIONS (t-1)	-0.061295	0.045447	-1.348717	0.1795
***,**, and * denote a significane level of 1%, 5% and 10%.				

Preliminary Thesis

Executive stock options in Norway

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Hand-in date:
15.01.2013

Campus:
BI Oslo

Exam code and name:
GRA 19002 Preliminary Thesis

Program:
Master of Science in Business and Economics
with Major in Finance

Content

Introduction

In this thesis we will look at what motivates the use of stock options as compensation to executives in Norwegian firms. Executive compensation is a subject that has received a great amount of attention for many years, especially in the US where executive pay has been higher than anywhere else (Nielsen and Randoy, 2002). People have different opinions on whether executive compensation is creating value for a firm, or if it is just a way of paying the executives even more. Some argue that most executives get paid enough with their base salary, and that this remuneration should be enough without them demanding more incentive compensation to take the actions shareholders request.

Earlier studies have focused primarily on the US and many of them lack to identify that political and other socioeconomic factors are of relevance for executive stock option compensation (Hall and Murphy, 2002). In our study we will look at executive stock options based on data of Norwegian companies listed on the Oslo Stock Exchange. Our analysis will be performed similarly like earlier studies completed by Kevin Murphy as he did on US data. In addition we will show that non-option based factors also affects the use of stock options as a compensation-tool (Oxelheim and Randoy, 2008).

In order to identify the motivational factors of using executive stock options, we will use both a quantitative and a qualitative approach. We will use the certainty equivalent framework from Hall and Murphy (2002) to address whether or not there exists a gap between the values the shareholder and the values the executive place on an option in Norwegian firms, and the implications this gap has for the use of options. We will also look at how the number of options issued by companies changed in the period from year 2000 to 2010 relative to regulations by government on executive stock option compensation. In addition we will perform interviews in order to identify which non-quantifiable factors like economic transparency affect the use of stock options.

Literature review

Our thesis will be based on previous work within the field of executive compensation. In this review we will go through history, theories and accounting legislations that have led to the share-based compensation for executives we have today, and we will start from the1990s in the US. Thereafter we will reflect upon the Scandinavian countries, and identify which factors Norway builds their executive compensation plan upon.

Stock Option Theory

An executive stock option is an option given to executives as an incentive for increasing company's market value, and unlike for regular options there exists no external capital market (Lai 2010). Through executive stock options the underwriter (shareholder) issues options to the recipient (executives), and if the stock price goes up both parties will benefit as the shareholder wants to maximize the stock price and the executive will receive greater pay (Lai 2010). Firms that use options as executive compensation typically issue them each year, with the strike price set equal to the prevailing stock price. While maturities vary across firms, these options are typically long term. Firms usually restrict when and whether these options can be exercised (Damodaran 2005). There are several types of stock options, where the incentive stock option is the one relevant to us. An incentive stock option is subject to additional rules designed to minimize taxes, e.g. they are not taxed to the shareholder when granted or exercised (under the regular tax); tax is imposed only when the stock is sold (Bickley 2012).

There are four purposes for stock options referred to as attract, retain, motivate and recognize (Glimstedt et al. 2006). The purposes are to attract the best executives, keep the best executives in the company, motivate them to work harder, and to recognize their contribution to the company. Hall and Murphy (2002) discuss similar issues where highly skilled executives receive non-tradable options to stay in the firm until the options expire.

Why stock options as executive compensation instrument?

There are several arguments that support the use of stock options as executive compensation. We will mention four in particular that plays a significant role when firm choose stock options as instrument for compensation. The arguments

are stated in the article of Drobetz et al (2007). The first argument is that stock options attract executives that are relatively less risk-averse and highly skilled, because they will see an upside in the firm. The second argument is that executives will retain in the firm, as mentioned above, when they receive non-tradable stock options. Thirdly, giving stock options to executives will make them think like owners when they become owners. The last argument takes an accounting perspective, stating from the firm perspective, that stock options will be regarded as a relatively cheap way of compensating executives.

Methods of Pricing Stock Options

To estimate the fair value of a stock option there are several conditions to account for such as market conditions, expected stock price volatility, risk free rate, expected dividend, exercise price, underlying stock price, non-vesting conditions and option lifetime[2].

The most common used model for valuing stock options is the Black-Scholes model (developed by Black, Scholes, 1973), and there is also the Binomial pricing model (developed by Cox, Ross and Rubenstein, 1979). Both models build around the same theoretical assumptions and foundations, such as price behavior and the risk-neutral valuation.

The Black-Scholes model acts under the assumption of continuous time under the normal distribution. The accurate and dynamic view of the option price in this model is due to the constant change in the option price, stock price and the delta. The binomial model differs from the Black-Scholes model in the two-step way of the underlying stock of either going up or down. The option price, stock price and the delta will only change when the binomial model turns into the next period.

In our paper we will use the Black-Scholes model to estimate the option value, and use it to estimate the value gap of options with respect to shareholders and executives.

Principal-Agent Theory

In 1976 principal-agent theory was introduced, and it is the main theory that forms the basis for implementation of incentive systems. It concerns how the principals delegate their interests to the agents, which is equivalent to the relationship

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[2] Figure 4.13, Fokus på IFRS, aksjebasert betaling, KPMG.

between shareholders and executives. In agency relationships, the principal's objective is typically to maximize the difference between the value it receives as a result of the agent's actions and any compensation it makes to the agent. The theory predicts a negative relation between risk and incentives, or alternatively, a positive relation between risk aversion and incentives (Murphy, 2012)

Problems arise when the principal and agent do not share the same goal and/or there is asymmetric information. In the absence of some mechanism to align the interests of the two parties, the executives do not care about the value generated for the shareholders (Besanko et.al. 2010). Stock options help ensure accountability of an executive's actions and provide incentives to align the interests of shareholders and executives, thereby reducing or eliminating principal-agent problems (Jensen and Meckling, 1976).

Optimal Contracting

Efficient contracting concerns how to mitigate or eliminate the conflicts of interests between the principals (shareholders) and the agents (executives). The efficient contracts will be the ones that maximize shareholder value and at the same time are paying the executives an amount of compensation that gets him to take the job. In addition, the contracts have to recognize that executives are responding to the incentives specified (Murphy, 2012).

Holmstrom (1979) describes the optimal incentive contracts in a principal– agent setting in which the principal knows exactly what actions he wants the agent to take, but the agent's action is unobservable so he will not be able to say whether or not the agent in fact took that action. Holmstrom shows that the optimal contract will include any performance measure that are useful in determining what action the agent took, and that any imperfect information about actions or states of nature can be used to improve the contracts. This is, however, not applicable in the realistic case where the shareholders do not know precisely what actions they want the executives to take, and have to trust their money to self-concerned executives specifically because they have superior skill or information in making investment decisions (Holmstrom, 1992)

Cost-Value Gap

The shareholders and executives will differ in terms of option-valuation due to their different risk-profile. Risk is defined as "the extent to which there is

uncertainty about outcomes" (Sitkin and Pablo, 1992). Shareholders tend to be well diversified and hence practically risk-neutral. Executives, on the other hand, are forced (by vesting requirements, board pressure etc.) to hold more company equity than is desirable in terms of portfolio diversification (Drobetz et.al. 2007). In addition executives are overinvested in the company because they hold too much of their physical and human capital there, hence they are more risk-averse. Since executive stock options have restrictions on trading- and hedging activities, a divergence between the cost and the value of the options arises. The opportunity cost is the amount the company would have received from selling the option to an outside investor in a tradable market. To a risk-averse, undiversified executive, this cost is significantly greater than the value of the option; hence they will value the options below their cost to the shareholders. This gap needs to be weighed against the incentive benefits in order to determine the optimal stock option compensation plan (Hall and Murphy, 2002).

CEOs pay from the 1980s until present

The US has been pioneers for CEO-pay the last century and our thesis will be based on the development in the US and the entry into Norway. Further we will elaborate important events that have led up to where we are today considering CEO pay and compensation.

Murphy states that the attempt of "explaining" the CEO pay without considering the causes and consequences of government interventions over the last century with regards to executive compensation is futility (Murphy, 2012). During the 1990s there was an explosion in the use of stock options, and Murphy (2012) describes six factors that he believes contributed to this explosion.

It started with the pressure from shareholders for equity-based pay in the 1980s. Institutions, inefficient firms and shareholders encouraged that pay should be more linked to shareholder performance. In the US in 1991, the US Security and Exchange Commission (SEC) came up with a new holding period rule. The six month holding rule was reformed into no holding period, meaning that exercising options could immediately be sold after exercised.

In 1992, SEC issued a new regulation called the SEC option disclosure rule. This disclosure rules stated that only the number of options granted, and not the value of grated options, needed to be disclosed.

In 1993 the Clinton administration decided a new bill of a $ 1 million deductibility cap. This was maybe one of the main outcomes that led to the increase in use of stock option. The purpose of this bill was not met, because the intention was to reduce the amount of executive compensation.

In 1995 the Financial Accounting Standard Board (FASB) tried to issue a new accounting rule, that granted options should be expensed at fair market value, without the any success.

During the 1990s NYSE came up with a listing requirement. Top-executives needed to get approval of their equity plans from shareholders. To avoid this regulation and bypass shareholders vote, options were given to lower level employees and executives instead.

After the scandals in firms like Enron, WorldCom, Freddie Mac, Fannie Mae, Arthur Anderson and others in the start of the 21st century, the Congress in the US passed on the Sabanes-Oxly act in 2002 (Murphy, 2012). Even though the primary target for this act was to regulate accounting firms, auditors, and board of directors of publicly tradedcompanies, the Congress also made it effective for executive pay.

In 2005 "option backdating" became a known practice to the public. The principle behind this was backdating of option agreements, as the option was granted at an earlier date than it originally was, and the option was now "in-the-money" instead of "out-of-the-money". Companies that performed backdating falsified the option agreement, and also committed accounting fraud (Murphy, 2012). But the change in 2002 of the accounting regulations stopped the illegal backdating for top-executives. By 2010 the SEC had managed the struggle against backdating.

Among these changes in the first decade of the new century, a shift in in composition of CEO pay and regulations, lead to a downturn in stock option grants as CEO compensation from 2001 to 2011, as the first decrease of this kind since 1970 (Murphy, 2012). With the decline in stock option grants in 2001, the increase in stock grants as a combination of restricted stocks and performance shares became a fact towards and during 2011. The Internet Bobble in the early 2000s and the stock market crash were reasons for the drop in option grants and rise in use of restricted stocks. Murphy (2012) also states that over the last 60 years, during every recession, the use of stock options has dropped substantially.

From June 15 in 2005 an accounting bill was finally issued for stock options, obliging companies to expense the granted stock options at fair value. During the

financial crises in 2007-2008, Leman Brothers went bankrupt as one of many huge banks. "Limiting executive pay, however, was a long-time top priority for Democrats and some Republican congressmen, who viewed the "Wall Street bonus culture" as a root cause of the financial crisis" (Murphy, 2012).

In 2010-2011 the Dodd-Franklin Act was among other things, a reform act of executive compensation. Its overall purpose was to regulate pay for all financial institutions (Murphy, 2012).

In Scandinavia and Europe stock option compensation plans became common by the end of the 1990s (Oxelheim and Randoy, 2008). In the late 1990s and beginning of 2000, the status for CEO compensation in Norway and Sweden was small compared to other countries in Europe and substantially smaller than in the US. This may be due to how egalitarian these countries are and the CEOs total compensation follow the domestic tendency rather than that of international companies (Randoy and Nielsen, 2002). It follows that the Scandinavian countries are characterized by economic transparency, high taxes, and a huge public sector. In 1999 Swedish CEOs made twelve times as much as the average employee and Norway even less than Sweden, compared to the CEOs on the S&P 500 that earned on average 475 times more than the average employee (Randoy and Nielsen, 2002).

Randoy and Nielsen (2002) argue that there are four main characteristics why CEO pay is at its low level. The first argument is that CEOs receive higher pay because their position is more demanding and not because the position is important. The second argument is the strong social democratic influence of union representation in the boards of mostly every publicly tradedcompany. The third argument says that the openness of CEO compensation to the public has forced boards to set the level of compensation at a decent level. The last argument states that the stockholders minority rights in Scandinavia have resulted in opposition of high CEO pay level.

The regulations above concern US companies, but there are also international regulations that affect the use of executive stock options for countries like Norway. Accounting legislations for share-based payment in Norway did not follow any specific accounting rules before the international standard, International Financial Reporting Standard 2 (IFRS-2), was implemented in

2005[3]. This legislation affected the use of options in Norwegian firms listed on the Oslo Stock Exchange.

With the complexity and continuous changes in the structure of executive stock options, regulations and accounting rules also change continuously. The introduction of the IFRS-2 is an example of this. The International Accounting Standards Board (IASB) released in 2005 the IFRS-2, which gave new rules and regulations to the use of executive stock options[4]. The most important change in Norway was the regulation that firms on the Oslo Stock Exchange needed to expense these executive stock options. After January 1 in 2005 the IFRS-2 and Norwegian Generally Accepted Accounting Principles (Norwegian GAAP), are more or less the same[5], and due to this our focus concerning accounting rules will be based on IFRS-2 from this date. The IFRS-2 has the objective to specify the financial reporting by a firm when it undertakes a share-based payment transaction[6].

After the financial crises in 2007-2008, EU introduced a directive for financial institutions called Capital Requirements Directive III (CRD III)[7]. The objective for this directive was to create specific policies concerning requirements for variable remuneration regarding share-based deferred payment. Development of certain performance criteria was subject to accounting rules in IFRS-2. This directive says inter alia that it should be a balanced ratio and limitation between fixed and variable remuneration in order to account for all types of risk, both current and future. Also for how long variable remuneration shall be deferred and rules regarding how fast vesting of such instruments shall be succeed. New regulations demand more advanced knowledge in order to handle these share-based payment engagements.

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[3] http://revregn.no/index.php?seks_id=26917&element=kapittel

[4] http://eifrs.ifrs.org/eifrs/bnstandards/en/2012/ifrs2.pdf

[5] Fokus på IFRS, aksjebasert betaling, KPMG.

[6] http://www.ifrs.org/IFRSs/Documents/English%20Web%20summaries/IFRS%202.pdf

[7] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:329:0003:0035:EN:PDF

Hypotheses

The fundamental research question we seek to answer is: **What motivates the use of executive stock options in Norwegian firms?** We want to test more specifically, and thus our hypothesis will appear as the following:

Cost value gap:

H_0: Value gap does not exist

H_A: Value gap exists

Accounting legislations:

H_0: Change in accounting legislations leads to no change in the use of stock options as CEO pay

H_A: Change in accounting legislations leads to change in the use of stock options as CEO pay

Transparency within the country:

H_0: High level of transparency do not change the use of stock options

H_A: High level of transparency changes the use of stock options

Our motivation for stating these hypotheses, and the framework we will use to test them, will be further discussed in the next section.

Methodology

Cost-value gap in executive stock options

Hall and Murphy (2002) identify and estimate the magnitude of the gap between the cost and value of options, and demonstrate that this gap has implications for several issues related to stock options, e.g. why executives often argue that Black-Scholes values are too high, why executives typically demand large premiums to exchange options for cash, and why companies allow executives to exercise options prior to the expiration date. The latter is generally advantageous to both the executives and the shareholders. We intend to follow the same approach in order to see if such gaps exist in Norwegian firms, and to what extent. The benefits of stock option compensation are well understood and widely accepted, so it is surprising that its costs have received much less attention (Drobetz et.al. 2007). Assessing the gap between value and cost will help explain what motivates (or prevents) the use of executive stock option compensation in Norwegian firms since in example; if the cost-value gap is large this would indicate that the purpose of options as compensation, that they should provide executives with incentives to act in a certain way, will be violated. The cost-value gap represents a cost for the company, hence the larger the gap, the higher the costs. This could be an explanation to why firms do not (or should not) use stock options to create incentives for their executives.

In order to identify and estimate the magnitude of the cost-value gap, both the cost and the value of stock options need to be estimated. In addition a measurement of the incentives created by such options will be provided. The definition of the value of executive stock options is divided into two parts; the economic cost to the firm, and the economic value to the executives. The value to risk-averse executives will be estimated using the "certainty equivalence" (CE) approach developed by Lambert et al. (1991), so that value is defined as a certainty equivalent in a utility-function framework (Hall and Murphy, 2002). By doing so, there will be evidence that e.g. Black-Scholes in general overestimates the value an executive places on an option (Hall and Murphy, 2002). Black-Scholes and other option pricing models assume that investors are risk-neutral and that all assets appreciate at the risk-free rate, however these assumptions are not describing the situation executives are facing. Since an executive is risk-averse,

not well-diversified and is facing restrictions on the use of the options, Black-Scholes and other common valuation methods are not appropriate (Hall and Murphy, 2002).

Following the CE-approach by Hall and Murphy (2002), we assume that an executive's utility over wealth is with constant relative risk aversion, and we measure the value of an option to an undiversified executive as the amount of riskless cash compensation a recipient would exchange for the option. An executive's risk adjusted compensation is the certainty equivalent that equals the expected utilities in equation (3) in Hall and Murphy (2002, p.7). In addition we assume that CAPM holds. The value of the executive stock option using this approach depends on nine parameters, where the first six are identical to the ones in Black-Scholes: exercise price, stock price, dividend yield, volatility, risk-free rate, maturity, the executives' risk aversion, his initial wealth and the fraction of his wealth that is tied to firm performance. Hall and Murphy (2002) introduce "executive value lines", which plot the certainty equivalents of options to executives as a function of the underlying stock. With this analysis, the last three of the nine parameters were identified.

The risk-free wealth of a company's executive, w, will in our case be the Norwegian CEOs non-firm related salary. In addition to this non-firm related wealth of w, we assume that the executives hold s shares of company stock and are given n options to buy n shares of stock at exercise price X in T years.

Accounting legislations

In 2002-2003 a change in accounting regulation for options in the US led to a decrease in the use of granted stock options for CEOs because the cost of granting options changed. One factor that led to this regulation was the accounting scandals, where firms like Enron and Arthur Anderson played a huge part. These changes can be viewed in figure 3.6 in Murphy (2012, pp. 82-83).

From June 15 in 2005 FASB decided that all US firms needed to expense options when granting stock options. This accounting law had been discussed for several years before it became effective as law, and then companies had time to adapt to it gradually. This is similar to the IFRS-2 regulation, as mentioned above, in which firms on the Oslo Stock Exchange are regulated under. In addition, the same

regulation under FASB in the US required that all firms needed to record expenses for options granted before 2005, which led to many companies exercising options they already possessed before this new accounting legislation became effective.

We will look at the pioneers in the US when it comes to treating options as executive compensation. We have shown that current and upcoming accounting regulations play a big role in how companies structure stock options as CEO pay, and their motivation of using such instruments. There have been done numerous studies on CEO pay in the US with regards to old and current accounting regulations. We want to look if Norwegian accounting regulation affects CEO pay in Norwegian firms. Accounting regulations will be seen as an explanatory variable to how CEO pay changes when changes in accounting regulation occur. In our thesis we will look at the last decade, from 2000 until 2010, especially how implementing IFRS-2 in 2005 changed the structure of CEO pay. We want to see if changes in accounting regulations play a significant part, if the structure of CEO pay happens approximately in the same period.

Transparency within the country

Countries operate with different levels of transparency, where Norway has a higher level of transparency than for example the US. Norwegian law requires a high degree of openness and this has forced boards to decrease the level of CEO compensations (Randøy and Nielsen, 2002). We want to look at different degrees of transparency in order to find out if this affects the use of executive stock options. To answer the hypothesis we will perform a comparison between Norway and the US.

Data

Cost-value gap in executive stock options

We will use Norwegian data from companies on the Oslo Stock Exchange, with a timeframe ranging from the year 2000 to 2005. To simplify we will only look at the CEOs of these companies. Compensation data will be collected from the companies' annual reports, while all other data will be obtained from Datastream.

Variables:

CEOs non-firm related salary: estimated based on individual compensation data collected from companies' annual reports.

Risk-free rate (rf) and market return (rm) will be based on the historical properties of the Norwegian stock market.

Firm-specific volatilities will be estimated based on firm's monthly stock return over the period from January 2000 to December 2010.

Firm-specific betas will be estimated by taking company returns and divide them by market returns. The returns will be in the same time period as for firm-specific volatilities.

All of this data will be collected from Datastream.

Accounting legislations

We will use the same timeframe from 2000 until 2005. Our objective here is to go into present and previous accounting legislations and compare it to structural changes in CEO pay in Norwegian firms listed on the Oslo Stock Exchange. Our argument for only using publicly traded firms is due to the transparency of information we can obtain. Through changes in accounting legislations as an exogenous variable we will observe how CEO pay change, in isolation from other explanatory variables.

Transparency within the country

Information regarding transparency and its effect on executive stock options in the US will be collected through previous studies. While information regarding Norway will be done in a similar way in addition to performing interviews.

Sources

Besanko, David and Dranove, Davidand and Shanley, Markand Schaefe, Scott *Economics of Strategy*. John Wiley & Sons, Inc. , 2010.

Bickley, James M. . "Employee Stock Options: Tax Treatment and Tax Issues." Congressional Research Service, 2012.

Damodaran, Aswath "Employee Stock Options (Esops) and Restricted Stock: Valuation Effects and Consequences." Stern School of Business, 2005.

Drobetz, Wolfgang, Pensa, Pascal and Schmid, Markus M.,. "Estimating the Cost of Executive Stock Options: Evidence from Switzerland." *Working paper series* (2007): 31.

Glimstedt, Henrik and Lazonick, William and Xie, Hao "The Evolution and Allocation of Employee Stock Options: Adapting Us-Style Compensation to the Swedish Business Model." *European Management Review* 3 (2006): 156-76.

Hall, Brian J. and Murphy, Kevin J. "Stock Options for Undiversified Executives." *Journal of Accounting & Economics* 33 (2002).

Holmstrom, Bengt. "Moral Hazard and Observability." *The Bell Journal of Economics,* 10 (1979): 19.

Holmstrom, Bengt and Nalebu, Barry. "To the Raider goes the Surplus? A Reexamination of the Free-Riderproblem." *Journal of Econoinics & Management Strategy* (1992): 37-62.

Jensen, Michael C. and Meckling, William H. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics* 3 (1976): 78.

Lai, Fu, Chang, Eugene "An Investigation into Optimal Stock Option Compensation." *A thesis presented in fulfillment of the requirements for the degree of Doctor Philosophy in Finance at Massey University* (2010): 157.

Murphy, Kevin J. "Executive Compensation: Where We Are, and How We Got There." *Forthcoming in Handbook of the Economics of Finance* (2012): 179.

Oxelheim, Lars and Randoy, Trond. "The Anglo-American Financial Influence on Ceo Compensation in Non-Anglo-American Firms." *Journal of International Business Studies* 36 (2005): 470-83.

———. "The Effects of Internationalization on Ceo Compensation." *Journal of International Business Studies* 36 (2005): 470-83.

———. "European Corporate Governance Guidelines and CEO Pay – the Case of Norway and Sweden." *Emerald Group Publishing* 24 (2008): 183-99.

Pablo, Sim B. Sitkin and Amy L. "Reconceptualizing the Determinants of Risk Behavior." *The Academy of Management Review* 17 (1992): 9-38.

Randoy, Trond and Nielsen, Jim. "Company Performance, Corporate Governance, and Ceo Compensation in Norway and Sweden." *Journal of Management and Governance* 6 (2002): 57-81.