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Measuring Effects from CEO Turnovers and Incentive-Based Compensation on Relative Corporate Performance

An empirical analysis examining the effects from CEO Turnovers and CEO incentive-based compensation on firm performance in the years following the financial crisis of 2007-2008

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ABSTRACT

This thesis seeks to increase our understanding of performance-enhancing decisions of company boards, with a specific focus on CEO turnovers and compensation policies following financial shocks. Using a self-made set of data including 830 CEO turnovers from 726 companies from the S&P1500, the thesis includes complete analyses of effects both related to CEO turnovers, and the effects of providing incoming CEOs with incentive-based compensation early after employment. The effects from the compensation factors are firstly measured on the full sample using different regression techniques and time aspects. The effects are thereafter analyzed on two different samples. Low ownership CEOs and high ownership CEOs respectively. This in turn to see if the two samples are motivated differently to affect firm performance, and also if the low ownership CEOs are more motivated by receiving new equity grants than receiving other incentive-based compensation components. The performance of the relevant companies is measured using both accounting- and market-based measures, in order to best explain the effects of the boards initiatives.

Based on turnovers in 2010, I find that the EBITDA margin provides inverse relationships comparing pre-turnover to post-turnover performance, improving after the employment of the new CEO. The same relationship is found looking at the EBITDA margin for turnovers in 2012. ROE creates sustainable growth in the years post-turnover for turnovers in 2011, while ROA provides general improvement for turnovers in 2009 and 2012. I find that the fraction of option grants in incoming CEO compensation packages provides significant positive relationships to industry-adjusted ROA the following year in the sample. In other words, providing incoming CEOs with relatively more option grants, early after employment, seems to increase the return on assets for the sample companies included. I also find positive significant relationships between new stock grants for the CEOs and industry-adjusted price-to-book. Focusing on the low ownership CEOs, it seems that their already existing ownership in the firm has a negative effect on ROA. New stock grants for the low ownership CEOs are however associated with positive effects on the EBITDA margin. The high ownership sample is recognized by having positive effects from bonus, option awards and existing ownership.

Key words: CEO Turnovers, CEO Compensation, Firm Performance, Corporate Governance, Corporate Finance, Financial Crisis

FOREWORD

This thesis is written as a closing part of the Master of Science degree in Economics and Business Administration at the Norwegian School of Economics (NHH). The author of the thesis has undertaken a specialization within financial economics, and has spent the recent period doing a comprehensive research examining the effects from CEO turnovers and incentive-based compensation on firm performance in the years after the outburst of the financial crisis of 07-08.

There were several factors involved in the decision of the topics that the research addresses. First of all, there has been a desire to work with issues which I have found interesting during the time of my degree. I have been lucky to study business and finance in a time-period where the global economic conditions have been greatly affected by one of the largest financial shocks of all time. Although it has been a period of devastation and big changes for a lot of companies from different industries, it has perhaps also been one of the most interesting periods to follow from an analytical perspective. Today, approximately ten years after the outburst of the crisis, I believe the timing of analyses and reviews could not have been better. A second factor for the choice of research was the desire to create a product where I could be able to use my abilities within statistics and econometrics. These are two subjects that I have highly appreciated during my educational degree, and are subjects that most likely will come to great use in later working settings as well.

I would especially like to thank my thesis advisor, Iver Bragelien, for constructive guidance and support throughout this period of researching the topic. His feedback has been truly invaluable throughout the period of developing the research. I would also like to thank Wharton Research Data Services for giving me access to the data that the thesis relies on.

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Birger Magnus Dingsør

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1 INTRODUCTION

The financial crisis of 2007-2008 has led to an increased focus on corporate governance, principal-agency and especially the compensation structure of company CEOs. Essentially, the misalignments between company stockholders and the CEOs have been stated as a main factor triggering the crisis in the first place. As a result of this, we have seen a lot of US companies experiencing CEO turnovers and changing the compensation policies with regards to their new incoming CEOs. Have CEO turnovers made any effect on firm performance? Does incentive-based compensation actually have a direct impact on the performance of the firms? Are incoming CEOs with low ownership motivated more by being provided with new equity grants, compared to other incentive-based compensation elements? These are all questions that this thesis seeks to answer.

Two instruments frequently used by boards facing misalignments between their manager and the company shareholders are the execution of CEO turnovers, and the provision of more incentive-based compensation as a fraction of the total CEO compensation package. There are however mixed opinions regarding the effects of conducting such instruments. Some examples show that companies have experienced positive effects related to the efforts, while other examples show that the efforts actually have a negative impact for the companies researched. Some even blame CEO bonuses and inflated compensation packages to be the very cause of the recent financial crisis. This thesis seeks to examine the effects of changing company CEOs and providing incentive-based compensation for the incoming CEOs in the years following the outburst of the financial crisis of 2007-2008. Using a sample of 830 turnovers from 726 companies in the period 2009-2013 the research looks at performance of companies surrounding the years of the respective CEO turnovers. The post-turnover performance of the companies is thereby tested on CEO incentive-based compensation making use of different regression methodologies. This in order to see if there are any significant relationships between the compensation factors and the company performance. The sample is then split into two separate groups. One group containing high ownership CEOs, and the other being low ownership CEOs. This is done in order to examine whether low ownership CEOs are more motivated to influence firm performance by being provided with new equity in the company.

The thesis is structured in the following manner: Section 2 represents an overview over relevant theoretical aspects, as well as past research used as inspiration for this thesis. Section 3 represents the different hypotheses tested. In Section 4, I present the data connected to all hypotheses and the construction of the final sample. Section 5 looks at the methodology applied in answering the hypotheses, before Section 6 reveals the results analyses and answers obtained from the different tests. The conclusions can be found in Section 7, and finish off the thesis, before the assessment of robustness in Section 8 and suggestions for further research in Section 9.

2 THEORETICAL ASPECTS

I have reviewed a lot of past literature regarding effects from CEO turnovers and incentive-based compensation on firm performance, before taking the decision of the research topics that this paper addresses. This chapter takes a comprehensive look at the most relevant theory and papers used as inspiration for the analyses of my thesis. I find theory of the firm, corporate governance and principal-agency as common themes among all issues that this paper address. This chapter therefore begins with a brief review of theory connected to these in Section 2.1. The chapter looks then more thoroughly at empirical articles and research that are directly related to firm performance surrounding CEO turnovers, before looking at effects of CEO incentive-based compensation on firm performance (also in relation to CEO turnovers). These will be found in Sections 2.2 and 2.3 respectively.

2.1 THEORY OF THE FIRM, CORPORATE GOVERNANCE AND PRINCIPAL-AGENCY

There are a lot of different research connected to theory of the firm, corporate governance and principal-agency. Jensen and Meckling (1976), being one of the pioneers, provide a general definition of an agency relationship as "a contract under which one or more persons (the principals(s)) engage another person (the agent) to perform some service on their behalf" (Jensen & Meckling, 1976). This involves the delegation of decision making authority to the agent. In the case were both the principal and the agent are utility maximizers, there are good reasons to infer that an agent not always will behave in the best interests of the principal. Agency theory specifically addresses two problems that might take place. The first problem occurs when (1) the goals or desires of the principal and agent are not aligned. The second

problem relates to the fact that (2) it is expensive or difficult for the principal to supervise what choices the agent is undertaking. Underlying these problems is the assumption that principals and their agent might not share the same risk appetite. According to Eisenhardt (1989), the agent and principals might prefer different actions because of their different risk preferences (Eisenhardt, 1989). These principal-agent problems create costs for the different parties involved.

Jensen & Meckling (1976) further defines companies as "legal fictions which serve as a nexus for a set of contracting relationships among individuals" (Jensen & Meckling, 1976). Their definition further elaborates the companies as "sets of contracts among factors of production". The theory points to shareholders of companies as principals and CEOs as agents. Following the definition of the organization as stated above, shareholders can be defined as one group of individuals and the manager(s) as another group of individual(s) within the firm. The relationship among them are bound between contracting relationships. Shareholders, as defined in most corporate governance literature, are recognized by having the desire to increase company value, maximizing the gains of their investments in the firm. They are also recognized as *risk neutral* (Harris & Raviv, 1979). Managers, on the other hand, might have personal agendas. In most literature, managers are regarded as *risk averse*.

Even though managers most often can be seen doing their best job possible for the company and their stockholders, there are also examples of problems related to *empire building* and *moral hazard*. Empire building refers to the concept of managers taking actions for the benefit of their own career development, rather than the better good of the company. This could for instance be the decision of creating rapid growth in the company, rather than providing increased value for their shareholders. This is often done in order for the CEO to shine personally at short term. Moral hazard, on the other hand, refers to the concept that individuals will change their activities if they are not fully exposed to their consequences (Berk & DeMarzo, 2014). An example of this could be the encouragement by banking employees to perform risky lending, when they are given the assurance of bailouts by central banks and governments. In other words, they perform riskier activities, because they do not carry the full risk themselves. Looking specifically at US companies, we can see that they are often recognized by having relatively dispersed ownerships within their firms, compared to companies from other countries (Thomas & Hill, 2012). Such a dispersed ownership is something that can further increase the probability of misalignments between the owners and

the company CEOs. The situation of companies not having one single shareholder, or a team of shareholders that have the necessary number of shares to be motivated to supervise the managers closely (i.e. blockholders), further strengthens the possibility of principal-agency issues. The issues are popularly explained in literature by *asymmetric information* between the manager and the company shareholders. Asymmetric information is related to the concept that managers have access to more information regarding the operations of a company, compared to the company shareholders. The asymmetry of information tends to be bigger the more dispersed ownership within a firm.

There are a lot of recent company scandals that have been blamed as a result of such principal-agency issues between company shareholders and CEOs within organizations (Berk & DeMarzo, 2014). One of the latest being the financial crisis of 2007-2008. Further examples are the Enron and WorldCom scandals also finding place in the 21st century. A common factor for all of these incidents are the misalignments between goals and desires of CEOs and other company stakeholders (especially the stockholders). The consequences connected to such misalignments (i.e. agency costs) between company CEOs and stockholders have essentially created an increased focus on the contract that governs the relationship between them. In many ways, research seeks to find the most efficient contract between stockholders and CEOs, that takes assumptions regarding "people (e.g., risk aversion, self-interest and bound rationality), organizations (e.g., conflict of goals among members) and information asymmetry into account" (Eisenhardt, 1989). Some research points to incentive-based compensation as a way of aligning the visions of company shareholders and CEOs, and thereby improving firm performance. In other words, binding compensation to performance, shareholders adequately provide the manager an ownership stake in the firm (Berk & DeMarzo, 2014). Such an incentive-based compensation contract is further defined as optimal contracting theory (Thomas & Hill, 2012).[1] Optimal contracting theory suggests that the CEO contracts are formed with the purpose of maximizing shareholder value net of transaction and contracting costs. Such a contract will minimize the agency costs between the shareholders and the CEOs, and other costs that may appear as a result of misalignments between the two. There are different ways that can link CEO compensation and firm performance. One way could for instance be to base bonus on

[1] According to Thomas & Hill (2012) there are two schools of theory related to US executive compensation. These are (1) Optimal Contracting Theory and (2) Managerial Power.

earnings growth of the company. Other ways are the additional inclusions of stock grants and stock options as a part of their total compensation packages. These are all incentive-based compensation elements that are common in modern American CEO compensation packages.

The popularity of using the different types of incentive-based compensation elements in the total compensation packages of CEOs have found place at different stages in history (Thomas & Hill, 2012). They have also been subject to different US regulations. The 1990s were especially recognized by an explosion in the use of stock options. The general pay-level of US CEOs rose to higher levels from the mid-1980s to the 2000s. Most of this increase was due to the increased use of stock options by firms. There are different explanations to why the use of options increased during this time period. Government policy is one of the reasons most commonly stated. The SEC especially performed three different legislations (in 1991, 1992 and 1993 respectively) that facilitated a greater use of stock options.[2] The first legislation (1991) implied that shares received by exercising options could be sold instantly after exercise. The second (1992) implied that American companies were only required to disclose the number of options granted. It was not necessary to report the whole value of the options. The third legislation (1993) related to the exemption of options from the $1 million limit of deductibility. The approval by FASB in 1995 to grant options without reporting it as an accounting expense further facilitated an explosion in the use of stock options.[3]

Options are however not the only incentive-based compensation element that has made an entrance to the total compensation packages of company CEOs (Thomas & Hill, 2012). The use of bonus was also something that increased in the time-period of 1980s and 1990s. Later years have however been recognized by the shift from stock options and bonus over to restricted stock as the leading component of incentive-based compensation for company CEOs. According to Thomas & Hill (2012), the value of stock options at award date represented approximately 53 percent of pay of a typical CEO from S&P500 companies in 2001. Restricted stock represented only 8 percent at that time. By 2010, as Thomas & Hill (2012) report, the restricted stocks accounted for 34 percent, while options had fallen to only represent 20 percent of the total compensation package. In other words, restricted stock increased by 26 percentage points, while stock options experienced a decrease of 33

[2] SEC refers to the Securities and Exchange Commission of the United States. SEC is an independent agency that have the responsibility to administer the federal securities law.
[3] FASB refers to the Financial Accounting Standards Board, which is responsible for the standards of financial accounting and reporting standards in the United States.

percentage points during these nine years. These changes have also been connected to changes in US legislation and government policy. Other explanations for the shift in the compensation structure in the early 21st century refers to the stock market crash connected to the internet bubble in 2000, and the 9/11 terrorist-attack of 2001 (also affecting the stock market). Thomas & Hill (2012) reports that the use of stock options tends to decline when markets trend downwards (i.e. bear markets).

In addition to adjusting the compensation structure of a CEO, CEO turnovers work as more direct instruments in order to align shareholder and manager interests, as well as improving company performance. In cases were turnovers prove to be forced, it might be because of a loose of faith from the shareholders and boards of a company with regards to their manager. Performing a turnover might result in finding a candidate that turns out to be a better fit. A turnover, however, does not necessarily have to be caused of forced reasons from a company's part. Vancil (1987) argues that 60 percent of CEOs decide to retire at the contractual time, and that 80-90 percent leave or retire under expected conditions (Vancil, 1987). A voluntary turnover might also provide effect on company performance that was not initially expected. Research connected to both CEO turnovers and CEO compensation, and their influence on firm performance, will be discussed in the following two chapters.

2.2 Research Related to CEO Turnovers and Their Effects on Firm Performance

The departure of a CEO is something that can be voluntarily, either because of CEO retirements or CEOs simply changing jobs. However, some cases show that CEOs are forced out due to different reasons. An incoming CEO can be internally hired, or externally hired. Some turnovers are performed as a result of poor performance for the industry as a whole, while others are performed because of internal conflicts within a company. Some are caused by company mergers. As we can see, there are a lot of different ways to analyze CEO turnovers and their effects on company performance. This chapter takes a comprehensive look at the main research used as inspiration and guidance for the first issue that the thesis addresses.

In their paper from 1995, Denis & Denis have documented that forced departures of outgoing CEOs are preceded by large and significant drop in operating performance, however followed by large increases in performance (Denis & Denis, 1995). They argue that voluntary CEO

turnovers are followed by small increases in operating income, as well as downsizing in the operations of the firms. The main argument is that if the internal control mechanisms of the companies are effective, there should be (i) a greater frequency of top management turnovers in poorly performing firms and (ii) improvements in firm performance following management changes. This falls in line with other research papers addressing the same topic. Coughlan & Schmidt (1985) and Warner et al. (1988) both find that the rate at which the top executives change is inversely correlated to prior stock price performance. Coughlan & Schmidt (1985) specifically looks at the hypothesis that both compensation changes and changes in management are ways to control top executives, and that the appliance of these control mechanisms is motivated by fluctuations in the firm's stock performance. Using a set of data from 1977-1980 they document that the boards of the firms in general creates managerial incentives which is in line with those of the owners of the firm, both with regards to the setting of compensation and decisions related to the position of the CEO. Warner et al. (1988) provide more accurately evidence on the inverse relationship between a firm's stock price performance and CEO turnover. Using a probit model they seek to see if monitoring of the board of directors, mutual monitoring among managers and monitoring by blockholders can create a negative relationship between top management change and share performance.

Jenter & Kanaan (2015) takes a thorough look at CEO turnovers and the fact that CEOs are fired after bad firm performance caused by factors that are beyond their control (Jenter & Kanaan, 2015). The study looks at 3365 CEO turnovers in the period from 1993 to 2009, and discover that the CEOs are more likely to be fired from their jobs in the period after bad peer performance, to a greater degree than after bad market performance. They argue that this can be explained in three parts: First, the managers might be optimally rewarded or punished for peer group results if the manager's choices affect the peer performance itself. Second, CEOs might be dismissed as a result of bad peer performance if the board receives more information about their CEOs in such times. Thirdly, the frequency of turnovers might be caused by bad firm performance if the board not behaves optimally and misattribute performance components from industry to the CEO. Huson et al. (2004) further complements the other research papers by finding deteriorating firm performance prior to turnover and increasing performance post-turnover. Their research uses the accounting-based measures of operating income to book assets (OROA) and operating income to sales (OROS) as performance margins of interest, both unadjusted and industry-adjusted. The data span a longer time period than that of Denis & Denis (1995), as their observations span the years

1971 to 1994.

2.3 Research Related to CEO Incentive-Based Compensation and Their Effects on Firm Performance

"A way to make managers act in the interests of the owners of the company, is to actually make the managers owners of the company. This can be done through the compensation policy of the firm" (Berk & DeMarzo, 2014). More specifically, tying compensation to firm performance, the shareholders adequately give the manager an ownership stake in the company. This chapter looks more closely at research connecting CEO compensation to company performance.

In his article on corporate performance and managerial remuneration, Murphy (1985) tries to examine the relationships between firm performance and managerial pay. The research makes us of a sample of five hundred executives from 73 of the largest US manufacturing firms in the time-span 1964-1981. Contradictory to other research, Murphy (1985) omits the executives' large quantities of stock and stock options. He rather focuses on the cash remuneration that the executives receive in the simultaneous year as the company performance. Using stockholders return as performance measure he finds evidence on pronounced positive effect of performance on compensation. He finds specifically that Salary, Bonus, Salary + Bonus and deferred compensation all provide positive significant relationships to firm performance.

Jensen & Murphy (1990) argues that equity-based compensation instead of cash compensation should provide managers with a better incentive to maximize firm value. Their discussion is based on the fact that the compensation policy of the firm can create value-increasing incentives for the CEOs. More specifically, they look at performance effects of bonuses, salary revisions, stock options and other performance-based compensation factors such as stock ownership. Their paper, based on performance pay and top-management incentives for 2000 CEOs, finds that the largest CEO performance incentives comes from their already existing ownership of the firm's stock. They further find that even though bonuses account for approximately 50 percent of CEO salary in their sample, they are awarded in ways that do not make a significant effect on firm performance. Mehran (1995) argues too that incentive-based compensation elements should have a greater impact on company performance (Mehran, 1995). Using a set of data covering 153 manufacturing firms

experiencing turnovers from 1979-1980, he tests if the structure of the compensation (rather than the level) can provide better results for the relevant companies of research. His research differs from that of Jensen & Murphy (1990) in the way that he looks at compensation in the context of the ownership structure of the firm, and the composition of its board of directors. He further includes both small and large firms in the sample tested. The relevant findings of Mehran (1995) is that the percentage of executive compensation that is equity-based is inversely connected to their percentage of equity holdings. He further finds that firm performance has a positive relation to the percentage of CEO compensation that is equity-based, and that firm performance is positively related to the percentage of equity held by managers, which confirms the stated suggestions of principal-agent theory.

Blackwell et. al. (2007) builds on some of the ideas of Mehran (1995) and Jensen & Murphy (1990). Blackwell et. al. focus on changes in CEO compensation structure and the impact on future firm performance following CEO turnovers (Blackwell, et al., 2007). Their research, using a sample of 100-121 turnovers from 1981-1992, reveals that incoming CEOs receive significantly greater percentage of their compensation from option grants and new stock grants than outgoing CEOs. They further find that post-turnover positive performance can be related to new stock grants as a percentage of total compensation both in cases of forced and voluntary turnovers (when analyzed separately). They argue that new stock grants have a greater effect on the incoming CEO relative to the outgoing. A possible drawback of this research is however the fact that incoming and outgoing CEOs are in different stages of their employment in the comparison being made. This will make the comparison of equity compensation somewhat skewed, as one often sees that CEO´s receive more equity based compensation early in the period of employment.

2.4 KEY TAKEAWAYS

All the above-mentioned papers have affected the choice of research that my thesis relies on. From reading the articles in Sections 2.2 and 2.3, I was inspired to look more thoroughly at firm performance surrounding CEO turnovers, as well as incentive-based compensation effects. Especially, Denis & Denis (1995) motivated me to look at changes in performance for companies changing their CEO. Huson et al. (2004) influenced me into looking at different performance measures, not only looking at stock returns. Jensen & Murphy (1990), Mehran (1995) and Blackwell et al. (2007) have been especially inspiring with regards to incentive-based compensation effects, and empirical methodology utilized. All research

papers have in the end provided the motivation to dig deeper into theory of corporate governance and principal-agency first presented in the chapter. Below follows an overview of the most important research papers review, providing information on the performance measures, sample sizes and some of the sources they have used.

TABLE 1: OVERVIEW OF RESEARCH REVIEWED

Author(s)	Performance Measures	Industry Adjusted	N (Turnovers)	Period	Sources of Data
CEO Turnovers and their Effect on Company Performance					
Denis & Denis (1995)	Stock Returns, OROA	Yes	908	1985-1988	Wall Street Journal, Standard and Poor's
Coughlan & Schmidt (1985)	Stock Returns	-	140	1977-1980	Forbes, CRSP
Warner, Watts and Wruck (1988)	Stock Returns	Yes	567	1963-1978	Wall Street Journal, Standard and Poor's
Weisbach (1988)	Stock Returns, EBIT	Yes	286	1974-1983	Forbes, NYSE, CRSP
Jenter & Kanaan (2015)	Stock Returns	Yes	3365	1993-2009	WRDS, Compustat, Execucomp
Huson et al. (2004)	OROA, OROS	Yes	1344	1971-1994	Forbes, Moody's, Proxy Statements
CEO Incentive-Based Compensation and their Effects on Company Performance					
Murphy (1985)	Stock Returns	Yes	-	1964-1981	Proxy Statements, CRSP
Jensen & Murphy (1990)	Shareholder Wealth	-	-	1974-1986	Forbes, Compustat, CRSP
Mehran (1995)	Tobins Q, ROA	Yes	153	1979-1980	Compustat, Proxy Statements, Moody's A
Blackwell et al. (2007)	Tobins Q, ROA, OIBDA	Yes	125	1982-1991	Forbes, Compustat, Wall Street Journal

Table 1 provides an overview over the most relevant research articles reviewed as inspiration for my thesis. The overview provides information on the different performance measures that they have used, as well as number of turnovers (if relevant) and sample time-period. I provide additionally some of the sources that they have used. As seen from the overview, the oldest data sample used was 1963-1978 by Warner, Watts and Wruck (1988). The most recent is Jenter and Kanaan (2015) using a sample from 1993-2009. The articles of Blackwell (2007) and Mehran (1995) were especially important for the choices of data sources and methodology that I use. Data related to this figure have been found by reading the articles. I have made the figure using Microsoft Excel.

3 HYPOTHESES

In this section I develop my hypotheses tested in the thesis, as mentioned in Chapter 1. From the research reviewed in the prior section, we have seen that CEO turnovers are often recognized by having inverse company results, when comparing pre- and post-turnover. Inverse in the meaning that the performance usually deteriorates to some extent before turnover, before they increase in the aftermath of the turnover. Since the period of research for my data looks at the years directly following the outburst of the financial crisis of 2007-2008, the results might differ from the ones seen in the prior research. The downturn of the American economy post-crisis has been partly softened as a result of fiscal stimulus (Davidson, 2013). It is however also recognized by continuing high debt-levels and slow recovery. An article from USA Today from 2013 confirms this when saying: "the aftershocks of the historic upheaval are still being felt in nearly every corner of the economy" and "it is the slowest growth in the economy since World War 2" (Davidson, 2013). It might be that the effects of changing CEO during the years of 2009-2013 not actually leads to sustainable improvements for the sample companies, post-turnover. The first hypothesis of the thesis is therefore stated as follows:

HYPOTHESIS 1: FIRM PERFORMANCE FOLLOWING CEO TURNOVERS IN THE PERIOD 2009-2013 DOES NOT PROVIDE SUSTAINABLE IMPROVEMENTS FOR THE SAMPLE COMPANIES

We learned in the *theoretical aspects* part of the thesis that a solution to principal-agent conflicts between a manager and company shareholders is to apply incentive-based compensation in the total compensation packages of the company CEOs. This in order to align the visions and goals of the shareholders and the managers of the firms. Popular incentive-based compensation factors used by modern companies are bonus, new equities and stock options among others. The use of incentive-based compensation is specifically something that emerged during 80's the 90's, as a result of legislation moving towards self-regulation, as we saw in the *theoretical aspects* part (Thomas & Hill, 2012). The 1990's was recognized by an explosion of stock options, while the early 2000's have been recognized by an increased use of restricted stock. Jensen & Murphy (1990), Blackwell et al. (2007) and Mehran (2005) all conducted empirical analyses studying the effects of different incentive-based compensation on firm performance, and found significant coefficients for the relevant

explanatory variables tested. I believe that these relationships should also hold in the years following the outburst of the financial crisis. Such a time period should lead to companies striving to align the visions of their shareholders and their manager to an even greater extent. The second hypotheses therefore states:

Hypothesis 2: Incentive-Based Compensation in Incoming CEO Compensation-Package Provide Significant Effects on Post Turnover Performance

One of the sub-hypotheses included in the research of Mehran (2005), was that boards effectively provide low ownership CEOs with more new equity grants early after employment, relative to the already high ownership CEOs of the sample firms. The last hypothesis of my thesis is also based on a splitting of the sample CEOs. One group of high ownership incoming CEOs and one group of low ownership incoming CEOs, following Mehran (2005). I specifically want to test if incoming CEOs that own less than 5% of the company shares, are more motivated to affect firm performance by being provided with more new equity. In other words, to see if correlation between performance and additional equity appears to provide robust significance. I will also see if the high ownership CEOs are more motivated to affect firm performance by other incentive-based compensation factors. A comparison to high ownership CEOs will therefore be conducted continuously. The third hypothesis states:

Hypothesis 3: Low Ownership Incoming CEOs Are More Motivated By Being Granted New Equity, Compared to other Incentive-Based Compensation Factors

All hypotheses are presented in their own respective parts under the *methodology* and *results* parts of the paper. The statistical soundness of the results connected to the empirical analyses of the second hypothesis has been tested in order to give the best possible conclusions to the hypothesis, and follows in the last chapter of the thesis, as well as in the *appendix*.

4 DATA

This section provides an overview of the data connected to the different analyses performed. Section 4.1 illustrates the sources of the data collected and the construction of the final dataset. Section 4.2 provides an overview over the choices of market and event window used. Section 4.3 describes the sample selection criteria of the sample turnovers, while Section 4.4 takes a closer look at company performance measures, which are used in answering all three hypotheses stated. Section 4.5 looks deeper at compensation and firm level data mostly relevant for the second and third hypotheses of the thesis. The different characteristics provided are based on the choices of independent- and control variables for the regressions analyses under the Methodology Part (Chapter 5) of the thesis. In the end Section 5 of this chapter contains a brief discussion regarding soundness of the data.

4.1 SOURCES OF DATA AND CONSTRUCTION OF THE FINAL SAMPLE

This thesis looks at a sample of 830 CEO turnovers originating from 726 companies from the S&P1500 in the timespan between 2009-2013. The S&P1500 is a stock market index produced by Standard & Poor's, including approximately 90% of the market capitalization of US stocks (S&P Dow Jones Indices, 2017). I have collected all data personally in order to construct the final dynamic dataset that is compatible for use in Stata. Stata is the program that I have used to produce the statistical regressions and summary statistics of the thesis. I have downloaded as good as all data from Wharton Research Data Services (hereafter WRDS). WRDS is an award-winning platform covering a great amount of data on companies, including financial-, compensation- and employment details (WRDS, 2017). The data which covers firm characteristics, CEO characteristics and CEO compensation have all been collected from the Compustat Executive Compensation of WRDS. The Compustat Executive Compensation platform was the one that initially helped me find the turnovers by collecting data on the incoming CEOs such as *Date Became CEO* within the timeframe 2009-2013. The first download contained CEO characteristics such as *Date Became CEO, Date Joined Company, Date Left as CEO, Date Left Company, Current Age, CEO Name* etc. This information became the foundation for my dataset, which I constructed in the first weeks of the research. The foundation, which included the incoming CEOs and their companies, facilitated the implementation of the rest of the belonging data downloaded. My sample is

based on years relative to the start year of the incoming CEOs (T0). This means, in turn, that the actual years differ dependent on the start year (within the timeframe 2009-2013) of the incoming CEO for the companies. Each observation of CEO turnover has initially been provided with eleven years of observations (five years prior- and post-turnover including transition year) in the original dataset. A CEO which was employed in 2011 would therefore have the framework of observations from year 2006 to 2016. After finding the CEOs and the relevant companies that were involved in turnovers from WRDS, I had to individually look up the Global Company Keys (hereafter GVKEYs) for each and every company on the Company Lookup Platform of WRDS. The GVKEYs are six digits codes that WRDS uses to recognize the firms, in order to provide data for the user. The system does not recognize the firms if the GVKEY contains the slightest deviation from its correct value. In other words, this required structured and thorough work (especially since the total sample consists of 726 firm observations). Financial numbers from company statements and balance sheets were then individually downloaded using Compustat Financials of WRDS. These have been used to calculate most of the performance margins for all analyses, as well as providing information of the control variables for the regression analyses. These were implemented into the dataset using Excel techniques, matching GVKEYs and respective years of the observations. It is important to notice that the availability of the different data collected from WRDS differ. This means that some years connected to the CEOs and companies have missing data with regards to compensation and firm financials respectively. Stata effectively screens out observations that does not contain the number of data necessary to perform the tests. This facilitates fewer observations in the regression models, then the number of turnovers initially structured in the dataset.

Two of the performance margins (Total Q and price-to-book presented in Section 4.4) and the relevant industry margins are obtained from the Financial Ratios Suite by WRDS. These are pre-calculated ratios delivered on a monthly basis. I have calculated these to provide yearly numbers respectively, after the collection. This in order to match the rest of the dataset. I have also received a pre-made overview of data from Dirk Jenter (associate professor of finance at London School of Economics), covering forced and unforced turnovers for the relevant time-period of research. This overview has been made following Parrino (1997),

using press reports and age criteria.[4] Dirk Jenter was contacted by E-mail and he sent an updated Excel sheet in return, indicating the turnovers that were forced. The overview builds on the one used in his research together with Fabi Kanaan (*CEO Turnover and Relative Performance Evaluation*). The Excel sheet contained a column indicating 1 if a turnover was forced and 0 if the turnover was voluntary. I received the E-mail containing the forced turnovers on September 25, 2017. The relevant companies covering the forced turnovers were provided with GVKEYs such that I was able to match the turnovers with the ones that I had retrieved from WRDS. I have additionally done a robustness-check by looking them up on the internet. The sample containing 830 CEO turnovers from 726 companies indicates an annual CEO turnover rate of 22.87%, which is slightly higher than those of Denis & Denis (1995) and Weisbach (1988).[5] This can come as a cause of choosing the time period directly following the financial crisis. The sample numbers also indicate that there are 52 companies experiencing two turnovers.

4.2 Choice of Market and Event Window

The choice to use turnovers and companies from America has mostly been made for statistical reasons. My impression is that data available on CEO and company information are a lot bigger in size, and more accessible for the American market, than other similar markets. I wanted to have access to as many observations, and as accurate information as possible, in order to get the most robust results from the research as possible. The American market was also the one first affected by the outburst of the financial crisis. I find additionally the American companies more appealing with regards to compensation structures and ownership policies, than other markets. According to Thomas and Hill (2012) American companies use more incentives such as equities and options compared to companies from other countries (Thomas & Hill, 2012). The choice to use the timeframe between 2009-2013 has been made as I have yet to find any other similar research from the same period. These are also the most recent years following the outburst of the financial crisis. Performance ratios were only provided up until 2015, and this is the reason why I choose to stop at 2013 for the turnovers. A lot of research examines time periods in which there have not been any great business

[4] The press reports indicating departures as fired or forced out due to differences in opinions or pressure are defined as forced (Jenter & Kanaan, 2015). CEOs with age equal to or above 60 are classified as voluntary. All others below 60 have been classified based on reasons of health conditions or the acceptance of other positions. Their paper can be found in the bibliography under: "CEO Turnover and Relative Performance Evaluation".

[5] This measure is calculated by dividing the total number of management changes on the total number of firm years (726 firms times 5 years), following Denis & Denis (1995). Denis & Denis (1995) and Weisbach (1988) obtain CEO turnover rates of 9.3% and 7.8% respectively.

shocks. Using data following the financial crisis may capture other effects, then those previously observed. The raw hand-constructed set of data covers five years before the turnover to five years after the turnover, including the transition year (a total of eleven years per observation) as previously mentioned. After narrowing down the issues of research in the paper, hypothesis one looks at the timeframe of one year prior to turnover (T0-1), the transition-year (T0) and three years after (T0+1), (T0+2) and (T0+3) respectively. This to best capture the changes in performance surrounding the CEO turnovers, and capturing the effects of implementing the new CEO with different compensation elements. The second and third hypotheses are analyzed using industry-adjusted performance measures from year two (T0+2) and three (T0+3) post-turnover and explanatory variables (compensation-, firm level- and turnover data) from year one (T0+1) and two (T0+2) post-turnover respectively. Hence, the relevant number of years per observations in the final sample make up a total of five years. The timelines connected to answering the different hypotheses can be found in methodology Sections 5.1, 5.2 and 5.3 respectively.

4.3 Sample Selection Criteria and Statistics for Sample Turnovers

Ending up with the final sample of 830 turnovers from 726 companies has required a lot of considerations, and a set of exclusions from the sample of data initially constructed. From the total sample of turnovers initially downloaded, I have excluded approximately 50 turnovers as a result of CEOs being employed for less than one year. These are so called interim CEOs that are presupposed to have had too short amount of time in the office in order to make a real impact on the company results. Such CEOs are often temporarily hired in the position, while waiting for a new employment of a CEO.

The final sample of data consists of 773 males and 57 females as newly hired CEOs. These have been classified as dummies with 1 being male and 0 being female respectively. The appointments have been defined as forced or unforced following Parrino (1997) as previously mentioned. This is the most common used procedure of classifying turnovers as forced, and makes use of press reports in addition to age criterions in its classification. Forced turnovers have been given value 1, while voluntary turnovers have been provided with a 0. The incoming CEOs are further classified as either internally or externally hired. From WRDS, I have been able to obtain data on the time period from when the CEOs joined the company (*Date Joined Company*), and when the CEOs actually became CEO (*Date Became CEO*). CEOs that joined the company over a year before their appointment as CEO have thereafter

been classified as internally hired. All else have been classified as externally hired. External hires have been classified with 1, while internal hires have been classified with 0 in the dataset.

The retentions of the CEOs have been provided with notation 1 if the CEO has remained in the company after his or her duty as CEO. Any position other than the position as CEO as last position held in company (*Most Recent Title*), has been characterized with this notation. The cases where I have been provided with the information that the CEO has left the position as CEO, and CEO was his or her last position in the company, have been classified with a 0. Information on *Date Became CEO* and *Date Left as CEO* has given me the opportunity to calculate CEO tenure at the company. In the cases where the CEO is still sitting as CEO, Date Became CEO has been subtracted from 2017 using the *Yearfrac* command in Excel.

Table 2 on the next page provide us with an overview over the descriptive statistics from the final sample. From this we learn that the number of voluntary turnovers largely outplay the forced ones. A mean value of the departure-dummy of 0.05 provide us with that conclusion. This is slightly lower than those of Denis & Denis (1995), who obtained 7% forced turnovers in their sample. We see that incoming CEOs have an average age of 51 when taking on the position, with a minimum age of 30 and highest age of 88.[6] The average CEO has one year in the company before becoming CEO. The highest observation in this regard is 56 years in the company before becoming CEO. Average tenure is five years in the seat. We can see that the CEOs have an average ownership in their firm of 1%, and that most of the hired CEOs are externally hired. The high amount of external hires contradicts those of Denis & Denis (1995) who reports that 65 percent were internal hires in their paper. A total of 31% of the CEOs remains as chairman after their duty as CEO in the company as seen in Table 2.

[6] Timothy S. Ho serves as the youngest employed CEO, when he became CEO of Enova International Inc. in 2011 at an age of 30. David H. Murdock of Dole Food Co Inc. represents the oldest when taking the position as CEO in 2013.

TABLE 2: OVERVIEW OF TURNOVER CHARACTERISTICS

Characteristics	Mean	Median	Std. Dev.	Minimum	Maximum	Observations
Turnover Characteristics						
Forced (Forced=1, Voluntary=0)	0.05	0	0.22	0	1	830
Incoming CEO Characteristicts						
CEO Age at Turnover	51	51	6.62	30	88	830
Years at Company Before CEO Position	1	0	5.24	0	56	830
Tenure as CEO	5	5	1.72	2	7	830
Outsider (External = 1, Internal = 0)	0.89	1	0.32	0	1	830
CEO Retention (Chairman=1, Out=0)	0.31	0	0.46	0	1	830
Share Ownership	1.00%	0.20%	4.06%	0%	33%	399
Gender (Male = 1, Female = 0)	0.94	1	0.24	0	1	830

Descriptive statistics of sample turnovers from 2009-2013 and the complementary CEO characteristics for the successor CEO. Forced turnovers follow Parrino (1997). CEO age at turnover is calculated by subtracting (2017-Start Year of CEO) from Present Age. Years at company before CEO position is calculated by subtracting Date Became CEO from Date Joined Company. Tenure as CEO is further calculated by subtracting Date Left as CEO from Date Became CEO. In the cases where Date Left as CEO is absent, 2017 is used instead. Internal CEOs are calculated by observing Date Joined Company and Date became CEO. Outsiders are defined as those who have not had a position in company prior to taking the seat as CEO. CEO retention is defined as 1 if the CEOs have position as Chairman after their position as CEO. All data have been downloaded from WRDS. I have calculated the Statistics by codes in Stata. The table is made by using Microsoft Excel.

4.4 Company Performance Ratios

The company performance ratios are used in answering all three hypotheses, and are therefore critical for the results of the research. The different performance ratios provided in the sample have been chosen with the purpose of covering the most important profitability measures for the relevant stakeholders of the sample companies. This has entitled the use of both accounting- and market aspects of the company performance. There is a continuing debate in literature regarding which proxies of firm performance that are the correct ones to use (Mehran, 1995). Some research argues that stock returns are the best way to measure firm performance. However, it has been proved that this mostly accounts for all-equity firms. An argument for using accounting-based returns is their high importance in the determination of executive compensation (Murphy & Jensen, 1990). Mehran (1995) and Hermalin and Weisbach (1998) argue additionally in their research that accounting-based and market-based performance measures are better than stock returns, with regards to capturing effects of CEO turnovers. It is argued that especially accounting-based returns give boards information regarding the value added to the firm by the new CEO. This thesis looks specifically at

companies with a wide range of different debt-to-equity levels, and falls otherwise also in line with the samples of Mehran (1995) and Hermalin and Weisbach (1998). Accounting-based and market-based measures are in other words chosen. A description of the performance measures and their calculations is provided in the subsection below.

4.4.1 Accounting-Based Performance Ratios

- Return on Equity

The return on equity **(ROE)** measures the respective company earnings over their total equity (Berk & DeMarzo, 2014). This profitability measure provides the reader with information on how much earnings a company generates with the money that the respective shareholders have invested in the firm. The higher the ROE, the higher the earnings growth generated from investments. The performance measure used in this thesis has been calculated for all sample firms by dividing the company earnings on their total equity in Excel. The earnings and total equity data were downloaded from WRDS. The formula can be presented in the following way:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Total Equity}}$$

ROE can further be decomposed into what is called the DuPont formula, which can be illustrated as the following:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Shareholders Equity}}$$

The DuPont formula divides the performance measure into three parts, and helps explain the changes in ROE over time (Berk & DeMarzo, 2014). The three different parts include net profit margin, asset turnover and the financial leverage respectively. In this way, we can see that an increase or decrease in ROE can be caused by different characteristics of the firms' financials.

- Return on Assets

The EBIT return on assets **(ROA)** has additionally been chosen in order to look at the company operating profitability relative to its total assets (Berk & DeMarzo, 2014). EBIT is short for earnings before interest and taxes. The measurement provides the viewer with information of how efficient management is at using its assets to generate earnings before

obligations such as interest and taxes are paid by the companies. It is therefore a good measure for organizations to use when wanting to compare the relationship between its resources and income. A higher ROA indicates higher EBIT returns to total assets. The ratio has been calculated in the dataset by dividing company EBIT on their total assets. Both measures are downloaded from WRDS. The formula can be presented in the following way:

$$\text{ROA}=\frac{\text{EBIT}}{\text{Total Assets}}$$

where EBIT = Net income + Interest Expense + Taxes.

- EBITDA MARGIN

The **EBTIDA margin** has been included in order to get a measure of the company operating profitability as a percentage of its total revenue (Berk & DeMarzo, 2014). This measure provides the reader with information on how much operating-cash that is generated for every dollar of revenue earned in the company. This was calculated in Excel by dividing the EBITDA for the sample companies on their respective revenues (for all years). Using measures prior to the deduction of tax, depreciation and amortization is an advantage as these are factors that do not belong to the company's core business making process. These factors may be biased because of employee considerations. Accounting-based measures will always have the possibility of being manipulated, for example by accruals (Denis & Denis, 1995). A departing CEO might for instance be motivated to increase the reported earnings in order to try and save their job. An incoming CEO might have incentives to reduce the reported earnings ("big bath") shortly after their employment in order to blame their predecessors and claim credit for the following success.[7] In addition to avoiding the above-mentioned issues, the use of EBITDA returns facilitates a solid comparison of different companies of different sizes, with different debt-to-equity structures and origination from different industries. The formula for the EBITDA margin can be illustrated as follows:

$$\text{EBITDA Margin} = \frac{\text{EBITDA}}{\text{Total Revenue}}$$

[7] Using net income instead of EBITDA might cause troubles related to "big bath". A lot of "baths" implicate accounting-based write offs that affect net income, but not operating income.

4.4.2 Market-Based Performance Ratios

Total Q (Tobin's Q) and **Price-to-Book** (P/B) have been included in order to get market-based measures of the company's performance following Mehran (1995) and Blackwell et al. (2007) and others.

- Q-Ratio

The Total Q ratio is the WRDS version of Tobin's Q, that includes intangible capital in the denominator (Peters & Taylor, 2016). Corporate finance literature has over the years been recognized by often using Tobin's Q as a proxy for a firm's investment opportunities. Tobin's Q is defined as initially by James Tobin of Yale University (Tobin & Brainard, 1977). He predicted that the market value of the total capital of all companies on the stock market should be similar to their respective replacement cost. The following frameworks were therefore set forward:

$$\text{Q Ratio} = \frac{\text{Total Market Value of Firm}}{\text{Total Asset Value of firm}}$$

Or similarly,

$$\text{Q Ratio} = \frac{\text{Market Value of Installed Capital}}{\text{Replacement Cost of Capital}}$$

The idea is that if the market-value completely represents the recorded value of the assets of the company, the Tobins Q should be equal to one. If the Tobins Q turns out to be higher than one, the market value surpasses the actual value of the company's assets. This means that the market captures some unmeasured or unrecorded assets of the firm. In many cases, this could encourage firms to invest more in capital, as they are worth more than the price paid for them. The company in the case of a Tobin's Q above one is characterized as overvalued by the market. Similarly, a Tobin's Q ratio between zero and one suggests that the market values the firm assets as less than their recorded value. In this case, the companies are characterized as undervalued. Tobin's Q focus to some extent on the firm's physical assets, as opposed to intangible assets. Peters & Taylor (2016) suggests that intangible assets should be included in the ratio initially set forward by Tobin. This in order to create an even better proxy for investment opportunities of the companies. The Total Q ratio represents otherwise the same characteristics as the Tobins Q ratio.

- PRICE-TO-BOOK RATIO

The price-to-book ratio is the second market-based performance measure included in the analyses. The ratio is used to compare a stocks market value to its book value, and can be illustrated as follows:

$$\frac{\text{Price}}{\text{Book}} = \frac{\text{Market Price Per Share}}{\text{Book Value Per Share}}$$

A low P/B ratio will similarly to a low Total Q ratio mean that the company is undervalued by the market, while a high value reflects that the equity is overvalued by the market (Berk & DeMarzo, 2014). The reason that the market value of equity might be higher or lower than the book value, comes from the fact that the market value is a forward-looking measure, driven by market consensus and future cash flows of the company. The book value of equity is accounting-based, and follows specific accounting rules (i.e. historic cost). The measure reflects earlier issuance of equity affected by profit or losses, dividends and share buybacks. The price-to-book ratio has been frequently used by investors in order to look at a company's growth opportunities. A general rule is that investors should be cautious in the case of large divergence between a company's ROE and price-to-nook (Berk & DeMarzo, 2014). Overvalued growth stocks are often characterized by low ROE and high price-to-book ratios simultaneously. A growing ROE for a company should be followed by a growing P/B ratio. It is important to reflect upon the fact that the price-to-book ratio is mostly useful when looking at capital-intensive companies, or financial businesses with plenty of assets on the books. Because of conservative accounting rules, the book value of the ratio usually ignores intangible assets like brand name, patents and goodwill set in place by the company. In this way, the book value doesn't provide as much information about the companies that are highly focused on intangible assets, such as for example Microsoft.

Most of the ratios mentioned above have been calculated from raw financial data downloaded from WRDS. Total Q and price-to-book ratios were downloaded as pre-made ratios on a monthly basis. The database did not have any data on ratios after 2015, and that is the reason to why later years have not been retrieved. The respective Fama 48 industry medians for the same time period have also been downloaded. The industry medians have been matched with their relevant years and company industries in order to adjust the performance measures. This is done in order to look at the company's performance above or below the industry. Such a

comparison is often used in relative performance evaluation in order to evaluate compensation contracts or threats of turnover. The developments of the different industry-adjusted performance measures for the sample companies can be found in Section 6.1.

4.5 Compensation and Firm Level Data

4.5.1 Distribution of Compensation for the Incoming CEOs

I have included the following compensation factors in order to best answer the second and third hypotheses of the paper: *salary, bonus, new stock grants, option grants, non-equity incentive plan compensation and all other compensation*. These were all collected from WRDS Execucomp database as previously mentioned in Section 4.1. WRDS defines *salary* as the dollar value of the base salary of the (cash and non-cash) which is earned by the CEO during the fiscal year (WRDS, 2017). The values are measured in thousands of dollars, when initially collecting them from WRDS. *Bonus* refers to the dollar value of bonus (cash and non-cash) that is earned by the CEO during the fiscal year. The units are provided in thousands of dollars similarly to *salary* when downloading from the database. *Equity grants* are defined as stock related awards (e.g. restricted stock, restricted stock units, phantom stock, phantom stock units, common stock equivalent units etc.) that does not have option-like features. The valuation that WRDS makes is based on the values of shares that vested during the year, as specified by FAS123R.[8] The amount provided by WRDS is the cost that is recorded by the company on its income statement or balance sheet for the fiscal year. *Option grants* are defined as option-related awards (e.g. options, stock appreciation rights and other instruments with option-like features). The valuation is in a similar manner to equity grants based on the value of vested options during the year according to FAS123R. The amount provided by WRDS is the cost that is recorded by the company on its income statement or balance sheet for the fiscal year. *Non-equity incentives plan* refers to incentives other than those offered by stock grants and option grants. The amount belongs to the year that the compensation was earned. *All other compensation* includes perks such as personal benefits, life-insurance premiums, awards under charitable awards programs and discounted share

[8] FAS123R refers to the financial accounting standard introduced by the Financial Accounting Standards Board that requires companies to subtract the amount of share-based (equity) payment as well as options granted to their employees on a yearly basis.

purchases etc. The latter category is also measured in thousands of dollars when downloading the data form WRDS.

The different compensation elements are all divided by total compensation for the CEO, following Blackwell et al. (2007). This in order to better illustrate the differences in size of the compensation elements. This is also a way to control for systematic differences in the level of pay as a result of differences in firm size (Blackwell, et al., 2007). I have made a thorough comparison of the distribution of the different compensation elements for the CEOs to that of Payscale, especially looking at cash compensation as a fraction of total compensation (PayScale, 2017).[9] Payscale is one of the world's largest databases on individual salary profiles, and is thereby a solid source for robustness checks in this manner. A comparison is also made to those stated by Thomas & Hill (2012). Data regarding the total percentage ownership of company stock for CEO are also considered in order to capture effects from the level of ownership in year one and two following employment for the respective incoming CEOs. It makes sense to assume that not only value of new stock awards provides incentives for CEO, but also the fraction of already total existing ownership that the CEOs have. The third hypothesis specifically compares shareholders with different ownership-level in the company.[10]

Observing Table 3, we can see that *new stock grants* for the incoming CEOs make up the largest share of their total compensation package on average (looking at the full sample). Specifically, we see that the fraction of *new stock grants* provides a mean value of 33.73%, which relates well to the fraction of stocks as presented by Thomas & Hill (2012), mentioned in the theoretical aspects Section 2.1. *Salary*, being the second highest element provides a mean value of 23.93% as a share of total compensation. *Option grants* make up 13.51%, while *bonus* make up only 3.22%. From these numbers, we learn that companies to a higher extent provide their CEOs with equity-based compensation rather than *bonus*, when it comes to incentive-based compensation for the period 2009-2013. This might come as a result of unwanted negative effects specifically related to bonus prior to the financial crisis. Top executive bonus is, after all, a component which has been blamed to cause higher risk-taking by company executives before the outburst of the financial crisis. This, in addition to the promise of bailouts from government and central banks. I have added a *total incentives*

[9] Payscale is one of the world's largest databases on individual salary profiles using crowdsourcing and big data technologies. For more information see www.payscale.com
[10] See Section 3 hypothesis number 3

category in Table 2 below. This illustrates the sum of *new stock grants, bonus and option grants*. These components make up over 50% of the total compensation, which supports Thomas & Hill (2012) further. Comparing high ownership CEOs to low ownership CEOs, we can see that high ownership CEOs are provided with relatively higher fractions of *salary* and *bonus*, compared to the low ownership CEOs on average. The low ownership CEOs are however provided with higher fractions of *new stock grants* and *option grants* as incentive-based compensation factors. This is something that complements one of the findings of Mehran (1995) who hypothesized that boards will use more new equity-based compensation when managers own smaller fractions of the firm (Mehran, 1995).

TABLE 3: DESCRIPTIVE STATISTICS OF INCOMING CEO COMPENSATION

Compensation Category	Percentages of Total Compensation					
	Mean (%)	Median (%)	Maximum (%)	Minimum (%)	SD (%)	Equality of Means Test Statistic [a]
Salary						
All Incoming CEOs	23.93	17.83	100	0	19.36	
High Ownership CEOs	32.97	32.46	100	0	26.96	7.3178 (0.000)***
Low Ownership CEOs	22.48	25.71	100	0	17.42	
Bonus						
All Incoming CEOs	3.22	0	79.39	0	9.83	
High Ownership CEOs	5.15	0	76.49	0	13.60	3.0407 (0.0024)***
Low Ownership CEOs	2.91	0	79.39	0	9.05	
New Stock Grants						
All Incoming CEOs	33.73	32.98	100	0	24.27	
High Ownership CEOs	25.57	20.45	100	0	25.57	6.3217 (0.0000)***
Low Ownership CEOs	35.24	34.9	100	0	23.52	
Option Grants						
All Incoming CEOs	13.51	5.88	96.78	0	17.43	
High Ownership CEOs	13.03	0	94.14	0	20.62	0.4228 (0.6725)
Low Ownership CEOs	13.59	8.01	96.78	0	16.87	
(Total Incentives)						
All Incoming CEOs	51.58	56.14	100	0	25.27	
High Ownership CEOs	43.37	49.74	100	0	30.26	5.0365 (0.0000)***
Low Ownership CEOs	52.89	36.35	100	0	24.13	
Non Equity-Incentive Based						
All Incoming CEOs	19.25	18.16	93.35	0	16.16	
High Ownership CEOs	16.36	11.45	93.35	0	18.61	2.7557 (0.0059)***
Low Ownership CEOs	19.71	18.89	91.59	0	15.69	
All Other Compensation						
All Incoming CEOs	5.25	1.69	58.63	0	13.13	
High Ownership CEOs	7.29	1.66	85.14	0	13.73	2.4025 (0.0164)**
Low Ownership CEOs	4.92	1.71	100	0	12.64	

Table 3 above illustrates the composition of the different compensation factors of the sample CEOs. The numbers are specified to look at the mean values from year two and three post-turnover for the sample. From this we learn that new stock grants make up the largest fraction when observing the full sample of CEOs. High ownership CEOs are granted relatively more salary and bonus, while low ownership CEOs are granted with relatively more incentives. (a) Equality of means test statistics (student t) is conducted in order to provide a comparison between high ownership CEOs and the low ownership CEOs. ***p<0.01, **p<0.05, *p<0.10. All data are retrieved from WRDS. I have calculated the statistics by codes in Stata. Table is produced in Excel.

4.5.2 Firm Level Data

I have thoroughly sorted the sample companies into their respective industry, based on the Fama 48 classification system, following Jenter and Kanaan (2015).[11] The Fama 48 system has also been chosen in order to be able to match the firms with their respective industry medians on firm performance measures, collected from WRDS. The industry medians of performance margins were provided by their respective Fama industries, while the companies originally were sorted by SIC codes when collecting financial fundamentals. In order to be able to match the two by Excel techniques, the FAMA classification was chosen.

Figure 1 on the next page provides an overview over the sectors containing firms that experience most turnovers between 2009-2013.[12] The graph is designed in such a way that it shows the number of companies in the specific sectors that experience turnovers, as well as the distributions of firm size. Firm size is here based on the total market capitalization of the companies. Companies having a mean market cap higher than or equal to $10 billion over the span of their respective time-series are categorized as Large Cap Companies. Example of such companies in the sample are Apple Inc., General Motors CO. and Accenture PLC. Small Cap Companies are defined as those with a total market cap less than $2 billion. Examples of such companies are Stein Mart Inc., Cognex Corp. and Panera Bread CO. The Medium Cap companies are the ones with market cap between $2 billion and $10 billion. Here we find companies such as Alaska Air Group Inc., FMC Corp. and First Solar Inc. Specifically, we can see that most of the turnovers have found place in companies belonging to the business services category. A total of 113 companies experiencing turnovers in the time period of 2009-2013 belong to this specific sector. I find that there are 62 companies defined as small cap, 34 defined as medium cap and only 17 large cap companies. Business services is one of the widest defined groups in the Fama 48 classification system, ranging from management consulting services to industrial launderers. We can further see that retail, banking, as well as petroleum and gas services are sectors that have experienced a lot of turnovers in the period of measurement. From the industries illustrated, we can observe that most of the large companies experiencing turnovers belong to banking, followed by business services and petroleum and gas. Healthcare services, electronic equipment and machinery are characterized by containing relatively higher share of small-cap companies.

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[11] See Appendix Part A3 for full overview of FAMA 48 industries.

[12] There are more sectors having turnovers, however only the nine experiencing the most turnovers are included in the figure for the purpose of example.

FIGURE 1: OVERVIEW OF TURNOVERS CATEGORIZED BY FIRM SECTORS

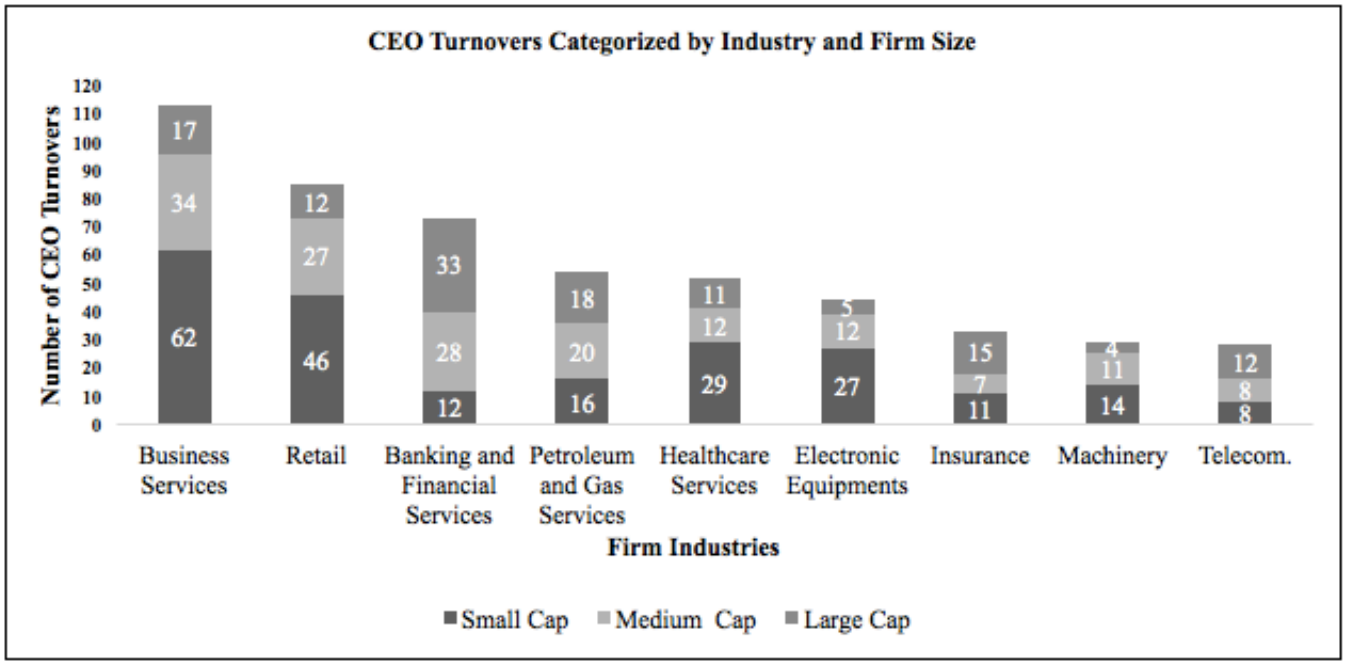


Figure 1: An overview of the nine Fama French sectors experiencing the most turnovers of the sample. From this we learn that business services account for the highest share, representing 113 turnovers. Retail represents 85, while banking and oil represents 73 and 54 respectively. The data originates from WRDS. I have calculated the statistics by codes in Stata, while the graphics are produced using Microsoft Excel.

Available financial data for the companies included in the sample have additionally been downloaded and implemented in the dataset, as previously mentioned. All regressions conducted in answering hypothesis two and three use combinations of these as control variables, which are presented in Section 5.2.4, Table 4. These include the use of total assets, R&D expenditures, total revenue, long-term debt, capital expenditures and acquisitions. These are financials that WRDS provides in dollar millions when initially downloading. Total assets refer to the total amount of assets as reported on the companies' balance sheets (WRDS, 2017). R&D expenditures count for the research and development expenses for the relevant companies. Total revenue refers to the company's total sales during the respective financial years. Long-term debt is defined by WRDS as long-term obligations, loans on insurance policies, bonds, mortgages and similar debt among others (WRDS, 2017). Capital expenditures refers to capital that are used for additions to property, plant and equipment and similar purchases. Acquisitions investments such as additional ownership in companies and company goodwill.

4.6 Discussions Regarding Data Soundness

4.6.1 Data Outliers

The sample contains companies from different sectors, with different sizes and in different stages of their lifecycles. This in turn will lead to some deviating observations from the mean with regards to company financials. One example could be the difference of companies from asset-intensive industries compared to companies from other industries with respect to ROA. Having more assets could cause lower values in this margin. Examples of such industries are Commercial Real Estate, Mining and Raw Materials as well as Oil and Gas. Another example could be that younger companies might focus more on growth, compared to already established companies. This could cause accounting-based margins (with focus on operating profitability) to be unnatural high in periods, compared to the sample average. The consensus of the market can from time to time influence the marked-based ratios. The decision to keep or remove outliers in a sample is largely discussed in econometrics (Woolridge, 2006). Outliers are something that might affect regression results when present, however to a larger extent when included in small sample sizes. The greatest problem is in the event that outliers are caused because of entering a number wrongly in the dataset. This is something that will cause incorrect regression results. This is however not the case for the sample companies that this thesis relies on. All performance variables have been calculated using formulas in Excel in the same manner, and can therefore not be subject to any typing mistakes. In fact, I have included a large span of different firms in the dataset to provide the variety necessary in conducting statistical tests. The decision of not removing all deviating values has therefore been made.

4.6.2 Wharton Research Data Services

Another aspect that might affect the soundness of the sample data, is the use of WRDS as data source. Firstly, the database restricts users that does not pay for full membership, meaning that full access has not been available. This in turn means that data regarding firm corporate governance, which could have been relevant for the research have not been available for collection. Second, WRDS operates with different platforms on the different data services offered. Some of the different platforms available utilize however different characteristics for the companies when collecting the data. This means that matching the data, has led to a lot of work with regards to matching relevant years and relevant industry characteristics. Apart from this, I do not believe any other database could have provided as

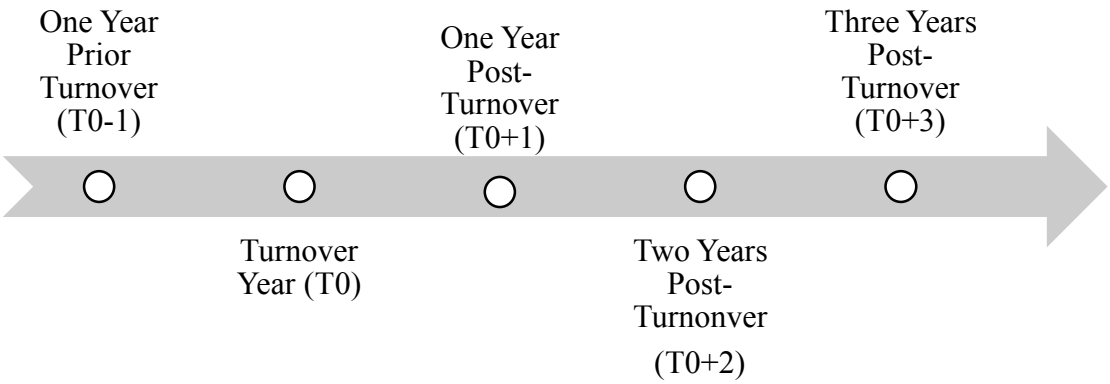
much data, and as precise, as WRDS does. Having used the first part of the research-period on screening sources of data, WRDS was by far the best with respect to the topics that this thesis address.

5 METHODOLOGY

5.1 METHODOLOGY RELATED TO RELATIVE PERFORMANCE EVALUATION (HYPOTHESIS ONE)

The methodology connected to relative performance evaluation of the sample companies, is specified to compare the industry-adjusted performance measures from the year prior to turnover (T0-1) to the transition year (T0) and the three years following turnovers in the sample (T0+1), (T0+2) and (T0+3). Denis & Denis (1995), Coughlan & Schmidt (1985) and Warner et al. (1988) all argued that the performance of the companies should have somewhat inverse relationships from prior- to post-turnover, with post-turnover representing improvement in the performance for the companies tested. My hypothesis states that the improvement is not necessarily sustainable for the research sample post-turnover, because of effects connected to the financial crisis. The methodology connected to hypothesis one is therefore to do a thorough analysis of the changes of the relevant industry-adjusted performance measures of the companies individually.[13] Improvements in the industry-adjusted performance measures are here defined as having increased mean values. This can be measured on a year to year basis, or for the period as a whole. The timeline below provides an overview of the time-aspects of answering the first hypothesis.

FIGURE 2: TIMELINE CONNECTED TO RELATIVE PERFORMANCE EVALUATION



[13] See Section 6.1 for analyses

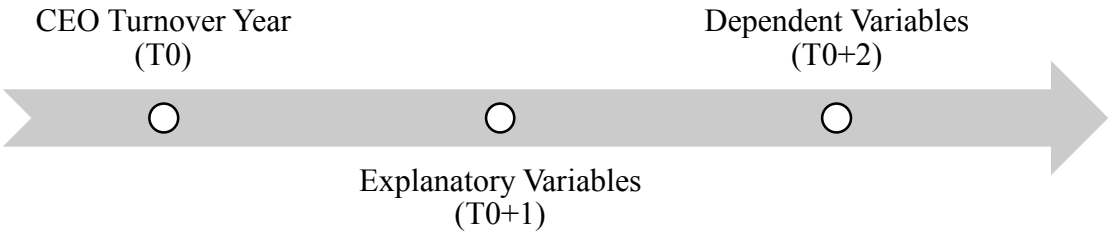
5.2 Methodology Related to Empirical Analyses of Compensation Effects on Relative Performance (Hypothesis Two)

5.2.1 Regression Methodologies and Time Issues

In order to best measure the effects from incoming CEOs incentive-based compensation on firm performance, there needs to be time-lag between the dependent variables and explanatory variables used in the tests. This in turn because effects of initiatives on company performance tend to take at least a year before they can be observed. The methodology related to the regressions below therefore looks at effects on performance measures from year two and three after turnover, by using independent variables lagged one year (except from the dummy-variables) and two years respectively. There are in total five types of regression analyses tested, each testing all five performance-measures as dependent variables. These can be presented in the following manner:

(1) OLS Model 1: The first regression methodology uses robust ordinary least squares regression (hereafter OLS) looking at performance measures from year two (T0+2) after turnover, regressed by independent- and control variables (explanatory variables) from year one (T0+1) after turnover. This in order to see if there are any correlation between the incentive-based compensation factors that the new CEO receives in his or her first year of employment, on the performance of the company in year two. The relationship between dependent and independent variables in the regression model can be illustrated as follows:

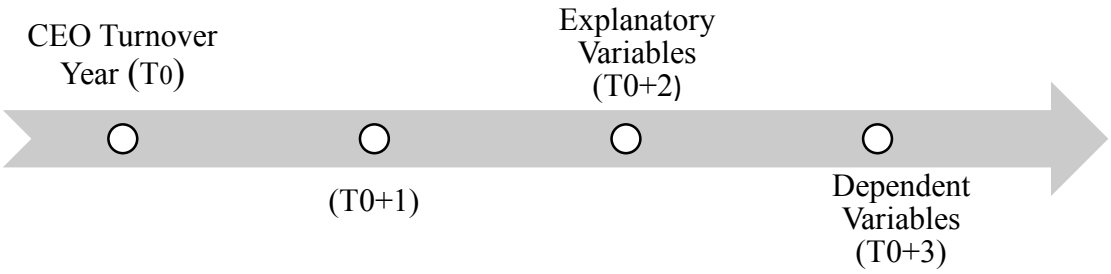
FIGURE 3: TIMELINE CONNECTED TO OLS MODEL 1



(2) OLS Model 2: The second type of regression analyses applies OLS analyzing industry-adjusted performance measures from year three (T0+3) after turnover regressed by explanatory variables from year two (T0+2) after turnover. In other words, testing if there are any effects of incentive-based compensation for the new CEO in his or her second year of employment on industry-adjusted performance for the company in year three after turnover. Remember, all CEOs included are in office for at least two years. They are therefore all

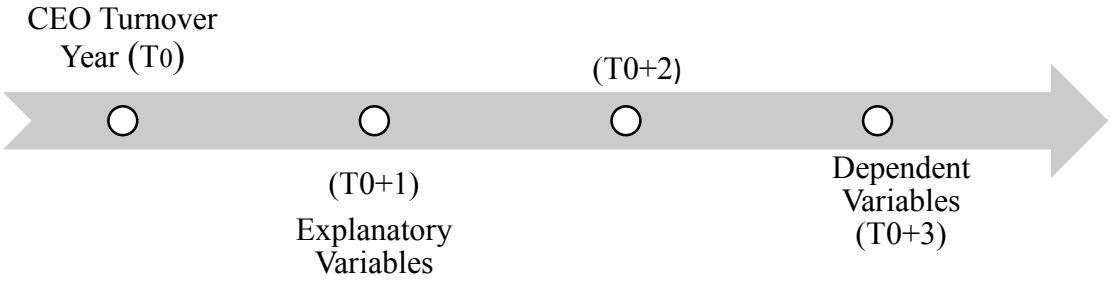
provided with compensation in year two after turnover as well. The relationship between dependent and independent variables can be illustrated as the following:

FIGURE 4: TIMELINE CONNECTED TO OLS MODEL 2



(3) OLS Model 3: The third regression uses OLS looking at industry-adjusted performance measures from year three (T0+3) after turnover regressed on explanatory variables from year one (T0+1) after turnover. Hence, the regression provides a two-year lag, in order to see if the compensation and firm-level data from year one after turnover make an impact on the performance three years post turnover. The regression can be illustrated as follows:

FIGURE 5: TIMELINE CONNECTED TO OLS MODEL 3

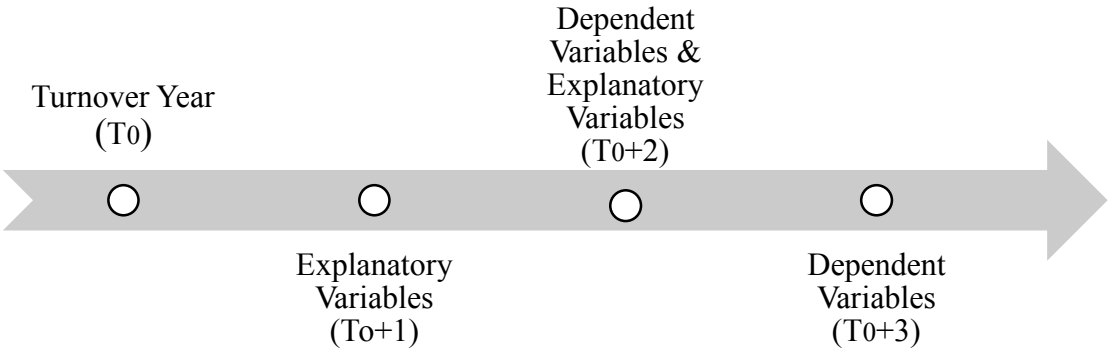


The use of OLS regressions follows Jensen & Murphy (1990), Blackwell et al. (2007) and Mehran (1995) among other research papers on compensation policy.

Regression number three and four uses random effects- and fixed effects models respectively, utilizing panel data analysis. These regressions analyze dependent variables from year two

and three simultaneously, while using explanatory variables lagged by one year. [14] The time-line can be illustrated as follows:

FIGURE 6: TIMELINE CONNECTED TO FIXED EFFECTS AND RANDOM EFFECTS MODEL



All five above-mentioned regressions follow the stated regression-equation below, varying the industry-adjusted performance measures.[15]

$$IAPM^{16} = \beta_0 + \beta_1*(\%\ New\ Stock\ Grants) + \beta_{2*}(\%\ Option\ Grants) + \beta_{3*}(\%\ Bonus) + \beta_4*(\%\ Stock\ Owned\ by\ CEO) + \beta_i*(Control\ Variables) + U$$

$$U|X \sim N(0,\sigma^2)^{17}$$

β_0 = Constant value (intercept) of the regression. This is the average value of the dependent variable, and is the value that the dependent variable will have if all other coefficients are equal to zero.

β_1 = Regression coefficient of the independent variables and control variables. Determines how much the average value of the dependent variable will change, by one units change in the independent- or control variable.

[14] The regression seeks to see effects of independent variables lagged one year on performance in year two and three (grouped) in the same regression. Measuring dependent variables over two years provides us with a times-series, and following panel data analysis. This entitles the use of fixed effects and random effects models.
[15] For more information regarding different regression methodologies, see Section 5.4.
[16] IAPM = Industry-adjusted performance measure. That is, Total Q, ROE, ROA, EBITDA Margin or price-to-book margin.
[17] The error term is normally distributed given all explanatory variables included.

U = The error term of the model. This is a residual variable that catches the variation in the dependent variable that the independent and control variables are not able to explain.

The analyses will be conducted by firstly observing all five regressions collectively to see if there are any relationships between compensation factors and performance measures that are similar with respect to signs and significance. Such a finding would strengthen the possibility of a solid relationship, and is therefore an important aspect. The methodology will then secondly take an individual look at all regressions, with a focus on specific characteristics for each and every regression model.

5.2.2 Dependent Variables

The industry-adjusted performance measures Total Q (Tobins Q) and ROA are included as dependent variables, following Blackwell et. al. (2007) and Mehran (1995). EBITDA margin, ROE and price-to-book ratio have been included as well in order to get a comprehensive measure of operating profitability for the companies, the return on equity and to get a complementary market-based measure to that of Total Q. Contradictory to Denis & Denis (1995) and Blackwell et al. (2007) I focus only on the industry-adjusted measures of performance margins. After testing for both, I find little or no particular difference in the effects. I find the adjusted measures more informative as they look at the company results relative to peer companies. This provides information on abnormal returns for the sample companies. According to Holmström (1982), using relative performance (by industry) to base compensation for CEOs provide them incentives to increase shareholder wealth, while at the same time eliminating the risk-increasing effects of industrywide and marketwide factors that the executives cannot control (Holmstrom, 1982). This is something that additionally argues in the direction of using relative performance evaluation.

5.2.3 Independent Variables

The independent compensation variables used in the regression analyses are the percentage of new stock grants to total compensation (*New Stock Grants (%)),* percentage of option grants to total compensation (*Option Grants (%))* and percentage rate of bonus to total compensation (*Bonus (%))*. These can all be found under independent variables in Table 4 in Section 5.2.4 below. Other compensation factors such as salary, non-equity based compensation and all other compensation factors are all dropped from the analyses as they are not presupposed to fall into the category of incentive-based compensation that this thesis researches. They are dropped also in order to avoid any singular matrix of independent

variables, following Blackwell et al. (2007). The last independent variable is the total fraction of existing share ownership for the company CEOs (*Stock Owned by CEO (%)*). The existing ownerships of the CEOs as a fraction of total company ownership is not a variable that falls under the total compensation category, but is included as an individual variable in order to see if the existing ownership is something that also could motivate managers to affect performance. This is additionally the variable relevant for sorting CEOs into high ownership and low ownership, answering the third hypothesis of the thesis. All independent variables are lagged by one year compared to the dependent variables in all regression analyses conducted.

5.2.4 CONTROL VARIABLES

One of the relationships that is most commonly documented in the executive compensation literature is the positive interaction between executive compensation and the size of the company. Providing higher compensation for management in larger companies might be needed as the position often requires the handling of more demanding and complex tasks. This is essentially an issue that needs to be accounted for when analyzing firm performance. A lot of previous research account for firm size by using the natural logarithm of firm total assets (E.g., Mehran (1995), Blackwell et al. (2007) & Murphy (1985)). I choose also to use the natural logarithm of total assets, consistent with previous literature.

Previous studies seem also to use firm growth opportunities when explaining firm performance. Some studies use Tobins Q as a measure for growth opportunities, while others use assets in place as the ratio of inventory.[18] Most commonly however is the use of R&D to sales. Since this research focus on Tobins Q (Total Q) as a performance measure, R&D to sales has been chosen as a proxy for firm growth opportunities, following Mehran (1995). R&D to sales measures the percentage of revenue that is effectively allocated to R&D expenditures. In addition to being a proxy for firm growth opportunities, R&D/Sales also serve as a proxy for managerial discretion and information asymmetry (Hirschey, et al., 2012).[19]

[18] Blackwell et al. (2007) use both assets in place as a ratio of inventory, and gross plant and equipment to total assets (Blackwell, et al., 2007).
[19] According to Hirschey et al. (2012) 24% of all papers published in the Journal of Finance, the Journal of Financial Economics or Journal of Corporate Finance in 2007 alone used R&D expenditures as an empirical proxy.

Following Blackwell et al. (2007) and Mehran (1995) long-term debt to total assets is used as an independent variable in the regression analyses. Studies on executive compensation-effects have previously used long-term debt to total assets as a variable because of its relation to agency costs of debt, which again might affect firm performance (Blackwell, et al., 2007).

Effects regarding the departure of old CEO and the arrival of new CEO are included in the analyses as dummy-variables. The recruiting-dummy takes the value of 1 if the incoming CEO is recruited externally, while 0 if recruited internally. The dummy is included in order to possibly capture effects of CEO affiliation. The departure-dummy equals to 1 if the old CEO was fired, and 0 if the old CEO resigned voluntarily. This follows Blackwell et al. (2007) and Denis & Denis (1995) among others. An age dummy has been included in order to account for possible horizon problems of the incoming CEO (Blackwell, et al., 2007). CEOs older than 60 years might prefer cash compensation rather than equity and options due to their shorter employment horizon. Underlying the horizon hypothesis is the fact that CEOs close to retirement age often choose to avoid valuable capital investment expenditures because their incentive plans based on accounting principles will penalize them, and further reward only the successor. This must be accounted for. The age-dummy takes values of 1 if the CEO is of 60 years and older. If the CEO is younger than 60 years, the dummy takes value of 0. A gender-dummy is additionally included to measure any possible effects of differences in performance as a result of the CEO gender. The gender-dummy takes value 1 if the CEO is a male, while it takes value 0 if CEO is female.

Capital expenditures divided by total assets and acquisitions/total assets are also included in order to adjust for the effects of these. It might be questioned if it is necessary to include acquisitions as a variable. I find however no difference in coefficients signs and only small changes in regression coefficients when including the variable. Hence, the variable is included in order to reduce the risk of omitted variable bias. Both variables are divided by total assets in order to differ on differences in size of the firms. All non-dummy independent variables in the regression are as mentioned lagged by one year. An overview over the different regression variables discussed and their statistics for the relevant years of measurement follow on the next page.

TABLE 4: DESCRIPTIVE STATISTICS OF REGRESSION VARIABLES

Variables	Mean	Median	Maximum	Minimum	Std. Dev	Observations
Dependent Variables						
Industry-Adjusted Performance Measures						
ROE (T0 +2)	-0.08	0.02	5.17	-50.17	2.00	750
ROE (T0 +3)	0.09	0.20	20.58	-4.49	1.10	533
ROA (T0 +2)	0.02	0.00	0.93	-1.02	0.13	825
ROA (T0 +3)	0.02	0.00	0.93	-1.02	0.13	533
EBITDA Margin (T0 +2)	-0.40	0.02	1.74	-2.33	0.27	825
EBITDA Margin (T0 +3)	0.06	0.02	1.71	-2.00	0.29	588
Total Q (T0 +2)	0.93	-0.02	85.97	-33.12	8.32	292
Total Q (T0 +3)	1.03	-0.15	96.86	-32.15	1.03	182
Price-to-Book (T0+2)	0.73	0.00	28.87	-6.23	3.44	641
Price-to-Book (T0+3)	0.94	0.01	35.23	-6.50	4.03	477
Independent (Explanatory) Variables						
New Stock Grants (%) (T0+1)	0.33	0.32	1.00	0.00	0.24	753
New Stock Grants (%) (T0+2)	0.37	0.37	1.00	0.00	0.24	723
Option Grants (%) (T0+1)	0.14	0.08	0.94	0.00	0.18	753
Option Grants (%) (T0+2)	0.13	0.00	0.97	0.00	0.17	723
Bonus (%) (T0+1)	0.04	0.00	0.79	0.00	0.10	753
Bonus (%) (T0+2)	0.03	0.00	0.75	0.00	0.09	723
Stock Owned by CEO (%) (T0+1)	0.01	0.00	0.39	0.00	0.03	702
Stock Owned by CEO (%) (T0+2)	0.01	0.00	0.31	0.00	0.23	661
Ln (Total Assets) (T0+1)	7.99	7.95	14.57	1.27	1.85	819
Ln (Total Assets) (T0+2)	8.08	8.08	14.61	1.28	1.83	790
R&D/Sales (T0+1)	0.03	0.00	3.36	0.00	0.16	779
R&D/Sales (T0+2)	0.04	0.00	4.38	0.00	0.20	753
LT-Debt/Total Assets (T0+1)	0.23	0.19	3.02	0.00	0.24	779
LT-Debt/Total Assets (T0+2)	0.25	0.21	3.21	0.00	0.24	753
Departure-Dummy (T0+2)	0.05	0.00	1.00	0.00	0.22	830
Departure-Dummy (T0+3)	0.05	0.00	1.00	0.00	0.22	830
Recruiting-Dummy (T0+2)	0.89	1.00	1.00	0.00	0.32	830
Recruiting-Dummy (T0+3)	0.89	1.00	1.00	0.00	0.32	830
Age-Dummy (T0+2)	0.16	0.00	1.00	0.00	0.37	830
Age-Dummy (T0+3)	0.19	0.00	1.00	0.00	0.40	830
Gender-Dummy (T0+2)	0.94	1.00	1.00	0.00	0.24	830
Gender-Dummy (T0+3)	0.94	1.00	1.00	0.00	0.24	830
CapEx/Total Assets (T0+1)	0.04	0.03	0.33	0.00	0.05	779
CapEx/Total Assets (T0+2)	0.04	0.03	0.34	0.00	0.05	753
Acquisitions/Total Assets (T0+1)	0.02	0.00	0.78	0.00	0.07	779
Acuisitions/Total Assets (T0+2)	0.02	0.00	0.53	0.00	0.07	753

Total Q = Market value of assets divided by book value of asses. Industry-adjusted.
ROE = Return on equity. Calculated by dividing company earnings by total equity. Industry-adjusted.
ROA = Return on assets. Calculated by dividing company EBIT by total assets of the firm. Industry-adjusted.
EBITDA Margin = Earnings before interest, taxes, depreciation and amortization divided by total assets of the firm. I-A Price-to-Book ratio. Market value of equity / book value of equity. Industry-adjusted.
T0+1 = one year post-turnover. T0+2 = two years post turnover. T0+3 Three years post-turnover.
New Stock Grants (%) = The value of new stock grants for the new CEO. Divided by total compensation.
Option Grants (%) = Value of option grants divided by total compensation for the CEO.
Bonus (%) = Value of bonus divided by total compensation.
Stock Owned by CEO (%) = Percentage value of total CEO ownership in company.
Ln (Total Assets) Natural logarithm of total assets of the companies. Proxy for firm size.
R&D/Sales = Firm R&D expenditures divided by total sales of the firm. Proxy for firm growth opportunities.
LT-Debt/Total assets = Long term debt of companies divided by their respective total assets. Proxy for agency cost of debt.
Departure-Dummy = Takes value of 1 if outgoing CEO was fired, 0 if he/she left voluntarily.
Recruiting-Dummy (1=external, 0 internal) = Dummy variable providing information about internal and external recruiting.
Age-Dummy = Takes value 1 if CEO is male and 0 if CEO is female .
CapEx/Total Assets = Capital expenditures of the companies divided by their total assets .
Acquisitions/Total Assets = Acquisitions of the companies divided by their total assets.

5.3 Methodology Related to Compensation-Effects On Relative Performance – Low vs High Ownership CEOs (hypothesis Three)

The methodology related to hypothesis three of the thesis follows the same pattern as the methodology for hypothesis two as previously presented. The only difference is that I now divide the sample incoming CEOs into one sample being low ownership CEOs and one sample being high ownership CEOs. The regression methodology restricts to looking at the three OLS models described in the previous section (not the fixed effects and random effects). A low ownership CEO is as previously mentioned defined as having ownership lower than or equal to 5% in the company. A high ownership CEO is defined as having ownership higher than or equal to 5% in the company. The comparison is done in order to see if CEOs with lower ownership in the firm are more motivated by new equity incentives rather than other incentive-based compensation factors. The analysis is structured to first look at the low ownership sample, before taking a more thorough look at the high ownership sample. The results of the regressions from the last hypothesis can be found in Section 6.3 below.

5.4 Characteristics of The Different Regression Methodologies

5.4.1 Ordinary Least Squares Model

The OLS models in the regressions of the thesis are included as the model in econometrics is regarded as the best linear unbiased estimator (BLUE) when analysing cross-sectional data (Woolridge, 2006). Cross-Sectional data refers to the fact that the dataset includes units that appear from the same point in time. This is exactly the case in the first three regressions of hypothesis one and two in the case of this thesis. In those regressions, we saw that the industry-adjusted performance measures originated from year two after turnover, and year three after turnover regressed individually. In other words, they originate from only one year in the time series. The same can be said with regards to the explanatory variables, only that they appeared from one year or two years prior to the dependent variable respectively. The OLS model, initially seeks to find the best way that a dependent variable can be explained by independent variables. This facilitates the search for fitted coefficient estimators which minimizes the sum of squared of the errors. The OLS model rest on several assumptions in order to cause unbiased estimates and robust numbers.

5.4.2 Random Effects Model and Fixed Effects Model

The random effects and fixed effects models are popularly used when working with time-series and panel data analysis (Woolridge, 2006). Time-series data refers to the data set containing variables that are drawn from different points in time. As we saw in the third and fourth regressions connected to hypotheses one, the dependent variables included industry-adjusted performance-measures originating from both year two and three after turnover. This make up a time-series of two years of observations, with regards to the explanatory variables. The reason that OLS is not preferred when dealing with time-series is because economic observations rarely can be seen as independent across time. Panel data essentially means that we have time-series for every cross-sectional variable in the set of data. In my case, this was every observation of CEO turnover (company) experiencing two years of performance measures. fixed effects models are based on the concern of having unobserved effects (α) in the model that might be correlated with explanatory variables. In this way, it wants to get rid of these unobserved effects, in order to avoid bias. Random effects model, on the other hand, allows these fixed effects. It assumes that the effects are not correlated with explanatory variables. In econometrics, it is stated that the Random Effects Model is more efficient than Fixed Effects if the assumption of no correlation holds.

6 Results

6.1 Results of Relative Firm Performance Following CEO Turnovers 2009-2013 (Hypothesis 1)

Table 5-10 and Figures 7-12 provide an overview over the different developments in the mean values of the industry-adjusted performance measures included in the analyses. All measures count for companies experiencing turnovers in the period 2009-2013. The tables and figures show the development from the year prior to turnover (T_0-1) of the CEO, the transition year (T_0), and the following three years (T_0+1), (T_0+2) and (T_0+3) respectively. As a result of lacking data on the margins after 2015, the turnovers from 2013 are measured up to and including 2015.[20]

[20] See Table 10 and Figure 12

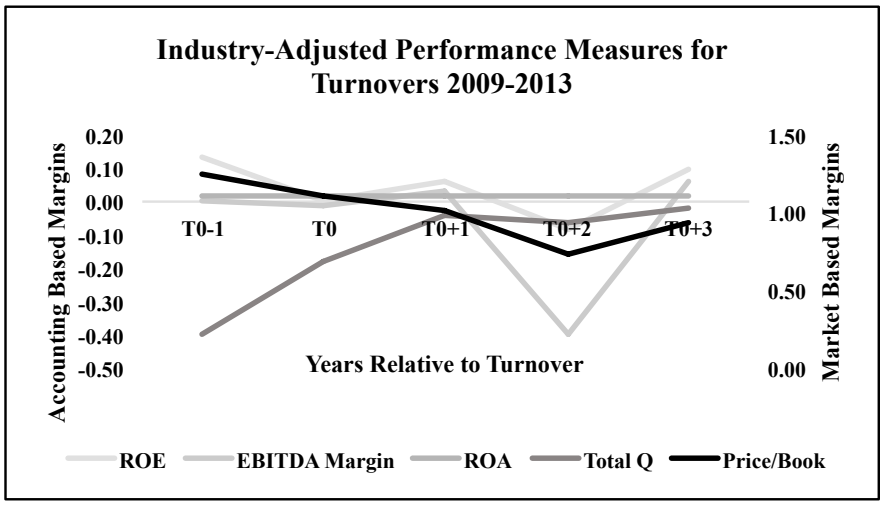
6.1.1 The Big Picture: Observing Performance Surrounding All CEO Turnover-Years

Observing Table 5 and Figure 7 below we can see that performance surrounding all CEO turnovers fluctuate to a large extent, looking away from ROA. ROA show high consistency, being 0.02 for all years. This means essentially that the sample companies provide higher returns to their assets for the whole period compared to peer companies. The industry-adjusted ROE follows Denis & Denis (1995), Coughlan & Schmidt (1985) and Warner et al. (1988) to some extent, as it decreases prior to turnover, and then increases the first year after turnover. We see however that the margin drops between year one and year two post-turnover, before increasing in the last year of measurement. The EBITDA Margin follows the same pattern as the ROE margin, going from reduced value, to increased value, to reduced value yet again. These two margins show great instability in the years of measurement, supporting the first hypothesis of the thesis. Moving over to the market-based performance measures, we see that Total Q show somewhat stable increase throughout the whole period of measurement, only being slightly reduced between year one and two after turnover. It seems as the sample companies are valued higher by the market, compared to their peer groups. However, to less extent from year to year. This could result from the market having high expectations because of turnover, however adjusting the expectations down after the implementation. The price-to-book ratio shows on the other hand steady decrease the first four years of measurement, before increasing between year two and year three after turnover. The margin is positive for the whole period, meaning that the

TABLE 5: INDUSTRY-ADJUSTED PEFORMANCE MEASURES SURROUNDING TURNOVERS 2009-2013

Industry-Adjusted Performance Measures 2009-2013					
Years	ROE	ROA	EBITDA Margin	Total Q	Price/Book
T0-1	0.13	0.02	0.00	0.22	1.25
T0	0.00	0.02	-0.01	0.69	1.10
T0+1	0.06	0.02	0.03	0.98	1.01
T0+2	-0.08	0.02	-0.40	0.93	0.73
T0+3	0.09	0.02	0.06	1.03	0.94

FIGURE 7: INDUSTRY-ADJUSTED PERFORMANCE MEASURES SURROUNDING TURNOVERS 2009-2013



sample company market values of equity to book values are relatively higher valued compared to their peer groups.

6.1.2 Relative Performance Evaluation Surrounding CEO Turnovers in 2009

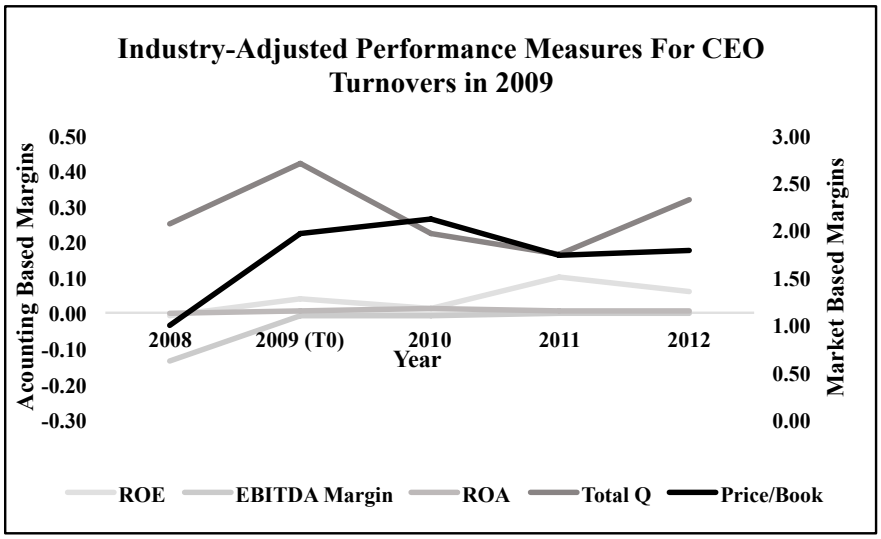
Looking at the accounting-based performance measures, we see that again ROE shows high instability in the period of measurement. The sample companies start out in 2008 by having 1% lower ROE compared to their peers on average. The following year is however characterized by an increase to industry-adjusted ROE value of 0.04, beating the peer companies to a large extent. The following years after turnovers are recognized by decrease, increase and decrease, before ending up at a value of 0.06 in 2012. It seems that the situation of being superior to their peers has stabilized somewhat after the turnover, which is a good sign moving forward. There is however not stability with regards to increasing difference, which supports the first hypothesis of the thesis.

TABLE 6: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2009

Industry-Adjusted Performance Measures for Turnovers in 2009

Year	ROE	ROA	EBITDA Margin	Total Q	Price/Book
2008	-0.01	0.00	-0.14	2.07	0.98
2009 (T0)	0.04	0.01	-0.01	2.70	1.96
2010	0.01	0.01	-0.01	1.95	2.11
2011	0.10	0.01	0.00	1.74	1.73
2012	0.06	0.01	0.00	2.33	1.79

FIGURE 8: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2009



The EBITDA margin and ROA have actually provided somewhat sustainable growth throughout the period of measurement, supporting Denis & Denis (1995), Coughlan & Schmidt (1985) and Warner et al. (1988). While ROA only increases by 0.01 the first year of measurement, the EBITDA margin increases both the first year, and the third year of measurement. It must be stated that the EBITDA margin remains negative all five years, meaning that the sample companies had poorer

operating margins than their peer group all period. The gap is however diminishing which means that the companies of interest improved more than their peers through the period looking at this margin. ROA develops from being approximately equal to peer group before the turnover, to being slightly better in the years following the turnover. This means that the sample companies were better to create returns to their total assets compared to their peers throughout the period.

For the turnovers finding place in 2009, I calculate the Total Q ratio in total to experience an increase by 12.56% in the period from 2008 to 2012. Starting at a value of 2.07 in 2008, the ratio increases to 2.70 in the transition year of the CEOs. The value then drops first to 1.95 in 2010, before falling further to 1.74 in 2011. The last year of measurement represents an increase of 34%. It might seem that the implementation of the new CEO leads to a temporary decrease of the ratio, before it turns back to the trend of increasing. This might be caused by the companies downsizing their book value of assets in the years directly following CEO change, as stated by Denis & Denis (1997). The sharp increase in the Total Q the last year of measurement could mean that the sample companies are seen as more overvalued compared to their peers. In this way, the market values the sample companies' value relatively higher compared to book value of assets. This might be caused by the sample companies having interesting prospects on average for this year, compared to peers. The Price/Book ratio supports the Total Q in that it is positive every year of measurement. This suggests that the market presuppose the value of equity of the sample firms to be greater than their book value, and to a greater extent compared to peer companies. The Price/Book ratio turns from decrease to increase and increase to decrease, meaning that there is not a clear pattern regarding the comparison of sample firms and their peer group. Being higher than 1 post-turnover suggests however that there are more stocks regarded as growth stocks.

6.1.3 Relative Performance Evaluation Surrounding CEO Turnovers in 2010

The accounting-based performance measures ROE and EBITDA seem at first glance to follow the findings of Denis & Denis (1995), Coughlan & Schmidt (1985) and Warner et al. (1988) quite well. Looking at Figure 9 we see that the ROE ratio dropped in the year prior to the turnover, and had a big positive change the first year following the turnover. This change relates well to Denis & Denis (1995), Coughlan & Schmidt (1985) and Warner et al. (1988). From 2011 to 2012, the measure decreased before increasing between 2012 and 2013. In this

way, we see however great instability looking at this measure, further complementing the first hypothesis.

The EBITDA margin show the same relationship in the years before and after turnover (T0) as ROE. The margin falls the year before the turnover going from 0.01 to -0.09. The first year of the new CEO represents however an increase to 0.04. The second year is represented by a slight decrease, before ending up at 0.06 in 2013. The turnover has in other words led to the sample companies having better operating numbers than their peers. We see that ROA improves the first year of measurement. Starting at a value of 0.02 it increases by 0.01 the year before turnover, before falling back to 0.02 in the year following the turnover. Here it stays until the last year of measurement.

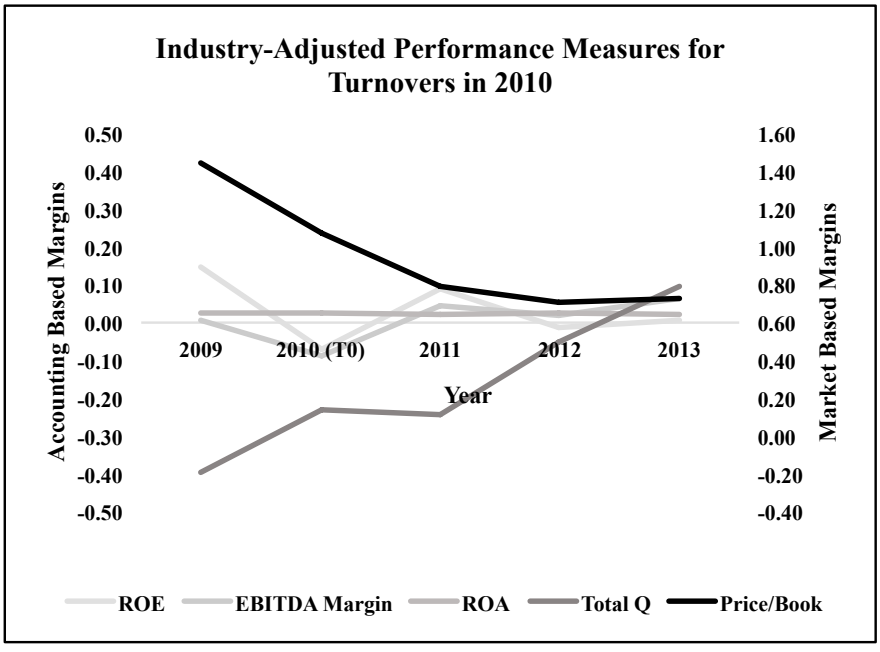
Observing Figure 9, we see that the two market-based performance measures show two complete different developments. Total Q starts out by having a value of -0.19, being relatively lower compared to the peer groups. The rest of the years are followed by increases in the ratio except from the first year of the new CEO, which sees a reduction of 21%. The Price-to-Book ratio in contrary, starts out with a value of 1.45 in 2009 before falling steadily until it reaches a value of 0.71 in 2012. The last year is recognized by an increase of 2.82%. It seems as though the market values the total assets of the company as

TABLE 7: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2010

Industry-Adjusted Performance Measures for Turnovers in 2010

Year	ROE	ROA	EBITDA Margin	Total Q	Price/Book
2009	0.15	0.02	0.01	-0.19	1.45
2010 (T0)	-0.07	0.03	-0.09	0.14	1.07
2011	0.09	0.02	0.04	0.11	0.79
2012	-0.02	0.02	0.02	0.50	0.71
2013	0.01	0.02	0.06	0.79	0.73

FIGURE 9: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2010



increasingly higher than the book value, while the market regards the value of equity as increasingly lower than the book value. In this way, the market must value the debt of the company as much higher than their actual book value.

6.1.4 Relative Performance Evaluation Surrounding CEO Turnovers in 2011

Observing Figure 10 below we can see that ROE is recognized by decreasing values the first three years of measurement. We observe however that the margin starts increasing from 2012 an onwards, providing a positive value of 0.15 in 2014. This means essentially that the sample companies have had greater increase in ROE relative to their peers the last two years of measurement. It seems that making the turnover in 2011, has provided positive effects on the return to shareholders the following years for the sample companies.

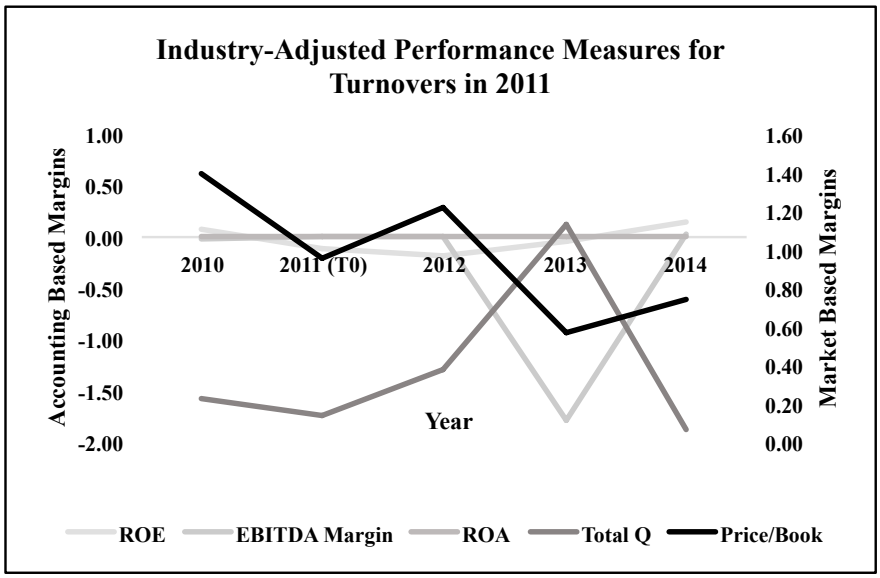
TABLE 8: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2011

Industry-Adjusted Performance Measures for Turnovers in 2011

Year	ROE	ROA	EBITDA Margin	Total Q	Price/Book
2010	0.07	0.01	-0.02	0.23	1.40
2011 (T0)	-0.12	0.00	0.00	0.14	0.95
2012	-0.19	0.00	0.01	0.38	1.22
2013	-0.03	0.00	-1.80	1.13	0.57
2014	0.15	0.01	0.04	0.07	0.74

The EBITDA ratio shows a somewhat different development. After increasing the first two years of measurement, we see a decrease from 0.01 to -1.80 between 2012 and 2013. The last year shows a large increase in value. It is hard to make a conclusion with regards to effects of turnovers, because of the fluctuations in the values. The ROA is much more stable in the period, only dropping slightly in the year prior to turnover and increasing slightly between 2013 and 2014.

FIGURE 10: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2011



The Price/Book ratio seems in general to follow a downward sloping trend in the years of measurement, developing from 0.23 in 2010 to 0.07 in 2014. The only year of increase is the transition years of CEO, which shouldn't come as an effect of the change. The positive values every year suggests that the sample companies provide higher Price/Book ratios than their peers, every year of measurement. Essentially, the market values the equity of the sample companies as higher than those of the peers. However, at a diminishing rate. The Total Q increases steadily throughout the period, before decreasing sharply between 2013 and 2014. Being positive every year, the market values the assets of the sample companies relatively higher than book value compared to peer companies.

6.1.5 Relative Performance Evaluation Surrounding CEO Turnovers in 2012

For the turnovers taking place in 2012, we can see that EBITDA margin follows the findings of Denis & Denis (1995), Coughlan & Schmidt (1985) and Warner et al. (1988) quite well. The margin is recognized by a decrease of 75% the year prior to turnover, before increasing steadily every year until 2015, ending up at a value of 0.09 in 2015. The operating profitability of the sample companies have in other words been better than those of the peer companies after the CEO change. The ROE can be said to have sustained good results in the transition year, as well as the first year of employment for the new CEO. We see however that the ratio dropped between 2013 and 2014, before increasing the last year of measurement. Looking at the ROA values in

TABLE 9: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2012

Industry-Adjusted Performance Measures for Turnovers in 2012

Year	ROE	ROA	EBITDA Margin	Total Q	Price/Book
2011	-0.08	0.01	0.04	0.01	1.01
2012 (T0)	0.17	0.02	0.01	-0.07	1.20
2013	0.19	0.02	0.04	0.71	0.83
2014	-0.01	0.02	0.05	0.31	0.46
2015	0.12	0.03	0.09	0.34	0.97

FIGURE 11: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2012

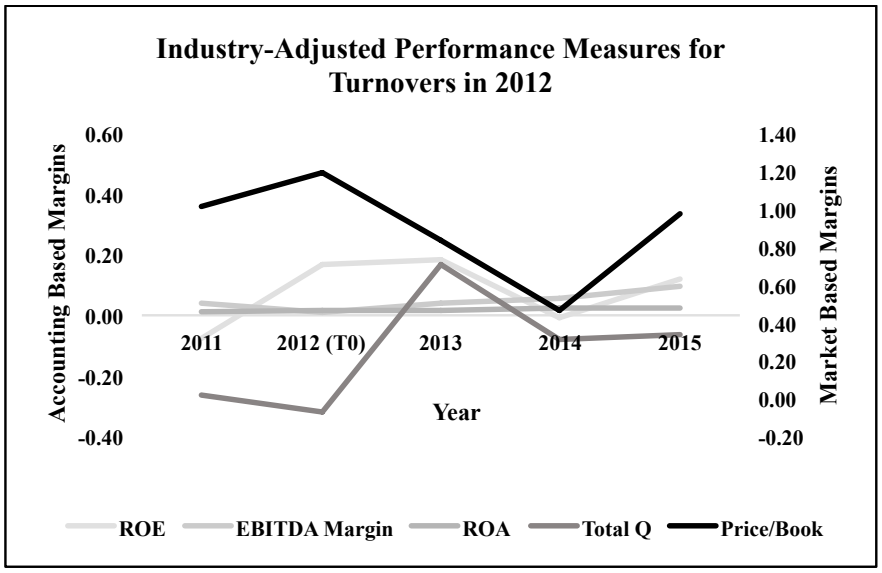


Table 9 we see that the values have increased steadily for the sample. The sample companies have in other words done better than their peers every year with respect to this measure.

The Total Q ratio shows a decrease in value in the year before the CEO transition, providing a negative value of 0.07 in 2012. The years after the turnover is recognized by positive industry-adjusted Total Q ratios. It seems in general as the market value of asset for the sample companies are valued relatively higher to the book value compared to peer companies. In this way, it seems as though the sample companies have obtained positive consensus by the market following the turnover.

6.1.6 Relative Performance Evaluation Surrounding CEO Turnovers in 2013

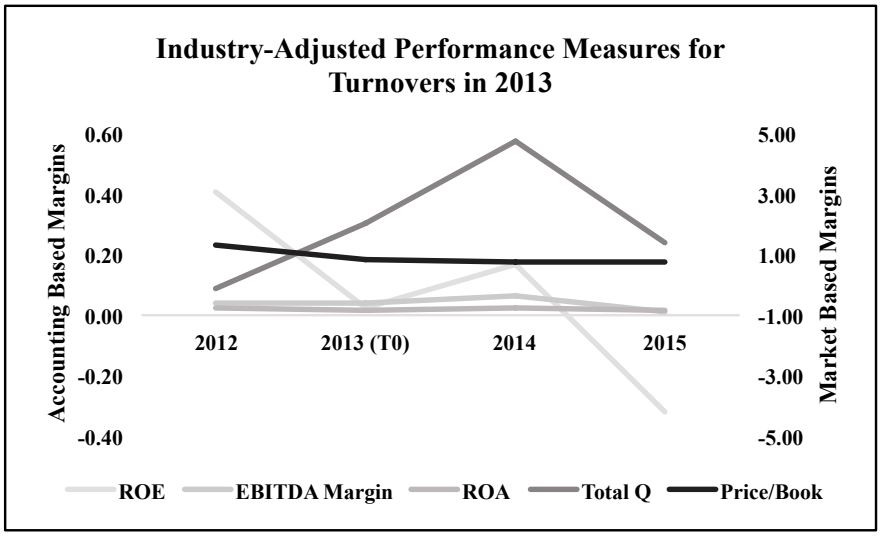
Looking at the Table 10 and Figure 12 representing turnovers in 2013, we see that the values for 2016 are 0 all together. This is as previously mentioned because of data not accessible for this year. This means one less year of analysis for these turnovers. From the table and figure, we can see that the Total Q ratio, ROA and ROE fluctuate largely on a year to year basis. There are no signs of stable patterns going forward. The Total Q ratio has however increased to being positive looking at the whole period of measurement all together, ending up at a value of 1.43 in 2015. The mean of the industry-adjusted EBITDA margin increased by 50% the first year following turnover,

TABLE 10: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2013

Industry-Adjusted Performance Measures for Turnovers in 2013

Year	Total Q	ROE	EBITDA Margin	ROA	Price/Book
2012	-0.15	0.78	0.04	-0.01	1.29
2013 (T0)	2.04	0.11	0.04	-0.02	0.85
2014	4.77	0.41	0.06	-0.01	0.75
2015	1.43	-0.13	0.01	-0.03	0.74
2016	0.00	0.00	0.00	0.00	0.00

FIGURE 12: INDUSTRY-ADJUSTED PERFORMANCE MEASURES FOR TURNOVERS IN 2014



however declining by 83% the following year. The findings from this sample of turnovers fall well in line with the first hypothesis of the thesis.

6.2 Results of Compensation Effects on Firm Performance (Hypothesis 2)

This chapter presents the results-analyses connected to the second hypothesis of the thesis. Section 6.2.1 seeks to capture common effects shared among all regression methodologies. The focus moves then over to each individual regression model, trying to capture regression-specific results. Section 6.2.2, 6.2.3 and 6.2.4 contain analyses of OLS model one, two and three respectively. Section 6.2.5 and 6.2.6 addresses the fixed effects and random effects models.

6.2.1 The Big Picture: Observing All Four Regression-Methodologies Collectively

Looking at all five regression analyses in Tables 11,12,13,14 and 15 collectively in this chapter, we register that the positive coefficient of **(1)** *Option Grants (%)* on industry-adjusted ROA is something that emerge in all regressions. This finding is something that argues in the direction that increasing the relative fraction of *Options Grants (%)* for CEOs soon after their employment, could lead to increased industry-adjusted ROA for the sample companies (holding every other variable constant). The coefficient show significance at 10% level in the OLS model 3, fixed effects model and random effects model respectively. A higher ROA could mean that the CEOs are motivated to affect the EBIT results of the companies for the better.

Similar to the unambiguous relationship between *Option Grants (%)* and Industry-Adjusted ROA, we see a **(2)** repeating positive relationship between *New Stock Grants (%)* and the price-to-book ratio for all methodologies assessed. The coefficient on stock grants show positive signs, being significant at 5% level in the random effects model. The relationship indicates that an increase in option grants as a fraction of total compensation in year one post-turnover, could lead to an increase in price-to-book, ceteris paribus. In this way, it seems as though increasing the fraction of option grants early after employment leads to increased price-to-book ratios for the sample companies. This could indicate that the market reacts

positively to the fact that the new CEO is provided with more option grants. Increased provision of such grants to a CEO could provide a signal that the company believes in both the manager and the future prospects of the firms, and might therefore create increased consensus regarding equity value.

Focusing on the sign of the coefficients of the different incentive-based compensation components, and not so much on significance, we can see **(3)** that several of them provide positive relationships to the accounting-based performance measures. *New Stock Grants (%)* provide positive signs for all five regressions when regressed on industry-adjusted ROA. Neither of the five regressions provide significant values for the relation. Nevertheless, being positive in all five is an interesting finding. This could imply that providing CEOs with new stock grants might cause effects on the returns to assets. One of the reasons why boards include new equity in CEO compensation in the first place is that it hopefully motivates the company CEOs to affect company performance.

Common relationships regarding coefficient signs are also found between **(4)** *New Stock Grants (%)* and industry-adjusted ROE for the sample companies. These are positive for four out of five regressions tested (all except the two-year lag OLS model), indicating that the increase of new stock grants as a fraction of total compensation could increase the performance measure. This could also be interpreted as providing short term effects, as the longer lagged model is not consistent. ROE is as previously mentioned dependent on earnings in the nominator, which essentially means that the increased value of ROE suggests that the companies create better bottom-line results. Such an improvement often comes from companies improving their revenues, or reducing their costs. There are many ways management can facilitate such a change. Examples of these are improved production, increased prices, lower interest payments and so on. The already existing fraction of CEO ownership seem to affect the marked-based measure of Total Q negatively. The variable *Stock Owned by CEO (%)* provides large negative coefficients, indicating that the existing ownership of the CEOs have a decreasing impact on the market value of total capital for the sample companies.

Observing the four shared findings above, we learn that equities as incentive-based compensation factors seems to explain performance well in different ways. Their significant values support the results from those of Blackwell et al. (2007), Mehran (1995) as well as Jensen & Murphy (1990) among others.

6.2.2 Results of One-Year Effects Using OLS Model 1

The following section presents the results connected to OLS model 1. In other words, to see effects of incentive-based compensation from year one post-turnover on industry-adjusted performance in year two post turnover individually.

Accounting Based Performance

From the regressions in Table 11, we can see that the variable *Option Grants (%)* produces a significant coefficient on the EBITDA margin at 1% level, providing a value of 0.212. Essentially, this means that looking at this regression model individually, and holding every other variable constant, an increase in the proportion of option grants in year one after turnover should lead to an increase in the industry-adjusted EBITDA margin for the companies on average in year two after turnover. The operating profitability of the sample companies seem in other words improved relative to their peer groups looking at the results between year one and two after turnover. Such short-term effects of compensation provide valuable information to company remuneration boards, when deciding upon compensation during recessions. The relationship supports the second hypothesis as it indicates a positive relation between incentive-based compensation and firm performance. More specifically, it seems that providing CEO with relatively higher fraction of options lead companies to having higher profitability on the money earned from their sales. The finding further supports those of Mehran (1995).

We can further observe the positive significant relationship of *Option Grants (%)* on the industry-adjusted ROE at 10% level. The variable returns a coefficient of 0.537, which essentially pulls in the direction that increasing the proportion of CEO option grants in year one by one percentage point, leads to the increase in the ROE ratio of 0.573 percentage points, holding every other variable constant. Receiving option grants might motivate the CEOs into providing solid results for the company, creating increased earnings to the equity of the shareholders. This falls otherwise also in line with the second hypothesis of the thesis. We saw in the *Data* section that a change in ROE can be caused by different actions. It could be caused by an increase in the net profit margin, asset turnover etc.

An interesting relationship with regards to the accounting-based measures is the strong negative relationship between the age-dummy and industry-adjusted ROA. We see specifically that the coefficient returns a negative value of 0.0312, being significant at 1% level. This could be interpreted in the way that the CEOs above 60 years of age provide lower

returns to the company assets, compared to the CEOs below 60 years of age. This might appear as a result of horizon issues as mentioned in Section 5.2.4. Older CEOs might suffer a lack of motivation as a result of being close to retirement, and thereby struggling to help improve the returns to the company assets.

MARKET-BASED PERFORMANCE

There are no significant relationships between incentive-based compensation factors and market-based performance measures, observing the regression outputs in Table 11. We see however that *R&D/Sales* provide a highly significant correlation with firm price-to-book ratio. The relationship can be caused by the market reacting negatively on increased R&D spending the previous year. This might be because of the economic shape of the sample companies, or the fact that the market thinks that the timing of high R&D spending is not the best. We can further observe a positive significant relationship between the *LT-Debt*/*Total Assets*-variable and the Total Q. This might indicate that the increasing use of debt in year one post-turnover leads to higher short-term market consensus of total assets of the firm the following year (holding every other variable constant). Increasing the debt levels might indicate that the sample companies have exciting projects under development that could improve the capital of the firm.

Another interesting finding is the negative coefficient related to the departure-dummy on company Total Q. This essentially tells us that forcing the outgoing CEO out of the office, provide negative impacts on the company results in year two post-turnover. It could be that the market reacts negatively to such a decision, and adjust their expectations to the value of total capital down. We can further see that the age-dummy provides a negative coefficient when regressed on Total Q. This suggests that having a CEO older than 60 years old, leads to lower Total Q values, all else equal. The market might interpret the total value of a company, of having such a CEO, as lower than the stated book values. The significance level is restricted to 10%, which essentially means that the correlation is not very strong in this case.

TABLE 11: OLS MODEL 1 REGRESSION. FULL SAMPLE

	Dependent Variables: Industry-Adjusted Performance Measures				
Lagged Independent Variables and Dummies	(1) ROE (T0+2)	(2) ROA (T0+2)	(3) EBITDA Margin (T0+2)	(4) Total Q (T0+2)	(5) Price/Book (T0+2)
New Stock Grants (%)	0.390	0.0130	0.0856	1.347	1.206
	(0.376)	(0.0240)	(0.0645)	(2.087)	(0.788)
Option Grants (%)	0.573*	0.0409	0.212***	0.516	-1.197
	(0.321)	(0.0298)	(0.0751)	(2.534)	(0.770)
Bonus (%)	-0.331	-0.0134	0.0262	4.264	1.340
	(0.780)	(0.124)	(0.178)	(9.021)	(1.582)
Stock Owned by CEO (%)	3.352	-0.200	0.162	-51.53	-5.503
	(2.570)	(0.243)	(0.330)	(32.32)	(3.868)
Ln (Total Assets)	0.147	0.00351	0.0110	-0.569	0.0341
	(0.120)	(0.00506)	(0.0130)	(0.345)	(0.0784)
R&D/Sales	-1.242	0.00948	-1.259***	-1.445	-2.157***
	(1.639)	(0.0840)	(0.423)	(1.040)	(0.597)
LT-Debt/Total Assets	0.235	0.0439	0.0512	3.166*	-1.212
	(0.298)	(0.0340)	(0.0431)	(1.729)	(0.770)
Departure-Dummy	0.214	-0.0105	0.0398	-1.580*	-0.215
	(0.176)	(0.0198)	(0.0607)	(0.830)	(0.476)
Recruiting-Dummy	-0.119	-0.0153	-0.0316	-0.342	-0.515
	(0.123)	(0.0198)	(0.0396)	(0.926)	(0.686)
Age-Dummy	-0.0606	-0.0312***	-0.0377	-1.961*	-0.0477
	(0.0999)	(0.0109)	(0.0230)	(1.159)	(0.366)
Gender-Dummy	-0.0727	-0.00923	-0.0266	1.198*	-0.0786
	(0.138)	(0.0181)	(0.0419)	(0.677)	(0.751)
CapEx/Total Assets	-2.762	0.0670	-1.453**	-8.568	1.245
	(1.894)	(0.177)	(0.662)	(14.57)	(3.817)
Acquisition/Total Assets	1.061*	0.116*	0.284*	-1.520	1.935
	(0.624)	(0.0629)	(0.156)	(3.219)	(3.042)
Intercept	-1.229	-0.00716	0.0154	4.322	1.045
	(1.102)	(0.0545)	(0.134)	(3.111)	(0.888)
Observations	636	636	635	243	499

Heteroscedasticity-consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10. The dependent variables represent industry-adjusted performance measures as measured in year two after turnover. The independent and control variables are lagged by one year in attempt to measure the effects of compensation and firm characteristics on the performance measures. All data are retrieved from WRDS Database. Regressions performed using Stata.

6.2.3 Results of One-Year Effects Using OLS Model 2

Accounting-Based Performance

From Table 12 on the next page, we see that the positive relationship between *Option Grants (%)* and the EBITDA margin is the only one being significant when looking at the incentive-based compensation factors of the regressions conducted. This is a similar finding to the first OLS model, however now only showing significance at 5% level. The coefficient can be interpreted as providing the CEOs with extra option grants in the second year of employment leads to the increase of EBITDA returns to sales of the company in year three after the turnover. This means that the CEOs might be motivated to affect firm performance positively regardless of the year in which they are received. A second finding, looking the Table 12 is that *Bonus (%)* provide negative coefficients on all accounting-based measures. In this way, it seems as though increasing the amount of bonus for the incoming CEOs in their second year of employment, provide negative impact on the accounting performance of the firms. It must be kept in mind that bonus was one of the compensation factors that contained the lowest share of total compensation for the sample incoming CEOs (Table 3). It might therefore be that the CEOs react negatively from being provided with such a low share of bonus. Looking further down the table, we see that *R&D/Sales* captures a lot of explanatory power for the accounting-based measures. Being positive and significant at 1% level confirms this.

Market-Based Performance

The regression model does not provide any significant relationships among marked-based measures and incentive-based compensation. We can observe however the negative impact on both Total Q and price-to-book from *Option Grants (%)*. Hence, it seems as though providing the CEOs with extra options in the second year of employment might lead to decreasing marked-based performance measures in year three post-turnover. This implies that the market values in both cases turn relatively lower compared to the book values, holding every other variable constant. It could be that the market believes that providing the CEO with such incentives in the second year, will lead to a manager that does not perform to the best of the firm. This might result in the reduced market values relative to book values of the companies.

TABLE 12: OLS MODEL 2 REGRESSION. FULL SAMPLE.

Dependent Variables: Industry-Adjusted Performance Measures

Lagged Independent Variables and Dummies	(1) ROE (T0+3)	(2) ROA (T0+3)	(3) EBITDA Margin (T0+3)	(4) Total Q (T0+3)	(5) Price/Book (T0+3)
New Stock Grants (%)	0.169	0.0234	0.0764	-1.133	1.540
	(0.263)	(0.0277)	(0.0629)	(3.746)	(1.227)
Option Grants (%)	-0.0733	0.0528	0.157**	-0.0623	-0.893
	(0.325)	(0.0343)	(0.0777)	(4.079)	(1.494)
Bonus (%)	-0.283	-0.0785	-0.0635	-9.213	3.131
	(0.596)	(0.0627)	(0.142)	(6.472)	(2.658)
Stock Owned by CEO (%)	-0.273	0.196	0.569	-42.26	5.150
	(2.653)	(0.279)	(0.634)	(48.29)	(11.35)
Ln (Total Assets)	-0.0212	0.00325	0.0147**	-0.617	-0.102
	(0.0306)	(0.00322)	(0.00731)	(0.409)	(0.135)
R&D/Sales	0.892***	0.0727***	0.318***	-0.953	-1.302
	(0.206)	(0.0217)	(0.0492)	(1.651)	(0.818)
LT-Debt/Total Assets	0.370*	0.0440*	0.0892*	2.759	1.448
	(0.223)	(0.0234)	(0.0532)	(2.154)	(1.318)
Departure-Dummy	0.592***	-0.0178	-0.0248	-0.829	-0.287
	(0.205)	(0.0216)	(0.0490)	(1.985)	(0.855)
Recruiting-Dummy	-0.106	0.00919	-0.00141	0.552	-0.355
	(0.158)	(0.0167)	(0.0378)	(2.118)	(0.672)
Age-Dummy	-0.00635	-0.0178	-0.00301	-2.680	-0.804
	(0.138)	(0.0145)	(0.0329)	(2.001)	(0.602)
Gender-Dummy	0.0205	-0.00548	-0.0341	1.453	-0.395
	(0.203)	(0.0214)	(0.0485)	(2.671)	(0.859)
CapEx/Total Assets	0.0140	0.102	-0.606**	-13.67	-1.631
	(1.051)	(0.111)	(0.251)	(19.81)	(4.924)
Acquisitions/Total Assets	0.0304	0.188**	0.452**	-7.947	-4.961
	(0.903)	(0.0951)	(0.216)	(14.25)	(3.661)
Intercept	0.153	-0.0414	-0.0939	5.434	2.163
	(0.354)	(0.0372)	(0.0845)	(5.028)	(1.506)
Observations	459	459	459	148	365

Heteroscedasticity-consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.01. Dependent variables represent industry-adjusted performance measures as measured in year three post-turnover. Independent and control variables are lagged on year in an attempt to measure effects of compensation and firm characteristics on firm industry-adjusted performance. All data are retrieved from WRDS. Stata is used to perform the regressions.

6.2.4 Results of Two-Year Effects Using OLS Model 3

Accounting-Based Performance

Observing Table 13 below, and the two-year effects, we see that *Option Grants (%)* provide a positive significant relationship to industry-adjusted ROA. The coefficient is significant at 10% level, and provides a positive coefficient of 0.0589. This means that providing the sample CEOs with option grants in their first year of employment provides effects on the company ROA two years after, holding every other variable constant. This is an interesting finding, as it seems that providing CEOs with option grants early after employment, can lead to long-term motivational effects. The ROA is, as mentioned, measured by having EBIT in the numerator. The effects relate more specifically to the motivation of managers to affect the operating profitability of the sample companies before the deduction of tax has been made. We can further see that the growth proxy (R&D/Sales) provides highly significant effects to the accounting-based measures of the sample firms. In this way, it seems as though increasing the use of surplus from sales on R&D in the first year after turnover leads to increasing accounting measures the following year. We can observe that the return on equity is the one most highly affected by the growth proxy, providing a positive coefficient of 1.534. In this way, an increase in the R&D/Sales in the first year of CEO employment leads to ROE increasing by 1.534 percentage points two years after. Another interesting finding is the highly significant coefficient on the departure-dummy. The dummy takes a value of 0.570 indicating that forced turnovers lead to higher returns to equity, compared to having voluntary turnovers.

Market-Based Performance

Observing the market-based performance measures, we see that the size dummy (*Ln (Total Assets*)) is the only one providing a significant coefficient. The coefficient is significant at 5% level providing a negative value of 0.881 in the regression including Total Q. This in turn could mean that increasing the total assets of the firm leads to negative Total Q two years after. It seems as though the market reacts negatively by the fact that the firms increase their size in this time period. They believe in other words that the value of total capitalization of the firms actually is less than the book value.

TABLE 13: OLS MODEL 3 REGRESSION. FULL SAMPLE.

Dependent Variables: Industry-Adjusted Performance Measures

Lagged Independent Variables and Dummies	(1) ROE (T0+3)	(2) ROA (T0+3)	(3) EBITDA Margin (T0+3)	(4) Total Q (T0+3)	(5) Price/Book (T0+3)
New Stock Grants (%)	-0.104	0.00759	0.0245	4.748	0.227
	(0.245)	(0.0264)	(0.0582)	(3.580)	(1.069)
Option Grants (%)	-0.344	0.0589*	0.0827	0.704	-0.814
	(0.318)	(0.0342)	(0.0755)	(4.189)	(1.389)
Bonus (%)	-0.458	-0.00768	0.0167	-7.835	3.450
	(0.584)	(0.0628)	(0.138)	(6.202)	(2.667)
Stock Owned by CEO (%)	-0.767	-0.0141	0.0757	-38.64	3.526
	(2.747)	(0.296)	(0.652)	(60.14)	(11.08)
Ln (Total Assets)	-0.00567	0.00387	0.0154**	-0.881**	-0.00558
	(0.0307)	(0.00330)	(0.00728)	(0.418)	(0.128)
R&D/Sales	1.534***	0.169***	0.683***	-1.626	-2.343
	(0.377)	(0.0406)	(0.0895)	(3.158)	(1.500)
LT-Debt/Total Assets	0.473**	0.0434*	0.0920*	2.946	1.036
	(0.230)	(0.0248)	(0.0546)	(2.279)	(1.310)
Departure-Dummy	0.570***	-0.0172	-0.0264	-0.772	-0.178
	(0.206)	(0.0222)	(0.0489)	(1.991)	(0.828)
Recruiting-Dummy	-0.0972	-0.00424	-0.0178	0.314	-0.298
	(0.156)	(0.0168)	(0.0371)	(2.189)	(0.648)
Age-Dummy	-0.0465	-0.0127	-0.00139	-2.292	-0.736
	(0.136)	(0.0146)	(0.0323)	(1.994)	(0.581)
Gender-Dummy	0.000494	-0.0141	-0.0360	1.143	-0.347
	(0.211)	(0.0227)	(0.0500)	(2.716)	(0.855)
CapEx/Total Assets	-0.143	0.206*	-0.333	-20.39	-2.118
	(1.082)	(0.116)	(0.257)	(21.73)	(4.912)
Acquisition/Total Assets	-0.397	0.108	0.189	-4.911	2.641
	(0.780)	(0.0839)	(0.185)	(10.92)	(3.995)
Intercept	0.166	-0.0282	-0.0696	6.116	1.672
	(0.361)	(0.0388)	(0.0856)	(5.162)	(1.428)
Observations	462	462	462	145	381

Heteroscedasticity-consistent standard error in parenthesis. ***p<0.01, **p<0.05 *p<0.10. Dependent variables represent industry-adjusted performance measures in year three post-turnover. Independent and control variables are lagged two years, in an attempt to measure effects of compensation and firm characteristics on the performance measures. All data are retrieved from WRDS. Stata is used to perform regressions.

6.2.4 Results of Compensation Effects Using Random Effects Model

Accounting-Based Performance

Looking at the random effects model in Table 14 on the next page, we can see that *Option Grants (%)* is the only variable that creates a significant coefficient, when regressed on the accounting-based measures. The coefficient is significant at 10% level on the industry-adjusted ROA, providing a coefficient of 0.0250. This means that providing the CEOs with one percentage point extra of *Option Grants* leads to an increase in the industry-adjusted ROA by 0.0250 percentage points (holding every other variable constant) the next year. We can again see that the growth proxy (R&D/sales) captures most of the explanation, providing positive significance at 1% level. Essentially, it seems that the accounting-based ratios are largely affected by the use of R&D expenditures the previous year. We can again observe the negative relationship between the age-dummy and the ROA, implying that the CEOs over 60 provide lower returns to the company assets compared to the CEOs younger than 60. The growth- and size proxy provide us with highly significant positive coefficients moving forward.

Market-Based Performance

I find a strong positive relationship between *New Stock Grants (%)* and P/B looking at the market-based performance measures. The relationship is significant at 5% level, and provides a coefficient of 1.273. In other words, increasing the fraction of new stock grants as a share of total compensation seems to make a positive impact on the price-to-book value the following year for the sample companies (holding every other variable constant) An increasing price-to-book can be caused by the market obtaining higher expectations for the value of equity on short term. Providing CEO with extra stock grants might indicate that the company believes in the manager and future prospects of the firm. We can additionally see that *Bonus (%)* provides a positive significant relationship to Total Q. The coefficient is significant at 10% level, taking a value of 5.207. In other words, increasing the amount of bonus for the CEOs seems to increase Total Q, ceteris paribus.

TABLE 14: RANDOM EFFECTS REGRESSION. FULL SAMPLE

	Dependent Variables: Industry-Adjusted Performance Measures				
Lagged Independent Variables and Dummies	(1) ROE (+2,+3)	(2) ROA (+2,+3)	(3) EBITDA Margin (+2,+3)	(4) Total Q (+2,+3)	(5) Price/Book (+2,+3)
New Stock Awards (%)	0.238	0.0136	0.0216	0.606	1.273**
	(0.240)	(0.0120)	(0.0391)	(1.374)	(0.527)
Option Awards (%)	0.387	0.0250*	-0.0293	0.360	-0.439
	(0.304)	(0.0150)	(0.0490)	(1.636)	(0.700)
Bonus (%)	0.0418	0.0299	-0.0161	5.207*	0.726
	(0.616)	(0.0316)	(0.103)	(2.973)	(1.344)
Stock Owned by CEO (%)	3.522	-0.131	0.397	-35.77	-3.128
	(3.435)	(0.206)	(0.673)	(33.13)	(6.381)
Ln (Total Assets)	0.145***	0.00514*	0.0436***	-0.457*	0.0321
	(0.0465)	(0.00291)	(0.00953)	(0.246)	(0.0910)
R&D/Sales	2.406***	0.153***	1.586***	-0.398	-0.875
	(0.347)	(0.0183)	(0.0598)	(1.173)	(0.651)
LT-Debt/Total Assets	0.279	0.0427**	0.128**	3.368**	-0.218
	(0.331)	(0.0199)	(0.0651)	(1.532)	(0.771)
Departure-Dummy	0.467	-0.00808	0.0447	-1.422	-0.250
	(0.375)	(0.0240)	(0.0786)	(1.424)	(0.677)
Recruiting-Dummy	-0.172	-0.0172	-0.0649	-0.423	-0.253
	(0.264)	(0.0169)	(0.0555)	(1.332)	(0.507)
Age-Dummy	-0.0164	-0.0199*	0.0166	-1.439	-0.169
	(0.186)	(0.0103)	(0.0336)	(1.117)	(0.394)
Gender-Dummy	-0.158	-0.0135	-0.0838	0.908	-0.174
	(0.353)	(0.0225)	(0.0738)	(1.796)	(0.670)
CapEx/Total Assets	-0.972	-0.0503	-0.803***	-4.722	0.608
	(1.503)	(0.0856)	(0.280)	(10.95)	(3.232)
Acquisitions/Total Assets	0.205	0.0140	0.0368	-1.370	-0.661
	(0.657)	(0.0316)	(0.103)	(3.806)	(1.440)
Intercept	-1.206**	-0.0145	-0.248**	3.521	0.767
	(0.575)	(0.0362)	(0.119)	(3.080)	(1.083)
Observations	1095	1095	1094	391	864

Standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10. Dependent variables represent industry-adjusted performance measures from year two and three post-turnover. Dependent variables are lagged by one year respectively. All data used are retrieved from WRDS. Stata is used to perform the regressions.

6.2.5 Results of Compensation Effects Using Fixed Effects Model

Accounting-Based Performance

Taking a specific look at the accounting-based performance measures in Table 15, we can observe the positive correlation between *Option Grants (%)* and the industry-adjusted ROE. This is something that was additionally found in the first OLS model in Section 6.2.2. The coefficient takes a value of 0.760 this time, which indicates that increasing the relative fraction of option grants by one percentage point, could lead to the increase in ROE by 0.760 percentage points the following year (holding every other variable constant). Being provided with new equity grants seems in other words to motivate the managers to affect the returns to shareholders equity. The *Option Grants (%)* variable causes a positive relationship to the ROA additionally. Being significant at 10% level, and providing a coefficient of 0.0275 indicates that increasing the option awards as a share of total compensation, ceteris paribus, leads to the increase of ROA by 0.0275 percentage points. It seems otherwise as the *R&D/Sales* variable explains a lot of the change in the accounting-based performance measures. The control variable provides positive coefficients for all accounting-based ratios at 1% level, indicating that spending the company revenue on R&D early after a new CEO appointment leads to the increase of operating performance, as well as bottom-line performance.

Market-Based Performance

From Table 15, we can again see the positive relationship between *Bonus (%)* and Total Q, strengthening the findings of the random effects model. The significance level is now at 5%, being stronger compared to the 10% relationship found previously. The price-book ratio provides no significant relationships to the explanatory variables moving forward. Focusing on the signs, we can see that *New Stock Grants (%) and Option Grants (%)* both provide positive coefficients with respect to Total Q and price-to-book, indicating that they both should have positive impacts on the marked-based performance measures. It is however difficult to draw any conclusions as they are not significant in value. The same can be said about the control variables *LT-Debt/Total Assets* and the age-dummy.

TABLE 15: FIXED EFFECTS REGRESSION. FULL SAMPLE

	Dependent Variables: Industry-Adjusted Performance Measures				
Lagged Independent Variables and Dummies	(1) ROE (+1,+2)	(2) ROA (+1,+2)	(3) EBITDA Margin (+1,+2)	(4) Total Q (+1,+2)	(5) Price/Book (+1,+2)
New Stock Grants (%)	0.0560	0.0102	-0.0233	0.686	0.958
	(0.290)	(0.0133)	(0.0325)	(1.686)	(0.667)
Option Grants (%)	0.760**	0.0275*	0.0425	0.227	0.297
	(0.359)	(0.0165)	(0.0403)	(2.174)	(0.892)
Bonus (%)	0.327	0.0564	-0.0925	9.205**	-0.432
	(0.805)	(0.0370)	(0.0905)	(3.782)	(1.835)
Stock Owned by CEO (%)	4.298	-0.0895	-0.375	-11.48	2.357
	(9.475)	(0.436)	(1.065)	(62.49)	(20.90)
Ln (Total Assets)	-0.701**	0.0203	0.0823**	-0.545	0.228
	(0.306)	(0.0141)	(0.0344)	(1.486)	(0.717)
R&D/Sales	4.733***	0.204***	2.524***	-0.216	0.156
	(0.487)	(0.0224)	(0.0548)	(1.665)	(0.981)
LT-Debt/Total Assets	-0.596	-0.0113	-0.0385	6.818	0.271
	(0.927)	(0.0426)	(0.104)	(4.878)	(2.228)
Departure-Dummy	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
Recruiting-Dummy	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
Age-Dummy	-0.0251	-0.0148	0.0147	0.0620	0.301
	(0.312)	(0.0144)	(0.0351)	(2.445)	(0.792)
Gender-Dummy	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
CapEx/Total Assets	1.770	-0.187	-0.705**	-8.891	-2.409
	(2.865)	(0.132)	(0.322)	(31.61)	(7.065)
Acquisitions/Total Assets	0.663	-0.00648	-0.00786	-1.780	-0.799
	(0.748)	(0.0344)	(0.0841)	(4.887)	(1.745)
Intercept	5.371**	-0.149	-0.680**	3.449	-1.327
	(2.430)	(0.112)	(0.273)	(12.16)	(5.744)
Observations	1095	1095	1094	391	864

Standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10. Dependent variables represent industry-adjusted performance measures from year two and three post-turnover. Independent variables are lagged one year respectively in an attempt to measure effects of year one explanatory variables on year two dependent variables, as well as year two explanatory variables on year three dependent variables.

6.3 Results of Compensation Effects on Firm Performance – Comparing Low Ownership CEOs to High Ownership CEOs

This section seeks to answer the third hypothesis of the thesis, taking a thorough look at low ownership CEOs of the sample, while comparing to high ownership CEOs. Section 6.3.1 provides an overview of the trends when looking at the regression models connected to low ownership CEOs. Section 6.3.2 digs deeper into the regression models connected to high ownership CEOs, comparing to the sample of low ownership consecutively.

6.3.1 Low Ownership CEOs

Accounting-Based Performance

Observing the regression Tables 16,17 and 18 we can see that there are several relationships between incentive-based compensation factors and performance measures that are shared with respect to signs and significance among the different regression models. An interesting finding is the positive relationship between *New Stock Grants (%)* and the EBITDA margin. The variable returns positive coefficients for all regression models, being significant at 10% level in the second OLS. This relationship aligns well with the third hypothesis indicating that CEOs with ownership lower than 5% in the firm, are motivated to affect firm performance, being provided with new equity. In this case, it seems as though receiving the grants in the second year of employment is the best with respect to timing. The results align well with those of Blackwell et al. (2007), Mehran (1995) and others. From Table 3, we learned also that low ownership CEOs are being provided more new equity grants relative to high ownership CEOs, which could also play a part in these results.

Observing effects on accounting based-measures further, we can see that *Stock Owned by CEO (%)* provide negative relationships to company industry-adjusted ROA, being significant in two out of three models. The first OLS model provides a negative coefficient of 1.861 at 5% level of significance, while the third OLS model produce a negative relationship at 1.762. In this way, it seems as though the already existing low ownership of the CEOs in year one after turnover have both short-term and long term negative effects on the industry-adjusted ROA. Having low ownership in the firm might be a demotivating factor for the CEOs, providing worse results for the company.

Providing the CEOs with more option grants in year one after turnover seems on the other hand to provide positive effects on the industry-adjusted ROA, as well as EBITDA margin.

The effects on the EBITDA margin are strongest in the first OLS model, which indicates that it might be smart to provide the grants in the first year of performance in order to capture positive short-term effects. The coefficient is significant at 5% level in the second OLS, while it seems to fade out in the third. The effects on ROA is only significant in the second OLS model providing significance at 5% level.

MARKET-BASED PERFORMANCE

Taking a specific look at the market-based measures in Table 16,17 and 18, we can see that *Stock Owned by CEO (%)* returns negative coefficients on the price-to-book ratio for all regression methodologies conducted. The variable is significant in the first and second OLS model, indicating that this relationship provides both short-term and long-term effects. Having low ownership in the company in year one after turnover, seems in other words to create reduced price-to-book ratios for the sample companies in the second and third year after turnover respectively (holding every other variable constant). It might be that the market anticipates that a low ownership CEO might be less motivated to improve the results of the firm. In this way, the market value of equity falls to lower levels.

A similar relationship is found between CEO option grants and the price-to-book ratio, being negative in all three regression models. The relationship is significant at 10% level in the first regression model, indicating that there are short-term effects between year one and year two. Essentially, providing company CEOs with more option grants in their first year of employment seem to decrease the price-to-book ratios of the sample firms the following year. We can observe that *R&D/Sales* obtain negative coefficients in both regression models being significant at 1% level on P/B in all three. In this way, we are provided with information that hiring a low ownership CEO and increasing the R&D expenditures from company revenue early after employment, leads to a decrease in the price-to-book ratio. It seems like the combination leads to the market providing lower expectations to the company equity compared to the book values on both short-term and long-term. Another finding with regards to firm characteristics and market-based measures is the relationship between long term debt and firm Total Q. Thus, increasing the debt-levels early after employment for the new CEO seems to provide positive reactions by the market, holding every other variable constant.

TABLE 16: OLS MODEL 1 REGRESSION. LOW OWNERSHIP SAMPLE.

	Dependent Variables: Industry-Adjusted Performance Measures				
Lagged Independent Variables and Dummies	(1) ROE (T0+2)	(2) ROA (T0+2)	(3) EBITDA Margin (T0+2)	(4) Total Q (T0+2)	(5) Price/Book (T0+2)
New Stock Grants (%)	0.408	0.0188	0.0969	1.401	1.234
	(0.403)	(0.0247)	(0.0684)	(2.219)	(0.853)
Option Grants (%)	0.494	0.0364	0.243***	0.620	-1.659*
	(0.343)	(0.0309)	(0.0810)	(2.593)	(0.848)
Bonus (%)	-0.476	-0.0295	0.0332	5.287	1.448
	(0.758)	(0.128)	(0.185)	(9.565)	(1.633)
Stock Owned by CEO (%)	14.73	-1.861**	-2.125	-115.4	-29.18*
	(14.98)	(0.726)	(1.628)	(71.07)	(17.23)
Ln (Total Assets	0.169	0.000807	0.00637	-0.658*	-0.0124
	(0.143)	(0.00542)	(0.0139)	(0.389)	(0.0905)
R&D/Sales	-1.181	0.00238	-1.286***	-1.551	-2.252***
	(1.649)	(0.0851)	(0.417)	(1.136)	(0.638)
LT-Debt/Total Assets	0.199	0.0496	0.0594	3.272*	-1.234
	(0.285)	(0.0332)	(0.0447)	(1.815)	(0.807)
Departure-Dummy	0.229	-0.0148	0.0349	-1.666*	-0.211
	(0.198)	(0.0197)	(0.0608)	(0.878)	(0.503)
Recruiting-Dummy	-0.137	-0.0126	-0.0198	-0.264	-0.543
	(0.139)	(0.0202)	(0.0397)	(1.021)	(0.707)
Age-Dummy	-0.0654	-0.0307***	-0.0412*	-1.915	-0.162
	(0.0941)	(0.0108)	(0.0235)	(1.182)	(0.383)
Gender-Dummy	-0.0804	-0.00432	-0.0192	1.310*	-0.117
	(0.154)	(0.0178)	(0.0422)	(0.730)	(0.761)
CapEx/Total Assets	-2.865	0.0318	-1.564**	-10.90	0.913
	(1.996)	(0.181)	(0.692)	(16.28)	(4.033)
Acquisitions/Total Assets	1.238**	0.180**	0.416**	-1.229	1.918
	(0.558)	(0.0726)	(0.177)	(3.696)	(3.251)
Intercept	-1.424	0.0146	0.0397	5.118	1.696*
	(1.313)	(0.0564)	(0.138)	(3.522)	(1.006)
Observations	606	606	606	235	470

Table 16 shows the outputs from regression model 1 applied on the low ownership sample of CEOs. Heteroscedasticity consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10.

TABLE 17: OLS MODEL 2 REGRESSION. LOW OWNERHIP SAMPLE

	Dependent Variables: Industry-Adjusted Performance Measures				
Lagged Independent Variables and Dummies	(1) ROE (T0+3)	(2) ROA (T0+3)	(3) EBITDA Margin (T0+3)	(4) Total Q (T0+3)	(5) Price/Book (T0+3)
New Stock Grants (%)	0.200	0.0282	0.0855*	-0.628	1.955
	(0.128)	(0.0268)	(0.0517)	(2.200)	(1.550)
Option Grants (%)	-0.0300	0.0624*	0.169**	0.109	-0.442
	(0.297)	(0.0362)	(0.0772)	(2.290)	(1.241)
Bonus (%)	-0.140	-0.0595	-0.0618	-9.482	4.621
	(0.250)	(0.0520)	(0.114)	(5.770)	(2.952)
Stock Owned by CEO (%)	-3.985	-0.678	-0.272	-91.44	-11.28
	(3.419)	(0.621)	(1.210)	(66.87)	(43.56)
Ln (Total Assets)	-0.0327	0.00208	0.0127	-0.716	-0.166
	(0.0420)	(0.00381)	(0.00890)	(0.512)	(0.134)
R&D/Sales	0.881	0.0727**	0.317***	-1.088	-1.417***
	(0.817)	(0.0344)	(0.0588)	(1.130)	(0.361)
LT-Debt/Total Assets	0.360	0.0486	0.0954**	2.761**	1.864
	(0.392)	(0.0477)	(0.0444)	(1.372)	(1.846)
Departure-Dummy	0.689	-0.0176	-0.0337	-1.209	-0.219
	(0.751)	(0.0138)	(0.0353)	(1.355)	(0.837)
Recruiting-Dummy	-0.136	0.00463	-0.00567	0.609	-0.434
	(0.0858)	(0.0144)	(0.0364)	(1.176)	(0.763)
Age-Dummy	-0.0154	-0.0183	-0.00809	-2.817	-0.905*
	(0.0919)	(0.0141)	(0.0329)	(2.074)	(0.477)
Gender-Dummy	0.0255	-0.00538	-0.0335	1.664	-0.414
	(0.0822)	(0.0208)	(0.0521)	(1.361)	(1.347)
CapEx/Total Assets	-0.240	0.0521	-0.684***	-18.65	-3.680
	(0.427)	(0.0918)	(0.233)	(24.10)	(5.285)
Acquisitions/Total Assets	-0.0499	0.193	0.461	-7.230	-6.697**
	(0.254)	(0.137)	(0.457)	(5.376)	(2.822)
Intercept	0.285	-0.0256	-0.0713	6.270	2.724*
	(0.257)	(0.0341)	(0.0812)	(4.379)	(1.516)
Observations	421	421	421	140	330

Heteroscedasticity-consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10. Dependent variables represent here the industry-adjusted performance measures of the sample companies. The independent variables are lagged by one year (i.e. represent year two post-turnover). Regression is produced using Stata.

TABLE 18: OLS MODEL 3 REGRESSION. LOW OWNERSHIP SAMPLE

Dependent Variables: Industry-Adjusted Performance Measures

Lagged Independent Variables and Dummies	(1) ROE (T0+3)	(2) ROA (T0+3)	(3) EBITDA Margin (T0+3)	(4) Total Q (T0+3)	(5) Price/Book (T0+3)
New Stock Grants (%)	0.0151	-0.00556	0.0411	5.023	0.0414
	(0.105)	(0.0252)	(0.0501)	(3.375)	(1.426)
Option Grants (%)	-0.323	0.0508	0.0999	1.263	-1.569
	(0.254)	(0.0356)	(0.0739)	(3.413)	(1.184)
Bonus (%)	-0.322	0.0176	0.0322	-7.882	4.007
	(0.325)	(0.0582)	(0.131)	(4.913)	(3.542)
Stock Owned by CEO (%)	-5.387	-1.762**	-1.960	-27.34	-57.16*
	(3.545)	(0.684)	(1.492)	(79.84)	(30.48)
Ln (Total Assets)	-0.0228	0.00275	0.0102	-0.898	-0.0858
	(0.0422)	(0.00425)	(0.0101)	(0.583)	(0.128)
R&D/Sales	1.543	0.175***	0.684***	-1.815	-2.427***
	(1.371)	(0.0651)	(0.174)	(1.469)	(0.793)
LT-Debt/Total Assets	0.476	0.0540	0.0954*	3.066**	1.339
	(0.417)	(0.0487)	(0.0534)	(1.474)	(1.907)
Departure-Dummy	0.669	-0.0192	-0.0416	-0.923	-0.423
	(0.751)	(0.0142)	(0.0364)	(1.330)	(0.842)
Recruiting-Dummy	-0.142*	0.00422	-0.00846	0.317	-0.270
	(0.0856)	(0.0140)	(0.0339)	(1.247)	(0.769)
Age-Dummy	-0.0340	-0.0188	-0.00312	-2.397	-0.865*
	(0.0934)	(0.0147)	(0.0303)	(1.641)	(0.480)
Gender-Dummy	-0.00254	-0.0106	-0.0317	1.175	-0.289
	(0.0736)	(0.0202)	(0.0514)	(1.113)	(1.203)
CapEx/Total Assets	-0.258	0.168	-0.465*	-22.31	-2.222
	(0.412)	(0.106)	(0.243)	(29.20)	(6.170)
Acquisitions/Total Assets	-0.399	0.211**	0.348	-4.470	5.696
	(0.614)	(0.0991)	(0.236)	(3.653)	(8.561)
Intercept	0.327	-0.0193	-0.0342	6.108	2.707**
	(0.295)	(0.0372)	(0.0844)	(4.720)	(1.233)
Observations	416	416	416	138	329

Heteroscedasticity-consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10. Dependent variables represent industry-adjusted performance measures from year three post-turnover. Independent variables are lagged by two years.

6.3.2 High Ownership CEOs

Accounting-Based Performance

Analyzing the Tables 19, 20 and 21 below, I find no evidence of shared significant relationships between the industry-adjusted performance measures and the incentive-based compensation factors. The different regression models differ highly and seems to create somewhat random results. This is something that contradicts the findings of the high ownership sample. Looking individually at the different regression methodologies, we can see that the first model produces 1% and 5% level significance from option grants on ROE and ROA respectively. The latter relationship was also found in the low ownership sample. We see further that *Bonus (%)* seems to cause positive correlation to ROE and ROA additionally. A positive significant relationship between *Stock Owned by CEO (%)* and ROE is also found. The second OLS model in Table 20 provide no significant relationships among compensation factors and performance, indicating that there are few effects from providing incentive-based compensation on performance for the sample companies from year two and year three respectively. Observing the third OLS model, I see a negative significant correlation between *New Stock Grants (%)* and ROE.

Market-Based Performance

Focusing on the market-based measures, I find a shared positive and significant relationship between *Bonus (%)* and price-to-book when looking at the first and the third OLS models in Table 19 and 21. In the first model, we see a positive coefficient of 63.24 being significant at 5% level. The third model yields a coefficient of 7.745 being significant at 5% level also. Both these models represent compensation factors from year one post-turnover for the sample CEOs, indicating that providing bonus to the new CEO in his or her first year of employment might provide positive short-term and long-term effects on the company Price-to-Book. Receiving bonus so early of their employment might indicate to the market that the manager and the firm is well governed, increasing the expectations from the market. The first and third model provide also positive coefficients of option grants on Price-to-Book, being significant in the first model. In a similar manner, it might cause the market to react positively with respect to the company outlooks.

TABLE 19: OLS MODEL 1. LOW OWNERSHIP SAMPLE

Dependent Variables: Industry-Adjusted Performance Measures

Lagged Independent Variables and Dummies	(1) ROE (T0+2)	(2) ROA (T0+2)	(3) EBITDA Margin (T0+2)	(4) Total Q (T0+2)	(5) Price/Book (T0+2)
New Stock Grants (%)	0.179	-0.00841	-0.0527	-0.0204	1.212
	(0.264)	(0.0673)	(0.0912)	(.)	(1.476)
Option Grants (%)	1.534***	0.206**	-0.0431	-4.482	2.776*
	(0.373)	(0.0951)	(0.130)	(.)	(1.576)
Bonus (%)	1.651*	0.784***	0.346	0	63.24**
	(0.894)	(0.228)	(0.307)	(.)	(25.48)
Stock Owned by CEO (%)	2.246**	0.116	0.362	0	-5.063
	(1.002)	(0.255)	(0.344)	(.)	(4.745)
Ln (Total Assets)	0.0479	0.0149	-0.00216	-0.249	0.259
	(0.0463)	(0.0118)	(0.0167)	(.)	(0.229)
R&D/Sales	1.557	0.308	0.547	0	6.806
	(2.367)	(0.603)	(0.815)	(.)	(5.168)
LT-Debt/Total Assets	1.100*	-0.145	0.108	2.582	-0.189
	(0.532)	(0.136)	(0.190)	(.)	(2.266)
Departure-Dummy	0	0	0	0	-0.619
	(.)	(.)	(.)	(.)	(1.954)
Recruiting-Dummy	0.264	-0.0443	-0.553***	0.0918	10.66*
	(0.333)	(0.0848)	(0.170)	(.)	(6.062)
Age-Dummy	-0.273	-0.0576	0.0195	-2.113	0.797
	(0.188)	(0.0480)	(0.0716)	(.)	(1.039)
Gender-Dummy	0	0	0	0	-10.48
	(.)	(.)	(.)	(.)	(6.372)
CapEx/Total Assets	0.783	1.194**	-0.715	0	7.097
	(1.722)	(0.439)	(0.716)	(.)	(8.545)
Acquisitions/Total Assets	-1.171	0.158	-0.308	-3.618	1.727
	(0.742)	(0.189)	(0.271)	(.)	(5.439)
Intercept	-1.166*	-0.157	0.575**	1.929	-3.272
	(0.591)	(0.151)	(0.269)	(.)	(2.006)
Observations	30	30	29	8	29

Heteroscedasticity-consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10. Dependent variables represent industry-adjusted performance measures from year two after turnover. Independent variables are lagged by one year. Missing numbers reflect too few observations.

TABLE 20: OLS MODEL 2. HIGH OWNERSHIP SAMPLE.

Dependent Variables: Industry-Adjusted Performance Measures

Lagged Independent Variables and Dummies	(1) ROE (T0+3)	(2) ROA (T0+3)	(3) EBITDA Margin (T0+3)	(4) Total Q (T0+3)	(5) Price/Book (T0+3)
New Stock Grants (%)	-0.459	0.0000402	0.0462	0.0673	-2.063
	(0.446)	(0.0878)	(0.149)	(.)	(3.575)
Option Grants (%)	0.0613	-0.0854	-0.0624	0	-2.113
	(0.526)	(0.0967)	(0.160)	(.)	(2.386)
Bonus (%)	0.206	-0.0678	0.163	-5.174	-0.458
	(0.721)	(0.166)	(0.312)	(.)	(3.742)
Stock Owned by CEO (%)	-1.923	-0.0146	0.0783	0	1.072
	(1.771)	(0.285)	(0.472)	(.)	(8.097)
Ln (Total Assets)	0.0311	-0.00255	0.0156	0.335	-0.0623
	(0.0289)	(0.00644)	(0.0125)	(.)	(0.295)
R&D/Sales	-0.623	-0.154	-0.0272	0	5.815
	(1.061)	(0.193)	(0.350)	(.)	(5.579)
LT-Debt/Total Assets	0.117	-0.0592	-0.0426	-0.0400	-0.683
	(0.345)	(0.0725)	(0.0966)	(.)	(2.701)
Departure-Dummy	-0.387	-0.0310	-0.0109	4.007	-0.191
	(0.248)	(0.0404)	(0.0841)	(.)	(1.148)
Recruiting-Dummy	0.380*	0.0715*	0.0748	4.016	0.976
	(0.212)	(0.0394)	(0.0620)	(.)	(0.893)
Age-Dummy	0.103	-0.0277	0.00707	-5.589	-0.00322
	(0.226)	(0.0279)	(0.0402)	(.)	(0.792)
Gender-Dummy	-0.230	0.0361	-0.00877	0	3.526**
	(0.292)	(0.0473)	(0.0907)	(.)	(1.660)
Capex/Total Assets	1.379	0.718**	0.488	0	17.35
	(1.163)	(0.298)	(0.456)	(.)	(16.80)
Acquisitions/Total Assets	-1.384	-0.256	-0.174	0	2.659
	(2.918)	(0.290)	(0.489)	(.)	(4.198)
Intercept	-0.232	-0.0641	-0.172	-5.787	-3.705
	(0.369)	(0.0690)	(0.126)	(.)	(2.280)
Observations	38	38	38	8	35

Heteroscedasticity-consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<.010 Dependent variables represent industry-adjusted performance measures from year three post-turnover. Independent variables lagged by one year. Missing numbers reflect too few observations.

TABLE 21: OLS MODEL 3. HIGH OWNERSHIP SAMPLE.

	Dependent Variables: Industry-Adjusted Performance Measures				
Lagged Independent Variables and Dummies	(1) ROE (T0+3)	(2) ROA (T0+3)	(3) EBITDA Margin (T0+3)	(4) Total Q (T0+3)	(5) Price/Book (T0+3)
New Stock Grants (%)	-0.948**	0.0562	-0.0986	3.880	-0.0993
	(0.456)	(0.0905)	(0.1000)	(.)	(1.450)
Option Grants (%)	-0.0334	0.0165	-0.00530	-3.979	1.276
	(0.339)	(0.0966)	(0.0887)	(.)	(2.007)
Bonus (%)	-0.430	0.0449	0.534	0	7.745**
	(0.742)	(0.199)	(0.320)	(.)	(3.800)
Stock Owned by CEO (%)	-2.434	0.214	0.123	0	17.00**
	(1.934)	(0.301)	(0.322)	(.)	(7.025)
Ln (Total Assets)	0.0690	-0.00701	0.0218	-0.142	-0.238
	(0.0455)	(0.0115)	(0.0131)	(.)	(0.205)
R&D/Sales	-2.252	-0.112	0.327	0	7.703*
	(1.520)	(0.329)	(0.423)	(.)	(4.401)
LT-Debt/Total Assets	-0.0580	-0.114	0.168*	6.219	1.425
	(0.438)	(0.133)	(0.0988)	(.)	(2.159)
Departure-Dummy	-0.339	-0.0810	-0.0168	2.354	-0.610
	(0.212)	(0.0574)	(0.0800)	(.)	(0.839)
Recruiting-Dummy	0.340	-0.0540	-0.0533	-0.492	-0.311
	(0.217)	(0.0781)	(0.0736)	(.)	(0.740)
Age-Dummy	-0.0152	0.0245	0.00109	0	0.799
	(0.212)	(0.0487)	(0.0417)	(.)	(0.778)
Gender-Dummy	-0.666	0.0222	-0.00835	0	3.337***
	(0.457)	(0.0806)	(0.110)	(.)	(1.004)
CapEx/Total Assets	0.853	0.581*	0.865	0	-8.036
	(0.914)	(0.305)	(0.617)	(.)	(11.36)
Acquisitions/Total Assets	0.232	-0.0451	-0.298	0	-10.15***
	(0.639)	(0.146)	(0.178)	(.)	(2.917)
Intercept	0.290	0.0615	-0.145	-1.331	-2.196
	(0.484)	(0.164)	(0.162)	(.)	(1.521)
Observations	46	46	46	7	52

Heteroscedasticity-consistent standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.10. Dependent variables represent industry-adjusted performance measures from year three post-turnover. Independent variables lagged two years. Missing numbers reflect too few observations.

7 CONCLUSION

By analyzing the developments surrounding CEO turnovers for the different performance measures in Section 6.1, I find mixed results. Looking at the accounting-based measures, I find that ROA and the EBITDA margin increase steadily for the turnovers finding place in 2009. The industry-adjusted EBITDA for turnovers in 2010 and ROE in 2011 show the same results. The development in EBITDA margins from turnovers in 2012 show perfect inverse relationships between pre- and post-turnover, supporting the findings of Denis & Denis (1995), Coughlan & Schmidt (1985) and Warner et al. (1988). Except from these, I find large variations in the margins on a year to year basis, meaning that sustained relative improvement is not found. ROE is a measure that provide especially large fluctuations.

Regarding the second hypothesis of the thesis, I find robust positive relationships between CEO *Option Grants (%)* on industry-adjusted ROA in all regression methodologies performed. Such a finding strengthens the plausibility that providing CEOs with an increased relative fraction of option grants early after employment, can cause increased return on the companies' assets the following financial year. I find also a robust positive relationship between *New Stock Grants (%)* and price-to-book for the sample companies for all regression methodologies performed. In this way, holding all other variables constant, an increase in the fraction of new stock grants to total compensation early after employment for the CEOs, seems to provide increases in company price-to-book the following year of measurement. *New Stock Grants (%)* provide also positive effects on ROA for all regression methodologies. The compensation element is however not significant with regards to this relationship.

After splitting the sample CEOs in the last hypothesis of the thesis into low ownership and high ownership, we are presented with other interesting findings. I find that the low ownership CEOs provide robust negative relationships between existing stock ownership and industry-adjusted ROA. I find too that increasing the fraction of option grants in the CEO compensation packages seems to cause positive effects on industry-adjusted ROA. The positive repeating relationship between *New Stock Grants (%)* and the EBITDA margin is something that supports the third hypothesis, indicating motivational effects of receiving new equity by the low ownership CEOs. Apart from this, I find no sound evidence that low ownership CEOs are influenced more by being provided with new equity grants compared to other kinds of compensation elements or compared to the high ownership CEOs.

8 ASSESSMENT OF ROBUSTNESS

An important aspect when working with econometric analyses is to assess the robustness of results achieved. The following section addresses potential aspects that might affect the results that the analyses has produced, and how these are accounted for.

First of all, using only one or two performance measures could have given results of the analyses that might not have been reliable in a bigger setting. In order to get as robust interpretations of the results as possible, I have included two different market-based performance measures and three different accounting-based measures in order to get as plausible results as possible. Interpreting results by only using one regression method might similarly be insufficient in analyses on effects regarding performance measures. Making a comparison of four different regressions, utilizing three different methodologies have provided sharpness to the relevant results achieved.

One of the most important factors to avoid in regression analyses is the presence of multicollinearity.[21] The choices of independent variables related to the regression analyses conducted in answering hypothesis two and three of the thesis, have been made after thorough analysis of past research and econometric principles. Firstly, there has been a thorough research on what kinds of variables that collectively explains firm performance in the best manner, without causing multicollinearity. In this way, I have conducted Variance Inflation Factor (VIF) tests on the different independent variables in order to be fully sure that no multicollinearity exists. The results of the VIF test signaled no multicollinearity between independent variables for the tests conducted in this thesis, and can be found in Appendix Part A.1.2. Another important aspect in conducting econometric regressions is to avoid the existence of heteroscedasticity in the model.[22] This problem has effectively been avoided in the regression analyses of the thesis by using the robust-function in Stata. The Robust Standard Errors effectively make sure that residuals with large values are being down-weighted in the regression, such that heteroscedasticity does not occur.

[21] Multicollinearity refers to correlation between the independent variables in a regression analysis. See Appendix Part A.1.2 for more information

[22] Heteroscedasticity refers to the case where the error U does not have the same variance given values of explanatory variables. See Appendix Part A.1.1 for more information

A common problem among research on firm performance is the presence of endogeneity.[23] Endogeneity can be caused by different factors, such as omitting variables, making functional form misspecifications, making measurement errors or having simultaneity of variables (Woolridge, 2006). In order to avoid endogeneity in the best possible manner, most of the independent variables in the thesis relies on past research. I have additionally added extra explanatory variables such as acquisitions, capital expenditures and different dummies in order to make sure that the concept of omitting variables is minimized in all the relevant regressions. I have further conducted Hausman tests for endogeneity on the different random effects models. The results of the test comparing random effects and fixed effects model can be found under Appendix Part A.1.3 below. All tests indicate no form of endogeneity for the relevant regressions. The results also indicate that the ransom effects model is more efficient than the fixed effects model, and thus might be more reliable.

9 ADVICE FOR FURTHER RESEARCH

Even though literature contains a lot of research on CEO turnovers, there are a lot of new exciting areas that could be further exploited. A possible new research could for instance be a comparison of different time periods and economic states. One could construct a similar dataset for five years prior the outburst of the financial crisis, and compare to the one utilized in this paper. In this way, one could possibly see the differences in compensation and firm decision effects in booms versus recessions. The findings of such a study could possibly strengthen knowledge for company executives on the timing of new CEO appointments, and how to best construct initial CEO compensation packages. It could also give some answers to what kinds of decisions with regards to firm investments that a newly hired CEO should undertake in his or her first year in the position.

Another possible research could use a dataset spanning a longer time period, comparing CEOs with different tenure in the forced category. In this way, one might get some answers to questions regarding the correctness of letting a CEO go early. There are a lot of incidents in where companies might be too impatient with their CEOs, and where they would actually benefit from more continuity. Such a study could measure the effects of changing CEOs at a high ratio, compared to staying with only one for a longer time period. A lot of sports teams

[23] Endogeneity refers to the case where an explanatory variable X is correlated with the error term U. See Appendix Part A1.3.

are for instance criticized for letting their manager go early, without even giving the person time to make a real impact on the team. This could be an interesting market to study further.

A study utilizing a longer time-series, would also have the possibility to utilize lags of even more years. My study seeks to capture effects of one year effects. A study looking at a large time-series could possibly look at a sample with CEOs of longer tenure and measure effects of compensation and firm decision with lags of up to two and three years for instance. This might be interesting as some firm decisions and compensation effects takes longer time to implement and mature. A longer time series might also provide a bigger data sample, which is preferable when conducting statistical tests.

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APPENDIX

A1: STATISTICAL ROBUSTNESS TESTS

A1.1 CONTROLLING FOR HETEROSCEDASTICITY USING ROBUST OLS

Heteroscedasticity in regression analyses refers to the violation of the assumption that the error term U has the same variance give any value of the relevant explanatory variables in the regression (Woolridge, 2006). The assumption states that VAR(U|X) = σ^2 for all explanatory variables included. The consequences of having heteroscedasticity in the regression is that the variance formulas of the estimators are invalid. Therefore, statistical inference might be affected. The use of *robust* command in the OLS regressions effectively adjusts for any heteroscedasticity that may appear in the regressions, and is therefore utilized in the relevant analyses using OLS. This provides Stata to produce robust standard errors, t-tests and 95% confidence variables.

A1.2 TESTING FOR MULTICOLLINEARITY USING VIF-TESTS AND PEARSONS R

Multicollinearity refers to the existence of correlation between independent variables in a regression analysis (Woolridge, 2006). One of the fundamental assumptions in econometrics is that explanatory variables are independent of each other. If a relationship exists between any of these variables, the regression will be biased and might cause the coefficient estimates of the regression to change erratically. A way to test for multicollinearity in a multiple regression model, is to conduct VIF tests. The VIF tests give each explanatory variable a score explaining the degree of how much the variance of an estimated regression coefficient has increased as a result of multicollinearity. A rule of thumb states that a VIF value higher than 10 indicates the existence of multicollinearity (O'Brien, 2007). The results of a sample of VIF tests conducted on the independent variables of the first four OLS regressions model in the thesis are provided in Figure 13,14,15 and 16 on the next page. We can see from the figures that the VIF scores centres around 1, which indicates no multicollinearity. The test is conducted on all regressions, providing the same conclusion.

FIGURE 13: OUTPUT FROM VIF TEST NUMBER 1

Variable	VIF	1/VIF
lag1Valueo~T	1.12	0.894184
lag1lntota~s	1.10	0.907735
lag1Valueo~s	1.09	0.917689
lag1rdsales	1.08	0.922350
lag1Percen~2	1.06	0.943391
Over60Over~0	1.05	0.949792
lag1Acquis~s	1.04	0.960258
lag1CapExT~s	1.04	0.964554
lag1ltdebt~s	1.03	0.973981
GenderMale~0	1.03	0.975279
lag1BonusT~1	1.02	0.975934
OldCEOdepa~t	1.01	0.985730
Recruiting~1	1.01	0.991962
Mean VIF	1.05	

FIGURE 14: OUTPUT FROM VIF TEST NUMBER 2

Variable	VIF	1/VIF
lag1lntota~s	1.34	0.746232
lag1Percen~2	1.22	0.822277
lag1CapExT~s	1.17	0.855065
lag1Valueo~s	1.17	0.857053
lag1Valueo~T	1.14	0.876426
lag1Acquis~s	1.13	0.881368
lag1rdsales	1.12	0.894122
GenderMale~0	1.08	0.928265
Over60Over~0	1.07	0.937030
lag1BonusT~1	1.05	0.954545
OldCEOdepa~t	1.03	0.974540
Recruiting~1	1.02	0.978784
lag1ltdebt~s	1.02	0.983504
Mean VIF	1.12	

FIGURE 15: OUTPUT FROM VIF TEST NUMBER 4

Variable	VIF	1/VIF
lag1Valueo~T	1.14	0.877537
lag1lntota~s	1.13	0.885123
lag1Valueo~s	1.12	0.894587
lag1rdsales	1.10	0.905848
lag1Percen~2	1.06	0.940360
Over60Over~0	1.06	0.943386
lag1CapExT~s	1.05	0.948950
lag1ltdebt~s	1.05	0.956205
lag1Acquis~s	1.04	0.962379
lag1BonusT~1	1.02	0.976573
OldCEOdepa~t	1.02	0.977552
GenderMale~0	1.02	0.977765
Recruiting~1	1.01	0.986971
Mean VIF	1.06	

FIGURE 16: OUTPUT FROM VIF TEST NUMBER 5

Variable	VIF	1/VIF
lag1Valueo~T	1.10	0.907403
lag1lntota~s	1.09	0.914537
lag1Valueo~s	1.08	0.928633
lag1Percen~2	1.06	0.945743
lag1rdsales	1.05	0.956067
lag1BonusT~1	1.04	0.961652
Over60Over~0	1.02	0.976008
lag1Acquis~s	1.02	0.977202
lag1CapExT~s	1.02	0.977644
lag1ltdebt~s	1.02	0.982785
GenderMale~0	1.01	0.986783
OldCEOdepa~t	1.01	0.993276
Recruiting~1	1.01	0.993435
Mean VIF	1.04	

A Pearson's R test for multicollinearity has been further assessed in order to check for multicollinearity between the different variables of the analyses. The Pearson's R provide values from -1 to 1, where -1 means perfect negative linear relationship and 1 represents perfect positive linear relationship. A value of zero indicates no relationships between the variables. We can see from the sample output of the test below that there are no values close to or equal -1 or 1. Again, this indicates no multicollinearity. It should however be noted that the Pearson's R relies on four assumptions in order to provide robust interpretations. The assumptions can be stated as follows: (1) The variables should be continuously measured, (2) There needs to be a linear relationship between the two variables, (3) There should be no significant outliers and (4) the variables should be approximately normally distributed. The regression analyses of this thesis utilize some time-invariant variables such as the *Gender-Dummy* and *Recruiting-Dummy*, which might affect the results of the robustness test as these are not continuously measured.

FIGURE 17: OUTPUT FROM PEARSONS R TEST

	lag1Va~s	lag1Va~T	lag1Bo~1	lag1Pe~2	lag1ln~s	lag1rd~s	lag1lt~s
lag1Valueo~s	1.0000						
lag1Valueo~T	-0.2061	1.0000					
lag1BonusT~1	-0.0928	-0.1398	1.0000				
lag1Percen~2	-0.0219	-0.0834	0.0371	1.0000			
lag1lntota~s	0.0700	0.0182	0.0356	-0.1106	1.0000		
lag1rdsales	-0.0137	0.0865	-0.0152	-0.0030	-0.1210	1.0000	
lag1ltdebt~s	0.0041	-0.0193	-0.0055	-0.0340	0.1085	-0.0540	1.0000
OldCEOdepa~t	0.0146	-0.0030	0.0033	-0.0215	-0.0336	-0.0027	-0.0433
Recruiting~1	0.0013	-0.0141	-0.0180	0.0386	-0.0037	0.0254	0.0096
Over60Over~0	-0.0398	-0.0426	-0.0052	0.0914	0.0405	-0.0236	-0.0014
GenderMale~0	0.0012	0.0276	0.0253	0.0376	-0.0375	0.0249	0.0040
lag1CapExT~s	0.0214	0.0136	0.0052	0.0219	-0.0783	-0.0563	0.0251
lag1Acquis~s	-0.0152	0.0596	-0.0203	-0.0026	-0.0680	0.0184	0.0719

	OldCEO~t	Recrui~1	Over60~0	Gender~0	lag1Ca~s	lag1Ac~s
OldCEOdepa~t	1.0000					
Recruiting~1	-0.0021	1.0000				
Over60Over~0	0.0313	0.0044	1.0000			
GenderMale~0	0.0343	0.0105	0.0405	1.0000		
lag1CapExT~s	-0.0356	-0.0072	-0.0288	-0.0002	1.0000	
lag1Acquis~s	-0.0195	0.0046	-0.0236	0.0005	-0.0569	1.0000

A1.3 Testing for Endogeneity in Random Effects Model Using Hausman's Test

Using any regression model, it is important to be aware of the possibility of having endogeneity problems. Endogeneity means in this setting that there is correlation between one or more of the explanatory variables of the model and the error term U. Such a presence would possibly cause biased and inconsistent estimators of the parameters obtained from the regressions. A Hausman test effectively test for such endogeneity problems in the random effects model. Testing for this endogeneity in this manner is also an indirect test of random effects model versus fixed effects model. The test specifically tests the coefficient estimates from the random effects model, from those of the fixed effects model. The idea is that both the random effects and fixed effects estimators should be consistent, given that there is no correlation between the error term and the explanatory variables. In the case where the estimators are consistent, one should expect the convergence to the true parameter β_i for large samples. The random effects model is initially seen as a more efficient compared to the fixed effects model, and is in many cases preferred if the null hypothesis from the Hausman's test is not rejected. Below are the results of the different Hausman's tests under the following null-hypotheses:

$$H_0 = \textit{There are no endogeneity problems in the random effects model}$$

Implying also that:

$$H_0 = \textit{Difference in coefficients are not systematic}$$

From the regression outputs below, we can see that the Hausman's test obtain chi-squared value of 6.82 and a complementary p-value of 0.7424. Based on these results, we cannot reject the null hypothesis, even at 10% level, and conclude that the random effects model does not provide endogenous relationships. A similar test is conducted for all different variants of regressions and provides the same conclusion. This means additionally that the random effects model, should be preferred to the fixed effects model. I performed the Hausman's test in Stata by first regressing the random effects model, and then the fixed effects model. Lastly, I typed. "Hausman fe re".

FIGURE 18: OUTPUT FROM HAUSMAN'S TEST IN STATA

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
lag1Valueo~s	.3175691	-.5932951	.9108641	.5759831
lag1Valueo~T	.2158747	.0119281	.2039465	1.266147
lag1BonusT~l	6.596198	3.128473	3.467724	2.130261
lag1Percen~2	-5.417509	-31.95853	26.54102	52.53495
lag1lntota~s	-.4732509	-.4357243	-.0375267	1.472875
lag1rdsales	-.1525723	-.3134189	.1608466	1.175533
lag1ltdebt~s	6.511112	3.338212	3.1729	4.705166
Over60Over~0	.0339842	-1.520595	1.554579	2.225902
lag1CapExT~s	-4.526357	-4.613353	.0869962	29.77688
lag1Acquis~s	-1.750011	-1.338326	-.4116856	3.107631

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 6.82
Prob>chi2 = 0.7424

A2: SUMMARY OF REGRESSION VARIABLES AND THEIR SOURCES

TABLE 22: SUMMARY OF REGRESSION VARIABLES AND THEIR SOURCES

IA TOTAL Q	Ratio of the individual companies' market value of assets divided by book value of assets. Adjusted by subtracting the corresponding industry median ratio.	*Financial Ratios Suite by WRDS*
IA ROA	Ratio of the individual companies' EBITDA divided by their total assets. Adjusted by subtracting the corresponding industry median ratio	*Execucomp, Financial Ratios Suite by WRDS*
IA ROE	Ratio of the individual companies' EBITDA divided by their total equity. Adjusted by subtracting the corresponding industry median ratio.	*Execucomp Financial Ratios Suite by WRDS*
IA EBITDA Margin	Ratio of the individual companies' EBITDA divided by their total sales. Adjusted subtracting the corresponding industry median ratio.	*Execucomp, Financial Ratios Suite by WRDS*
IA Price-To-Book	Ratio of the individual compenies' market value of equity divided by book value of equity. Adjusted by subtracting the corresponding industry median ratio.	*Financial Ratios Suite by WRDS*
New Equity Grants (%)	The proportion of new stock grants as a percentage of total compensation for the individual incoming CEO's. Calculated by finding the positive year-on-year changes in total equity values received by the CEO's.	*WRDS, Execucomp*
Option Grants (%)	The proportion of option grants as a percentage of total compensation on a year-to year basis for the individual incoming CEO's	*WRDS, Execucomp*
Bonus (%)	The proportion of bonus as a percentage of total compensation received on a year-to year basis for the indicidual CEO's	*WRDS, Execucomp*
Stock Owned by CEO (%)	The total stockholdings of CEO in the company entered	*WRDS, Compustat*
Ln (Total Assets)	Natural Logarithm of firm Total Assets measured on a year to year basis	*WRDS, Compustat*
R&D / Sales	Research & Development expenses divided by total sales. Measured on a year-to-year basis	*WRDS, Compustat*
LT-Debt/Total Assets	Long term debt divided by total assets. Measured on a year-to-year basis	*WRDS, Compustat*
Departure Dummy	Provided value 1 if forced, 0 otherwise	*Jenter & Kanaan (2014)*
Recruiting Dummy	Internal hires are provided with 1 if CEO had a position in the company before the position as CEO. 0 otherwise.	*WRDS, Execucomp*
Age-Dummy	Calculated by subtracting (2017-*Start Year of CEO*) from *Current Age*.	*WRDS, Execucomp*
Gender-Dummy	Provided value 1 if male and 0 if female	*WRDS, Execucomp*
CapEx/Total Assets	Calculated by dividing CapEx to total assets of the firm.	*WRDS, Compustat*
Acquisitions/Total Assets	Calculated by dividing Acquisition to total asset of the firm	*WRDS, Compustat*

A3 A CLOSER LOOK AT THE FAMA 48 INDUSTRIES

Figure 19 below provide a full overview over the 48 different industry categories as defined by Fama. The numbers in the parentheses indicate the amount of different services that the industry category covers. As we saw in Figure 1 of the thesis, business services accounts for the highest number of turnovers. We can additionally see that this is one of the widest defined industries from the table below, spanning a total of 44 different services. Examples of such services are management consulting, advertising, security and cleaning. The retail category spans 64 different services being the largest defined category, and the one experiencing second highest number of turnovers. Examples of retail services as defined by Fama are

FIGURE 19: OVEVIEW OF FAMA FRENCH SECTORS

1 Agric	Agriculture (5)	25 Ships	Shipbuilding, Railroad Equipment (2)
2 Food	Food Products (11)	26 Guns	Defense (3)
3 Soda	Candy & Soda (5)	27 Gold	Precious Metals (1)
4 Beer	Beer & Liquor (5)	28 Mines	Non-Metallic and Industrial Metal Mining (11)
5 Smoke	Tobacco Products (1)	29 Coal	Coal (1)
6 Toys	Recreation (6)	30 Oil	Petruleum and Natural Gas (11)
7 Fun	Entertainment (10)	31 Util	Utilities (9)
8 Books	Printing and Publishing (8)	32 Telcm	Communication (10)
9 Hshld	Consumer Goods (26)	33 PerSv	Personal Services (36)
10 Clths	Apparel (7)	34 Bussv	Business Services (44)
11 Hlth	Healthcare (1)	35 Comps	Computers (13)
12 Medeq	Medical Equipment (3)	36 Chips	Electronic Equipment (11)
13 Drugs	Pharmaceutical Products (6)	37 LabEq	Measuring and Control Equipment (11)
14 Chems	Chemicals (7)	38 Paper	Business Supplies (5)
15 Rubbr	Rubber and Plastic Products (7)	39 Boxes	Shipping Containers (4)
16 Txtls	Textiles (9)	40 Trans	Transportation (28)
17 BldMt	Construction Materials (27)	41 Whlsl	Wholesale (41)
18 Cnstr	Construction (6)	42 Rtail	Retail (64)
19 Steel	Steel Works etc (9)	43 Meals	Restaurants, Hotels, Motels (7)
20 Fabpr	Fabricated Products (5)	44 Banks	Banking (25)
21 Mach	Machinery (20)	45 Insur	Insurance (9)
22 Elceq	Electrical Equipment (12)	46 RlEst	Real Estate (14)
23 Autos	Automobiles and Trucks (16)	47 Fin	Trading (17)
24 Aero	Aircraft (5)	48 Other	Almost Nothing (14)

hardware stores, convenience stores, bakeries and book stores. Banking and financials cover 25 services, thereby depository institutions, commercial banks, savings institutions and federal credit agencies. A full overview of all Fama services connected to the defined industries can be downloaded from the Internet for the interested reader.