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We sincerely hope that our contributions from this thesis will encourage and inspire future researchers to further examine the relationship between CEO turnovers and firm performance in various ways.

Oslo, June 2020

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Abstract

In this paper, we investigate the impact of CEO turnovers on company performance in the energy industry. In the first part, we perform an event study for various event windows where we estimate the abnormal returns from stock price reactions in companies which experience CEO turnovers. In this analysis our sample comprise Nordic energy companies from Oslo Stock Exchange. We find evidence that CEO turnovers affect the abnormal returns negatively for the first event windows, i.e. the day of the event and the day posterior to the event. In the second part we use accounting related measures. Here, our data comprise private Norwegian energy companies. Moreover, we assess how the performance measures impact CEO turnovers, and if CEO turnovers lead to changes in the performance measures. We find that one out of two accounting measures impact the probability of a CEO turnover occurring, and that CEO turnovers on average do not lead to changes in performance. We conclude that CEO turnovers affect company performance if we look at stock price reactions, however, there is no impact when studying the accounting related measures.

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1. Introduction

In this master thesis we present evidence that CEO turnovers affect performance in energy companies differently, dependent on which performance measure we utilize. We find that stock price reactions are negatively impacted posterior to a CEO turnover. Moreover, we find that one out of two accounting related performance measures used in our models impact the probability of a turnover to occur. Lastly, we find that posterior to a CEO turnover, there are no changes in our accounting related performance measures. Connecting these distinguished performance results, our takeaway is that investors acknowledge that the CEO turnover do not improve accounting performance, thus the negative stock price reaction is justifiable due to inefficient decision making. In this introductory chapter we present the background of our thesis by shedding light on related existing research, the research question and the main purpose of our thesis, and we elaborate regarding the underlying motivation provided for the chosen topic. Lastly, we present a precise and compressed outline of our thesis.

1.1 Background

A company's Chief Executive Officer (CEO) is one, if not the most, influential and powerful figure in a firm (Li, Li & Minor, 2016). The CEO is responsible overseeing vital operations within the firm, in addition to implementing an approach and vision for the company, leaving little room for error given the potential implications stemming from the CEO's actions. Thus, a CEO turnover needs to be thoroughly discussed and reviewed by the board of directors, before planning the succession process (Dalton & Dalton, 2007). This have caused comprehensive research on the topic of CEO turnovers and whether there exists a relationship between change in firm performance and CEO turnover (e.g. Adams, Almeida & Ferreira, 2005; Core, Holthausen & Larcker, 1999). Given that one of the CEO's main responsibilities is to drive shareholder value (Lazonick & O'Sullivan, 2000), it can be difficult to uphold expectations made by shareholders or top management within the firm. Consequently, this can lead to a turnover event even if the firm performance is below expectations due to external forces outside of the CEO's control (Boone, Brabander & Witteloostuijn, 1996).

There are several existing studies which have been using stock market returns as a measurement of firm performance, and have found an inverse relationship

between firm performance and the frequency of CEO turnovers (e.g. Pan, Wang & Weisbach, 2015; Dikolli, Mayew & Nanda, 2014; Warner, Watts & Wruck, 1988). Moreover, while assessing this relationship, previous research has also studied whether different attributes and characteristics for the new CEO is significantly improving firm performance (Wang, Holmes, Oh & Zhu, 2016). Interestingly, there has been a trend of more frequent CEO turnovers in recent years (Zhu & Shen, 2016), causing the average CEO tenure to decline whereas in a significant portion of cases, the new CEO often leaves the company within three years after being appointed (Zhang, 2008). Others have also studied to what degree the market reacts to a CEO turnover, in addition to analysing whether these stock market fluctuations are caused by external forces not connected with the CEO's actions (Zhang & Wiersema, 2009).

Even though this topic is extensively researched, there is little existing study related to turnovers and firm performance found within a single industry, e.g. energy industry, related to the demographics we have chosen for our study. Through investigating one industry exclusively it allows us to compare performance between firms which to a substantial degree is quite similar to each other, in addition to allowing us to easily control for industry idiosyncratic risk. Moreover, the energy industry is an intriguing segment, as a common denominator throughout our thesis is that a large fraction of the companies we describe as energy companies, are companies operating in the oil sector. With this specification, we can further emphasise that a major part of the companies comprised in our thesis are subject either directly or indirectly to global commodity prices. Furthermore, with the majority of the energy companies highly dependent on these volatile commodity prices, the corresponding sector of oil companies is highly cyclical which they have been historically characterized by. With our new contribution in mind, existing research will be used as a measure of comparison, but with contingency, as the restrictions on the sample group is unique compared to the vast majority of existing studies.

1.2 Research Question & Purpose

The research question studied in our thesis is the following: "*How Does CEO Turnover Affect Performance in Energy Companies?*". Additionally, our research question is restricted to studying effects found in Nordic energy companies who

are currently, or have previously been, listed on the Oslo Stock Exchange.

The purpose of the thesis is to investigate whether CEO turnovers are significantly affecting firm performance within Nordic energy companies, through studying abnormal returns within specified event windows, caused by stock return fluctuations. Moreover, we examine whether these abnormal returns are affected by different attributes and qualifications possessed by the new CEO, exploring whether particular characteristics tend to significantly cause abnormal returns following the succession. Furthermore, we supplement our study with an additional part examining the potential double causality of CEO turnover and accounting related performance.

1.3 Motivation

There are several underlying motivational factors for our choice of topic and business segment. Firstly, studying the topic of CEO turnovers is highly interesting, given that CEOs are ultimately responsible for the strategic approach and the performance of the company. Thus, we find it interesting to examine whether the event of replacing the current CEO of a company benefit, deteriorate or leave the firm performance unaffected. Additionally, we find this topic compelling as one may argue that replacing a CEO is among the most important and influential corporate decision a company can conduct (Chen, Cheng & Dai, 2013).

We also made a decision to restrict our sample to Nordic energy companies. The reason why we are focusing on Nordic companies is that this area is truly relevant and compelling for us, given the great probability we will work in a Nordic company during our careers. Regarding the energy industry, this business segment is interesting as fluctuations in stock prices usually is correlated with changes in the commodity prices. This gives the business segment a special flair compared to other industries, as it also involves studying whether fluctuations in the oil price could affect their performance which in turn could lead to a turnover event. Thus, we have added a smaller supplemental analysis comparing returns on the energy index with the oil price, analysing potential similarities and differences. Additionally, from our early research we found that existing research tends not to focus on a single business segment, which stimulated our decision to investigate

effects within one industry compared to the entire economy. Our contribution to a relatively well-researched topic is that we have restrictions in terms of demographics, solely including Nordic companies which have been listed on the Oslo Stock Exchange, while the vast majority of existing research are focused around different areas and stock exchanges.

Our study provides originality as we examine a single business sector, namely the energy industry. In our opinion, studying a single industry is an intriguing idea as your results can closely relate to one business segment, compared to results across industries which are more likely to have greater differences in approaches or organisational behaviour. Thus, our results could potentially be more appealing towards top management in these Nordic energy companies, as our restricted sample is directly related to turnover events specifically in the industry they operate. Furthermore, compared to earlier research, we include delisted companies which were listed during the time period we examine in our sample. We also contribute with a different time horizon than most research papers (2000-2018), in addition to including different CEO attributes. Within our time horizon we also experience the cyclical commodity prices as our sample include years with very high oil prices, in addition to years where the commodity price is low.

Connecting various performance measures posterior to the CEO turnover, where we bridge the different perspectives together, in terms of investors' reactions and the actual realized performance gives us an edge which could provide us to understand the results in a more proper manner. Additionally, our study contributes to originality through studying major attributional changes in leadership, where the CEO successor possess opposite traits compared to the predecessor, e.g. the successor is an outsider, while the predecessor initially was an insider.

1.4 Thesis Outline

Our thesis consists of seven chapters:

- Chapter 1 is an introductory segment where we elaborate on the fundamentals with regards to the thesis background, research question and purpose of the study, in addition to our underlying motivational factors.

- Chapter 2 presents our theoretical framework consisting of relevant existing literature and research, in addition to the development of our hypotheses.
- Chapter 3 describes the type of data which have been used, how this data is collected and comprehended, in addition to limitations to our data.
- Chapter 4 elaborates on the methodological approach and present the applied empirical models for our study.
- Chapter 5 contains a discussion and analysis concerning the empirical results of the study, and the evaluation of the significant results related to the hypotheses.
- Chapter 6 elaborates on the accounting related performance measures, with focus on the reverse relationship between the two phenomena, and how CEO turnover impact changes in performance.
- Chapter 7 provides conclusive remarks, limitations to the study and recommendations to further research on our topic.

2. Literature Review & Hypotheses Development

In this chapter we will present relevant existing literature which touch upon the fundamentals regarding our thesis. Further, we present the development of our hypotheses supported by existing theories and papers, followed by an evaluation of the appropriateness and criticism of our sources.

There have been extensive previous research on the topic of effects in firm performance following CEO turnovers, where existing studies have found both positive and negative market reactions caused by turnovers, an increased frequency of CEO turnover occurrences and different findings associated with attributes of the CEO successor. However, there is a lack of existing literature specifically focused on CEO turnovers in Nordic energy companies, in addition to little research of the energy industry segment itself and its connection with commodity prices. Thus, these gaps in literature will give us some methodological differences to existing research but enable us to compare our results with relevant findings examined in other demographics and time horizons.

2.1 CEO Turnovers

There is a substantial amount of existing research regarding CEO turnovers. Some of which have researched this extensively and claims that a CEO turnover is essential to the businesses given two main arguments: Firstly, poor performance is a prime indication of inefficient leaders; secondly, CEOs are not usually comfortable taking necessary measures implementing major organizational and strategic changes to comprehend with poor firm performance (Kanter, 2003). However, despite extensive research there seems to be a lack of concrete evidence supporting that a CEO turnover is favourable in most turnover decisions as it often causes trauma and reckless changes which offsets the positive benefits of the turnover (Haveman, 1993). Another research paper which endorse this is Finkelstein, Hambrick & Cannella Jr. (2009) which argues that the CEO replacement must be more experienced and better suited to deal with the challenging circumstances than the former CEO in order for the turnover to successfully improve firm performance. The reason being that replacing the CEO just for the sake of it is likely to hurt the performance, rather than improving the firm.

Nonetheless, firms often strive to improve their performance and if they conclude that their current CEO is inadequate to capitalize on the firm's potential, a CEO turnover could be imminent. One reason is the symbolic measure of hiring a new CEO which could sway the industry or give the firm a more capable CEO which have more desired attributes for the circumstances at hand (Chen & Hambrick, 2012). In addition, changing the CEO could also serve the purpose of bringing new resources to the firm and reform the pattern of behaviour inside the organization (Chen, Hambrick & Pollock, 2008). Through looking at returns as a performance measure, there are also causality problems connected to factors beyond the CEOs control which could prompt a turnover situation (Finkelstein & Hambrick, 1996). Additionally, the research paper by Jenter & Lewellen (2014) titled "Performance-induced CEO turnover" found evidence that there is a tight relationship between firm performance and frequency of CEO turnovers, arguing that the probability of being replaced escalates when the firm is performing below expectations.

2.1.1 CEO Impact on Firm Performance

Studying the effect on firm performance posterior to the turnover, a relationship to further examine relates to the impact CEOs have on firm performance. In the article "Does Leadership Make a Difference to Organizational Performance", Thomas (1988) studies 12 British retail companies during the period 1965-1984. Controlling for economic, industry and other company-specific factors, Thomas measured the unexplained variance in profits, sales, and profit margin. Consequently, he concluded that the CEOs do not have significant impact on the performance of the firm, and thereby only accountable for 3.9% to 7.0% of firm performance.

Mackey wrote in 2008 the article "The Effect of CEOs on Firm Performance". The study concerns 92 CEOs at 51 companies from 1992 to 2002, and where the CEO have been CEO at least twice. With a different approach than the former study, she first located whether the CEO have impact on firm performance. Moreover, contingent on impact from the CEO, she located if the contribution came through corporate or segment level. The study shows that CEOs have a significant impact on firm performance. Firstly, the impact at the corporate level accounts for 29.2% of the unexplained variance in profitability, namely Return on Assets (ROA). Secondly, the CEO impact accounts for 12.7% of the unexplained variance in the business-segment profitability.

By reviewing similar studies, the former example shows that the influence CEOs have on company performance lead to ambiguous results. The researchers deviate in their findings, however, this is not surprising given their methodological differences. In contrast to this study we should bear in mind that we research the effect on firm performance occurring from a change in CEO and not solely influential longstanding CEOs.

When measuring the performance of a CEO following the turnover, we need to assess how much of the performance is due to actions conducted by the CEO, as opposed to circumstances beyond the CEO’s control. This could for instance be during times of recessions or booms, where the performance of the firm is not necessarily due to the isolated effects of the CEO, but they could i.e. be riding a wave of good performance in the industry which is unrelated to the CEO’s

activities (Renneboog & Zhao, 2017). Moreover, boards generally mistakenly reward or blame the CEO for performance which is beyond their control during recessions or booms (Yunlu & Murphy, 2012). In the main part of our thesis we utilize the abnormal returns of the companies in one specific industry, with the majority of the companies subject to the same risks. With our construction of the market model, we can control for industry idiosyncratic risks, and isolate the effects from recessions and booms which is categorized as conditions beyond the CEO's control.

2.1.2 Occurrence of CEO Turnovers

Initially, touching upon the drivers behind CEO turnovers, the article "CEO Education, CEO Turnover, and Firm Performance" by Bhagat, Bolton & Subramanian (2010) appear relevant. Their findings imply that poor performance increases the likelihood of a disciplinary turnover, with the latter resembling a decision made by the board of directors. Further, the study suggests that poor performance, rather than CEO education, is the main driver of disciplinary turnovers. Shifting focus towards the non-disciplinary turnovers, the study shows that performance is not the main driver of non-disciplinary turnovers, with the determinants related to age and ownership, elderly CEOs imply a higher probability of leaving, while CEOs with higher stock ownership infers the contrary perspective.

Jenter & Kanaan published a journal in 2015 called "CEO Turnover and Relative Performance Evaluation". Here, they assessed reasons why CEO turnovers occur through relative performance evaluation in the industry and market, in addition to explaining the rationale behind forced turnovers. They found that CEOs are dismissed when the boards' evaluation of the CEOs abilities falls below a set benchmark, i.e. the expected ability of a replacement CEO, which they adjust for costs of replacing the current CEO. Using a large data set containing 875 forced turnovers, they found that low industry stock returns compared to market returns increases the frequency of forced CEO turnovers. Even though CEO turnovers generally should exclude observable exogenous shocks from their firm performance prior to evaluating the CEOs abilities, their findings showed that boards allow exogenous shocks to affect the retention decisions of the company's CEO.

2.1.3 Upper Echelon Theory

Due to the inclusion of the CEOs attributes in our model, we found the article "Do CEOs Matter to Firm Strategic Actions and Firm Performance? A Meta-Analytic Investigation Based on Upper Echelons Theory" written by Wang et al. (2016) highly interesting. The investigation which resembles a review, comprises 308 studies, divided into 5 different measures: Age, Tenure, Education, Experience, and Personality. The latter is related to the strategic choices of a firm and not directly with performance. Further, as the personality measure impact the strategic choices, the authors do not conclude with certainty that CEO attributes affect performance as strategic choices could lead to worse performance. Therefore, the conclusion says that CEO attributes might impact performance. These findings are interesting, as the overview reflects that the personal CEO attributes we have specified in our models ought to impact performance positively.

2.2 Returns as a Measure of Firm Performance

A common denominator for existing literature measuring performance prior to and following the CEO turnover is that they use stock prices and company ratios, i.e. ROA and ROE, to examine potential improvement in firm performance following the succession. Assessing returns as a measure of the CEO's performance is common for the management, and this causes fundamental uncertainty about the CEO's abilities during negative volatile trends, provoking a turnover if the management perceives the results as inadequate (Pan et al., 2015). Using different measures of returns, Furtado & Rozeff (1987) found results indicating that turnovers are likely to be inside successions when the firm generates positive return, while they would seemingly appoint an outsider when the firm generates negative return.

2.2.1 Stock Returns

Measuring firm performance through stock returns is a common measurement in existing papers due to its ability to capture market reactions. One reason being that stock prices resemble the firm to outside investors, which are more willing to invest to provide firm growth if stock prices are steady and growing. Firms which experience an increase in coverage by investors tend to create positive contemporary abnormal returns and firms which experience less coverage often lead to negative returns (Kecskés & Womack, 2008). In turn, increased attention

from investors are also related to an up rise of liquidity in the company's stock (Roulstone, 2003). These existing research papers prove the importance of avoiding abnormal declines in the stock prices, in order to decrease the probability that the firm will suffer due to lack of liquidity or coverage from outside investors.

Consequently, theories regarding stock returns become highly relevant for our study, as it incentivizes the management to conduct changes, i.e. replace their current CEO, in times where they experience abnormal negative returns emphasising its negative impact on firm performance. This is in accordance with the journal "Stock Prices and Top Management Changes" written by Warner et al. (1998), where they claim there is an inverse relationship between stock performance and the probability of a CEO turnover. Thus, if the stock price goes down, the probability of replacing the current CEO rise. Lastly, according to Lambertides (2009) there is correspondence between a CEO turnover and the reaction to the firm's stock price. Seemingly, firms which replace their CEO are more likely to increase their performance through positive abnormal returns on their stock price.

2.2.2 Oil Prices

Given that our sample solely contains energy companies, we investigate whether there is a link between abnormal returns in the industry and fluctuations in the oil prices. However, most existing research papers have studied the effect on stock prices in general caused by oil price movements. A research paper studying the effect of oil prices and emerging stock markets found that there seemingly is strong evidence that risks related to oil prices have a negative effect on stock markets. In addition, situations where unanticipated oil price volatility occurs lead to increased risk and uncertainty in the market, negatively affecting stock prices (Basher & Sadorsky, 2006). Moreover, running a vector auto regression, Sadorsky (1999) found evidence that oil prices and its volatility are very influential in terms of affecting real stock returns in the market.

The link between oil prices and stock market reactions are extensively researched and given the results presented above there seem to be a relationship between them, especially factoring in uncertainty or unanticipated events. However, there

is less research studying potential effects situated in the energy industry. Henriques & Sadorsky (2008) studied the effect of oil shocks on the energy stock market and found that the shocks had little significant effect and perhaps are not as crucial for the energy industry as once thought. Nonetheless, many of these papers stress the effect of volatility and risk, consequently causing uncertainty in the stock market.

2.3 Hypotheses Development

In the review of different aspects of the theories and results presented earlier, we initiated the development process of our hypotheses to determine specific relevant elements providing fundamental answers to our research question. These are developed through supplementary theories and research specifically entitled towards the relationship between performance and turnover, in addition to the significance regarding upper echelon theory.

2.3.1 The Relationship Between CEO Turnovers and Organizational Performance

As mentioned earlier through results found in several research studies, there is a strong relationship between the frequency of CEO turnovers and level of acceptable organizational performance. Additionally, others study potential behaviour measures which could discipline the CEO to improve corporate governance, in cases where the delivered results were below expectations (González, Guzmán, Pombo & Trujillo, 2015). Thus, creating a pattern of firm behaviour where turnover rates often emulate the degree of good or poor firm performance (Shaw, 2015). Beatty & Zajac (1987) study stock market reactions in response to CEO turnovers in large firms, where their results imply that turnovers lead to a reduction in stock returns affected by production and investment decisions made by the successor. Moreover, in a study from Warner et al. (1988), they found that no average stock price reaction is detected at the announcement of a top management change, arguing that actual abnormal returns are the sum of two components; an informational and a real component. Others have found that frequent turnovers harm the companies' communication network, thus disrupting production efficiency (Shaw, Duffy, Johnson & Lockhart, 2005).

Thus, with these studies in mind we want to examine whether CEO turnovers have a significant effect on firm performance related to our specific demographics

and segment. In order to analyse these effects, we apply stock returns from relevant firms at the turnover date, with a time span including 20 days prior- and 25 days posterior to the turnover, enabling us to look at effects within our specified event windows. The objective of this analysis is to examine whether the average abnormal returns across these companies are significantly affected by the CEO turnover. Putting emphasis on how uncertainty affects stock market reactions or that frequent turnovers may damage the company efficiency; we believe that a CEO turnover will generally not benefit a firm. Hence, we hypothesize the following:

Hypothesis 1: *Appointing a new CEO does not impact the abnormal returns*

2.3.2 Inside Succession

When appointing a new CEO the firm is left with two choices; either hire internally (insider) or externally (outsider). A study examined these choices found that firms which struggle tend to hire outsiders as they are more capable of altering changes to firm strategy, while insiders may have larger difficulties distinguishing major challenges and interfering fast enough (Chung, Rogers, Lubatkin & Owers, 1987). Other studies examined whether inside successions occurs more frequently than outside successions, where their results indicate that large companies are more reluctant to hire outside the organization, despite the insider lacking required candidate qualifications or experience to manage their organizational needs (Dalton & Kesner, 1983). This contributes to a later research, arguing that outsiders in fact are handicapped in CEO successions due to the management being hesitant in appointments outside the firm (Agrawal, Knoeber & Tsoulouhas, 2006). One key argument from this study is that firms prefer to incentivize insiders to potentially rising through the ranks within their company through hard work and loyalty. Further, there could be other limitations appointing insiders as they often neglect altering existing patterns of activities within a firm, failing to create new and diverse experiences within the company (Greiner & Bhambri, 1989).

Examining a characteristic such as insiders is interesting because they are often more knowledgeable about various aspects within the firm and have created strong social networks. Thus, considering these studies we want to examine

whether there is a significant effect to the companies' firm performance by appointing insiders for the CEO position. Using the beforementioned approach we create a variable which solely include stock returns in our event study where the CEO successor is appointed from within the company. Given that insiders are more hesitant and reluctant to conduct necessary altering changes in due time, we believe the appointment of an insider will not impact abnormal returns. Thus, we hypothesize the following:

Hypothesis 2: *Appointing an insider as a new CEO does not impact the abnormal returns*

2.3.3 CEO Age

Our sample of turnovers contains appointing CEOs with a broad range of different ages, which makes an interesting study whether the age of the CEO actually influence their capability of enhancing firm performance. Earlier research has shown that younger CEOs have less experience of creating firm value and lacks the knowledge of business compared to older CEOs (Yim, 2013). This could make them conduct a more aggressive strategy chasing improved performance. Meanwhile, Serfling (2014) argues that older CEOs are more risk averse and are safer in their investment decisions, where his findings indicate that older CEOs underperform compared to firms managed by younger CEOs.

Evaluating a characteristic such as the age of the CEO is interesting as older CEOs are more likely to be more experienced, been involved in previous managerial positions, thus encountered situations of challenging decision-making. Consequently, we want to examine whether this is true for our sample by creating a benchmark average age which is calculated through the age of the CEO successor for each turnover event in our study. Given Serfling's recent argument, we explore whether these older CEOs are significantly affecting abnormal returns through solely including stock returns in turnovers related to appointing a CEO above average age of all successors in our sample. Putting emphasis on that older CEOs tend to be more risk averse, thus maintain a more cautious investment strategy, we believe that elderly CEOs do not impact abnormal returns. Hence, we hypothesize the following:

Hypothesis 3: *Appointing an elderly CEO does not impact the abnormal returns*

2.3.4 Experienced CEOs

CEOs often face challenging decisions which could influence an appreciation or depreciation to firm value depending on its outcome, raising a question whether experienced CEOs tend to outperform inexperienced CEOs in terms of improving firm performance. Ang, Lauterbach & Vu (2003) found a significant relationship between the announcement of an experienced CEO succession and positive market reactions. Moreover, previous research studying this factor have shown that the stock market reacts positive towards the hire of an experienced CEO, while inexperienced CEOs often lack their managerial abilities (Elsaid, Wang & Davidson, 2011). However, after conducting tests on their sample, they found mixed results which did not indicate that experienced CEOs can improve the financial performance significantly compared to inexperienced CEOs.

Inspecting an attribute such as experienced CEOs is interesting as they are likely to be more knowledgeable while facing challenging situations, altering strategies and conducting actions on behalf of the company. Bearing these studies in mind, we want to examine whether amount of CEO tenure significantly impacts the abnormal returns. Consequently, we reviewed the tenure of CEO experience for each successor and created an average tenure criterion, which enables us to examine this subject. To investigate the objective of this hypothesis, we only included stock returns for firms which appoint a CEO who has more experience than the benchmark in our sample. However, given rational behaviour, a firm would not appoint an inexperienced CEO who does not possess necessary qualifications to improve the firm, hence we believe that experienced CEOs will not impact the firm performance abnormally. Thus, we hypothesize the following:

Hypothesis 4: *Appointing an experienced CEO does not impact the abnormal returns*

2.3.5 Gender

The majority of CEO positions have historically been occupied by males, however recent trend has shown that female CEOs are becoming more common.

Interestingly, studies have also shown that gender diversity is correlated with increased profitability and value creation (Hunt, Prince, Dixon-Fyle & Yee, 2018). Research have also shown that the two genders differ in their strategic and investment approaches, which leads gender diversity to be value-creating (Bliss & Potter, 2002). However, from a CEO perspective, there does not seem to be any concluding evidence that men outperform females.

Examining the gender characteristic is interesting because as reflected by our sample, most CEOs are male. However, as previously mentioned, there are no conclusive findings reasoning why males are more attractive for top management positions, but rather underline the importance of gender diversity. Given the above-mentioned studies we want to examine whether gender is significantly affecting abnormal returns. Considering that male CEOs are the most common, we chose to exclusively include stock returns for companies in which the CEO successor is male to analyse whether males tend to significantly impact firm performance. Even though there is no conclusive evidence on this topic, we believe that male CEOs are not outperforming female CEOs, but rather that a firm would benefit from gender diversity. Hence, we hypothesize the following:

Hypothesis 5: *Appointing a male CEO does not impact the abnormal returns*

2.3.6 Education

Some recent studies involving the banking industry have shown that CEOs with higher level education from prestigious schools have better results than firms where the current CEO have a lower level of education (King, Srivastav & Williams, 2016). In contrast, Gottesman & Morey (2006) studied whether upper level education had a significant effect on firm performance in addition to graduating from prestigious schools. Their results showed that firms managed by a CEO possessing an MBA do not outperform firms where the CEOs do not hold a graduate degree.

Evaluating education as an attribute is interesting because one would initially believe that more educated CEOs are more resourceful in terms of knowledge given their academic background, which should enhance their abilities to thoroughly contemplate their decision-making and alteration of strategies.

Interestingly, these existing research papers make different arguments, and we want to examine whether education is significantly influencing abnormal returns within our sample. Thus, we examined the education of each CEO successor, labelled as higher and lower education, whereas higher education represents CEOs who possess a master's degree or more. However, putting emphasis on that higher education isolated does not necessarily resemble superior leadership, we believe that highly educated CEOs do not impact abnormal returns. Thus, we hypothesize the following:

Hypothesis 6: *Appointing a highly educated CEO does not impact the abnormal returns*

2.3.7 Forced Turnovers

Regarding the circumstances surrounding natural versus forced turnovers, we need to establish parameters for identifying and classifying what determines a forced turnover without having to exceedingly speculate. Thus, we have decided to use Parrino's framework from the journal published in 1997 called "CEO turnover and outside succession: A cross-sectional analysis". Here, Parrino classified parameters belonging to forced and voluntary turnovers, which creates a useable framework which minimizes the need for speculation in some circumstances of forced turnovers. These parameters evaluate descriptive media reports, CEO age, death or illness or acceptance of a similar position either internally or externally. With regards to whether firm performance benefits from a forced turnover, Farrell & Whidbee (2003) researched this relationship and found that forced turnovers tends to perform worse compared to a natural CEO replacement in all relevant measurements, e.g. returns and ROA. However, Denis & Denis (1995) found positive abnormal stock returns posterior to the announcement of a forced turnover, which they argued was due to an indication of the company performing below expected performance, which would improve as the company find a more suitable CEO. However, most forced turnovers are rarely explained by the firm as a cause due to poor management performance, but rather due to other circumstances (DeFond & Park, 1999).

Examining forced turnovers within a company is interesting because when a CEO is forced out of the company, it is common to believe that the CEO has been

insufficient or lacked the abilities to further improve the performance of the firm. However, there are external forces which the CEO cannot account for which possibly could prompt an unjustified forced departure from the firm. In coherence with these research studies, we examine whether there is a significant impact on the abnormal returns following a forced turnover. We researched all CEO departures in accordance with Parrino's framework and looked exclusively at stock returns in companies where the predecessor was presumably forced out of the company. Given that CEOs uncommonly express themselves openly about being fired, it is an absolute necessity to establish a framework to minimize possibilities of potential bias caused by speculation. With emphasis on that most forced turnovers are rarely caused by poor management performance, but rather as a consequence of poor performance due to circumstances affected by external forces, we believe that forced turnovers do not impact abnormal returns. Thus, we hypothesize the following:

Hypothesis 7: *Appointing a new CEO through a forced turnover does not impact the abnormal returns*

2.4 Hypotheses Summary

In an organized fashion, the hypotheses we test are thereby the following:

H_1: *Appointing a new CEO does not impact the abnormal returns*
H_2: *Appointing an insider as a new CEO does not impact the abnormal returns*
H_3: *Appointing an elderly CEO does not impact the abnormal returns*
H_4: *Appointing an experienced CEO does not impact the abnormal returns*
H_5: *Appointing a male CEO does not impact the abnormal returns*
H_6: *Appointing a highly educated CEO does not impact the abnormal returns*
H_7: *Appointing a new CEO through a forced turnover does not impact the abnormal returns*

2.5 Source Criticism

Critically reviewing the applied sources is essential for the study's reliability, as it provides a thorough evaluation of the quality and appropriateness of existing research, which enables an opportunity to discover what is already known, and

potential gaps in the literature, with regards to a specific topic (Stewart & Kamins, 1993). Thus, to ensure the quality of our sources, we utilized research tools which are easily accessible, such as Google Scholar and Web of Science, when searching for existing studies regarding our topic and additional relevant theories contributing to the fundamentals of our research question. The existing literature we found while constructing the literature review were comprehensively evaluated based on the publisher (e.g. reputable journals), publishing date and the number of citations on the literature in question. Additionally, in a seminar related to the preparation prior to our thesis we were enlightened regarding top academic journals, which provides additional reliability for the applied literature stemming from these prominent publishers. These research criterions on reliability measurements enhances the credibility and quality of the literature we have obtained and overall improves the reliability of our sources (Rust & Cooil, 1994).

3. Data

In this chapter we describe the data we apply to conduct our analysis, the collection process from various data sources and the filtering process which is applied to remove unnecessary data. Thus, we are left with relevant data to conduct our analysis.

One of the most important aspect to carefully consider before analysing the data is to determine the research time horizon we want to examine. An appropriate time horizon is a crucial characteristic when writing a thesis (Saunders, Lewis & Thornhill, 2009). Moreover, a time horizon should be relevant for the current conditions, be manageable and analytical, and contain a large enough sample to provide representative and reliable results. Thus, we decided to limit our research time horizon from year 2000 to 2018, that provide us with a sufficiently large and reliable sample. Returns are thereby retrieved for this specific time period.

3.1 Data Collection

The primary data source which we have used in our data collection originates from Oslo Stock Exchange. Through BI Norwegian Business School, we came in touch with a representative from Oslo Stock Exchange who provided us with firm-specific returns for listed companies. We received daily, monthly and annual returns from 1980-2018, in which we focused on daily returns within our time

horizon 2000-2018.

Additionally, we included returns from companies which were previously listed on the stock exchange, but which have been delisted during our time horizon. The list of delisted companies was provided by the Oslo Stock Exchange. In the construction of the market model we extracted a historical energy index OSE1010GI. Further, we wanted to add to our analysis by comparing differences using an oil index rather than the aforementioned energy index. We extracted historical Brent Crude oil prices from 2000 to 2018, in which we created a return index.

3.2 Data Sorting

After collecting necessary data we started the filtering process in terms of including returns which were solely related to companies in the energy industry. Further, given that our selection criteria were under the restriction of CEO turnovers of Nordic energy companies listed on the Oslo Stock Exchange we excluded returns from companies who did not fulfil these criterions. Thereafter, we looked at historical records for each individual company to obtain information regarding CEO turnovers in which we obtained turnover dates and the name of the CEO successor. For consistency, we strictly use the turnover dates from the historical records provided by Brønnøysund Register Center.

Once we had sorted each relevant turnover within our time frame, we started collecting necessary characteristics connected to the appointed CEOs. These attributes were found through different professional networks, i.e. LinkedIn, and through news reports related to the turnover event. A limitation with regards to the CEO attributes is that we were unable to determine key characteristics connected to the appointed CEO's personality, in addition to their standard approach and strategic preferences. Thus, we decided to leave these characteristics out given that determining these would require vast speculation. All turnover events which did not meet the requirements of our event windows or incidents where collected returns were inadequate of running necessary analysis for either event window were removed. Thus, we ended up with a final sample of 112 turnovers from 46 different companies.

Thereafter, in contemplation of running the analysis, we sorted the previously mentioned OSE1010GI energy index for our relevant time period, providing us with the opportunity of calculating abnormal returns using a market model. In furtherance of improving our analysis, we additionally ran the same process for our Brent Crude oil index enhancing different perspectives. The collected data were thereby sufficient to run the primarily desired analysis, however, we also decided to sort the collected data in terms of outliers. During this data filtering process, we found some interesting results, making it worthwhile to run a secondary analysis based on the filtered data. Due to potential outliers influencing our results, we thereby chose to winsorize the data, by removing anomalous values that significantly deviate from the remainder of our sample.

3.3 Data Limitations

After we completed the data collection and sorting process, we found some slight limitations to the data we were processing, despite the continuous attention to maintain an adequate and non-biased sample. Firstly, we use the OSE1010GI index as the market model to calculate the abnormal returns from stock price fluctuations surrounding every CEO turnover. However, the OSE1010GI index includes all the listed energy companies on the Oslo Stock Exchange, meanwhile we focus on turnovers in Nordic companies. Firms which are primarily registered outside of our demographic area are not included in our sample. Thus, there will be some implications regarding our market model, considering that firms which are not included in our sample are to some degree influencing the applied market model.

Moreover, we are unable to include all turnovers in our time horizon due to a few delisted companies lacking returns which makes our estimation window inadequate, i.e. got delisted before the criterions regarding our estimation window were satisfied. Additionally, we received stock returns up until the end of 2018, which makes turnovers that occur late in 2018 inapplicable for our sample. Thirdly, there are companies which have had several turnovers within a certain period causing some overlaps, which we have solved through providing each company and turnover combination with separate IDs, treating each of the turnovers uniquely. Lastly, we analyse forced turnovers as one of our hypotheses. Given that it is uncommon for media reports to state whether the CEO got forced

out of the company or if it was a natural departure, we have implemented Parrino's framework to minimize speculation for each individual turnover. However, despite using a competent framework, there are still some limitations in categorizing forced turnovers where media reports are insufficient, as it is impossible to verify whether Parrino's framework is adequate in each of the unique events.

4. Methodology

In this chapter we elaborate on our main research approach and methodology. We utilize the application of event studies, and examine different components related to this phenomenon. Next, we distinguish between the stock price reactions and accounting measure changes, and finally some validity remarks.

4.1 Research Approach: Event Study

The event study gives rise to measure the effects of an economic event on the values of the companies. This approach widely used in economics and finance permits quantification of a relevant variable of choice. Furthermore, using data from financial markets, a typical approach within this field relates to the stock price response to an event. With the fundamental assumption of rationality in the marketplace, the functionality of such a study becomes highly viable; the effects of an event should be directly reflected in the price of the stock. Moreover, an assessment of the economic impact of the event can be obtained using stock prices over a limited duration (MacKinlay, 1997).

Another strength of the event study relates to its numerous applications. In the field of finance, the application to a wide spectre of company specific and economy wide events appear. Moreover, events of M&As, earnings announcements, issues of debt or equity and other announcements of macroeconomic variables such as interest rates reductions or the trade deficit (MacKinlay, 1997). Furthermore, deviating from the field of finance, applications in other areas also appear frequently, including the areas of law and economics, properly highlighted in both the papers "Using Financial Data to Measure Effects of Regulation" by Schwert (1981) and "The Role of Financial Economics in Securities Fraud Cases: Applications at the Securities and Exchange Comissions" by Mitchell & Netter (1994). Worth mentioning is that in the majority of

applications, the measured variable of interest is the price of a particular stock, most often common equity (MacKinlay, 1997). Furthermore, emphasised in Kothari & Warner (2007), event studies play a vital role in capital market research as a test of market efficiency. Moreover, the persistence of systematic nonzero abnormal stock returns after a specific event are inconsistent with market efficiency. Thus, event studies with emphasis on longer horizons after an event can provide sufficient proof of market efficiency (Brown & Warner, 1980; Fama, 1991).

There are several known event study methodologies approaching various disciplines within the business field. The basic event study technique is well known and consequently used in a number of fields, often inspired by MacKinlay's (1997) general approach in "Event Studies in Economics and Finance" (Krivin, Patton, Rose & Tabak, 2003). Moreover, in our study we follow chapter 4 in "The Econometrics of Financial Markets" made by Campbell, Lo & MacKinlay (1997). The chapter shed light on the event-study analysis and gives a brief outline of the structure of an event study. We use this outline as a flow of guideline, rather than a strict framework, which means that minor deviations from the structure outlined by the authors will occur.

4.1.1 Model for Determining Normal Returns

We will measure abnormal returns (AR) to estimate the impact of the event. The AR represents the actual ex-post return of the stock minus the normal return during the event window, where the normal return reflects the expected return if the event had not occurred. For company i and event date τ the abnormal return is:

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_\tau) \tag{4.1}$$

$AR_{i\tau}, R_{i\tau}$, and $E(R_{i\tau}|X_\tau)$ are the abnormal-, actual- and normal returns respectively for stock i during period τ, and X_τ is the conditional information in the normal return model. Further, we measure the normal return, and there are several procedures available to compute this. Moreover, the literature typically distinguishes between two categories of models - statistical and economical. Models underlying the former category, such as the Constant Mean Return Model,

Market Model (One Factor Model) and Multifactor Models follow statistical assumptions concerning sole behaviour from stock returns, thus not dependent on economic factors. Contrarily, economical models such as the Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) underlies in practice both statistical assumptions and assumptions concerning investors' behaviour (MacKinlay, 1997). To calculate the normal returns, we applied the aforementioned statistical model, the market model. The construction of the market model implies reduced variance of the AR, as we dismissed the portion of the return that is related to volatility in the market's return. This can improve the probability to identify event effects, thus represent an improvement to the Constant Mean Return Model. The market model correlates the return of a given stock with the return of a benchmark reference portfolio. This construction tracks the abnormal returns on the specified day(s) of the event window, and thereby report the difference between the stock's actual- and normal return. For the return of a given stock i the market model assumes a linear relationship to the return of the market portfolio:

$$R_{i\tau} = \alpha_i + \beta_i R_{m\tau} + \varepsilon_{i\tau} \tag{4.2}$$

$$E[\varepsilon_{i\tau}] = 0 \qquad Var[\varepsilon_{i\tau}] = \sigma_{\varepsilon_i}^2$$

$R_{i\tau}, R_{m\tau}$ and $\varepsilon_{i\tau}$ are the period-τ returns on stock i, the market portfolio and the zero mean disturbance term, respectively. Further, the parameters of the market model are α_i, β_i and $\sigma_{\varepsilon_i}^2$. Hence, the difference between the actual return and the predicted normal return, namely the abnormal return, is then calculated as:

$$AR_{i\tau} = R_{i\tau} - \widehat{\alpha_\iota} - \widehat{\beta_\iota} R_{m\tau} \tag{4.3}$$

Under the null hypothesis, the AR are jointly normally distributed with a zero conditional mean and conditional variance $\sigma^2(AR_{i\tau})$:

$$\sigma^2(AR_{i\tau}) = \sigma_{\varepsilon_i}^2 + \frac{1}{L}\left[1 + \frac{(R_{m\tau} - \bar{R}_m)^2}{\sigma_m^2}\right] \tag{4.4}$$

L is the estimation period length (i.e number of estimation days) and $\bar{R}_m$ is the

mean of the market benchmark portfolio. However, with L large, $\sigma^2(AR_{i\tau}) \rightarrow \sigma^2_{\varepsilon_i}$.

4.1.2 Proxy for Market Portfolio

Briefly touched upon in the previous section, the application of the market model implies that we need to choose a benchmark reference portfolio. Moreover, a suitable proxy for the market return should be addressed. Existing literature commonly use a broad-based stock index to properly represent the market portfolio (MacKinlay, 1997). In our study where the sole emphasis is on energy companies we deviated from this conventional approach. The Oslo Stock Exchange Energy Index (OSE1010GI), which consists of companies that operate in the energy sector and are listed on Oslo Børs, appear adequate, and better suited to represent specific trends for the energy industry compared to other indices. Thus, we believe this more accurately yield sufficient forecasts of the abnormal returns.

4.1.3 The Event Window

Utilization of the market model require us to specify our preferred event window(s). Outlined by MacKinlay (1997), represented in Table 1 below, it is of common procedure to specify the event window to be greater than the particular period of relevance. Furthermore, addressing the period surrounding the event contributes to reduce potential data errors. The extension of the event window with some days prior to the day of the event, contribute to seize the effect stemming from investors trading on non-public information before an announcement (Keown & Pinkerton, 1981).

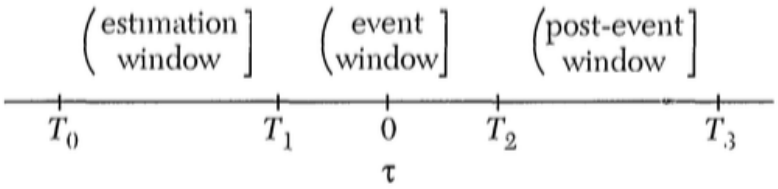

Table 1: Timeline for an Event Study

Examining other research papers' chosen length of event window(s), we notice that the existing literature represent different duration of the event windows. Hillmer & Yu's study (1979) shows that the event window should be closed within hours of the initial announcement. Chang & Chen (1989) believe that the market needs more time to respond to the announcement, thus leading to an event window for a number of days. Krivin et al. (2003) highlights that the appropriate event window should be equivalent to the period of observation.

Following the rationale of MacKinlay (1997) and guidance from the existing literature above, we have specified a handful of event windows to strengthen the robustness of our results. In the following 6 event windows are used: [-0,+0], [-1,+1], [-5,+5], [-10,+10], [-15,+15], [-20,+25], where [-0,+0] is the day of the event, - represent days before the event and + represent days after the event.

4.1.4 The Estimation Window

Posterior to the specified market model, we determined the estimation window. Moreover, the most customary approach is to use the period prior to the event window, which is the rationale we follow in our study. With the intention of forecasting the correlation between the returns from our benchmark index and the returns from the various securities included, we adjust accordingly so that the various event windows are not included in the estimation period. This exclusion of overlapping is to prevent the CEO turnover from influencing the normal performance model parameter estimates. Furthermore, in order to increase the robustness and reliability of the normal market return measure we specified our estimation window to the 200-days prior to the event. The magnitude of this span should be adequate to obtain sufficient and representative parameter estimates. Furthermore, the substantial length of the estimation window makes it reasonable to assume that the contribution of the second component to the variance of the AR in (4.4) is zero.

4.1.5 Measuring and Analysing Abnormal Returns

Continuously, returns will be indexed in event time using τ:

$\tau = T_0 + 1$ to $\tau = T_1$ Estimation window

$\tau = T_1 + 1$ to $\tau = T_2$ Event window

$\tau = T_2 + 1$ to $\tau = T_3$ Post-event window

$L_1 = T_1 - T_0$ Length estimation window

$L_2 = T_2 - T_1$ Length event window

$L_3 = T_3 - T_2$ Length post-event window

For each individual CEO turnover, we can estimate the AR and corresponding test-statistics at each case within the event windows. However, to draw plausible and overall inference on the AR for the various CEO turnovers, we aggregate the AR (Dasgupta, Laplante & Mamingi, 1998). The sampled aggregated abnormal returns (AAR) are calculated as:

$$AAR_\tau = \frac{1}{N}\sum_{i=1}^{N} AR_{i\tau} \quad (4.5)$$

Again, for large L, the variance is:

$$VAR(AAR_\tau) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma_{\varepsilon_i}^2 \quad (4.6)$$

Another measure we will use is the cumulative abnormal return (CAR), which allows us to test for the persistence of the impact of the CEO turnovers during the period $T_2 - T_1$. In this way, the AR can be added to acquire the $(CAR_i(T_1, T_2))$ for stock i in the period $(T_2 - T_1)$:

$$CAR_i(T_1, T_2) = \sum_{\tau=T_1}^{T_2} AR_{i\tau} \quad (4.7)$$

where $T_{low} \leq T_1 < \tau < T_2 \leq T_{up} \in$ event window, and T_{low} and T_{up} are the lower and upper limits of the event window, respectively. Further, as L increases, the variance of the CAR for stock i is:

$$\sigma_i^2(T_1, T_2) = (T_2 - T_1 + 1)\sigma_{\varepsilon_i}^2 \quad (4.8)$$

The distribution of the CAR under the null hypothesis is:

$$CAR_i(T_1, T_2) \sim N(0, \sigma_i^2(T_1, T_2)) \quad (4.9)$$

Further, to compute the test statistics of zero CAR, we formulate a conventional *t*-test, $CAR_i(T_1, T_2) \sim N(0, \sigma_i^2(T_1, T_2)$, as:

$$t = \sqrt{N}\frac{CAR}{\sqrt{\sigma_i^2(T_1,T_2)}} \sim N(0,1) \quad (4.10)$$

Further, we can also obtain aggregation across both time and events. The average cumulative abnormal return (CAAR) is formulated as:

$$CAAR(T_1,T_2) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(T_1, T_2) \quad (4.11)$$

Further, the variance of CAAR is:

$$var\big(CAAR(T_1, T_2)\big) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma_i^2(T_1, T_2) \quad (4.12)$$

Intuitively, construction of a similar conventional *t*-test is obtained, under the null hypothesis that the ARs are zero:

$$t = \sqrt{N}\frac{CAAR(T_1,T_2)}{\sqrt{var\big(CAAR(T_1,T_2)\big)}} \sim N(0,1) \quad (4.13)$$

, where the distribution is asymptotic with respect to the number of stocks N and the length of the estimation window *L* (MacKinlay, 1997).

The former conventional *t*-statistics imply that distributions are asymptotic. However, asymptotical distributions are not always the occasion, and we should therefore have another *t*-statistics which account for this. It is common to have some extent of skewness in the distributions, however, a normal distribution is not skewed. Furthermore, we expect degrees of skewness and leptokurtic distributions, the latter being typical for financial time series (Brooks, 2008). Stemming from these expectations, the skewness needs to be incorporated into our *t*-statistics to prevent biased results. Moreover, a solution to this is the skewness-

adjusted *t*-statistic introduced by Hall (1992), where it corrects the conventional *t*-test for skewed abnormal return distribution. First, the skewness estimation is given by:

$$\gamma = \frac{N}{(N-2)(N-1)} \sum_{i=1}^{N} (CAR_i - CAAR)^3 S_{CAAR}^{-3} \quad (4.14)$$

Furthermore, let

$$S = CAR/\sigma_{CAR} \quad (4.15)$$

then, the skewness-adjusted *t*-statistic for CAR, which is asymptotically standard normally distributed is formulated as:

$$t_{skew} = \sqrt{N}(S + \frac{1}{3}\gamma S^2 + \frac{1}{27}\gamma^2 S^3 + \frac{1}{6N}\gamma) \quad (4.16)$$

4.2 Stock Price Reactions & Accounting Measure Changes

In the main chapters of our study we have denoted the abnormal returns in terms of the stock prices as our performance measure. In chapter 6 we altered this perspective, solely focusing on accounting measures as proxies for performance. This distinction should be subject to elaboration as the measures deviate. The utilization of both concepts enable us to draw inferences stemming from various perspectives. Moreover, we have both market- and book values of the companies' financial performance.

First, elaborating on the market value, thus applying the stock price as the performance measure, some direction should be provided. Moreover, stock price reactions measure changes in future expectations, where the emphasis here should be the phenomenon of expectations (Whelan, 2020). A simplified, however, an explanatory view on how the mechanics of the stock price reaction works is provided in the following. If a CEO turnover is perceived as good news for the firm, this will result in a positive stock price reaction, hence the stock price will go up. Thus, the emphasis is centered around investors' continuous expectations of the firm, and not the actual, realized state. Incorporating the stock price reactions enables us to isolate investors' perception and appetite for the companies' future performance. Hence, by studying the CEO turnover's impact

on the stock price, what we identify is the investors' reaction to the event.

In addition, we applied accounting-based performance measures, namely ROA and ROE. These accounting performance measures are the actual and realized performance for various time horizons. Hence, if a CEO turnover is perceived as good news about the firm, this will not affect the accounting measures of the company as long as it remains sole expectations and not realized performance. Applying the accounting measures enable us to study the realized effect, thus present realized performance measures in the time horizons posterior to the event.

4.3 Validity

Choosing the methodological approach for a research study is a decisive decision, given that one must evaluate how the choice of methodology may affect the output, and consequently the results of the analysis. Through exploring existing research papers which examined the relationship between firm performance and CEO turnovers, we found that using event study as a research approach is a common and popular way of carefully assessing the relationship. Thus, we assessed the validity, reliability and generalisability of our chosen methodology.

The principles surrounding validity is based on trustworthiness, utility and dependability of our research, whether the research is believable and true, and if the measurements evaluate their intended purpose (Zohrabi, 2013). Given that our applied research approach is quite popular for similar previous research studies, it increases the trustworthiness and dependability of our chosen methodology. Additionally, we use different measurements throughout our study where we apply empirical models, such as the market model, in addition to accounting-based performance measures (e.g. ROA, ROE) which is elaborated upon in section 6.1.2.2. These approaches are frequently used in similar existing research studies and given that collected data originate from reliable sources it contributes to the credibility of the output. As validity is an essential criterion to evaluate acceptability and quality of research (Burns, 1999), we have carefully considered our methodological choices as described above, and argue that our measurements on the relationship between firm performance and CEO turnovers is valid.

Moreover, the measure of reliability is concerned with the consistency and

replicability of the results which is obtained from the research (Zohrabi, 2013). Given that we have collected our data directly from both Oslo Stock Exchange and the CCGR database, we find that our data originates from what is considered reliable sources. In terms of replicability we have detailed our methodology carefully and it is constructed in a way which is easily replicable for future researchers. Thus, we are under the impression that our measurements are reliable.

Lastly, measuring the generalisability is with regards to the degree of transferability of our findings to other settings and to what extent it is applicable in other contexts (Noble & Smith, 2015). We find our study to be plausibly easy in terms of transferability to other settings, and we argue that it should be easily applicable in other contexts evaluating this type of relationship. Based on our methodological approach, our study could be generalised to analysing either a different industry or include all the listed Norwegian firms. Additionally, our study should be easily generalised even if researchers intend to examine a different country, e.g. the U.S., without many methodological differences. Overall, we are pleased with the level of validity, reliability and generalisability of the methodology applied for our study.

5. Empirical Results & Analysis

In this chapter, we present and interpret the results from the following analyses. The analyses are performed using the approaches described in chapter 4. Thus, in addition to the AR from the event day, the five aforementioned event windows of [-1,+1], [-5,+5], [-10,+10], [-15,+15] and [-20,+25] are used in order to obtain inference in a short horizon. First, we analysed whether a CEO turnover influenced the abnormal returns. Further, we incorporated CEO related attributes into our study to examine if any of the attributes would impact the abnormal returns. For significance testing, we utilize a rejection rule corresponding to the 5% significance level.

5.1 Relationship Event of Turnover & Abnormal Returns

H_1: Appointing a new CEO does not impact the abnormal returns

Overviewing the corresponding summary statistics in Appendix 1- and 2, the majority of the distributions are highly leptokurtic and skewed. Consequently, we apply both the conventional *t*-statistic (*t*-conventional) and the skewness-adjusted *t*-statistics (*t*-skewed) when drawing inference on our hypotheses. Examining the respective *t*-values we notice consistency between the two test-statistics on the majority of the coefficients. Applying the *t*-skewed, the day of the event [-0,+0] and [-1,+1] are statistically significant different from zero at the 5- and 1% significance level, respectively. Using the *t*-conventional, [-0,+0] and [-1,+1] are statistically significant at the 10- and 5% level respectively. First, we reject the null hypothesis for [-1,+1] as both test-statistics are consistent with respect to our rejection rule. Next, for [-0,+0] we notice that the distribution is highly skewed, which lead us to put more emphasis on the *t*-skewed. Thus, we reject the null hypothesis, which lead us to draw the inference that the event of CEO turnover does have an effect on the abnormal returns for [-0,+0] and [-1,+1].

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,03 %	-1,93 %	0,99 %	1,15 %	-3,08 %	-3,16 %
σ	6,01 %	8,07 %	22,42 %	28,34 %	32,68 %	37,03 %
Significance level	*/**	**/***	-	-	-	-

*p<0.1; **<0.05; ***p<0.01
Conventional *t*- stat / Skewness-adjusted *t*- stat

Table 2: Regression Output Hypothesis 1

Interestingly, for both [-0,+0] and [-1,+1], the coefficients are negative. This imply that a CEO turnover causes negative abnormal returns for both [-0,+0] and [-1,+1], where the coefficients amount to -1.03% and -1.93% respectively. Hence, the immediate response from the investors is negative. Furthermore, our negative results are aligned with Warner et al. (1988). However, our two first periods are statistically significant, contrary to the aforementioned study. Following Warner et al. (1988) rational behind the sign of the abnormal returns, the information component exceeds the real component in absolute terms. Intuitively, this implies that the turnover's effect on the interest of shareholders is not sufficiently outweighing the public's perception of the performance in absolute values. Another explanation of the negative returns could be seen in relation with Beatty & Zajac (1987), implying that the new CEOs substantially affect both production-

and investment decisions of their companies. Lastly, even though the magnitude of the effect is somewhat high in our event windows, a possible implication of our results could be that the additional costs associated with the turnover, the recruitment- and advertising process exceeds the marginal benefit stemming from the turnover (Dahya, Lonie & Power, 2000). To locate this negative response further, there might be other factors explaining this which is not initially accounted for. Thus, we present the results after the incorporation of the CEO attributes below.

5.2 Relationship CEO Attributes & Abnormal Returns

Throughout the following analyses we also have the issue with leptokurtic and highly skewed distributions. Thus, we approach this by utilize the *t*-skew statistic.

5.2.1 Analysis of Insider Succession

H_2: *Appointing an insider as a new CEO does not impact the abnormal returns*

Studying the corresponding *t*-conventional, we find only for the event window [-1,+1], that an appointment of an *Insider is* statistically significant at the 10% level. Applying the *t*-skewed the results deviate from the former perspective, where in [-1,+1], *Insider* is statistically significant at the 5% level. Furthermore, for [-5,+5], *Insider* is statistically significant at the 10% level. Hence, we reject the null hypothesis for the [-1,+1] event window, which implies that appointing an *Insider* as CEO does influence the abnormal returns for the respective event window.

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-0,49 %	-1,87 %	4,84 %	4,02 %	1,66 %	1,85 %
σ	5,22 %	8,98 %	26,70 %	26,60 %	26,62 %	32,36 %
Significance level	-	*/**	/*	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*- stat / Skewness-adjusted *t*- stat

Table 3: Regression Output Hypothesis 2

Examining the coefficients from the respective windows, we notice deviations in the signs as time passes: For the event window [-1,+1] the coefficient is negative, implying that appointment of an insider will affect the abnormal return negatively, by the amount of the corresponding coefficient -1.87%. However, all the four longer event windows correspond to positive coefficients, although these are not

statistically significant. Thus, investors' instant reaction implies a negative attitude, which gradually changes positively as the event windows expand. Comparing these results with Greiner & Bhambri's (1989) findings, the majority of our event windows resemble consistency. However, in the [-1,+1] window, the occurrence of the negative *Insider* effect could be due to insiders' limited deviations from traditional policies, and thus inability to alter existing activity to obtain new and diverse investment opportunities. On the other hand, this effect is less negative than the impact of the average CEO turnover. Comparing these results with the appointment of an outsider, we refer to Appendix 3, and notice that the reaction for all the event windows is more negative. Moreover, where the abnormal returns gradually turn positive studying the insider, the abnormal returns remain negative and reinforces for each extension of the event window, which implies that investors' reaction to an outsider appointment is of negative nature irrespective of time horizons.

Furthermore, we analysed the effect of major organizational changes within the firms, in terms of the preceding CEO being an insider, while the newly appointed CEO is an outsider. Referring to Appendix 4, we see that such a change of strategy results in a substantial loss of 3.73% on the date of the turnover, which is statistically significant at the 5% level. Comparing the results to the appointment of an insider in general, all the corresponding coefficients within each event window are inferior when the outsider's predecessor was an insider. On the date of the turnover, the company suffers a loss of 3.24% following this major organizational change in leadership. Additionally, this is a considerable loss compared to appointing an outsider in general, which results in a loss of 1.79%. Given the momentous effect following this major change, one may argue that the negative market reaction possibly could be explained due to uncertainty arising from a risky decision, or that an outsider with less knowledge regarding in-house processes would have a negative short-term effect on the firm. This is reflected with the additional loss of 2.7% compared to the average CEO turnover within the same event window.

5.2.2 Analysis of Age

H_3: Appointing an elderly CEO does not impact the abnormal returns

The *t*-conventional shows that only for [-1,+1], the *Age* of the succeeding CEO influences the abnormal returns, statistically significant at the 5% level. This finding is consistent with the values we draw from the *t*-skewed for [-1,+1], where *Age* is also significant at the 5% level. Hence, we reject the null hypothesis and draw the inference at the 5% level that appointing a CEO above the age-threshold does influence the abnormal returns for the event window [-1,+1].

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-0,71 %	-2,08 %	2,69 %	3,11 %	-3,66 %	-5,77 %
σ	5,76 %	7,79 %	27,26 %	36,72 %	40,2 %	44,45 %
Significance level	-	**/**	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*- stat / Skewness-adjusted *t*- stat

Table 4: Regression Output Hypothesis 3

Furthermore, we notice that for [-1,+1] the *Age* of the successor following the CEO turnover influences the abnormal return negatively. Moreover, the magnitude of the respective coefficient amounts to -2.08% which implies a reaction more negative than the average CEO turnover. The negative influence *Age* has on the abnormal returns can be seen in context with Serfling (2014). Moreover, appointment of a CEO above the age-threshold could imply a more risk averse executive and a higher degree of alignment between the CEO and company risk preferences. Furthermore, with younger CEOs to overperform old CEOs, the instant impact *Age* has on the abnormal returns in [-1,+1] is reasonable. However, the significance vanishes quickly, and inferences over a longer horizon are therefore limited. Comparing these results with the case of younger CEO appointments presented in Appendix 5, we find similar results. However, for all the event windows the abnormal returns have negative signs, which differ from the initial perspective. Studying the first two event windows, the return on the event day is more negative and statistically significant at the 5% level, while for the [-1,+1] event window investors' reaction is less negative compared with our initial results.

5.2.3 Analysis of CEO Tenure

H_4: Appointing an experienced CEO does not impact the abnormal returns

Studying the *t*-conventional we notice that the *Tenure* of the CEO-successor is only statistically significant for the event window [-1,+1] at the 10% level. Furthermore, applying the *t*-skew, the former event window is the only duration where C*EO-Tenure* is statistically significant at the 5% level. Noticing the substantially high skewness for the corresponding distribution, we put more emphasis on *t*-skew, and thus reject the null hypothesis. Hence, this imply that the tenure of the appointed CEO influences the abnormal returns for the event window [-1,+1].

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-0,90 %	-2,54 %	4,28 %	1,01 %	-7,80 %	-7,73 %
σ	5,67 %	8,61 %	31,97 %	32,95 %	42,3 %	47,35 %
Significance level	-	*/**	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Table 5: Regression Output Hypothesis 4

Similar to the significant variables from the former hypotheses, the *CEO Tenure* influences the abnormal returns negatively for the [-1,+1], with the magnitude of the corresponding coefficient equal to -2.54% which implies an even more negative reaction than the average CEO turnover. Our results contradict Ang et. al (2003) where the announcement of an experienced CEO yields a positive market reaction. However, our findings are more consistent with Elsaid et al. (2011), where their findings implied mixed results which did not indicate that experienced CEOs can improve the performance more than inexperienced CEOs. However, the immediate negative [-1,+1] reaction is not consistent. A potential reason for this could be seen in context with the same impact on [-1,+1] stemming from the *Age* hypothesis: One can infer that more experienced CEOs are equivalent to elderly CEOs, and that the risk aversion is higher. Thus, a higher degree of alignment between the company and the CEOs risk preferences could occur, with the extension that the immediate stock market reaction is negative due to elderly CEOs' performance below expectations. Furthermore, in the [-1,+1] event window we notice that the impact from *CEO Tenure* is stronger than the *Age* impact. However, this could be due to a lower amount of observations of CEOs in the *Tenure* category compared to the *Age*. Comparing these results with the case

of CEO below the average tenure our findings are rather similar (Appendix 6). Again, since we cannot present results that indicate more experienced CEOs will improve the performance, this emphasises that our results are more consistent with Elsaid et al. (2011).

In the same manner as with the appointment of outsiders, we examined major organizational changes involving appointment of CEOs with less tenure than the average, where the predecessor possessed above-average experience. Applying the *t*-skewed the results are statistically significant at the 5% level for all event windows except in event window [-20,+25], as shown in Appendix 4. Following this major change, all coefficients in the six event windows are inferior to the average CEO turnover in general. Comparing the results with the appointment of more experienced CEOs, we notice that the coefficients are more negative for all the significant event windows. Measuring the deviation towards the significant coefficient of appointing the experienced CEO in [-1,+1], companies suffer a loss of 1.39%. Additionally, comparing these results to the average appointment of a less experienced CEO we find that such a major change creates a substantial loss for the firm in five event windows, which is increasing over time within the four statistically significant windows. These negative results peak at [-15,+15] where the coefficient amounts to -15.40%, which is a major loss of 14.65% compared to the average appointment of less experienced CEOs. Given the magnitude of the losses, and that the negative effects ascend over time, this can be explained consistently with Elsaid et al. (2011) where the negative market reaction is based on the perception of an inexperienced CEO lacking the necessary managerial abilities. However, there are only 17 occurrences within our sample where this major change is conducted so the results need to be analysed with caution.

5.2.4 Analysis of Gender

H_5: Appointing a male CEO does not impact the abnormal returns

Studying the impact of the *Male* variable we have consistency between the two *t*-statistics in both the event windows [-0,+0] and [-1,+1], when it comes to rejection of the null hypothesis. For the event window [-0,+0], the gender of the appointed CEO impacts the abnormal returns at the 5% level, applying both tests. Similarly, for [-1,+1], both tests yield the same conclusion, showing that *Male* is

statistically significant at the 1% level. Hence, we reject the null hypothesis, which implies that appointing a male CEO does influence the abnormal returns for [-0,+0] and [-1,+1].

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,19 %	-2,14 %	0,93 %	1,17 %	-3,19 %	-3,51 %
σ	5,97 %	8,04 %	0,00 %	28,52 %	32,89 %	36,76 %
Significance level	**/**	***/***	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Table 6: Regression Output Hypothesis 5

Furthermore, examining the economic significance, the corresponding coefficients of the two significant variables are both of negative sign. For [-0,+0] and [-1,+1] the magnitude of the coefficients amounts to -1.19% and -2.14% respectively, which are more negative compared to the average CEO turnover. Thus, with the appointment of a male CEO we notice for both event windows a negative impact on the stock returns, with immediate effect. From our sample 96.4% of the CEOs are males, which strongly imply that the majority of the CEO positions are filled with men. Thus, the appointment of yet another male does not support gender diversity, and the results with negative effect impact on [-0,+0] and [-1,+1] therefore support Hunt et al. (2018) and Bliss & Potter (2002). However, these studies concern the broad senior management, and not solely the CEO position. Furthermore, in comparison with the results on female appointment we notice quite the deviation (Appendix 7). The results also support the aforementioned studies with regards to increased gender diversity, showing that the abnormal returns from the event day and [-1,+1] are 3.17- and 3.75% respectively. However, none of the event windows in the female regression are statistically significant, with one of the reasons being the inadequate number of observations corresponding to 4.

5.2.5 Analysis of Education

H_6: Appointing a highly educated CEO does not impact the abnormal returns

First applying *t*-conventional, we notice that for [-1,+1], *Education* is statistically significant at the 5% level. Furthermore, utilizing *t*-skewed, the corresponding *Education* is significant at the 1% level. Next, for both the [-15,+15] and [-20,+25], *Education* is statistically significant at the 10% level. This does not

adequately meet our rejection rule, however, both distributions are highly skewed. Moreover, applying the *t*-skewed, *Education* is significant at the 5% level. Hence, we reject the null hypothesis for all the following horizons [-1,+1], [-15,+15] and [-20,+25]. Thus, at the 5% level we can state that appointing a CEO with higher education will impact the abnormal returns for the stated event windows.
Initially touched upon in chapter 2, previous studies showed that higher education affected the firm performance in a non-negative fashion. However, our results contradict this as for all our event windows, the appointment of a CEO with higher education influences the abnormal returns negatively. For [-1,+1], [-15,+15], [-20,+25] the corresponding *Education* coefficients are -1.71%, -5.63% and -2.38% respectively. This trend is unexpected, as we would expect a higher education to be a non-negative trait in affecting the abnormal returns. We also see how the magnitude of the coefficients increases as the horizons increase, emphasised with the substantial -5.63% in the [-15,+15] window. Moreover, an explanation could be that for longer durations, other variables not accounted for have a more substantial role in the determination of the abnormal returns, and thus limiting us to isolating the educational effect on the returns. However, comparing the day of the event and the [-1,+1] window with the average CEO turnover the results follow the rationale: higher education yield a less negative effect on the abnormal return compared to the average CEO.

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-0,95 %	-1,71 %	-1,31 %	-1,01 %	-5,63 %	-6,89 %
σ	6,15 %	7,16 %	14,06 %	24,68 %	31,52 %	35,07 %
Significance level	/*	**/***	-	-	*/**	*/**

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*- stat / Skewness-adjusted *t*- stat

Table 7: Regression Output Hypothesis 6

Furthermore, with the inclusion of CEOs with lower education, the immediate reactions related to the return of the event day and [-1,+1] are more negative than for higher education and the average CEO turnover, which also appear intuitive (Appendix 8). However, for all the other event windows we have substantial positive abnormal return. Related to this variable, this trend is unexpected, lead us to believe that it should be beneficial and companies should be rewarded for appointing CEOs with lower education. This struggle with the rational belief on education, and the unexpected results from this could be explained by the limited observations of lower educated CEOs.

Similar to the analysis of insider succession and CEO tenure, we examined major changes in the appointment of educated CEOs, shown in Appendix 4, where the newly appointed CEOs is less educated than their predecessor. Applying the *t*-skewed we obtain one result statistically significant at the 10% level, for event window [-5,+5] where the magnitude of the coefficient amount to 5.44%. Comparing these results with the appointment of a more educated CEO in general, the first two event windows [-0,+0] and [-1,+1] are inferior following this major organizational change. However, the remaining event windows are superior to the appointment of an educated CEO, where the significant coefficient in [-5,+5] is 6.75% greater following the major change. Nonetheless, this coefficient is not statistically significant for educated CEOs, which means we should be cautious drawing any conclusions. Moreover, this is substantially lower than the average appointment of less educated CEOs where the magnitude of the statistically significant coefficient in [-5,+5] amounts to 15.88%, thus making the major change inferior by 10.44%. The remaining five event windows provide us with no statistically significant results. Additionally, this major change only occurs at 8 occasions throughout our sample, which indicates that any conclusive results lacks some reliability and credibility.

5.2.6 Analysis of Forced Succession

H_7: Appointing a new CEO through a forced turnover does not impact the abnormal returns

In the application of both test statistics we see that for neither of the event windows, a *Forced* CEO turnover significantly impacts the abnormal returns. Thus, we fail to reject the null hypothesis for *Forced,* in all the corresponding event windows. Hence, we can confirm that a *Forced* CEO turnover does not impact the abnormal returns for any of the event windows.

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-0,94 %	-0,24 %	2,40 %	7,21 %	-6,59 %	-6,33 %
σ	5,39 %	7,40 %	23,00 %	42,87 %	51,53 %	57,72 %
Significance level	-	-	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*- stat / Skewness-adjusted *t*- stat

Table 8: Regression Output Hypothesis 7

Our results support Farrell & Whidbee's (2003) economically as their findings imply a negative response in performance in the aftermath of a forced turnover. Furthermore, our results could align with Denis & Denis (1995). If we follow the latter intuition mechanically, our results imply that the initial performance of the company is worse than expected and will now increase because the successor is more suitable for his tasks than the predecessor. Moreover, the rationale for this is that the immediate reaction of the stock price is not as negative as for the reaction related to an average CEO turnover. Comparing these results to those of natural turnovers (Appendix 9), we see that for both the event day and [-1,+1] the abnormal returns of natural turnovers are more negative, and also statistically significant at the 10- and 1% level, respectively. Moreover, these reactions are more negative than the average CEO turnover. However, we find it important to put emphasis on our limited sample in terms of forced turnovers, which amounts to marginally below 20% of the turnovers. Furthermore, this limitation can contribute to inadequate conclusions, and we should therefore be careful when drawing inferences.

5.3 Oil Price Versus Energy Index: Normal Return Measure

In the construction of our study, the approach of the event study is a vital determinant for our results and inferences. Playing a significant role in this approach is the normal return measure, where we decided to use the aforementioned energy index as we believe this would best suit the totality and broadness of the assigned energy industry. However, a common denominator for the utmost majority of these company is that their performance is dictated by a commodity price, namely the oil price. Thus, due to the appropriateness of this commodity price we will briefly include it to increase the robustness. We decided to incorporate the Brent Crude oil price as this reflect a common reference price of this commodity and constructed an index from these prices to further calculate the abnormal returns. Hence, the procedure is equivalent to the former where we used the energy index and the sole deviation is the replacement of the normal return measure.

From the graph below we notice that the two highly correlated curves which reflect the daily CAARs in the [-20,+30] interval, start off being rather close to each other. Further, the energy index incorporated CAAR increases relative to the

oil index incorporated CAAR before it converges closer towards the end of the event duration with some deviations. In the aforementioned interval the energy CAAR surpass the oil CAAR throughout the entire period. However, the previous finding is not adequate to draw any important conclusions. Moreover, what is interesting is repeating the event study with the assigned hypotheses but with the new measure for normal return, and study the regressions results to see if this give other conclusions than the former analysis.

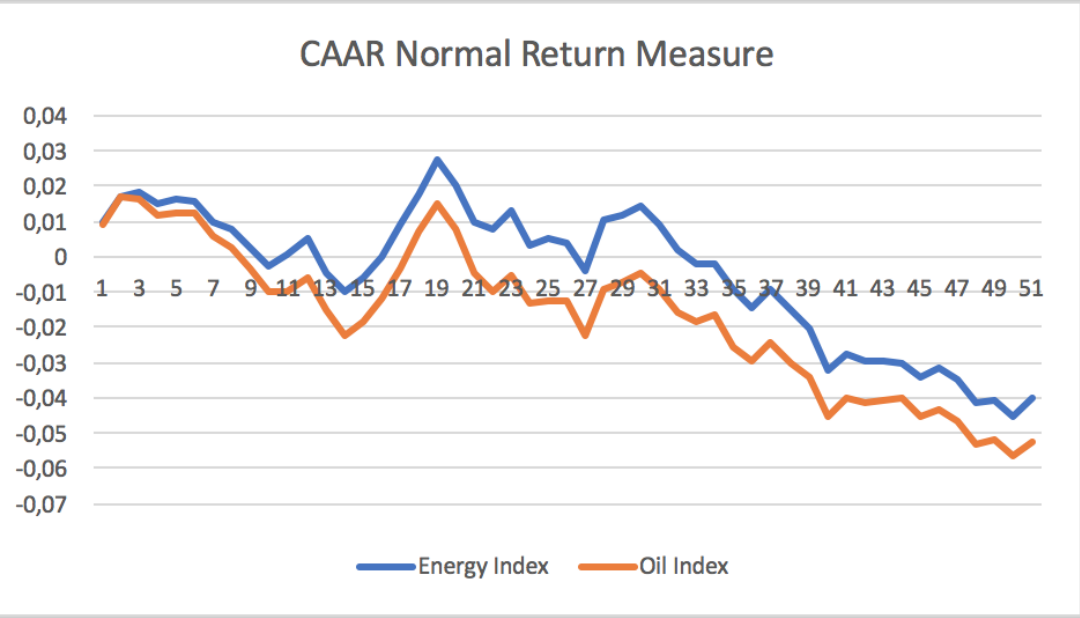

Table 9: CAAR for Oil- and Energy Indices as Normal Return Measures

Repeating the same event study procedure as before, the regression results and summary statistics are presented in Appendix 10 & 11. Summarizing and comparing the findings we emphasise that the majority of the distributions are highly skewed and we apply the skewness-adjusted *t*-statistics. Moreover, the equivalent rejection rule corresponding to a 5% significance level also apply here. First, the majority of the coefficients' signs are equivalent to before. From 46 coefficients we have 3 deviations, in terms of sign. However, the corresponding 3 variables are not statistically significant, and we therefore choose to not give this much attention. Moreover, the magnitude of the coefficients is very similar. In terms of statistically significant variables sufficiently meeting the rejection rule, we have 1 deviation from the conclusions in the former hypotheses: Incorporating the oil index, *Education* is statistically significant at the 5% level, thus influence the AR on the day of the event. Conclusively, we notice that deviations in the results are substantially limited and the overall conclusions are highly consistent,

when comparing the results from the energy- and oil-index as the normal return measure.

5.4 Winsorization

When there are several unusually large or small observations in a data sample, the estimated analysis might be influenced to overestimate the mean squared error. A technique which can be utilized to manage this problem is to winsorize extreme values to the cut off values, creating a slightly more biased estimator, which considerably reduces the mean squared error compared to including the entire sample size (Kokic & Bell, 1994). By winsorizing the anomalous values, we improve the robustness of our sample and move the extreme values towards the centre of the distribution, causing more normality in our sample, meaning we obtain smaller variance and favourable power (Malik, 2017).

Briefly touched upon in section 3.2, we examined our results and found significant outliers which influenced our results. In our winsorization approach we limited extreme values by adjusting values which were either larger than the 95^{th} percentile, or lower than the 5^{th} percentile of the values. The data were thereby transformed into the 95^{th}- and 5^{th} percentile to analyse to what degree these extreme values affected our results. By transforming the extreme outliers, they are not removed from the sample but by preference rather conserved in our study to preserve our sample size and avoid unnecessary degrees of bias without excluding these observations.

The output generated through the winsorization procedure is presented in Appendix 12. When solely studying the signs of the 42 coefficients, 7 of them deviate from the initial analysis. However, common for these 7 deviations is that the corresponding variables are not statistically significant, and it is not adequate to change our conclusions. Maintaining a rejection rule corresponding to the 5% significance level, we notice 3 new cases where we reject the null hypothesis: Appointing an insider as CEO influences the abnormal returns for the event window [-5,+5]. Also, the tenure of the CEO successor impacts the returns for the [-15,+15]. Finally, appointing a CEO with higher education affects the abnormal returns for the [-0,+0]. Also, what emerges intuitively is that the magnitude of the

majority of the coefficients are reduced, and that the corresponding standard deviations of all coefficients decline.

6. The Relationship Between Performance and CEO Turnovers

In this chapter we present the relationship between company performance and CEO turnover from another perspective. Utilizing the accounting related performance measures, we study whether performance affect CEO turnovers and address potential changes in performance posterior to a CEO turnover.

6.1 Empirical Method

In our study we mainly focus on the causality with regards to how the CEO turnover affect the performance of the company in terms of the stock price returns. However, there are reasons to believe that the reverse relationship is of interest. Namely, how and if organizational performance affect CEO turnover in a company. With the reverse causality closely related to our study we want to elaborate further on this relationship in the following chapter. In the first section of the chapter we present the empirical method. Firstly, we narrow our focus to the sample selection and the data collection, before we present our variables. Further, the binary response- and logistic regression models are presented.

6.1.1 Sample Selection & Data Collection

For this isolated study within our thesis, we were provided with data from the Centre for Corporate Governance Research (CCGR) database. The CCGR database provide extensive data on Norwegian private firms, which gave rise to a larger flexibility when it comes to include and exclude variables relevant for the following analyses.

The initial data set from CCGR, spanning from 2000 to 2018 included 20 different variables of choice consisting of independent companies in the excess of 2 million observations. We drew inspiration from Ahmed & Hellerslia's (2019) data filtering process, starting off with a major dataset before trimming it. The following filters are applied to our initial dataset:

1. Companies that are not labelled "Energy Companies" are dismissed.

2. Companies with zero or negative average revenue for the duration of the period are dismissed.
3. Companies with negative total assets are dismissed.
4. Companies with a CEO controlling more than 50% are dismissed.
5. Companies with CEOs holding less than a year of tenure are dismissed.
6. Companies that have a lifespan of less than 3 consecutive years are dismissed.

For our study, energy companies are our sole area of interest and *filter 1* is thus applied. Each company is associated with either one or several industry codes throughout the sample. However, these industry codes were changed in 2007 with effect from 2009, meaning that observations prior to 2009 have different industry codes than the ones of today. This change made it challenging to include the relevant companies, where our classification of "Energy Companies" drawn from the CCGR data are companies corresponding to the industry code spans of 6.000-6.999 and 33.201-39.000, namely oil, electricity, gas, steam and air conditioning supply. Companies prior to the change are converted to be coherent with the relevant industry classifications.

Filter 2 and *3* are applied to disregard firms that are not of a substantial economic nature or inactive firms.

Intuitively, with a CEO in control of more than 50% of the company, little suggests that the CEO will be dismissed. Thus, we have a situation of the CEO acting as the majority owner which is a new area we are not exploring in this thesis. Hence, we apply *filter 4,* which restrict us to study CEO turnovers in the case of CEO ownership less or equal to 50%.

We apply *filter 5* and *6,* and we are therefore left with companies that have a minimum number of observations. This contribute to draw inference over a substantial time period, which is vital to examine the causality performance and CEO turnover.

Applying these filters we are left with a total of 1 222 observations. However, our dataset includes several missing values. On the other hand, we do not eliminate an

observation due to some missing values as this could reduce our total number of observations and impact the statistical power of our tests substantially. Also, Stata handles missing values in a proper manner, which also goes against the premise of disregarding the observations with missing values.

6.1.2 Variables Specifications

In the following sections, we present the relevant variables for our analyses. We elaborate on and distinguish between the dependent-, independent- and control variables.

6.1.2.1 Dependent Variable

CEO turnover: In the first regression model, we apply CEO turnover as our dependent variable. We created a binary variable which amounts to 1 if there was a CEO turnover in year *t,* and 0 under other conditions. Separating each company by identification numbers, we observe a CEO turnover when there is a deviation in the birth date of the CEO between year *t* and year *t+1,* which indicate that a CEO turnover occurred in year *t.*

6.1.2.2 Independent Variables

Return on Assets (ROA): Findings presented in a previous study reported that there is an inverse relationship between financial performance measured through accounting-based proxies, such as ROA or ROE, and the likelihood of a CEO turnover (Farrell & Whidbee, 2003). Deviating from our initial analysis in the study, we now apply accounting measures as proxies for performance. First, we study the effect ROA has on CEO turnover. The obvious drawback here is that we only have one number per measure each year. Mentioned earlier, we are aware of the potential double causality in the relationship of performance and CEO turnover. Stemming from this phenomenon, we can control this better by the use of lagged ROA by one year. This means that we always use ROA one year prior to the CEO turnover if it occurs; turnover in year *t*, hence we use ROA from year *t-1*. This is in coherence with previous studies conducted on accounting-based performance and CEO turnovers (e.g. Huson, Parrino & Starks, 2001; Puffer & Weintrop, 1991). We define ROA as

$$ROA_{it} = \frac{Net\ Income_{it}}{Total\ Assets_{it}} \quad (6.1)$$

, where $Total\ Assets_{it} = Total\ Fixed\ Assets_{it} + Total\ Current\ Assets_{it}$

Return on Equity (ROE): As described above, previous research have shown the strong link between accounting-based performance and CEO turnovers. We continue to apply accounting measures as proxies, and another relevant accounting-based performance measure is ROE. Similar to ROA and the potential double causality mentioned, we lag ROE by one year. Further, we define ROE as

$$ROE_{it} = \frac{Net\ Income_{it}}{Shareholders'\ Equity_{it}} \quad (6.2)$$

Profit Dummy: In addition to ROA and ROE we wanted to incorporate an another performance measure, in the respect of profits. We define the profit variable as a binary variable that equals 1 if the firm announce a positive profit in year *t,* and 0 otherwise. Similarly to ROA and ROE, we lag the dummy by one year. Under circumstances where the costs of a company outmatch their income the company would generate negative profit which potentially could lead into financial distress. Under such challenging conditions, the management will prioritize to improve their financial performance, thus the possibility of replacing their current CEO increases (Murphy & Zimmerman, 1993; Gilson, 1989).

6.1.2.3 Control Variables

In other empirical studies addressing the causalities we are interested in, the following control variables are often used. Moreover, as this chapter solely act as a supplemental part we do not want to elaborate further on the theoretical relationship on the following variables. However, we describe how we identify and incorporate them in our regression.

Company Size: Functioning in the role as a proxy for the size of the company, we use the corresponding revenue of the company.

Company Age: Provided with the year of establishment for the firm and the year of the corresponding data, we find the company age by subtracting the

establishment year from the year of the corresponding data.

CEO Age: Following the same approach as the former, we subtract the birth year of the CEO from the year of the corresponding data to define the CEO age.

CEO Tenure: We define the CEO tenure in years by manually include a counting row after each turnover, where it corresponds to 1 the year after the turnover, year *t+1*, and 2 in year *t+2* and so on.

CEO Ownership: This controlling variable ranges from 0- to 50%, as we applied the aforementioned removal of observations in the excess of 50% ownership.

6.1.3 Binary Response & Logistic Regression Models

We follow the standard approach when studying the CEO turnovers' sensitivity to performance of the company, by estimation of non-linear models (Brooks, 2008; Wooldridge, 2016). Typically, logit- and probit models are applied for estimation of binary data, thus highly relevant when our dependent variable only can yield binary response. Hence, since our dependent variable is dichotomous, we utilize the binary response model for our regressions. However, we will solely apply the logistic model as the results usually are indistinguishable, and not utilize the probit model (Brooks, 2008).

Scoping in on the logistic regression model, we use Brooks' (2008) intuition. We apply this model as it analyses the relationship between a binary variable and the independent variable(s). Further, the model fits the data to the logit function, and forecast the probability of a specified event to happen. The logistic function *F* is a function of any random variable *z* , and represent the cumulative logistic distribution:

$$F(z_i) = \frac{e^{z_i}}{1+e^{z_i}} = \frac{1}{1+e^{-z_i}} \tag{6.3}$$

, where *e* is the exponential under the logit approach. We interpret the function $F(z_i)$ as a probability. With the model, 0 and 1 are asymptotes to $F(z_i)$ and thus the probabilities will span from 0 to 1, but will not fall to precisely zero or rise to

one. Next, the estimated logistic model would be:

$$P_i = \frac{1}{1+e^{-(\beta_1+\beta_2 x_{2i}+\cdots+\beta_k x_{ki}+u_i)}} \quad (6.4)$$

, where P_i is the probability that $y_i = 1$.

6.2 Empirical Results & Analysis

In the last section of the chapter we present the empirical results and the associated analysis. We also review the econometric assumptions and tests. First, a discussion on the descriptive statistics is presented before we touch into sections on normality, heteroscedasticity, multicollinearity, endogeneity and autocorrelation. Finally, we present the regression models and the corresponding analysis.

6.2.1 Descriptive Statistics

Our descriptive statistics results are highlighted in Table 10 below. We identified 222 CEO turnovers out of our final sample constituting 1222 observations, during a span of 18 years. First, studying the company specific results we find that the average company in our sample is 13 years old, has a ROA and ROE of -0.01 and 0.23 respectively. Similarly, focusing on the CEO characteristics the average CEO has an age of 50, holds a CEO tenure of 3 years and holds ownership of 29% of the company.

Variables	N	Minimum	Maximum	Median	Mean	Std. Deviation	Skewness	Kurtosis
CEO Turnover	1 222	0,00	1,00	0,00	0,18	0,39	1,65	3,73
ROA	1 072	-2,67	0,70	0,02	-0,01	0,38	-5,52	37,61
ROE	1 072	-6,69	7,93	0,15	0,23	1,38	0,37	18,12
Profit Dummy	1 145	0,00	1,00	1,00	0,66	0,47	-0,66	1,44
Revenue	1 222	0,00	133''	15''	11''	21,4''	5,19	42,04
CEO Age	1 222	23,00	80,00	51,00	50,54	10,65	-0,11	2,36
Company Age	1 207	0,00	92,00	2,30	13,04	12,21	2,64	14,21
CEO Tenure	1 222	0,00	16,00	1,10	2,86	3,01	1,42	4,98
CEO Ownership	1 222	0,53	50,00	28,66	28,76	14,40	0,05	1,82

Table 10: Descriptive Statistics

Touching into our two most prominent independent variables, starting off with ROA, we notice substantial value differences in our sample, with values ranging from minimum -2.67 to the maximum of 0.70. Furthermore, the skewness and kurtosis are -5.52 and 37.61 respectively, implying a negatively skewed and highly leptokurtic distribution, hence a case of non-normality. Important to notice

is that the values reported in the descriptive statistics are winsorized at the 1st- and 99th percentile both for ROA and ROE.

For ROE, the differences in values are also of substantial nature, ranging from a minimum of -6.69 to a maximum of 7.93. The associated distribution of the sample has a skewness and kurtosis of 0.37 and 18.12, reflecting a leptokurtic- but not skewed distribution. Earlier mentioned in the thesis, a leptokurtic distribution is typical for financial data series, hence we are not surprised by these numbers.

6.2.2 Normality

For sample sizes sufficiently large, violation of the normal distribution occur effectively inconsequential (Brooks, 2008). Following this intuition, the plausibility of the following regressions should not be impacted by the absence of normality due to our sufficient sample. However, as highlighted in the descriptive statistics we have substantial large span in our values, and with the appearance of extreme values this could be misleading for our conclusions and inferences. To deal with the outliers, we transform the level variables of revenue, CEO age and CEO tenure, and utilize the natural logarithm. This will mitigate the extreme values, thus yield more plausible conclusions.

Furthermore, prior to the winsorization we had a strong emergence of extreme values, primarily for two of our independent variables, namely ROA and ROE. Portrayed below, we notice the substantial transformation in ROA and ROE prior and posterior to the transformation. First, ROA comprised values ranging from -107 to 1.44, while ROE had values in the span from -36 to 195. Winsorizing both variables at the 1st and 99th percentile, we notice from the histograms that both the ROA- and ROE intervals are significantly shrunk. Thus, we follow the same rational from the winsorization, as in section 5.4.

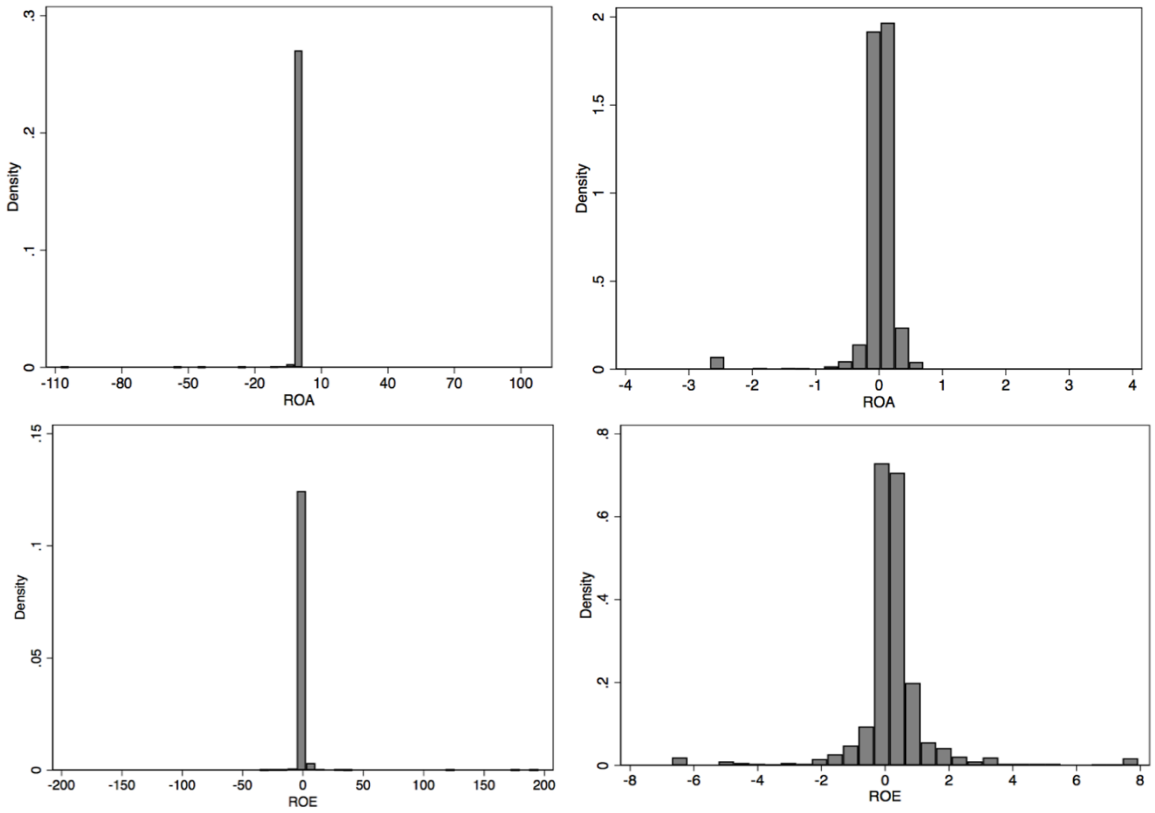

Table 11: ROA & ROE Values Prior- and Posterior to Winsorization

6.2.3 Heteroscedasticity

Homoscedasticity states that the variance of the unobserved error, conditional on the independent variables is constant. Homoscedasticity fails, i.e. heteroscedasticity occur, whenever the variance of the unobserved factors changes across different segments of the population, where the segments are determined by the different values of the independent variables (Wooldridge, 2016). Furthermore, if heteroscedasticity occurs in our residuals, this could weaken the validity of our tests, leading us to draw incorrect conclusions and inferences. To deal with and mitigate the presence of heteroscedasticity we follow the former approach applied for the non-normality issue, thus apply the natural logarithm to the revenue-, CEO age- and CEO tenure- variables. Additionally, we incorporate heteroscedasticity-robust standard errors into our models, which is in alignment with our substantial sample size, allowing heteroscedasticity to appear (Wooldridge, 2016).

6.2.4 Multicollinearity

The phenomenon of multicollinearity occurs when the explanatory variables are highly correlated with each other. We often distinguish between perfect- and near multicollinearity, where *perfect* occurs when we have an exact relationship between two or more variables, and *near* occurs when there is a non-negligible, however not perfect relationship (Brooks, 2008). Furthermore, as a rule of thumb, an absolute correlation coefficient of larger than 0.7 among two or more explanatory variables indicate occurrence of multicollinearity (Molala, 2019). Moreover, to depict the various correlations in a more sensible manner, we present the correlation matrix in Table 12 below.

	CEO Turnover	ROA	ROE	Profit Dummy	Revenue	CEO Age	Company Age	CEO Tenure	CEO Ownership
CEO Turnover	1,000								
ROA	-0,101	1,000							
ROE	-0,015	0,142	1,000						
Profit Dummy	-0,059	0,439	0,156	1,000					
Revenue	-0,024	0,253	0,129	0,260	1,000				
CEO Age	-0,212	-0,001	-0,061	-0,015	-0,139	1,000			
Company Age	-0,090	0,084	-0,100	0,138	0,292	0,132	1,000		
CEO Tenure	-0,034	0,114	-0,043	0,143	0,059	0,249	0,307	1,000	
CEO Ownership	0,014	0,034	0,089	-0,044	-0,045	-0,027	-0,059	-0,015	1,000

Table 12: Correlation Matrix

Studying the various correlation coefficients, the largest coefficient equals 0.44 between ROA and the Profit Dummy. Hence, our correlation coefficients are within a justifiable interval, thus no clear signs of multicollinearity issues.

6.2.5 Autocorrelation

The phenomenon of auto- or serial correlation occurs when the error terms of the variables are correlated with one each other (Brooks, 2008). The appearance usually shows when we work with longer time series. Thus, for the following model where we work of data spanning 18 years, we find it relevant to assess. We utilize the Wooldridge test, which can be implemented when testing for serial correlation in panel-data models (Drukker, 2003). The null indicates no serial correlation in our model. However, the test results show that we have presence of autocorrelation in the error terms, thus we reject the aforementioned null, presented in Appendix 13. Furthermore, to reduce this issue we utilize the equivalent procedure as for the presence of heteroscedasticity, and apply robust standard errors.

6.2.6 Endogeneity

Endogeneity occurs when a variable that is excluded in our model, is related to a variable we have included in our model (Pinzon, 2016). The main issue with endogeneity is the prevention it has on making causal inference. Moreover, to mitigate and prevent endogeneity, and the issue of double causality regarding CEO turnover and company performance, we apply lagged values of the independent variables, namely ROA, ROE and the Profit Dummy. We point out that the application of our lagged variables do not certainly remove the endogeneity. However, the article "Organizational Form, Ownership Structure, and CEO Turnover: Evidence From The Property – Casualty Insurance Industry" (Cheng, Cummins & Lin, 2015) among several, show that the endogeneity is sufficiently mitigated if we use the aforementioned procedure. Furthermore, by including relevant variables in our models, this will mitigate the endogeneity problem.

6.2.7 Regression Models

In the following section we specify our regression models. In the application of the model on our panel data we utilize Stata. This provides us with odds ratios and standard errors for all the independent variables. Furthermore, we are provided with the marginal effects on each independent variable. The specification of the regression is inspired by previous studies researching similar topic (Ahmed & Hellerslia, 2019; Enarsson & Magnusson, 2017).

6.2.7.1 Does Performance Affect CEO Turnovers?

In this regression model we want to use the independent variables as our performance measures, with the inclusion of the control variables as additional explanatory variables. Moreover, the expectation for this regression involves a negative relationship between company performance and CEO turnover.

$$p(CEO\ turnover = 1) = \alpha_0 + \beta_1 ROA + \beta_2 ROE + \beta_3 Profit_D + \beta_4 Revenue + \beta_5 CEOage + \beta_6 CompanyAge + \beta_7 CEOtenure + \beta_8 CEOownership \quad (6.5)$$

, where $p =$ the probability of CEO turnover.

Shifting attention to the independent variables functioning as performance

measures, our expectation is that β_1, β_2 and β_3 will be significant and negative. Hence, we expect a negative relationship between performance and CEO turnover. Moreover, we are provided with the odds ratio and the negative relationship should be highlighted with odds ratios lower than one.

6.2.7.2 Changes in Performance Post CEO Turnover

In our last supplemental model we incorporate the change in ROA and ROE from time *t*=0 to *t*=3, subject to the event of turnover. Hence, if there has been a CEO turnover in *t*=0, we want to examine if the turnover impact the change in accounting performance from when the CEO is appointed to the third year posterior to the appointment. We use the span of three years to let the CEO incorporate his philosophy and let him make his mark (Zhang, 2008). From the former regression model the other deviation is the inclusion of the binary variable $Turnover\_D_t$ as an independent variable, corresponding to 1 in the case of a CEO turnover in year *t* and 0 if else. Holding the rest of the regression model unchanged, in terms of lagging both ROA and ROE with 1 year, we control for and fix the performance prior to the change in CEO. In this way, we obtain the real change in performance, by isolating the performance prior to the event.

$$\Delta_{ROA} = \alpha_0 + Turnover\_D_t + \beta_2 ROA_{t-1} + \beta_3 ROE_{t-1} + \beta_4 Profit\_D_{t-1} + \beta_5 Revenue_t + \beta_6 CEOage_t + \beta_7 CompanyAge_t + \beta_8 CEOtenure_t + \beta_9 CEOownership_t \quad (6.6)$$

$$\Delta_{ROE} = \alpha_0 + Turnover\_D_t + \beta_2 ROA_{t-1} + \beta_3 ROE_{t-1} + \beta_4 Profit\_D_{t-1} + \beta_5 Revenue_t + \beta_6 CEOage_t + \beta_7 CompanyAge_t + \beta_8 CEOtenure_t + \beta_9 CEOownership_t \quad (6.7)$$

As the aforementioned empirical studies find ambiguous results on the change in accounting measures posterior to a CEO turnover, and furthermore the lack of studies comprising the energy industry, we do not have clear expectations on how the turnover will affect the performance. However, stemming from the previous analysis corresponding to the stock price reactions, assuming rationality in the marketplace, we would not expect the change in performance to be significantly positive.

6.2.8 Regression Analysis

In the following section we present the results and analyses from the stated regression models.

6.2.8.1 Does Performance Affect CEO Turnover?

The results from the regression model 6.5 are presented in Table 13 below. Moreover, we see that the odds ratios for the performance measures are below one with corresponding negative marginal effects. Thus, our results indicate a negative relationship between company performance and CEO turnover, i.e. a negative ROA increases the probability of a CEO turnover to occur. However, both the coefficients of ROE and the profit dummy are insignificant, with only ROA statistically significant at the 10% level.

CEO Turnover	Odds Ratio	Marginal Effect	Robust SE
ROA	0,516*	-0,083	0,046
ROE	0,958	-0,005	0,010
Profit Dummy	0,864	-0,018	0,032
Revenue	0,990	-0,001	0,008
CEO Age	0,943***	-0,007	0,001
Company Age	0,783*	-0,031	0,018
CEO Tenure	1,236	0,027	0,021
CEO Ownership	1,000	0,000	0,001
Constant	6,432*		0,007

Table 13: Regression Output For Accounting Measures I

Focusing on the economic interpretation of the corresponding marginal effects, we put emphasis on ROA and ROE. We create two independent scenarios where ROA and ROE individually decline from the 50th- to the 25th percentile, and consequently report the effects. First, a decline in the ROA from the 50th- to the 25th percentile causes a 4% reduction in ROA. Consolidating the 4% reduction in ROA with the corresponding marginal effect of the variable, the probability of a CEO dismissal increases by 0.33%. Similarly, a reduction in ROE from the sample median to the 25th percentile causes a 18% decrease in ROE. Furthermore, this means that the probability of a CEO dismissal increases by 0.097%. The economic interpretation aligns well with Jenter & Lewellen (2014) who infer that the probability of being replaced escalates when firms perform below standard.

Following up on the statistical interpretation of the results, a possible explanation for the insignificant performance measures regarding ROE and the profit dummy could be a result of our construction of the CEO ownership variable. Mentioned earlier, we removed CEOs in controlling ownership positions. However, we notice that the median of the CEO ownership constitutes a stake equivalent to almost a third of the total ownership of the company. Thus, the average CEO still have substantial influence through the large stake the CEO holds in the company. Bearing this in mind it could be argued that the average company and the corresponding board of directors will have more tolerance and patience regarding the poor performance in a higher degree compared to firms where the CEO has less ownership.

Furthermore, an explanation regarding the insignificant profit dummy could be that a year of financial struggle in terms of negative profit is not sufficient to dismiss the CEO. This align with companies focusing on a long-term horizon, and especially where a large part of the energy industry is faced with a lot of cyclicality and corresponding volatility.

Another reason for the insignificant result could be that a large fraction of our CEO turnovers are non-disciplinary, where the CEO choose to leave voluntarily and not being forced or dismissed. Our control variables should account adequately for this, however, we have the variable CEO age and CEO tenure with contradictory signs here. A counterargument to the non-disciplinary argument relates to Bhagat et al. (2010), showing that CEOs with a higher stock ownership have a lower probability of leaving, which is more representative for the majority of the CEOs in our sample.

6.2.8.2 Changes in Performance Post CEO Turnover

Following the regression models 6.6 & 6.7 on the change in accounting performance, we notice from Table 14 below that the change in the performance measures i.e. ROA and ROE are not affected significantly from the CEO turnover variables. Touched upon in the previous section, the change in accounting performance after a CEO turnover is rather ambiguous. We find evidence that the CEO turnover event does not isolated improve nor deteriorate accounting measured performance.

Δ_{ROA}	Coefficient	Robust Standard Error	Δ_{ROE}	Coefficient	Robust Standard Error
Turnover	-0,074	0,109	Turnover	0,086	0,627
ROA	0,17*	0,098	ROA	-0,877*	0,505
ROE	0,000	0,003	ROE	0,097	0,063
Profit Dummy	-0,016	0,150	Profit Dummy	0,486	0,340
Revenue	0,033	0,057	Revenue	-0,131	0,085
CEO Age	-0,009	0,009	CEO Age	-0,011	0,019
Company Age	0,053	0,088	Company Age	0,210	0,303
CEO Tenure	0,009	0,217	CEO Tenure	0,058	0,049
CEO Ownership	0,004	0,003	CEO Ownership	0,003	0,006
Constant	-0,349	0,720	Constant	1,300	1,519

Table 14: Regression Output For Accounting Measures II

In section 6.2.8.1 we find that ROA affect the probability of a CEO turnover occurring. However, reasoned from both the insignificant turnover coefficients from the table above we find that CEO turnovers does not lead to improvement in the accounting related performance measures in the time horizon of 3 years. If the CEO turnover does not lead to performance improvement we could question the lack of quality related to the turnover, which would fall back on the people responsible for the turnover decisions. Our results above could indicate that the former, average CEO is dismissed ahead of what would be an optimal and efficient moment for the company. Moreover, lack of quality related to the event of turnover could be a sign of inefficient decision making and thus monitoring by the board. With the aim of setting these results in context with those from the first part, we draw the following reasoning: We see from the last part that ROA impacted the probability of a CEO turnover happening, however, there is no sign of improvement in ROA posterior to the CEO turnover. We could infer that the company does not obtain the results it aims at, and what we experience are inefficient decisions by the people responsible for the event to take place. If the investors are familiar with these results and the additional inefficient board decisions, the average stock price reaction posterior to the CEO turnover could be justifiable, as the CEO turnover does not create value for the accounting related

performance measures.

6.2.9 Causality Remarks

We do find evidence which implies that one of our two accounting measures affect the probability of the event of CEO turnover. Hence, we find that CEO turnover happen because of firm performance amongst other variables. This causality is not perfectly mechanical, however, our results show that poor performance contributes to a higher probability of a CEO turnover event. Studying the reverse causality, namely if firm performance change because of the CEO turnover we have two ambiguous cases. One, firm performance in terms of stock price reaction is impacted negatively. Second, change in accounting measures does not lead to a positive improvement nor deterioration of firm performance.

In terms of accounting measures and the study of causality, we find evidence that performance affect CEO turnover, however, we also find justifiable evidence that the CEO turnover does not impact the performance of the firm. We constructed the regressions in a robust manner to isolate previous performance, keeping performance prior to the turnover constant with the inclusion of lags and control variables. However, in terms of stock prices we have evidence that the immediate stock price reaction is negative studying the day of the CEO turnover and the day after. We have not elaborated on the reverse relationship, namely how the performance in terms of stock price affect the CEO turnover probability. Moreover, studying the stock returns around the time of the CEO turnovers is useful to address the aforementioned endogeneity concerns, as previous performance of the company should already be reflected in the stock price before the CEO turnover.

7. Conclusive Remarks

The objective of this master thesis is to investigate how CEO turnover affect performance for energy companies. We provide the application of event studies with respect to stock price reactions, and furthermore an assessment of the accounting related performance measures both prior and posterior to CEO turnover. With the former as our main part, we constructed seven hypotheses. The first hypothesis looked at the stock price reactions in terms of abnormal returns

for various event windows posterior to the CEO turnover. The next six hypotheses examined how various CEO attributes would impact the abnormal returns. Furthermore, to increase the robustness of our study, we winsorized the returns and instead of using the energy index as our normal return measure we incorporated the oil price. Moreover, the inferences and conclusions from the findings were similar to the initial analyses with minor deviations.

For the first hypothesis, described throughout our thesis as the "average CEO turnover impact", we found that the immediate stock price reaction on the day of the event and the day after is significantly negative. Incorporating the relationship between CEO attributes and the abnormal returns we found both expected and unexpected results. Firstly, for our main CEO attributes none of the turnovers where the CEO incurred such attributes lead to a positive impact on the performance through our stock price measurement. We therefore isolated and distinguished the numerous effects by a comparison with the abnormal returns resulting from the average CEO turnover. For some of our variables we found mixed results, also stemming from a limited sample size from CEOs with these traits. In the second hypothesis, the appointment of an insider had less negative impact on the returns compared to the average turnover. Examining major changes going from insider to outsider, companies suffer a momentous loss on the date of the turnover which arguably is related to negative market reactions due to uncertainty regarding short-term performance. In the third hypothesis, the hire of an elderly CEO yielded mixed results, however, the rapid reaction after a day resemble a more negative impact on the returns than both the average CEO and the younger CEO. Moreover, we found that this was in alignment with previous studies as elderly CEOs tended to be more risk averse, thus align the CEOs and the company's risk preferences in a more proper way. Furthermore, the former results were quite similar to our findings of the appointment of a CEO who constitutes longer CEO tenure, related to the fourth hypothesis. There are reasons to infer that the more experienced CEOs reflect many of the elderly CEOs, thus incur a higher degree of risk aversion, which we saw that the stock market reacted in a negative manner to. Additionally, inspecting major changes replacing an experienced CEO with an unexperienced, results show that this change is inferior compared to the average CEO turnover and the appointment of experienced CEOs.

In the fifth hypothesis, we saw that the announcement of a new male CEO did affect the abnormal returns more negatively than the average, which supported the ideas of the lack of gender diversity. When compared to the appointed female CEOs this argument became stronger, where the corresponding abnormal returns yield positive returns. However, our findings on the female CEOs resemble a limited sample size and therefore cannot be of certainty. In the sixth hypothesis, we find results corresponding with our initial expectation and previous empirics when it comes to the appointment of a CEO with higher education. Hence, appointing a higher educated CEO yields a less negative impact on the abnormal returns compared with the average CEO turnover. For comparison we looked at the results from a lower educated CEO, and we find this impact to be substantially more negative than for the average CEO turnover. Studying major changes appointing a lower educated CEO when the predecessor was highly educated, we see that the results are inferior to both the average appointment of a less educated CEO and the average CEO turnover. Finally, looking at the seventh hypothesis, and the impact of a forced CEO turnover, the reaction is less negative than the average turnover which aligns with the intuition of previous studies. On the contrary, we find that a natural CEO turnover impacts the abnormal returns more negatively than the average turnover.

In the second part of the thesis, we utilized accounting-based performance measures. With this data available we could study both relationships and also the reverse causality. First, we examined whether accounting measures such as ROA and ROE impacted the CEO turnover. We found a negative relationship, meaning that a higher ROA would reduce the probability of a CEO turnover to occur. Second, we examined changes in performance posterior to a CEO turnover. Looking at changes in ROA and ROE from the year of the turnover to three years after, we found both turnover coefficients to be insignificant, showing signs of inefficient decision making and monitoring from the boards.

We have studied CEO turnovers' impact on performance through both the stock price reaction and the accounting measures. Interestingly, we find different results. Where the stock price reaction, measured through the abnormal returns is negatively impacted, we find no support for performance improvement posterior to a CEO turnover for the energy companies. These evidence could be explained

in context. If investors hold the knowledge of inefficient decision making from the boards, implied through former CEOs dismissals prior to ideal moment in time, the negative stock price reaction could be justifiable.

7.1 Limitations & Further Research

Briefly touched upon in section 3.3 we elaborate with regards to certain data limitations. The data sample which is collected from the CCGR database and applied in chapter 6 holds some limitations regarding forced and voluntary turnovers. As the CCGR database refrain from presenting the designated firm names applicable for each company's accounting-based performance, we are prevented from examining whether a CEO turnover within the company is forced or voluntary. Moreover, this could affect our results primarily when assessing whether the accounting-based performance could impact CEO turnovers. Our perspective is clearly permeated, meaning that companies will dismiss the CEO if the performance are poor, rather than the CEO would voluntarily walk away from his role. This is not necessarily the case, and optimally we would like to distinguish between the two phenomena. However, the issue of forced and voluntary turnovers were thoroughly studied in the primary analysis conducted in chapter 5.

Furthermore, our sample size of CEO turnovers in Nordic energy companies are somewhat limited at 112 turnovers. Clearly, we would prefer the sample size to be larger, however, given the desire to mainly focus our research towards one industry within a restricted geographical area, we accepted a relatively small sample size. Additionally, the inclusion of delisted companies mitigates some of the limitations associated with the sample size. Moreover, in chapter 6 we disregard companies in which the CEO possess higher than 50% ownership stake in a firm, which eradicate a major portion of the sample. However, this is a necessary precaution given the low probability of a CEO turnover in a company where the CEO possess higher than 50% ownership stake. A limitation related to this benchmark is that the CEO could still possess an ownership stake of e.g. 45% and remain the largest shareholder in the firm. Given the necessity of maintaining an adequate sample size, we decided not to speculate whether the CEO remained the largest shareholder and enforced this benchmark on the collected data.

While analysing CEO attributes we included a discussion and analysis of reverse attributes in addition to major organizational changes. As mentioned throughout this discussion, these analyses are conducted on small sample sizes, which forced us to be cautious with drawing any absolute concluding remarks. This portion of the analysis is a mere contribution to our primary analysis, thus we do not find the limitation to be severely affecting the thesis.

Previously touched upon, in the second part of the study we examined the CEO turnover-performance relationship from both perspectives. However, in the first part of the study, we only elaborate on CEO turnovers impact on the stock price reactions, and not the reverse relationship. Even though our main part in this chapter is the event study and the stated causality, we could have further elaborated on the reverse relationship to look at the potential double causality this could imply.

The reverse relationship between stock price reactions and CEO turnovers could prove to be interesting inspecting further for future research. Moreover, in this study our focus is one particular industry, but it would be interesting for further research to either study a different industry across the Nordic countries, e.g. finance, or include several industries which would be beneficial to investigate how industrious exogenous shocks affects the relationship between CEO turnovers and performance. Including exogenous shocks across industries would be beneficial for further inspecting potential causality issues. Additionally, our methodology is as previously mentioned easily applicable in other contexts or settings, where future researchers could potentially examine this topic further in other countries in Europe. This could possibly provide a larger sample size and increase the credibility of the results. Lastly, the supplementary analyses we provided in terms of major organizational changes revealed interesting results, however the sample sizes were insufficient to draw explicit conclusions based exclusively on these analyses. Thus, future research could further elaborate on this segment, where they mainly conduct research based on these major changes following a turnover and examine their influence on firm performance.

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Appendix

Appendix 1: Summary Statistics, Hypothesis 1

	AR	CAR(-1,+1)	CAR(-5,+5)	CAR(-10,+10)	CAR(-15,+15)	CAR(-20,+25)
Mean	-1,03 %	-1,93 %	0,99 %	1,15 %	-3,08 %	-3,16 %
Std Dev	6,01 %	8,07 %	22,42 %	28,34 %	32,68 %	37,03 %
Root N	10,58	10,58	10,58	10,58	10,58	10,58
T-Conventional	-1,82	-2,53	0,47	0,43	-1,00	-0,90
Kurtosis	7,22	10,50	34,41	12,12	11,55	8,51
Skewness	-1,28	-2,24	4,34	2,27	-1,57	-0,98
S	-0,17	-0,24	0,04	0,04	-0,09	-0,09
T-Skewed	-1,98	-3,05	0,57	0,48	-1,07	-0,94

Appendix 2: Summary Statistics, Hypothesis 2-7

AAR	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
AR	-0,32	-0,40	-0,33	-1,29	-0,93	-0,21
Mean	-0,49 %	-0,71 %	-0,90 %	-1,19 %	-0,95 %	-0,94 %
Std Dev	5,22 %	5,76 %	5,67 %	5,97 %	6,15 %	5,39 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-0,75	-0,92	-0,96	-2,07	-1,53	-0,82
Kurtosis	2,01	2,04	1,49	7,45	7,41	2,00
Skewness	0,82	0,36	-0,23	-1,31	-1,36	0,52
S	-0,09	-0,12	-0,16	-0,20	-0,16	-0,17
T-Skewed	-0,71	-0,90	-0,98	-2,28	-1,66	-0,78
CAAR(-1,+1)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	-1,21	-1,16	-0,94	-2,31	-1,66	-0,05
Mean	-1,87 %	-2,08 %	-2,54 %	-2,14 %	-1,71 %	-0,24 %
Std Dev	8,98 %	7,79 %	8,61 %	8,04 %	7,16 %	7,40 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-1,68	-2,00	-1,79	-2,76	-2,35	-0,15
Kurtosis	11,42	10,74	10,89	10,65	11,75	0,00
Skewness	-2,72	-2,08	-2,41	-2,28	-2,20	-0,06
S	-0,21	-0,27	-0,30	-0,27	-0,24	-0,03
T-Skewed	-2,07	-2,44	-2,32	-3,40	-2,82	-0,16
CAAR(-5,+5)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	3,15	1,50	1,59	1,01	-1,27	0,53
Mean	4,84 %	2,69 %	4,28 %	0,93 %	-1,31 %	2,40 %
Std Dev	26,70 %	27,26 %	31,97 %	22,55 %	14,06 %	23,00 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	1,46	0,74	0,82	0,43	-0,92	0,49
Kurtosis	27,51	31,24	25,07	34,29	2,75	1,03
Skewness	4,23	4,99	4,65	4,37	-0,24	-0,04
S	0,18	0,10	0,13	0,04	-0,09	0,10
T-Skewed	1,96	0,98	1,12	0,53	-0,93	0,49
CAAR(-10,+10)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	2,61	1,74	0,37	1,26	-0,98	1,59
Mean	4,02 %	3,11 %	1,01 %	1,17 %	-1,01 %	7,21 %
Std Dev	26,60 %	36,72 %	32,95 %	28,52 %	24,68 %	42,87 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	1,22	0,63	0,19	0,43	-0,40	0,79
Kurtosis	13,18	7,61	11,44	12,03	13,15	5,13
Skewness	2,80	2,10	2,37	2,28	1,78	1,57
S	0,15	0,08	0,03	0,04	-0,04	0,17
T-Skewed	1,45	0,72	0,26	0,48	-0,36	0,92
CAAR(-15,+15)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	1,08	-2,05	-2,89	-3,45	-5,47	-1,45
Mean	1,66 %	-3,66 %	-7,80 %	-3,19 %	-5,63 %	-6,59 %
Std Dev	26,62 %	40,24 %	42,28 %	32,89 %	31,52 %	51,53 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	0,50	-0,68	-1,12	-1,01	-1,76	-0,60
Kurtosis	5,33	9,33	11,44	11,43	12,61	8,04
Skewness	1,05	-1,32	-1,69	-1,57	-2,38	-2,22
S	0,06	-0,09	-0,18	-0,10	-0,18	-0,13
T-Skewed	0,54	-0,74	-1,29	-1,09	-2,06	-0,74
CAAR(-20,+25)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	1,21	-3,23	-2,86	-3,79	-6,68	-1,39
Mean	1,85 %	-5,77 %	-7,73 %	-3,51 %	-6,89 %	-6,33 %
Std Dev	32,36 %	44,45 %	47,35 %	36,76 %	35,07 %	57,72 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	0,46	-0,97	-0,99	-0,99	-1,93	-0,51
Kurtosis	3,08	7,72	8,92	8,96	10,21	6,88
Skewness	0,53	-0,90	-1,46	-1,04	-1,63	-1,77
S	0,06	-0,13	-0,16	-0,10	-0,20	-0,11
T-Skewed	0,48	-1,03	-1,11	-1,04	-2,18	-0,61

Appendix 3: Regression Output for Outsider CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,79 %	-2,02 %	-4,33 %	-2,82 %	-9,64 %	-10,09 %
σ	6,93 %	6,70 %	13,09 %	30,42 %	38,93 %	42,05 %
Significance level	*/**	**/**	**/**	-	*/**	/*

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Appendix 4: Regression Output for Major Organizational Changes

Outsider CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-3,73 %	-2,71 %	-4,50 %	-6,43 %	-7,10 %	-4,44 %
σ	9,61 %	9,02 %	16,44 %	20,17 %	30,00 %	31,67 %
Significance level	*/**	-	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Lower Tenure CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-2,70 %	-3,93 %	-9,10 %	-11,23 %	-15,40 %	-7,17 %
σ	6,31 %	7,41 %	15,93 %	25,10 %	35,8 %	30,61 %
Significance level	/**	*/***	**/**	/**	/**	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Lower Educated CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,51 %	-2,77 %	5,44 %	5,94 %	0,99 %	7,25 %
σ	3,93 %	5,65 %	9,58 %	13,53 %	18,54 %	28,22 %
Significance level	-	-	/*	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Appendix 5: Regression Output for Younger CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,36 %	-1,78 %	-0,70 %	-0,81 %	-2,50 %	-0,54 %
σ	6,28 %	8,40 %	16,29 %	16,26 %	23,2 %	27,90 %
Significance level	/**	/*	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Appendix 6: Regression Output for Lower Tenure CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,10 %	-1,63 %	-0,63 %	1,22 %	-0,75 %	-0,90 %
σ	6,20 %	7,83 %	15,77 %	26,01 %	26,8 %	30,84 %
Significance level	/*	*/**	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Appendix 7: Regression Output for Female CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	3,17 %	3,75 %	2,64 %	0,65 %	-0,04 %	6,30 %
σ	5,32 %	5,93 %	0,00 %	20,86 %	23,64 %	44,54 %
Significance level	-	-	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Appendix 8: Regression Output for Lower Educated CEOs

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,55 %	-3,35 %	15,88 %	15,11 %	13,45 %	20,98 %
σ	4,63 %	12,45 %	48,25 %	43,13 %	34,36 %	39,38 %
Significance level	-	-	/*	/*	/**	**/***

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Appendix 9: Regression Output for Natural Turnovers

Event Window	[-0,+0]	[-1,+1]	[-5,+5]	[-10,+10]	[-15,+15]	[-20,+25]
CAAR	-1,06 %	-2,34 %	0,65 %	-0,33 %	-2,22 %	-2,38 %
σ	6,17 %	8,21 %	22,39 %	23,59 %	26,49 %	30,35 %
Significance level	/*	***/***	-	-	-	-

* p<0.1; ** p<0.05; *** p<0.01
Conventional *t*-stat / Skewness-adjusted *t*-stat

Appendix 10: Summary Statistics & Regression Output w/ Oil Index as Normal Return Measure, Hypothesis 1

	AR	CAR(-1,+1)	CAR(-5,+5)	CAR(-10,+10)	CAR(-15,+15)	CAR(-20,+25)
Mean	-1,21 %	-2,45 %	0,56 %	0,08 %	-4,21 %	-4,33 %
Std Dev	5,88 %	9,14 %	22,55 %	31,83 %	36,28 %	40,74 %
Root N	10,58	10,58	10,58	10,58	10,58	10,58
T-Conventional	-2,18	-2,84	0,26	0,03	-1,23	-1,12
Kurtosis	7,90	7,28	33,18	11,70	10,12	8,12
Skewness	-1,60	-2,01	4,22	2,09	-1,20	-0,69
S	-0,21	-0,27	0,02	0,00	-0,12	-0,11
T-Skewed	-2,45	-3,41	0,34	0,06	-1,30	-1,16

Appendix 11: Summary Statistics & Regression Output w/ Oil Index as Normal Return Measure, Hypothesis 2-7

AAR	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
AR	-0,43	-0,45	-0,47	-1,51	-1,10	-0,37
Mean	-0,67 %	-0,79 %	-1,27 %	-1,39 %	-1,13 %	-1,68 %
Std dev	4,85 %	5,47 %	5,55 %	5,84 %	6,08 %	5,52 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-1,11	-1,09	-1,39	-2,48	-1,84	-1,43
Kurtosis	1,63	1,63	1,81	8,31	8,14	2,22
Skewness	0,55	0,00	-0,24	-1,69	-1,69	0,61
S	-0,14	-0,15	-0,23	-0,24	-0,19	-0,30
T-Skewed	-1,07	-1,09	-1,42	-2,86	-2,06	-1,33
CAAR(-1,+1)	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
CAR	-1,81	-1,53	-1,30	-2,91	-2,23	-0,34
Mean	-2,78 %	-2,72 %	-3,51 %	-2,70 %	-2,30 %	-1,53 %
Std dev	10,34 %	9,10 %	10,51 %	9,16 %	8,56 %	9,23 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-2,17	-2,24	-2,03	-3,06	-2,64	-0,78
Kurtosis	6,99	7,47	5,49	7,32	7,44	0,71
Skewness	-2,27	-2,11	-2,01	-2,03	-1,96	-0,68
S	-0,27	-0,30	-0,33	-0,29	-0,27	-0,17
T-Skewed	-2,69	-2,79	-2,57	-3,74	-3,17	-0,81
CAAR(-5,+5)	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
CAR	2,70	1,35	1,38	0,47	-1,70	0,49
Mean	4,15 %	2,41 %	3,72 %	0,44 %	-1,75 %	2,21 %
Std dev	26,88 %	27,50 %	32,43 %	22,81 %	14,44 %	21,62 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	1,25	0,66	0,70	0,20	-1,20	0,48
Kurtosis	26,57	29,71	23,35	32,98	1,89	1,55
Skewness	4,10	4,83	4,43	4,24	-0,38	-0,29
S	0,15	0,09	0,11	0,02	-0,12	0,10
T-Skewed	1,61	0,86	0,94	0,27	-1,22	0,47
CAAR(-10,+10)	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
CAR	1,32	1,42	-0,01	0,00	-2,19	1,50
Mean	2,04 %	2,54 %	-0,04 %	0,00 %	-2,26 %	6,80 %
Std dev	30,04 %	40,32 %	34,37 %	32,25 %	29,22 %	51,43 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	0,55	0,47	-0,01	0,00	-0,76	0,62
Kurtosis	8,97	7,99	9,94	11,52	14,05	5,02
Skewness	1,80	2,16	2,09	2,09	1,85	1,45
S	0,07	0,06	0,00	0,00	-0,08	0,13
T-Skewed	0,61	0,54	0,05	0,03	-0,70	0,67
CAAR(-15,+15)	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
CAR	-0,20	-2,43	-3,42	-4,81	-6,69	-1,20
Mean	-0,30 %	-4,34 %	-9,25 %	-4,45 %	-6,89 %	-5,43 %
Std dev	29,54 %	44,48 %	44,36 %	36,71 %	35,86 %	60,18 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-0,08	-0,73	-1,27	-1,26	-1,89	-0,42
Kurtosis	4,30	8,39	11,75	9,97	10,86	5,93
Skewness	0,57	-0,97	-1,82	-1,19	-1,70	-1,50
S	-0,01	-0,10	-0,21	-0,12	-0,19	-0,09
T-Skewed	-0,07	-0,78	-1,49	-1,34	-2,14	-0,46
CAAR(-20,+25)	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
CAR	-0,12	-3,29	-3,21	-5,16	-7,83	-1,19
Mean	-0,19 %	-5,88 %	-8,69 %	-4,78 %	-8,07 %	-5,43 %
Std dev	35,09 %	49,21 %	49,38 %	40,81 %	39,61 %	67,34 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-0,04	-0,89	-1,07	-1,22	-2,01	-0,38
Kurtosis	2,10	7,32	9,54	8,38	9,63	5,14
Skewness	0,31	-0,59	-1,65	-0,71	-1,08	-1,08
S	-0,01	-0,12	-0,18	-0,12	-0,20	-0,08
T-Skewed	-0,04	-0,93	-1,22	-1,26	-2,18	-0,40

Appendix 12: Summary Statistics & Regression Output, Winsorised Values

	AR	CAR(-1,+1)	CAR(-5,+5)	CAR(-10,+10)	CAR(-15,+15)	CAR(-20,+25)
Mean	-0,94 %	-1,43 %	-0,24 %	-0,88 %	-1,53 %	-3,09 %
Std Dev	4,13 %	4,95 %	11,80 %	15,79 %	19,81 %	25,58 %
Root N	10,58	10,58	10,58	10,58	10,58	10,58
T-Conventional	-2,42	-3,05	-0,22	-0,59	-0,82	-1,28
Kurtosis	-0,36	-0,45	-0,08	-0,38	-0,06	-0,33
Skewness	-0,40	-0,23	0,08	-0,22	-0,09	-0,12
S	-0,23	-0,29	-0,02	-0,06	-0,08	-0,12
T-Skewed	-2,50	-3,12	-0,21	-0,59	-0,82	-1,29

AAR	d1(Insider)	d2(Age)	d3(CEO Tenure)	d4(Male)	d5(Education)	d6(Forced)
AR	-0,41	-0,50	-0,32	-1,16	-1,14	-0,27
Mean	-0,63 %	-0,89 %	-0,87 %	-1,07 %	-1,17 %	-1,24 %
Std dev	4,45 %	4,64 %	4,78 %	4,10 %	5,70 %	4,34 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-1,14	-1,43	-1,10	-2,72	-2,02	-1,33
Kurtosis	0,18	-0,16	-0,37	-0,32	9,05	-0,26
Skewness	0,31	-0,11	-0,20	-0,41	-2,12	-0,40
S	-0,14	-0,19	-0,18	-0,26	-0,21	-0,28
T-Skewed	-1,12	-1,45	-1,12	-2,83	-2,37	-1,40
CAAR(-1,+1)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	-1,29	-0,93	-0,79	-1,89	-1,28	-0,09
Mean	-1,99 %	-1,67 %	-2,14 %	-1,75 %	-1,32 %	-0,42 %
Std dev	8,77 %	4,82 %	5,24 %	5,20 %	4,49 %	6,52 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	-1,83	-2,58	-2,48	-3,50	-2,89	-0,30
Kurtosis	12,35	-0,83	0,33	0,18	-0,66	-0,93
Skewness	-2,99	-0,06	-0,91	-0,53	-0,21	-0,39
S	-0,23	-0,35	-0,41	-0,34	-0,29	-0,06
T-Skewed	-2,34	-2,61	-2,83	-3,72	-2,95	-0,32
CAAR(-5,+5)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	2,17	-0,17	-0,27	-0,40	-1,13	0,76
Mean	3,34 %	-0,30 %	-0,73 %	-0,37 %	-1,16 %	3,48 %
Std dev	12,45 %	12,37 %	10,62 %	11,70 %	11,13 %	20,18 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	2,16	-0,18	-0,42	-0,33	-1,03	0,81
Kurtosis	0,65	0,45	-0,26	0,00	-0,12	0,24
Skewness	0,96	0,61	-0,14	0,02	-0,01	0,57
S	0,27	-0,02	-0,07	-0,03	-0,10	0,17
T-Skewed	2,37	-0,17	-0,43	-0,33	-1,03	0,85
CAAR(-10,+10)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	1,16	1,04	-0,65	-0,85	-1,79	1,28
Mean	1,78 %	1,86 %	-1,76 %	-0,78 %	-1,84 %	5,82 %
Std dev	17,65 %	23,86 %	15,26 %	16,07 %	15,19 %	28,62 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	0,81	0,58	-0,70	-0,51	-1,19	0,95
Kurtosis	0,48	2,09	-0,58	-0,19	-0,49	1,41
Skewness	0,34	1,40	0,24	-0,14	-0,30	1,25
S	0,10	0,08	-0,12	-0,05	-0,12	0,20
T-Skewed	0,83	0,64	-0,69	-0,51	-1,21	1,08
CAAR(-15,+15)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	0,61	-0,98	-2,37	-2,70	-4,73	-0,48
Mean	0,94 %	-1,75 %	-6,40 %	-2,50 %	-4,88 %	-2,18 %
Std dev	20,54 %	23,59 %	18,01 %	22,03 %	20,38 %	30,84 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	0,37	-0,55	-2,16	-1,18	-2,36	-0,33
Kurtosis	0,25	-0,02	-0,79	0,72	0,53	0,67
Skewness	0,09	0,46	-0,42	-0,50	-1,03	-0,56
S	0,05	-0,07	-0,36	-0,11	-0,24	-0,07
T-Skewed	0,37	-0,54	-2,28	-1,21	-2,57	-0,36
CAAR(-20,+25)	**d1(Insider)**	**d2(Age)**	**d3(CEO Tenure)**	**d4(Male)**	**d5(Education)**	**d6(Forced)**
CAR	1,34	-2,63	-2,66	-3,81	-6,12	-0,55
Mean	2,06 %	-4,70 %	-7,20 %	-3,52 %	-6,31 %	-2,49 %
Std dev	25,91 %	30,45 %	25,91 %	25,62 %	24,45 %	38,78 %
Root N	8,06	7,48	6,08	10,39	9,85	4,69
T-Conventional	0,64	-1,15	-1,69	-1,43	-2,54	-0,30
Kurtosis	0,39	0,24	-0,43	-0,15	-0,37	2,02
Skewness	0,47	0,53	-0,43	-0,23	-0,40	-0,39
S	0,08	-0,15	-0,28	-0,14	-0,26	-0,06
T-Skewed	0,66	-1,11	-1,77	-1,45	-2,64	-0,32

Appendix 13: Wooldridge Test

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      89) =      9.242
           Prob > F =      0.0031
```