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BI Norwegian Business School – Thesis

Master of Science in Business
Major in Business Law, Tax and Accounting

- Earnings management during CEO turnovers -

Examination code and name:
GRA 19003 Master Thesis

Supervisor:
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Date of submission:
01.09.2016

Campus:
BI Oslo

This thesis is a part of the MSc programme at BI Norwegian Business School. The school takes no responsibility for the methods used, results found and conclusions drawn

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Acknowledgement

We show our deepest appreciation to our supervisor, postdoc. Jeff Downing, whose guidance and stimulating suggestions allowed us to develop an increased understanding of the subject of the thesis. In addition, we would like to thank Ivar Otto Ekker at the CCGR who provided us with the data necessary to conduct our analysis.

Writing the thesis has been challenging and demanding, as well as highly educational. Through the work we have been able to apply much of the understanding and knowledge we have gained through our education at BI.

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Executive Summary

This thesis addresses the question of whether CEO changes in Norwegian publicly listed firms leads to earnings management efforts by accruals. We further explore the characteristics around the CEO change and specifics regarding the firm. The empirical findings suggest that newly appointed CEOs in publicly listed Norwegian firms manage earnings downwards in their first year in office by adjusting discretionary accruals. We do not find sufficient evidence of reversals of these accruals the following year. We attribute the last finding to the fact that managers may save these reversals to later periods, e.g. to periods where earnings are low, which may occur several years later.

1 Introduction

Earnings are considered the most important figure in the financial statements issued by firms. There exist several incentives for managers to manage earnings (see part 2.4). In general, earnings management is a worldwide phenomenon that has gained widespread academic attention. This thesis examines one specific case of earnings management, which is related to CEO turnover. Accruals are widely used as a proxy for earnings management, and the discretionary part of these accruals are estimated by subjective opinions. This measure is thus instrumental for the study.

In many markets, it is a perception that newly appointed CEOs manage earnings downwards. By doing this in their first year in office, the former CEO is assumed responsible, and the benchmark for the new CEO is thus lowered, resulting in better possibilities for future growth in earnings. In the years to come, earnings increasing actions such as accrual reversals are conducted – resulting in earnings growth. We call this phenomenon the “CEO Turnover Effect”. Related to the “CEO Turnover Effect”, there is an important distinction between voluntary- and forced CEO turnovers, which are called routine and non-routine, respectively (Pourciau 1993: 319-323). The type of CEO turnover generally has implications for the incentives of the next CEO, and will thus serve as an important distinction in the thesis.

This phenomenon has gained attention in some countries such as the US (Ali and Zhang 2014) and Korea (Choi, Kwak and Choe 2014). However, few studies have been conducted in Norway. As Norway possesses some interesting characteristics, namely low litigation risk and strong labour protection (See part 2.7), the findings from this market will be of interest. This study will contribute to the literature by examining the occurrence of this phenomenon in the unique context of Norway.

The aim of this thesis is firstly to examine whether discretionary accruals are used as a tool to manage earnings for newly appointed CEOs during their immediate tenure. The second aim is to examine the level of discretionary accruals during the years surrounding a CEO change.

2 Literature review

2.1 Efficient Contracting Theory

Efficient contracting theory serves as a natural starting point in the earnings management literature. It is the overall concept, and studies the role of financial accounting information to facilitate the information asymmetry gap between contracting parties (Firms and various stakeholders).

The information asymmetry arises because the management possesses inside information, and may hide, distort or exaggerate the information to the contracting parties. Financial accounting information also serves as a communication bridge for inside information from management to outsiders, and thus serves as a protection from exploitation for outsiders.

As a concept, efficient contracting theory highlights the fact that firms enter into contracts with customers, suppliers, management, other employees and lenders. These contracts should be efficient, that is, align the firms' activities with the stakeholders' interests. Contracting is relevant to financial accounting since contracts often depend on accounting variables.

Efficient contracting theory assumes that managers are rational. Managers thus cannot be assumed to necessarily maximize profits of the firm, but rather their own utility. For that reason, the interests of management and various stakeholders may conflict. Efficient contracting theory studies show how this conflict is resolved. It predicts how management will respond to new accounting standards. Even though efficient contracting theory cannot predict individual behaviour, it sets the basis for the earnings management literature, and is thus an important theory in the context of this thesis. (Scott 2015, 315)

2.2 Earnings Management

There exist several definitions of earnings management, but the perhaps most frequently used is the definition by Healy and Wahlen (1999):

“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.”

Earnings management can be viewed in the financial reporting perspective, and the contractual perspective. In the financial reporting perspective, managers may use earnings management as a tool to e.g. meet analyst forecasts or to avoid reporting losses. This may be done to avoid bad reputation and a decline in the share price. From a contracting perspective, earnings management may be used to protect the firm from the consequences of unforeseen events when contracts are rigid and incomplete. These management tactics suggest that management does not fully accept securities market efficiency (Scott 2015, 445). In the theory of market efficiency, all available information will be reflected in the share price, meaning that earnings management efforts would be a waste of time if the incentive were to prevent a decline in the share price. There are other incentives, but as avoiding a decline in share price is a reasonable incentive, market efficiency is not an assumption in this thesis.

Earnings management includes both accounting policy choices and real actions. Accounting policy choices can be split in two. Firstly, policies per definition, such as the choice between straight line- and declining balance amortization. Secondly, the use of discretionary accruals, such as provisions for bad debts, special items, provisions for restructuring etc. However, there is a so-called iron law related to accruals, that is, they reverse. This fact means that management cannot indefinitely postpone a reversal of an accrual (Scott 2015, 445). In addition, managers face reputation constraints. This implies that managers getting caught engaging in earnings management may suffer from a reputation loss, in turn having a negative impact on their career, and thus constraining them from extensive use of earnings management. Also, studies show that institutional investors play a monitoring role in reducing earnings management, serving as a

constraint for the managers (Zang 2012: 677). At last, outsiders in the board of directors might serve as a constraint for extensive earnings management (Osma 2008: 129).

The fact that managers cannot indefinitely postpone an accrual reversal brings us to the “Horizon problem”. Horizon problem theory states that when CEOs perceive their own tenure as limited, they do not necessarily make decisions that are in the best interest of the firm and stakeholders. Rather, they will approach the end of their tenure as the “end of the firm”, and (often sub-optimally) make decisions maximizing firm value up until their perceived departure (Dechow and Sloan 1991). This means that managers that expect to have a short tenure are likely to engage early in aggressive earnings management. According to Kuang et al., 2014 this is particularly present when specialist CEOs are hired (e.g. turnaround or interim specialists) because they expect a shorter tenure. The theory is relevant for this thesis as it states that discretionary accruals are some of the main tools managers use to manage earnings.

The natural interpretation of earnings management is that it is “bad” (That is, value eroding). However, management’s use of judgment in financial reporting has both costs and benefits. The costs are potential misallocation of resources. The benefits include potential improvements in management’s (credible) communication of private information to external stakeholders, and improvements in resource allocation decisions (Healy and Wahlen 1995). However, since the natural interpretation is that earnings management is value eroding, we further present a discussion regarding how earnings management can be value creating.

Scott (2015, 458) states that earnings management can be good. The arguments in this favour are based on the “Blocked communication”-concept (Demski and Sappington 1987). The concept states that agents (i.e. the CEO) frequently obtain specialized information as part of their expertise. This obtained information will often be costly (in terms of difficulty) to communicate to the principal (i.e. the shareholders), and for this reason, the communication is blocked. It is shown that when the agent shirks on information, he might fail to receive vital information from the principal, which may lead to sub-optimal actions. Demski and Sappington (1987) study showed that the presence of blocked communication

could reduce the efficiency of agency contracts. In this context, earnings management can serve as a tool to reduce blockage. This is best highlighted by an example from Scott (2015, 459): Suppose a CEO possess inside information that future earnings will be constant at 1.000.000. If the manager announced this information directly, the market would find it costly to confirm it. Suppose also that there is a non-recurring gain of 180.000 this first period. The firm would then report earnings of 1.180.000, which would mislead the market into too optimistic assumptions of the future. The manager could then take on restructuring costs (That is, use earnings management) of approximately 180.000 to guide the market into correct expectations of the future. There are several other studies that investigated “good” earnings management (Scott 2015, 460-464). This highlights the fact that earnings management does not necessarily have to be value eroding.

It can also be argued that there are other earnings reducing measures during a CEO turnover that is not necessarily conducted to mislead the public. New CEOs may take on additional cost to restructure and “clean up” after the old management. The former management has little incentive to take on additional cost towards the end of their career in a company even though it may be healthy for the long-term purpose of the company, which is in line with the Horizon problem theory (Dechow and Sloan, 1991). Hence, new CEOs may take on such costs in their initial year to “clean up” for the sake of the company rather than for their own benefit. Hence, in certain cases a negative change in earnings in the year of a new CEO may not necessarily be “bad”, nor considered earnings management.

It’s worth mentioning that all publicly listed firms in Norway are required to have their financial statements audited. However, auditing is not perfect, hence the flexibility outlined above creates an opportunity for managers to engage in earnings management. Thus, auditing does not fully mitigate the earnings management problem (Healy and Wahlen 1999).

2.3 Distinction between fraud and Earnings Management

The IASB (International Accounting Standards Board) is the independent standard-setting body of the IFRS (International Financial Reporting Standard).

Publicly listed companies in Norway have to report according to the IFRS. According to chapters 1 and 3 of the IASB/FASB Conceptual Framework (2010), the objective of financial statements is to provide financial information that is “useful to present and potential investors, lenders, and other creditors about providing resources to the entity”.

As mentioned above, there are comprehensive standards that companies are obliged to follow. However, there will always be flexibility that managers can exploit to different degrees. In general, there will always be a need for subjectivity in reporting. It should be mentioned that in 2002, EU decided that all publicly listed firms within EU (Including Norway, due to the European Economic Act, EEA) should be subject to IFRS from 2005 and onwards. However, the distinctions used to separate between within and violate GAAP in Dechow and Skinners model (2000) are still highly relevant, as the same principles generally apply to the IFRS framework.

Numerous companies use the GAAP more aggressively than others, but are still following legally acceptable standards. As pointed out by the table below, there is a clear conceptual distinction between what is fraudulent accounting principles and those judgments and estimates that fall within GAAP and which may comprise earnings management depending on managerial intent (Dechow and Skinner 2000).

When the costs of not meeting expectations (such as earnings, revenues, debt covenants etc.) are high, managers may use the flexibility in the accounting standards to influence the accounting numbers. Exploiting the flexibility allowed by the accounting principles is often called “Within GAAP earnings management”, and can range from “Conservative accounting” to “Aggressive accounting”, as shown in the model by Dechow and Skinner (2000) in Table 1.

The other category of earnings management clearly violates the standard and is categorized as “Violates GAAP”. This involves management fraud.

	<u>Accounting Choices</u> <u>Within GAAP</u>	<u>"Real" Cash Flow Choices</u>
"Conservative" Accounting	Overly aggressive recognition of provisions or r Overvaluation of acquired in-process R&D in purchase acquisitions.	Delaying sales. Accelerating R&D or advertising expenditures.
"Neutral" Earnings	Overstatement of restructuring charges and asset write-offs. Earnings that result from a neutral operation of the process.	
"Aggressive" Earnings	Understatement of the provision for bad debts. Drawing down provisions or reserves in an overly aggressive manner.	Postponing R&D or advertising expenditures. Accelerating sales.
"Fraudulent" Accounting	<u>Violates GAAP</u>	
	Recording sales before they are "realizable". Recording fictitious sales. Backdating sales invoices. Overstating inventory by recording fictitious inventory.	

Table 1: Distinction between within- and violates GAAP (Dechow and Skinner 2000)

It is not always easy to distinguish between what is “Within GAAP” and what “Violates GAAP”. However, this thesis is not concerned with this separation, and treats all types of earnings management as the same (Except for those firms excluded from the sample due to fraud and accounting manipulation).

2.4 Incentives for Earnings Management

In order to develop a research design, it is necessary to first investigate the incentives for earnings management. This is primarily because the research has to be conducted in situations where these incentives are present, to potentially isolate earnings management.

The first incentive for earnings management is related to capital market expectations and valuation. Corporate managers will have incentives to smooth reported income for rational reasons (Trueman and Titman 1988). Publicly listed firms seek external financing in the capital and credit market, and in doing so; they are compelled to satisfy investors’ and creditors’ demand for decision-useful

information. If the information quality is unsatisfactory, investors and creditors will be reluctant to provide financing. This will in turn increase the firm's cost of capital. From this perspective, capital markets provide an effective monitoring of financial reporting quality of listed firms, and thus relaxes the incentives for aggressive earnings management by managers (Burgstahler, Hail, and Leuz 2006).

Secondly, contracts also create incentives. In essence, lending contracts create incentives for earnings management, as stated by Watts and Zimmerman (1978); management compensation contracts may also incentivize earnings management (Dechow and Sloan 1991). Thirdly, regulations will incentivize earnings management (Healy and Wahlen 1999). There also exist several other incentives, but the three mentioned above will serve as the main incentives in the context of this thesis as they are instrumental for earnings management during a CEO turnover.

An important incentive for earnings management is the CEOs compensation contracts. Some of these bonus schemes will often be directly tied to accounting figures, and thus indirectly tied to the share price of the firm (share programs, option schemes etc.). It will thus be beneficial for a CEO to sell shares or exercise options when the share price is high. For example CEOs might benefit from stock sales when the market reacts positively to abnormally high accruals. As listed firms generally get more media attention than non-listed firms, sending good signals to the market (i.e. in terms of improved earnings) might also help the CEOs career. The CEOs extra incentive element from shares and options schemes, and career reputation suggests that it will be of interest looking at listed firms.

2.5 Patterns of Earnings Management

Just as there are several incentives to manage earnings, there are several ways in which earnings can be managed. These will be described below.

Earnings

Generally, earnings are the overall variable to investigate regarding earnings management. The variable can be managed both up- and downwards by managing either income or costs. Typically this is done by accruing income or taking on "cost baths" such as write-downs. In the specific context of a CEO change, one

would typically observe a V-shaped pattern in earnings, where the new CEO would manage earnings downwards while giving the “blame” to the previous CEO. This can later be reversed for personal benefit in the future due to different reasons as described in part 2.4 of this thesis.

Accruals

Accruals can be used as a tool to manage earnings. Specifically, they are often used to move profits and losses between different accounting periods. A central measure related to this will be change in accruals, which is simply the difference between accruals in period t and period $t-1$. This difference can serve as a measure for “abnormal” accruals, and can give good indications of whether earnings management has occurred. Accruals in period t are defined as net operating profit after interest and tax less cash flow from operations. The critical objective of the analysis related to earnings management will be to isolate and measure management's impact on financial reporting by adjustments in accruals, discretionary accruals to be specific. The topic of discretionary accruals will be explained more in debt in part 3.2.1 of the thesis.

Write-downs

In addition to accruals, write-downs are frequently used to take on so-called “cost baths” or shift expenses from future periods to current periods (Wells 2000). There is a close relationship between these “cost baths” and write-downs, as write-downs are the primary instrument for conducting such “cost-baths”. It is common that these “cost-baths” are committed in the first year of new CEOs for different reasons. In some cases write-downs can be value creating by “cleaning up” after the old management, by e.g. getting rid of unprofitable or unwanted assets, creating a healthier business for future growth in earnings. However, it can also be used to artificially boost future earnings by taking on a lot of costs, while blaming the bad performance on old management. If large write-downs are very apparent in the CEO turnover period, this may indicate earnings management since reduced earnings in the tenure year results in a lower benchmark for future performance reviews for the new CEO. Unexpected write-downs follow the same methodology as abnormal accruals, being the difference between write-downs in period t and period $t-1$.

2.6 Earnings Quality

Earnings quality and earnings management are two interrelated concepts. Generally, researchers agree that aggressive earnings management results in lower earnings quality, e.g. Ball and Shivakumar (2007). However, the lack of earnings management is not sufficient to guarantee high-quality earnings, because many other factors also contribute to the quality of earnings (Lo 2007).

Earnings quality is, like earnings management, a broad term that have several definitions. One of the more popular definitions follows from Dechow, Ge, and Schrand (2010, 344), *“Higher quality earnings provide more information about the features of a firm’s financial performance that are relevant to a specific decision made by a specific decision-maker”*.

High earnings quality thus implies that investors and stakeholders can make appropriate decisions, based on a correct view of the company performance.

The concept of earnings quality is elusive. Literature does not provide clear definitions of what this “quality” consists of. However, it does identify different attributes associated with or reflective of earnings quality (Givoly, Hayn, and Katz 2010). In essence, accruals serve as a fundamental component of earnings quality in most studies (E.g. Sloan 1996). Accruals may improve or reduce the ability of a financial statement to measure a firm’s performance. Since managers may have short-term incentives (referring to “The horizon problem”), they may engage in earnings management that cannot be related to the firm’s fundamental earnings process, and are thus presumed to decrease earnings quality (Dechow, Ge, and Schrand 2010). This type of accruals is also called abnormal or discretionary accruals. Even though earnings quality is context-specific, and the proxies differ according to the degree to which they measure decision-usefulness, the discretionary accruals proxy is the most useable tool for managers, and will thus serve as our main proxy.

2.7 Institutional setting

The majority of earnings management studies have been conducted in the US, and compared to this setting, Norway is a low litigation environment. This can be highlighted by the fact that between 1945 and 2005, the total number of court cases in Norway against auditors is only 40. Of those, only three cases resulted in convictions. All court cases prior to 1996 were reviewed by Grønn, Hirsch, and Knutzen (1996), and had also been published and discussed in the widely read professional magazine *Revisjon og Regnskap (Accounting and Auditing)*. Thus it is common knowledge for the managers in our sample that the litigation risk is quite low compared to e.g. the US (Hope and Langli 2010).

Due to these institutional characteristics, Norway constitutes a unique environment to study the CEO turnover effect. The described institutional characteristics are also consistent with Francis (2004) who questions whether the kind of extreme litigation exposure in the US is really necessary to achieve an appropriate level of audit quality, explicitly stating that litigation risk in Norway is lower than that of the US. Hope and Langli (2010) state that for accounting non-compliance, the litigation risk in Norway is deemed low. It's worth noting that these studies do not argue that there is *no* regulatory oversight in Norway, but rather that the expected litigation costs are significantly lower than in the US (Hope and Langli 2010). Norway's low litigation risk should thus give earnings management a bigger chance of happening, as compared to e.g. the US. With respect to differences in institutional setting, the possibility of generalization will vary, which will be discussed further in part 5 of the thesis.

2.8 Routine- and non-routine turnover

Each CEO turnover is unique, but it is important and possible to group them into two main categories. In accordance with Pourciau (1992), CEO turnovers are classified as either routine or non-routine. As the incentives and opportunities differ substantially between the two groups, the distinction will be important for this research.

In accordance with Pourciau (1993), which builds upon Vancil (1987), the two types of turnovers are either routine or non-routine. Routine turnovers are characterized as a process where the departing CEO retires, stays in the firm in another position (typically enters the board of directors) or leaves the position on his own initiative. In contrast, non-routine turnovers are situations where the company does not have adequate time or opportunity to select and groom a successor (Pourciau 1992). These changes are thus unplanned and it is less likely that the successor is an insider, or that the departing CEO takes place in the board of directors (Vancil 1987).

2.9 The CEO Turnover Effect

Various literatures prove that the phenomena of earnings management related to CEO turnover are highly present in many markets. Bengtsson, Bergström and Nilsson (2007) discuss the use of accruals and write-downs for earnings management related to CEO turnovers in Sweden. They find that the incentives to use earnings management for boosting compensation contracts are economically significant. Specifically, their research states that the new CEO attributes poor performance on their predecessors by taking on a “Big bath”/”Cost-bath” for personal benefit. Further, Ashiq and Weining (2014) also proves that the phenomena of earnings management related to a CEO turnover is present to a higher degree earlier rather than later in the tenure. While studying differences between internal and external hired CEOs and earnings management, Kuang, Flora and Wielhouwer (2014) find that CEOs in general seem to be more engaged in earnings management right after being hired, while in the long term CEOs engagement in earnings management diminish. CEOs recruited from the outside also have stronger incentives to engage in earnings management (Kuang, Flora and Wielhouwer 2014). Also, CEO successors of external background may encounter greater pressure from the board and the market to demonstrate their managerial ability (Freidman and Saul 1991). In addition, short-tenured CEOs report earnings more aggressively than long-tenured CEOs (Ali and Zhang 2014), this study rely on research by Hermalin and Weisbach (1998).

There exist studies that are quite similar to ours, e.g. Bengtsson, Bergström and Nilsson (2007), who examine the CEO Turnover effect in Sweden. There are also

examples of several other similar studies but these are in other countries than Norway. Norway has interesting institutional characteristics that distinguish this study from other studies outside of the country. Specifically, Norway has a low-litigation risk setting, and also a quite strong labour protection. All in all, this creates an interesting context to investigate earnings management for new CEOs in companies, since this context gives earnings management a “good chance” of occurring. We try to fill the gap in literature by investigating whether earnings management will flourish in this kind of unique environment. As limited research has been provided when it comes to the subject of Norway, conducting this research based on new CEOs among companies listed at Oslo Stock Exchange will provide valuable information on the topic of earnings management.

3 Research design

3.1 Hypotheses

This thesis aims to explore the usage of earnings management during CEO turnover in Norwegian companies listed on OSE. Two research questions were developed in order to try to fill the gap in current research concerning earnings management during a CEO turnover in a Norwegian context (OSE). First, do new CEOs manage earnings by accruals during their tenure year? Second, how do discretionary accruals behave in the period surrounding a CEO turnover?

Based on prior literature it is expected that Norway, as a low litigation environment with IFRS-based accounting, inhabit the right circumstances for earnings management. To detect earnings management this study will use the cross-sectional time-series versions of the Jones model and the Modified Jones model. These models find and distinguish between discretionary and nondiscretionary accruals. The resulting trend of the discretionary accruals will reveal any abnormal movement of this figure. This is important because it is within the discretionary part of total accruals that earnings management may have been conducted. These models, and others, will be discussed more in depth in part 3.4 of the thesis.

In this thesis, earnings management is expected to take place in companies listed on OSE during a CEO turnover. In the tenure year of the new CEO, this is expected to be earnings-reducing efforts. These earnings management efforts are conducted by an increase in discretionary accruals, which are reported as costs. These efforts will cause discretionary accruals to become less positive or more negative. The reasoning behind these statements is that it is seen as common practice that new CEOs are not measured by their first year of tenure. It is seen as reasonable to blame poor performance on old management. This can be attributed to old management by blaming poor performance on lagged result caused by the old management, or that a restructuring with increased costs were needed to clean up after old management. Hence new CEOs have an opportunity and an incentive to reduce earnings in their initial year of tenure as they are seen as less responsible for the performance this year. This year of low performance will also create a lower benchmark for future performance reviews for the new CEOs, which is another incentive to keep the earnings low in their initial year of tenure. To capture this phenomenon, the following hypothesis is developed:

H1: *The new CEO will conduct earnings-reducing initiatives by discretionary accruals in their tenure year.*

In line with the belief that earnings are managed in Norwegian companies during a CEO turnover, the abnormal discretionary accruals are expected to fall back to normal the following year(s). There can be several reasons to why this occurs due to actions done to manage earnings. First of all, earnings can naturally fall back to normal, when the new CEO has initiated cost increasing initiatives to reduce the benchmark for their performance reviews. This is often the case with write-downs, which is a non-recurring event that may have limited impact on future earnings. Since there is an increase in earnings after a new CEO is hired it may seem like the new CEO has improved the performance of the company. When looking at earnings management related to accruals, CEOs may create a “cookie jar” that can be used to reach future period performance targets. The CEO then boosts the earnings in the following year(s) by reversing the management of accruals that was conducted in the initial year of the CEO (Moehrle 2002). This is consistent with the iron law of accruals as described in part 2.2 of the thesis. The CEO may

have an incentive to do this to reach future period performance targets. To capture this expectation, the following hypothesis is developed:

H2: *In the year following a CEO turnover, the CEO will conduct earnings-increasing initiatives by discretionary accruals.*

These hypotheses' make out a V-shape for the trend of discretionary accruals in the years surrounding a CEO turnover.

3.2 Theoretical background

3.2.1 Discretionary accruals models

Discretionary accruals and abnormal accruals are often used as synonyms. While models for measuring earnings management differ, most models focus on estimating discretionary accruals. This makes sense as the discretionary part of the accruals is the part that management can use as a tool to manage earnings. This does not mean that discretionary accruals equal earnings management, but if earnings management is conducted by accruals, it resides within the discretionary part of accruals. The reason behind the uncertainty of this statement is that management has the flexibility to assume and estimate certain accruals according to their own subjectivity. Hence, these estimations are based on personal experience, opinions and a lot of uncertainty. This means it is impossible to distinguish between the part of discretionary accruals that are based on real expectations, and adjustments that are done by a CEO for personal benefit.

3.2.2 Potential models

There are several potential models for estimating discretionary accruals. Apart from the Jones- and the modified Jones Model, the most popular and widely used ones include DeAngelo (1986) Model, Healy (1985) Model and the Industry Model (Dechow, Sloan, and Sweeney 1995).

The DeAngelo (1986) Model uses the last period's total accruals scaled by lagged total assets as the measure of nondiscretionary accruals. The Healy (1985) Model uses the mean of total accruals scaled by lagged total assets from the estimation period as the measure of nondiscretionary accruals. The Industry (1995) Model relaxes the assumption that nondiscretionary accruals are constant over time. Instead of modelling the determinants of nondiscretionary accruals directly, it assumes that the variation in the determinants (For nondiscretionary accruals) is common across firms in the same industry (Bartov and Gul 2000).

Dechow, Sloan, and Sweeney (1995) evaluated the relative performance in detecting earnings management of all these models (including Jones- and Modified Jones Model), and found that the Modified Jones Model provide the most powerful and reliable test of earnings management. Due to this finding, the Jones- and Modified Jones model make out the core tools of analysis used in this thesis.

3.2.3 The Jones Model

When studying earnings management and accruals the Jones Model is one of the most common models used to locate discretionary accruals. A strength of this model compared to others is that the model attempts to control for changes in economic circumstances on non-discretionary accruals. The weakness of the Jones Model is related to its conjectured tendency to measure discretionary accruals with error when discretion is exercised over revenues. It also orthogonalizes total accruals, causing the estimate of earnings management to be biased towards zero (Dechow, Sloan and Sweeney 1995). Jones recognizes this limitation of her model (Jones 1991). The Jones Model detects earnings management by dividing total accruals into a non-discretionary and a discretionary part. The non-discretionary part is considered accruals that are "fixed", since it is the amount of accruals that are needed to sustain the current level of the company's operation. The discretionary part is, as mentioned in the last section, where earnings management may reside.

When applying the Jones Model in our research, the following formula (1) was used to estimate discretionary accruals and non-discretionary accruals. Being

abnormal accruals, the discretionary accruals are the residual in the regression below. An OLS regression were conducted to estimate the firm-specific coefficients a_1, a_2 & a_3 .

$$\frac{TA_t}{A_{t-1}} = a_1 \left(\frac{1}{A_{t-1}} \right) + a_2 \left(\frac{\Delta REV_t}{A_{t-1}} \right) + a_3 \left(\frac{PPE_t}{A_{t-1}} \right) + \varepsilon_t \quad (1)$$

By eliminating the residual from equation (1), only non-discretionary accruals are left on the right side of the equation. Hence non-discretionary accruals can be calculated by estimating formula (2). In this calculation the OLS estimates of the coefficients from formula (1) a_1, a_2 & a_3 are the OLS estimates used for α_1, α_2 & α_3 .

$$\frac{NDA_t}{A_{t-1}} = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_t}{A_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) \quad (2)$$

When non-discretionary accruals were estimated, these were subtracted from total accruals to calculate discretionary accruals. The resulting discretionary accruals are the residual from equation (1), and rearranging formula (1) by leaving the residual alone on one side of the equation is the same as formula (3).

$$\frac{TA_t}{A_{t-1}} - \frac{NDA_t}{A_{t-1}} = \frac{DA_t}{A_{t-1}} \quad (3)$$

According to the Jones model all variables are scaled by lagged total assets. In our analysis of means we look at the percentage change in discretionary accruals, and for this we used the un-scaled version of discretionary accruals. To obtain this value, the scaled discretionary accruals are simply multiplied with lagged total assets. However, the un-scaled discretionary accruals are not a good figure for analysis. Even though un-scaled discretionary accruals show the size and magnitude of the accruals, it is not easy to study. The size of discretionary accruals will vary a lot for firms of different sizes, while the portion of accruals compared to firm size may not be as different. Nevertheless, since the variable will be transformed once more in the analysis of means, by making it into the percentage change from t-1, this issue of firm size will once more be eliminated.

3.2.4 The Modified Jones Model

The Modified Jones Model is a slight adjustment of the Jones Model. This reworked model attempts to eliminate the conjectured tendencies of the Jones Model. The model is fairly similar to the one of the unmodified Jones Model. The addition to the model is the subtraction of change in receivables from change in revenue as seen in equation (4). This adjustment considers that the amount of non-discretionary accruals a firm needs also depends on the level of receivables. The model implicitly assumes that all changes in credit sales (receivables) in the event period result from earnings management. If this is not the case, it may serve as a weakness of the model (Dechow, Sloan and Sweeney 1995). It is important to note that the coefficients used in the Modified Jones Model are the ones obtained by the original Jones Model.

$$\frac{NDA_t}{A_{t-1}} = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) \quad (4)$$

After non-discretionary accruals are estimated, the discretionary accruals are calculated just as with the original Jones model, by subtracting total accruals of the non-discretionary accruals.

3.3 Data description

3.3.1 Data

Publicly listed firms

As previously discussed, it is important to conduct the research in situations where the incentives for earnings management are strong.

An important incentive is that of capital market expectations (Trueman and Titman, 1988). Listed firms will, contrary to non-listed firms, be subject to quite intense capital market expectations. This might create incentives for a CEO to prove his ability to the public capital market. However, there are studies arguing that because the demand for high-quality account information is higher for publicly listed firms, their accounting quality is higher than for non-listed firms –

suggesting that earnings management is more widespread for private than public firms (Ball and Shivakumar 2004). Another study examining earnings management in European private and public firms found that private firms exhibit higher levels of earnings management, with some variations related to the strength of the legal systems (Burgstahler, Hail and Leuz 2006). This suggests that there are significant differences between earnings management in private and public firms, and that other factors related to the specific market plays an important role.

In general, data for publicly listed firms are more transparent, easily available and homogeneous in terms of accounting variables. These characteristics will increase the internal validity of this study. For this reason only listed firms are included in this thesis.

The sample of listed firms generally consists of relatively big firms in terms of market value (due to requirements for listing) from various industries. One could assume that the behaviour of these large firms could be somewhat norm setting for the use of earnings management in the firms' respective industries. This makes the firms on Oslo Stock Exchange an especially interesting sample from a research perspective.

Firms listed at Oslo Stock Exchange

In many markets, it is a perceived fact that earnings are being managed in the event of a CEO turnover. However, prior empirical evidence has been based on other countries than Norway (i.e. Ali and Zhang 2014). Therefore, it will be of interest to see if this phenomenon occurs among Norwegian firms within this context.

Norway has characteristics that make the country interesting for research related to earnings management. Specifically, Norway is a low litigation environment (Hope and Langli 2010). In addition, the Norwegian accounting standard is IFRS, contrary to GAAP, which is the relevant accounting standard in most of the previous studies in other countries.

These characteristics make firms listed on Oslo Stock Exchange an interesting sample to examine earnings management during a CEO turnover, as there may be a high probability of earnings management to occur in this setting.

Excluding certain sectors/industries

Financial institutions such as banks, debt collectors and insurance companies are excluded from our sample. This is due to the regulations that apply to these industries. Financial institutions generally are not free to choose which accounting principles to apply, which makes them differ from the other firms in our sample. The accrual-related variables for many of the financial institutions are also unavailable, and these firms are thus not applicable to the Jones-model.

Excluding specific companies

Our initial sample of firms listed on Oslo Stock Exchange from 1994 to 2013 consisted of 413 unique company ids and 3997 observations. Firms with no information available regarding the CEOs and CEO-changes were deleted from our initial sample. More firms were deleted from the sample, as financial data from Bloomberg were not available in the whole- or parts of the relevant period. Observations where the financial data were either insufficient or unrealistic (and thus clearly flawed) were also deleted. Firms with unknown- name, -IPO and/or -delist date were also deleted from the sample. Firms where mergers/demergers and/or acquisitions could cause significant noise and incomparability between periods were removed or separated to avoid potential bias in our findings. Firms with observations in a too narrow time span were deleted, as our analysis is dependent on -1 to +1 years related to a CEO change.

3.3.2 Databases

CCGR

Centre for Corporate Governance (CCGR) served as our starting point. The initial database consisted of 462 579 unique Norwegian company ids from 1994 to 2013, with various corporate governance variables associated. The next step was to exclude all non-listed firms. The dataset now contained 413 unique company ids and 3997 observations. CCGR variables were used to identify the firm's name, the different years, CEOs ID, and tenure (Number of years in office).

Observations lacking information or containing flawed information were corrected by looking up the correct information in the firm's annual statements, company websites, the website of OSE, the webpage of Brønnøysundsregisteret (Norwegian public register) and Norwegian financial newspapers (Dagens Næringsliv, Hegnar, e24).

TABLE 2
Sample selection description

	Unique company IDs	Observations
Publicly listed companies on OSE 1993-2013	413	3997
Less:		
Financial institutions (GICS codes)	72	576
Mergers, demergers and acquisitions	3	36
Flawed or unavailable data	19	1089
Too rapid CEO changes	19	262
Other specific companies or observations	10	128
Too few observation (Less than 3)	168	429
First and last year of the dataset	3	77
Observations outside relevant timespan or control group	0	575
Reducing control group to match test sample	4	404
Number in the final sample	115	421

Table 2: Description of Sample Selection

Excluding financial institutions (Reasoning above) left us with 341 unique company ids and 3421 observations. CCGR was also used to identify firm name changes, which were often a result of mergers, demergers and acquisitions. These were confirmed or rejected by investigating the annual reports, company websites, statements by OSE, and related news articles for the various firms. Cases where mergers, demergers and acquisition would cause incomparability between the periods were thus deleted. The next step was to exclude situations where financial data were unavailable or flawed, the firms operations changed drastically, some years were missing or where the firm was charged with illegal conduct.

Situations where the CEO could not be identified, where the CEO were only in office for one year and at last situations where the company had too few observations were removed. The next step of the process is to exclude situations where t-1 does not have any values (that is, does not exist in our dataset), since our analysis scales variables by lagged values. We then excluded years where the

CEO is in office for too few years. At last, if there are two (or more) turnovers in the same company, and the gap between that turnover and the next is two years or less, we exclude the first period. The year 2013 is excluded, because there might have been CEO changes during that year or the following year that is not registered in CCGR and could potentially cause noise in the dataset. At last, year 1994 is also excluded for two reasons. First we did not have data from previous years, meaning we could not observe whether there had been another CEO change just before 1994. Second, there seemed to be a flaw with the new CEO indicator in this year, as an unrealistic number of companies had a new CEO this first year of the dataset. This could cause bias to our studies, and were therefore excluded. The control groups were companies that had no observations of a CEO change. For these companies certain observations were dropped if there had been a CEO change just before the first observation of the company. The observations for companies were also reduced so the amount of observed years for each company in the control group would be somewhat similar to that of the CEO change. This was conducted by removing observations at the start and the end of the period for control firms where this action was necessary. By this procedure the amount of firms and observations for the control and test sample had a relatively similar size. Companies with too few observations were also deleted, as our study required a 3-year period. At last, special cases that could potential bias the study were deleted. This left us with the final sample of 115 unique company ids and 421 observations. Of these 115 companies 49 companies were companies that have had a CEO change, and 66 companies were in the control group. Out of the 421 observations 147 were from companies that have had a CEO change, while 274 were from the control group.

TABLE 3
Distribution - Treatment vs. Control group

	Treatment	Control	Sum
Number of observations	147	274	421
Number of firms	49	66	115

Table 3: Distribution of the Treatment and Control group

Due to the different criteria's for the sample the final time period ranged from 1998 to 2012, and the distribution of years can be seen in Table 4 below.

TABLE 4
Distribution - Years

Year	Treatment group	Control group
1998	0	21
1999	0	27
2000	6	28
2001	10	25
2002	16	21
2003	12	22
2004	12	21
2005	9	20
2006	11	18
2007	11	17
2008	16	11
2009	16	11
2010	16	11
2011	8	12
2012	4	9
Sum	147	274

Table 4: Distribution of the yearly observations

Industry Classification

The companies are grouped within “Global Industry Classification Standard” (GICS industry codes). This standard is developed and implemented by MSCI and Standard & Poor’s. For our sample, 10 sectors are used. Oslo Stock Exchange uses this classification, and we thus believe it serves as the best classification for the companies involved in our sample. These industry classifications were used to generate a control variable for high litigation risk industries, which will be discussed further in part 3.4.3.

Bloomberg

In order to ensure reliability in our accounting data, financial data were derived from Bloomberg. To ensure this reliability, a comparison between the accounting data from Bloomberg and the firms own annual reports were performed. Financial data for delisted, acquired and bankrupt firms were also available at Bloomberg. Some firms and observations were excluded because the data were either

unavailable at Bloomberg, or because Bloomberg showed combined (merged) numbers historically for the firms that merged in a later period. Financial statements were used as a control, and to fill gaps in the data. The financial data were then merged with the CCGR data to form the final data sample.

CEO Turnover

The phrase “CEO Turnover” describes the process where a new CEO is hired, and the former leaves his position, either voluntarily or forced.

The turnover year is defined as the first year where the new CEO signs the annual report singlehandedly. This distinction is important, because in some cases, the new CEO signs the annual report together with the departing CEO. In these situations, it is less likely that the new CEO would have incentives to attribute poor performance to the past CEO. In these cases, the subsequent year will thus count as the new CEOs first year in office. Annual reports, financial newspapers and the company websites were used to clarify the CEOs relevant turnover date.

Incentives for managing earnings are dependent on the nature of the specific turnover. We adopt the distinctions between routine and non-routine turnovers (Pourciau 1993). This distinction clarifies that incentives for managing earnings are likely to vary between the two types of turnover.

Routine turnovers are defined as well-planned processes. A benchmark routine turnover would be the following: The former CEO retires and a new CEO is recruited internally. In general, these processes are very well planned, and the successor is often planned weeks, months or even years before the current CEO retires. The former and current CEO also generally shares the same goals. As a result, it is less likely that the incentives for managing earnings downwards and attributing poor results to the predecessors will be present. A formal definition of a routine turnover could be: “A process in which the departing CEO gives notice regarding his departure, and leaves voluntarily”.

Non-routine turnovers are defined as unplanned processes where the former CEO is forced to leave, and the company has to initiate a process to find a suitable successor. This process can often take time, and the company will often operate

with an interim CEO for a period of time. In the non-routine cases the former CEO is often leaving the company due to poor performance, disagreement regarding strategy or pressure from the board of directors. A typical example is when a CEO is fired due to poor financial performance. The company then hires an insider as an interim CEO, before finally hiring an external successor. A formal definition of non-routine turnover could be: “A process in which the departing CEO is unnoticed regarding his departure, and is forced to leave”.

The general consensus is that the incentives for managing earnings are greater in the context of a non-routine turnover (Wells 2002). The rationale is that the past CEO were forced to leave his position, which leaves little sentimental relationship between the former CEO and the company. For this reason, many studies exclusively focus on non-routine turnovers (Pourciau 1993). This study will not exclude routine turnovers, but rather be aware of this distinction and use it as a control variable. The distribution of this variable in our sample is shown in Table 5 below.

TABLE 5
Distribution - Routine vs Non-Routine

	Routine	Non-Routine	Sum
Number of observations	117	30	147

Table 5: Distribution of Routine and Non-Routine CEO changes

3.3.3 Write-downs

As mentioned in part 2.5, write-downs are another potential tool for earnings management. The initial plan was to perform a logistic regression to investigate the probability of write-downs occurring related to CEO changes. However, our financial data included too few observed reported write-downs. Due to these data limitations, we were unable to conduct any meaningful analysis, and the occurrence of write-downs related to CEO changes in Norway could thus be subject for future research.

3.3.4 Descriptive statistics

In this section the different control variables are presented, the variables characteristics can be found in Table 6. The transformation of the different control variables is done so each variable has a normal distribution. A Skewness and Kurtoses test for normality was conducted (see appendix 1). Due to transformation, values in Table 6 may seem arbitrary and hard to interpret. Some of the variables will be discussed here.

The descriptive statistics reveal some traits and differences between the control group and the treatment group. The firms in the treatment group seem to do relatively worse than the control group when judging from *ROA*. The treatment group has a negative *ROA* up until the 25th percentile, while the control group has a positive *ROA* at the 25th percentile. When looking at the min and max for *ROA* it is clear that the treatment group does worse by having a lower value for both min and max than the control group. This general difference between the samples are not that strange, as often low returns may be a reason to why there is a CEO change in the first place, and that initiatives (earnings management or not) may lower return in the period.

For *CFO* this variable mostly contains positive values, meaning that there is a positive cash flow from operations in most cases. It is only at the 10th percentile for both groups that there are negative cash flow from operations. The max is higher for the control group, though the min is also smaller, meaning that the range for the control group is slightly larger. This may be due to the difference in sample size so that individual companies drive this value up. Further, when comparing the 10th and the 90th percentile the *CFO* value is not that different.

When it comes to *LaggedAcc* there is a big difference in the maximum value between the two groups. The max for the control group is over twice as high as for the treatment group. However, when examining the 90th percentile the difference is rather small, meaning that also in this case there seems to be only a few companies in the control group that is the reason for the max difference.

TABLE 6
Descriptive statistics

Treatment group Variable	Mean	SD	Variance	Min	Max	p10	p25	p50	p75	p90
<i>Litigation</i>	0,347	0,478	0,228	0	1	0	0	0	1	1
<i>NonRoutine</i>	0,204	0,404	0,164	0	1	0	0	0	0	1
<i>LogMarketBookWin</i>	0,451	0,911	0,829	-2,794	2,080	-0,677	-0,046	0,416	1,045	1,704
<i>ROA</i>	0,003	0,174	0,030	-1,164	0,561	-0,186	-0,054	0,025	0,080	0,134
<i>CFO</i>	0,064	0,134	0,018	-0,474	0,557	-0,093	0,003	0,066	0,138	0,202
<i>LaggedAcc</i>	-0,027	0,089	0,008	-0,423	0,341	-0,118	-0,066	-0,024	0,014	0,058
<i>LogTAGrowthNorm</i>	-4,994	0,337	0,113	-7,205	-4,027	-5,286	-5,121	-4,980	-4,854	-4,703
<i>LaggedNOA</i>	0,530	0,267	0,071	-0,261	0,884	0,125	0,348	0,582	0,748	0,822
<i>LogLeverage</i>	-0,471	1,194	1,426	-2,545	7,228	-1,221	-0,881	-0,517	-0,273	-0,072
<i>LogAge</i>	2,443	0,957	0,916	0,693	4,615	1,386	1,792	2,303	2,833	4,290
Control group Variable	Mean	SD	Variance	Min	Max	p10	p25	p50	p75	p90
<i>Litigation</i>	0,325	0,469	0,220	0	1	0	0	0	1	1
<i>LogMarketBookWin</i>	0,482	1,136	1,290	-11,026	2,080	-0,487	-0,095	0,406	1,162	2,080
<i>ROA</i>	0,044	0,176	0,031	-0,755	1,662	-0,101	0,001	0,044	0,096	0,177
<i>CFO</i>	0,075	0,126	0,016	-0,564	0,759	-0,055	0,013	0,061	0,137	0,222
<i>LaggedAcc</i>	-0,019	0,099	0,010	-0,523	0,713	-0,100	-0,057	-0,019	0,023	0,077
<i>LogTAGrowthNorm</i>	-4,904	0,310	0,096	-5,886	-3,668	-5,245	-5,049	-4,934	-4,769	-4,562
<i>LaggedNOA</i>	0,586	0,246	0,061	-0,267	0,974	0,253	0,425	0,637	0,783	0,861
<i>LogLeverage</i>	-0,537	0,850	0,722	-3,319	9,169	-1,193	-0,804	-0,487	-0,217	0,064
<i>LogAge</i>	2,130	0,784	0,614	0,693	4,477	1,386	1,609	2,079	2,398	2,944

Table 6: Descriptive Statistics of Control Variables

3.4 Model description

3.4.1 Analysis of means

Once the discretionary accruals for both the original and the modified Jones model were estimated, we wanted to study the trend of this variable in the years surrounding a CEO change. As explained earlier discretionary accruals itself does not necessarily indicate earnings management. However, the trends in discretionary accruals may provide more insight into whether earnings management has occurred. We look at an event that takes a few years, hence it is insightful to see how discretionary accruals change over that time. Merely looking at change of accruals may not show a common trend, as companies of different sizes have accruals at different proportions. Hence, we transformed the discretionary accruals in this analysis to percentage change in discretionary accruals. This will present the change, and the magnitude of the change, properly for each firm.

$$\% \Delta DA = \frac{DA_t - DA_{t-1}}{DA_{t-1}} \quad (5)$$

Formula (5) simply shows how the percentage change for each firm is estimated. In this study we are interested in the change of discretionary accruals in the years surrounding the specific event of a CEO change. To examine this trend, we categorized observations according to the year relative to a CEO change. Meaning that the time aspect has been normalized so year 0 is the year of a CEO change, while t-1 and t+1 is the year pre- and post- a CEO change. By categorizing the observations in this way we can isolate the trend of percentage change in discretionary accruals during the event of a CEO change. Once all observations were categorized, we wanted to study the mean percentage change over this normalized timeline. Formula (6) show how the mean percentage change of discretionary accruals was estimated, where t denote the year relative to a CEO change.

$$\overline{\% \Delta DA}_t = \frac{\sum \Delta DA_t}{n} \quad (6)$$

If the hypotheses in this thesis are true, observing the trend of this mean percentage change in discretionary accruals should have an abnormal movement in the period surrounding a CEO change. According to H1, the movement in mean percentage change in discretionary accruals should be negative from the year $t-1$ to the year of a CEO change. Then according to H2 the amount of discretionary accruals should be reversed from the year of a CEO change to the following year, which means that discretionary accruals should become less negative or more positive in this period. This should make out a V-shape if presented graphically.

3.4.2 Regression model

From the databases we had observations from several years for each company, meaning the format of our dataset was panel data, also called cross-sectional time-series data or longitudinal data. This gives the opportunity to control for variables that cannot be observed or measured such as differences in business practices across companies. A Hausman test (appendix 2) was conducted to see whether it would be appropriate to use a regression with random or fixed effects. The result from this test suggests that difference across companies that are not captured by the control variables do not affect the dependent variable. Hence the regression was conducted with random effects.

The purpose of this regression was to see whether there is a significant change in the level of discretionary accruals over the event of a CEO turnover, and also to compare this to a control group of companies without any recent CEO change. Discretionary accruals were standardized by scaling with lagged total assets. In the case of the original Jones Model there were some extreme outliers for the value of discretionary accruals, this was not the case for the modified Jones. Thus, for the original Jones Model the discretionary accruals scaled by lagged total assets were winsorized at a 5% level. This variable, $DACC_{WINSOR}$ (winsorized discretionary accruals scaled by lagged total assets), was used as the dependent variable for the regression using data from the original Jones Model. While for the modified Jones version $DACC_{MOD}$ (discretionary accruals scaled by lagged total assets) were used as the dependent variable in the regression.

The main purpose of this regression is to see whether there is a significant difference in the level of discretionary accruals between the years during a CEO turnover. To do this we generated indicators for the different years relative to a CEO change; *PreChange*, *CEOChange* & *PostChange*. These variables have the value of 1 if the observation belongs to the year indicated by the variable, and zero otherwise. If these variables prove to be significant in the regression, this would indicate that there is a significant movement of the level of discretionary accruals during a CEO turnover. To control whether there is a significant difference between companies that is undergoing a CEO change and companies that have not changed CEO within the period, the indicator variable *SameCEO* was added. This variable takes the value of 1 if the observation belongs to a firm in the control group.

When conducting a regression for panel data with random effects it may be heteroscedasticity and autocorrelation in the residuals. This is an issue as it may underestimate the standard error, which may bias the study by providing false significance. To counter this, we conducted the regression with standard errors that are robust against heteroscedasticity and autocorrelation.

3.4.3 Control variables

To control for other factors that are likely to affect a company's level of discretionary accruals, the regression was conducted with a variety of control variables based on prior literature. When using the control variables in the regression they should be normally distributed so the residuals will have a homoscedastic distribution. Hence, to make the distributions of the control variables normal, some variables were transformed by different methods. The normality was tested using a Skewness and Kurtosis test, as seen in appendix 1.

The variable *Litigation* is a binary variable taking the value 1 if the firm is classified within industries that are characterized (According to Francis 1994) as having high litigation risk (GICS industry codes 25, 35 and 40), and zero otherwise. This particular aspect, and its effect on discretionary accruals, is investigated further in part 4.3 of this thesis.

NonRoutine is also a binary variable, and equals the value 1 if the respective CEO change were classified as non-routine (In accordance with Pourciau 1992), and 0 otherwise (Routine).

LogMarketBookWin is the log of the ratio market value divided by book value of equity. Due to some extreme outliers, the observations above the 95 percentile were winsorized. *ROA* is earnings scaled by lagged total assets, while *CFO* is cash flow from operations scaled by lagged total assets. The variable *LaggedAcc* is the lagged accruals scaled by total assets for that respective year. *LogTAGrowthNorm* is the natural logarithm of normalized growth in total assets, while *LaggedNOA* is net operating assets the previous year scaled by lagged total assets. *LogLeverage* is the log of total leverage scaled by lagged total assets, and at last, *LogAge* is the log of the number of years the firm has been publicly listed.

Time fixed effects also served as control variables. These variables ranged from 1998 to 2012.

3.4.4 Models

Based on the predictors described in the previous sections, the following regression models were constructed and are the ones used in the regression analysis in this thesis.

Model 1 – Using the Jones Model:

$$\begin{aligned}
 DACC_{Winsor} = & \beta_0 + \beta_1 PreChange + \beta_2 PostChange + \beta_3 SameCEO \\
 & + \beta_4 Litigation + \beta_5 NonRoutine + \beta_6 LogMarketBookWin \\
 & + \beta_7 ROA + \beta_8 CFO + \beta_9 LaggedAccWin \\
 & + \beta_{10} LogTAGrowthNorm + \beta_{11} LogNOA + \beta_{12} LogLeverage \\
 & + \beta_{13} LogAge
 \end{aligned}$$

Model 2 – Using the Modified Jones Model:

$$\begin{aligned}
DACC_{MOD} = & \beta_0 + \beta_1 PreChange + \beta_2 PostChange + \beta_3 SameCEO \\
& + \beta_4 Litigation + \beta_5 NonRoutine + \beta_6 LogMarketBookWin \\
& + \beta_7 ROA + \beta_8 CFO + \beta_9 LaggedAccWin \\
& + \beta_{10} LogTAGrowthNorm + \beta_{11} LogNOA + \beta_{12} LogLeverage \\
& + \beta_{13} LogAge
\end{aligned}$$

It is important to note that for all different indicator variables, such as the CEO change indicator or the control variable for time fixed effects, one of the indicators is left out of the regression. Meaning that the left out indicator variable will reflect the case when all the included indicator variables are equal to 0. For the CEO change indicators, the *CEOChange* is left out, and for the time fixed effects indicators the *1998* is left out. This mean that if *PreChange* and/or *PostChange* is significant in the regression then there is a statistically significant difference in the level of discretionary accruals in the year of a CEO change compared to the year before and/or after. If both are significant, this only partly supports the hypotheses in this thesis, since significance does not explain the direction of the discretionary accruals during a CEO turnover. The hypotheses also relies on the sign of the coefficient in order to be correct. The way the model is structured, the coefficient of both *PreChange* and *PostChange* would need to be positive and significant to support the hypotheses in this thesis, as the year of the CEO change should have a higher level of discretionary accruals compared to the year before and after.

4 Results

4.1 Analysis of means

When examining how earnings management may be conducted in firms in the years surrounding a CEO change, observing the trends of changes in some key indicators of earnings management can show some peculiar movements. In this analysis we observed the means of percentage change for earnings and discretionary accruals. The discretionary accruals are extracted from total accruals

by the Jones model, and the Modified Jones model. Meaning there are two analyses of discretionary accruals in this part. It is important here to underline the fact that discretionary accruals itself do not equal earnings management. However, if earnings have been managed, this would be within the discretionary part of total accruals. To verify if there is actually a significant change in the mean percentage change in discretionary accruals, an independent group t-test has been conducted to see if there is a significant difference between the years of each variable. This test will compare the means of the percentage change between two time periods. This t-test will use the null-hypothesis that the means of the two time periods are the same. Hence it will provide results of whether this hypothesis should be rejected and if difference in means is significantly different from 0. This analysis is divided into three subsections for each of the mean analyses: Earnings, Discretionary Accruals by the Jones model, and Discretionary Accruals by the Modified Jones model.

4.1.1 Mean analysis of earnings

To observe whether earnings are managed, observing the trend of earnings in the years surrounding a CEO change may provide evidence of whether this has occurred. In this analysis the mean percentage change in net income are observed during the event of a CEO change. The results from this analysis should provide insight into whether there are peculiar trends in earnings during the event of a CEO turnover, which may imply that earnings have been managed.

An increase in discretionary accruals in the year of a CEO change is expected according to H1. These discretionary accruals are expenses, hence this would lower earnings in the year of a CEO change. Hence earnings are expected to drop from year $t-1$ to the year of the CEO change, followed by an increase to the year $t+1$ when some of these accruals are reversed. This should make out a V-shape in earnings, just as with discretionary accruals, with the year of the CEO change being the lowest point in the V-shape. The results from this analysis of means can be seen in Figure 1, and it is graphically showing a V-shape as predicted. There is a decline from the year $t-1$ to the year of the CEO change, followed by an increase in the year $t+1$.

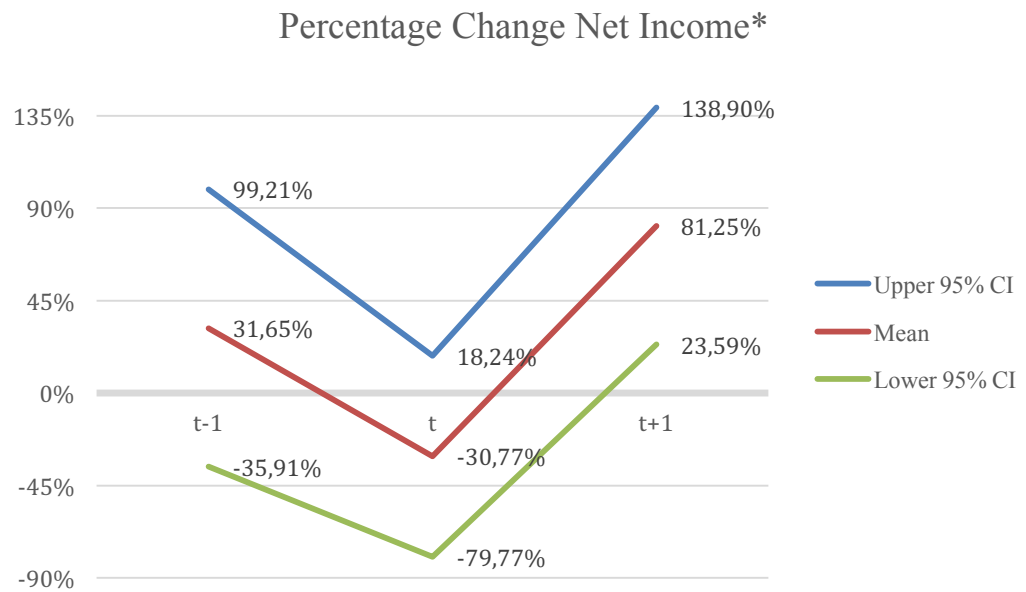


Figure 1: Percentage change of Net Income, * Including the 95% confidence Interval

Another aspect with this figure worth mentioning, is that the year of the CEO change is the only year that has a negative mean percentage change in earnings. This supports the idea that earnings are negatively managed in the year of a CEO change. However, the results of the t-test that compare the means of the year t-1 and year t finds that the difference between the means of these two years are not significantly different from 0 at the five-percent or even the 10-percent level (see appendix 3). This may imply that earnings have not been managed. However, by looking at the mean values they are rather different, and the p-value for this t-test is still quite low and relatively close to the ten-percent significance level. Hence, even though it is insignificant in this case, with an increased sample size it could become significant. When it comes to whether earnings have been managed or not, one should note that earnings are built up of many components. A closer look at discretionary accruals in the later subsections will reveal whether earnings actually have been managed by discretionary accruals regardless of whether this effect is captured in the movement of earnings.

The movement of the earnings growth in the year following a CEO change increase, and may support the argument that CEOs wish to reverse their earnings management in the year after they are hired to reap of the buffer they have built for themselves. In this case the t-test show that there is significant difference

between the mean percentage change in net income between the year t to the year $t+1$, and this is significant at a one-percent level (see appendix 4).

It is also worth noting that the mean percentage change in earnings in the year following a CEO change is the highest for the period, which in one way supports the statement that a new CEO is interested in reversing earnings management initiatives in year $t+1$. However, one could argue that since earnings growth are quite low in the year of a CEO change, the earnings does not need to increase by much to achieve a high percentage growth. Meaning that it is plausible that the negative earnings initiatives conducted from the year before a CEO change to the year of the change are not fully reversed in the year following the change.

4.1.2 Mean analysis of discretionary accruals - Jones Model

Discretionary accruals are often used as a synonym to abnormal accruals, and as stated earlier it is within this part of the accruals that earnings management reside if it is conducted by accruals. Hence, the trend of discretionary accruals may imply whether earnings management has been conducted. If this is the case, this trend will also show in what direction earnings have been managed.

In this analysis of means, we examine the percentage growth of discretionary accruals for the period surrounding CEO changes. A graphical illustration of this trend can be seen in Figure 2. By examining the trend of percentage change of discretionary accruals, we can observe a negative movement from the year $t-1$ to the year of the CEO change. This means that management has conducted earnings-reducing efforts by the use of discretionary accruals. This is as expected and consistent with H1. According to this hypothesis, discretionary accruals were expected to become less positive or more negative in the year of a CEO change, causing a negative percentage change from the year before. In this case the t-test reveal that there is a significant difference in the mean between the year $t-1$ and year t at the ten-percent level (see appendix 5).

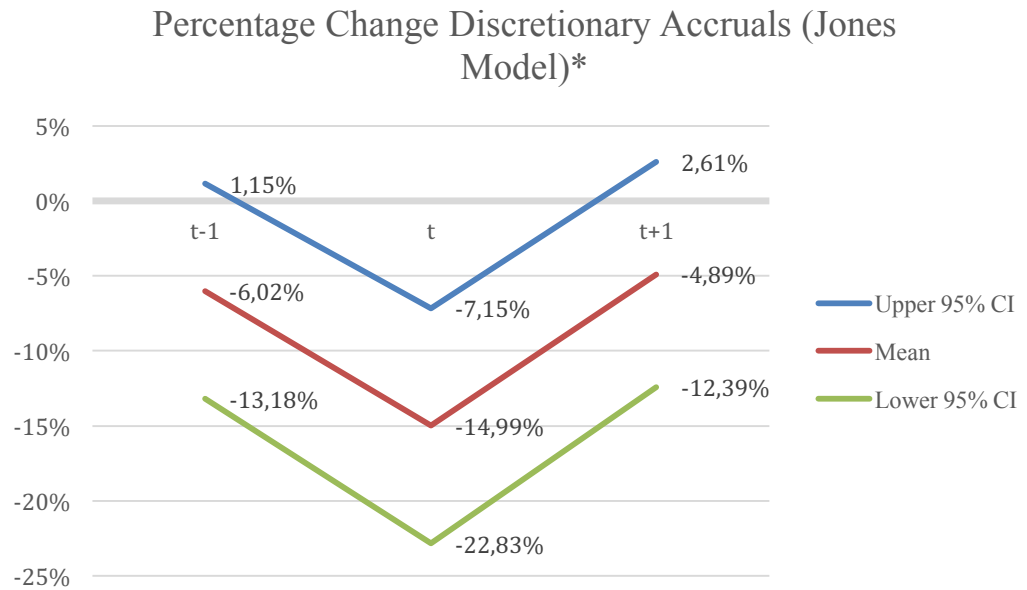


Figure 2: Percentage change of Discretionary Accruals by the Jones Model,* Including the 95% confidence Interval

In the year following a CEO change, the percentage change in discretionary accruals reverse to a level lower than before. Also here the t-test came with evidence of a significant difference in the mean between the two years, from t to t+1, at the ten-percent level (see appendix 6). This do not prove that discretionary accruals managed in the year of a CEO change are reversed in the year following the change, as the percentage change is still negative. However, the fact that the percentage change has fallen back to a normal level, highlights the point that something drastic is done with discretionary accruals in the year of a CEO change. Even though the graph makes out the V-shape as predicted, this result does not support H2. These results do not support that the managed discretionary accruals are reversed in the year following a CEO change. If there had been a full reversal of the discretional accruals the second half of the V-shape would have been steeper than the drop from the first half. Hence, after the increase in discretional accruals from t-1 to the year of the CEO change, the percentage change in discretionary accruals will fall back to about the same level as before from the year of the CEO change to the year t+1.

4.1.3 Mean analysis of discretionary accruals - Modified Jones Model

Just as with the Jones model the discretionary accruals by the Modified Jones model also indicate earnings management. From the sample the mean percentage change of discretionary accruals for the regular and modified Jones shows almost the same results. These variables are highly correlated as can be seen in Table 7.

	%Δ DACC (Jones Model)	%Δ DACC (Modified Jones Model)
%Δ Discretionary Accruals (Jones Model)	1	
%Δ Discretionary Accruals (Modified Jones Model)	0,9916	1

Table 7: Correlation Matrix of discretionary accruals by the Jones- and the modified Jones model

This means that the same conclusions can be drawn from this model as the analysis for the regular Jones Model. There are earnings-reducing changes in discretionary accruals from year t-1 to the year of the CEO change (See appendix 7), which is consistent with H1. In this case the t-test provides results that there is a significant difference in the means of the year t-1 and year t at the ten-percent level.

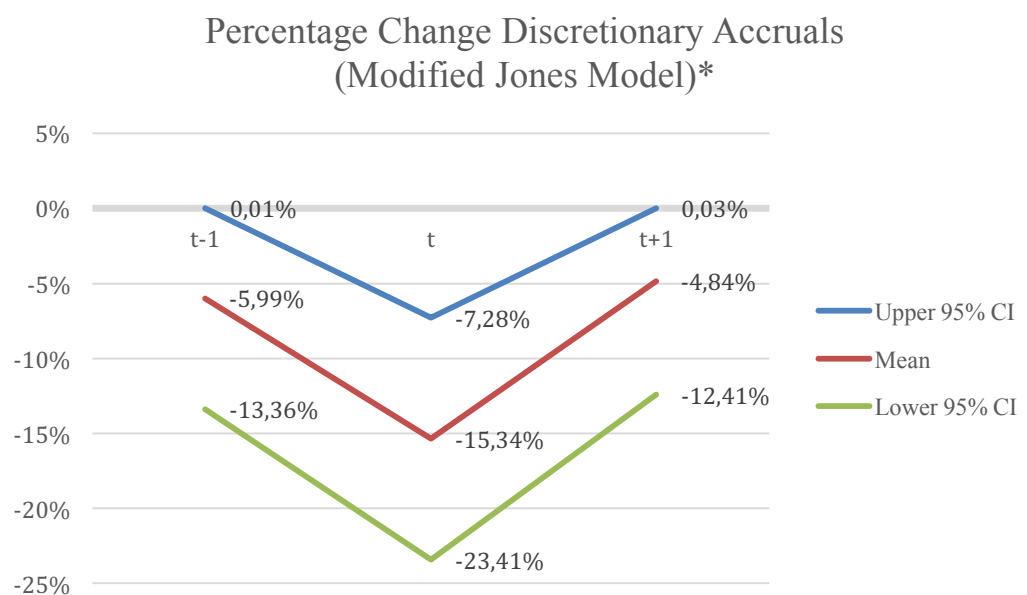


Figure 3: Percentage change of Discretionary Accruals by the modified Jones Model,* Including the 95% confidence Interval

In the year $t+1$ of a CEO change discretionary accruals reverse to a level lower than before. Also in this case the t -test provides evidence of the means of the year t and $t+1$ being significantly different at the ten-percent level (appendix 8). Once more the change does not support H2. The graph makes out a V-shape, but since the percentage change in discretionary accruals is still negative there is no significant reversal of earnings management conducted in the year of a CEO change. Though it is peculiar movements from year $t-1$ to the year of the CEO change, which may imply that earnings management efforts have been conducted.

4.1.4 Mean analysis interpretation

The results from these mean analyses provide evidence that there is a significant change in earnings and discretionary accruals in the years surrounding a CEO change. The results from the mean analyses are presented in Table 8. However, the t -tests showed that there was an insignificant drop in net income from the year $t-1$ to t , and this raise some questions.

	<i>t-1</i>	<i>t</i>	<i>t+1</i>
Net Income	31,65 % (2.35)	-30,77 % (1.71)	81,25 % (2.01)
Discretionary Accruals (Jones Model)	-6,02 % (0.25)	-14,99 % (0.27)	-4,89 % (0.26)
Discretionary Accruals (Modified Jones Model)	-5,99 % (0.26)	-15,34 % (0.28)	-4,84 % (0.26)

Table 8: Mean percentage change of Net Income and Discretionary Accruals

According to these results there is not a significant difference in the mean in percentage change in net income between the year $t-1$ and t . As stated earlier this is a counterargument to whether earnings fall in the year of a CEO change due to being managed by new CEOs. However, there is a significant increase in discretionary accruals, and since this is an expense, it should contribute with a similar drop in net income. This means that there are other factors this year that reduce the effect discretionary accruals have on earnings. Hence, even though

there is no significant difference in the mean change of net income, earnings may still be managed by discretionary accruals while other factors reduce this effect on net income.

4.2 Regression analysis

A regression analysis should give valuable insight whether there has been abnormal movement in discretionary accruals over the period of a CEO change. In this section several regression analyses have been conducted. The first two regressions are conducted with the year of the CEO change as the omitted indicator variable to observe the difference in discretionary accruals over the period of a CEO change. The next two regressions are conducted with the indicator variable for the control group as the omitted variable to observe whether there is a significant difference between the control group and all the years for companies that have a CEO change. The last few regressions are conducted where there are separate regressions for the two levels of litigation risk industries. Each variant of regression is done once with the dependent variable for discretionary accruals based on the Jones model, and once with the variable based on the modified Jones model. The construction of both regression models has been explained in part 3.4.4 of the thesis. In the following sections the results from all regressions will be discussed.

4.2.1 Model 1

The regression analysis using the discretionary accruals from the Jones model provided some quite interesting results. The results from this regression can be observed in Table 9. The regression has an overall R-squared at 0,11 and this represents how well the model explains the variance of the overall dataset. This R-squared seem sufficiently high for the model to have an explanatory power of discretionary accruals.

TABLE 9
Regression based on the Jones Model

Dependent variable: Discretionary Accruals

Variable	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	0,0223 **	0,0087	2,56	0,011
<i>PostChange</i>	0,0141	0,0089	1,58	0,114
<i>SameCEO</i>	0,0928 ***	0,0257	3,61	0,000
<i>Litigation</i>	- 0,0311	0,0279	- 1,11	0,266
<i>NonRoutine</i>	- 0,0025	0,0579	- 0,04	0,966
<i>LogMarketBookWin</i>	- 0,0027	0,0021	- 1,30	0,194
<i>ROA</i>	0,0856 ***	0,0274	3,12	0,002
<i>CFO</i>	- 0,2487 ***	0,0456	- 5,46	0,000
<i>LaggedAcc</i>	- 0,0381	0,0363	- 1,05	0,294
<i>LogTAGrowthNorm</i>	0,0045	0,0114	0,40	0,692
<i>LaggedNOA</i>	- 0,0349	0,0284	- 1,23	0,219
<i>LogLeverage</i>	- 0,0018	0,0027	- 0,66	0,506
<i>LogAge</i>	0,0068	0,0115	0,60	0,552
<i>1999</i>	- 0,0134	0,0126	- 1,06	0,288
<i>2000</i>	- 0,0069	0,0156	- 0,44	0,657
<i>2001</i>	0,0069	0,0132	0,53	0,599
<i>2002</i>	- 0,0187	0,0157	- 1,19	0,234
<i>2003</i>	- 0,0301 *	0,0160	- 1,89	0,059
<i>2004</i>	- 0,0192	0,0186	- 1,04	0,301
<i>2005</i>	- 0,0085	0,0193	- 0,44	0,658
<i>2006</i>	- 0,0072	0,0215	- 0,33	0,739
<i>2007</i>	- 0,0414 *	0,0227	- 1,82	0,068
<i>2008</i>	- 0,0269	0,0233	- 1,16	0,248
<i>2009</i>	- 0,0591 **	0,0250	- 2,36	0,018
<i>2010</i>	- 0,0419	0,0267	- 1,57	0,117
<i>2011</i>	- 0,0431	0,0291	- 1,48	0,138
<i>2012</i>	- 0,0589 **	0,0292	- 2,01	0,044
<i>Intercept</i>	- 0,9821 ***	0,0651	- 15,09	0,000
Overall R-Squared:	0,1064			
Number of obs:	421			
Number of groups:	115			
Wald chi2:	224,75			
Prob > chi2:	0,0000			
Rho:	0,9209			

Table 9: Regression of Discretionary Accruals by the Jones Model. ***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

To observe whether there is a significant movement of discretionary accruals over the period of a CEO change with this regression one would have to look to the indicator variables for the CEO change. The coefficient of the predictor *PreChange* is positive, and the two-tailed p-value test reveal that the coefficient is significantly different from 0 at the five-percent level, and almost at the one-percent level. This means that there is a significant difference in the level of discretionary accruals between the year before a CEO change, and the year of a CEO change. Since the coefficient of *PreChange* is positive, this imply that the level of discretionary accruals is at a significantly lower level in the year before a CEO change compared to the year of the change. This supports H1 since this means that there are earnings-reducing adjustments of discretionary accruals from the year before, to the year of a CEO change.

The coefficient of *PostChange* is also positive, but the two-tailed p-value test reveals that this variable is not significantly different from 0 at even the ten-percent level. The p-value is low, and almost at the ten-percent level, and a larger sample size may tip this variable over the ten-percent significance threshold. However, according to the current regression H2 is rejected. This means that there is no significant earnings-increasing adjustments of discretionary accruals in the year following a CEO change that would support a reversal of managed accruals contradictory to what was expected. An explanation to this may be that managers do not instantly reverse the managed discretionary accruals. Managers may save a “buffer” or “cookie jar” of discretionary accruals to reverse them in even later years when the firm otherwise may have relatively low earnings, or to reach future goals to achieve bonuses. It may also be that a new CEO wants to slowly reverse the discretionary accruals to not make earnings have such a visible spike their first year, and instead smooth the reversal out over a few years.

The *SameCEO* indicator should show whether there is a difference between companies during a CEO change and companies that have not had a CEO change in the period. This variable has a positive coefficient and is significant at a one-percent level. Thus there is a clear difference between the treatment group and the control group. Since the coefficient is positive, companies in the control group have a significant lower level of discretionary accruals than firms in the year of a CEO change. It is important to note that in this regression, the control group is

only compared to the year of the CEO change, and not with the years before and after the CEO change. Regressing with the control group as the omitted indicator variable to explore this is done in part 4.2.3.

There are also a few control variables that are significant. Both *ROA* and *CFO* are significant at the one-percent level. Both of these variables are highly related to financial results and accruals. A high *ROA* means that there is a high return on the firm's assets, and as return increases this opens up the opportunity to increase discretionary accruals for future use and still have positive results. When *ROA* is low, it is less likely that there would be high discretionary accruals, as this expense would drive the results even lower. Hence, a high *ROA* provides the financial opportunity to manage discretionary accruals in an earnings-reducing manner, while keeping the overall level of earnings positive. A low level of *ROA* diminish this opportunity. It is thus reasonable that the coefficient for *ROA* is positive. An increase in accruals is often at the expense of the cash flow from operations, hence it is logical that the coefficient for *CFO* is negative, because an increase in *CFO* would mean that the level of accruals will be lower.

Previous studies found that there was a significant difference between routine and non-routine CEO changes. However, in our study the respective control variable proved to be insignificant. That being said, it should be noted that in our dataset there was a low amount of observed non-routine CEO changes. Hence, for this particular variable there may be some bias.

4.2.2 Model 2

The regression using discretionary accruals estimated by the modified Jones model has very similar results to the Jones model. This is not a surprise since the adjustments to the dependent variable are relatively small. The results from this regression can be seen in Table 10. With the regression based on the modified Jones the overall R-squared is 0,06 and this is less than the overall R-squared of the original Jones model. This implies that the regression based on the Modified Jones model has less explanatory power in the variance of the dataset.

TABLE 10***Regression based on the modified Jones Model***

Dependent variable: Discretionary Accruals

Variable	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	0,0254 ***	0,0087	2,92	0,003
<i>PostChange</i>	0,0160 *	0,0089	1,80	0,073
<i>SameCEO</i>	0,1535 ***	0,0473	3,24	0,001
<i>Litigation</i>	0,0187	0,0612	0,31	0,759
<i>NonRoutine</i>	0,0343	0,0700	0,49	0,625
<i>LogMarketBookWin</i>	- 0,0032	0,0021	- 1,56	0,119
<i>ROA</i>	0,0901 ***	0,0310	2,91	0,004
<i>CFO</i>	- 0,2685 ***	0,0443	- 6,05	0,000
<i>LaggedAcc</i>	- 0,0752 *	0,0421	- 1,79	0,074
<i>LogTAGrowthNorm</i>	0,0162	0,0117	1,39	0,166
<i>LaggedNOA</i>	- 0,0485	0,0299	- 1,62	0,106
<i>LogLeverage</i>	0,0003	0,0028	0,11	0,914
<i>LogAge</i>	0,0172	0,0166	1,03	0,301
<i>1999</i>	- 0,0177	0,0126	- 1,41	0,159
<i>2000</i>	- 0,0221	0,0154	- 1,44	0,151
<i>2001</i>	0,0025	0,0146	0,17	0,863
<i>2002</i>	- 0,0296 *	0,0177	- 1,67	0,094
<i>2003</i>	- 0,0411 **	0,0179	- 2,29	0,022
<i>2004</i>	- 0,0262	0,0202	- 1,30	0,195
<i>2005</i>	- 0,0222	0,0212	- 1,05	0,296
<i>2006</i>	- 0,0222	0,0233	- 0,95	0,342
<i>2007</i>	- 0,0475 *	0,0250	- 1,90	0,057
<i>2008</i>	- 0,0386	0,0264	- 1,46	0,143
<i>2009</i>	- 0,0684 **	0,0290	- 2,36	0,018
<i>2010</i>	- 0,0519 *	0,0312	- 1,66	0,097
<i>2011</i>	- 0,0533	0,0349	- 1,52	0,128
<i>2012</i>	- 0,0744 **	0,0350	- 2,12	0,034
<i>Intercept</i>	- 0,9663 ***	0,0767	- 12,60	0,000
Overall R-Squared:	0,0628			
Number of obs:	421			
Number of groups:	115			
Wald chi2:	277,46			
Prob > chi2:	0			
Rho:	0,9738			

Table 10: Regression of Discretionary Accruals by the modified Jones Model. ***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

Also for the modified Jones model the *PreChange* indicator variable has a positive coefficient, and in this regression this variable is significant at the one-percent level according to the two-tailed p-value test. Once more this means that there is a significant difference in the level of accruals in the year before and in the year of a CEO change. Also here the coefficient is positive, meaning that the level of discretionary accruals is significantly lower in the year before a CEO change than in the year of a change. Hence, there are earnings-reducing adjustments of discretionary accruals in the year of the CEO change, which is in line with H1.

In contrast to the regular Jones model, the variable *PostChange* for the modified Jones model is significantly different from 0 at the ten-percent level. This means that in the case of discretionary accruals estimated by the modified Jones model there is a significant difference in discretionary accruals between the year of a CEO change and the following year. The coefficient is positive, meaning that the amount of discretionary accruals is earnings-increasing from the year of the CEO change to the year following the change. Hence, contradictory to the regression by the original Jones Model, the regression by the Modified Jones Model does not reject H2 at the ten-percent significance level.

The variable for the control group, *SameCEO*, is positively significant at the one-percent level. This means that there is a significant difference in the level of discretionary accruals for the control group and the year of a CEO change. The coefficient is positive, meaning that the level of discretionary accruals is significantly lower for the control group than it is for the group of companies going through a CEO change. Just as with the original Jones this regression will only provide information to whether there is a significant difference for this one year of a CEO change and the control group.

Some control variables are significant. *ROA* and *CFO* are significant at the one-percent level, and the reasoning is the same as for the previous regression from part 4.2.1. As *ROA* increase there is more room for an increase in discretionary accruals, hence it is reasonable that the coefficient is positive. When *CFO* increases, it is less room for an increase in discretionary accruals, hence the coefficient for *CFO* has a negative sign. A control variable that is significant in

the regression based on modified Jones version, while not for the original Jones model, is *LaggedAcc*. This variable is significant at the ten-percent level. It does make sense that the level of discretionary accruals, as being a part of total accruals, depends on the amount of accruals the previous year. Based on the two regressions this may indicate that the adjustment done to get the modified Jones version of discretionary accruals reveal that the level of accruals does depend to some extent on the year before. The coefficient is negative, implying that a high level of total accruals the previous year results in slightly lower discretionary accruals in the following year. Since the level of discretionary accruals does increase at the one-percent significance level from that year, these findings suggest that there is a reduction of the level of non-discretionary accruals in the same period.

The non-routine control variable is also insignificant for the modified Jones model. Implying that there is no significant effect whether the new CEO is hired according to a routine or non-routine procedure. Just as with the original Jones Model the insignificance may be due to bias caused by the small amount of observed companies for the non-routine group. Hence, this particular variable may not reflect the true behaviour of this variable for the entire population.

4.2.3 Regression of control group

When testing whether there is a significant difference between firms that have had a CEO turnover and the control group, the regressions above will only compare the year of the CEO change with the control group. It makes more sense to compare all years of each company in the treatment group with the control group. This should provide evidence to whether there is a general difference in discretionary accruals for firms that are changing their CEO.

Two regressions were computed, one for the Jones model and one for the modified Jones model. Both regressions were structured similarly to the two that has been discussed above. The only difference is that the indicator variable *SameCEO* has been changed with the indicator variable *CEOChange*. The output from these two regressions can be found in appendix 9 and 10.

In both regressions there is a significant difference in discretionary accruals between the control group and the firms during a CEO change for all years during the CEO turnover. The difference is significant at the one-percent level for each time period. All of these coefficients are negative, meaning that firms undergoing a CEO change has significantly more discretionary accruals than firms that have not had a CEO change for a while.

4.3 Regression analysis: Different levels of industry litigation risk

Just as it is expected that management in countries with different litigation risk have a different threshold to conduct earnings management, it is reasonable to believe that this difference may also apply to industries with different level of litigation risk. In the main regression *Litigation* was included as a control variable to control for the effect that high- or low litigation risk industries may have on the level of discretionary accruals. In addition to using this variable as a control variable, it would be interesting to see the movement of discretionary accruals in companies within high litigation risk industries separate from companies in low litigation risk industries. Hence in this section additional regressions are conducted, one for the group of companies in high litigation risk industries and one for companies in low litigation risk industries. This type of regression is done separately for the Jones model and the modified Jones model. Similar to how accruals behave in different litigation risk countries, one could expect that companies within industries with high litigation risk have a higher threshold to commit earnings management. The findings from this sub-analysis could potentially strengthen the validity of the findings in the main-analysis, as Norway as a whole is characterized as having low-litigation risk.

4.3.1 Model 1: Separate industries

The results from the regression based on the Jones model had a few interesting results that can be seen in Table 11 (for the remaining output of the regression see appendix 11 and 12). A disclaimer for this analysis is that since the sample used in this study is split into two groups, the sample size for each litigation risk level are reduced compared to the main sample. This analysis provides results that seem to be adequate, but due to the reduced sample size the results should be taken with

some precaution. The overall R-squared of the regressions with discretionary accruals based on the Jones Model are 0,15 and 0,11 respectively for the high- and low litigation risk industries. This does imply that the model is better at explaining the variance of the high litigation risk sample than the sample consisting of low litigation risk companies. However, the sample size of companies in high litigation risk industries are roughly half the size of the sample size consisting of companies in low litigation risk industries. This may cause some bias and inflate the overall R-squared for the high litigation risk industries sample.

TABLE 11

Regression based on the Jones Model - High vs. Low Litigation Risk Industries

Dependent variable: Discretionary Accruals

	High Litigation Risk Industries			Low Litigation Risk Industries		
		Robust			Robust	
	Coefficient	Std. Err.	P> z	Coefficient	Std. Err.	P> z
<i>PreChange</i>	0,0393 *	0,0206	0,056	0,0146 *	0,0082	0,076
<i>PostChange</i>	0,0223	0,0149	0,134	0,0093	0,0101	0,353
<i>SameCEO</i>	0,0946 **	0,0427	0,027	0,1072 ***	0,0367	0,004
...						
Overall R-Squared:	0,1544			0,1077		
Number of obs:	140			281		
Number of groups:	39			76		

*Table 11: Separate Regressions of Discretionary Accruals by the Jones Model of high- and low litigation risk industries.. ***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively. The rest of the output from this regression can be found in appendix 11 and 12.*

The first interesting finding that can be drawn from the results is that the variable *SameCEO* is significant for both samples. The high litigation risk industries are significantly different from the control group at the five-percent level, and the low litigation risk industries sample is significantly different from the control group at the one-percent level. This implies that there is a significant difference in firms

going through a CEO change compared to the control group consistent with the regression done in part 4.2.1.

The second finding is that there is a significant difference between the year before and to the year of a CEO change for both samples at the ten-percent level. Meaning there is a significant change in the level of discretionary accruals in this period, which may indicate earnings management. The effect is slightly larger for the high litigation risk industry

Lastly there seems to be no significant difference for either group from the year of the CEO change to the following year. This is similar to what was found in the regression analysis in part 4.2.1. Hence, the same conclusion can be drawn from this finding. This finding could indicate that CEOs do not reverse their earnings management initiatives by discretionary accruals in the year following the CEO change. As were also discussed in part 4.2.1 CEOs may save the buffer of managed discretionary accruals for times when it is more useful to reverse them.

The level of significance does not imply any major differences between the two groups. The question then is whether the coefficients are significantly different between the two groups. This would reveal whether there is an actual difference between the two samples. To explore this a Z-test has been conducted for each coefficient. This kind of test has not been used much in accounting research. However, since we regress based on panel data other more common tests like a “Seemingly unrelated estimation” test is not possible to conduct in statistical software we used (STATA 14). This type of Z-test has been used in other studies, and is documented to be a good approach to coefficient comparison according to Clogg, Petkova and Haritou 1995. The results from these Z-tests can be found in appendix 15. What is found by these Z-tests is that there is no significant difference between the two groups for any year throughout the period. This seems to be reasonable since it does not appear to be a big difference in the coefficients between the two groups.

4.3.2 Model 2: Separate industries

This regression comparison was also done with the modified Jones version of discretionary accruals as the dependent variable. The results from the main indicator variables can be seen in Table 12, while the complete output can be found in appendix 13 and 14. In these regressions the overall R-squared was 0,06 for the high litigation risk industries sample, and for the low litigation risk industries sample the overall R-squared was 0,11. The R-squared for the low litigation risk sample seems to be adequate, but the R-squared for the high litigation risk sample seems to be low. An overall R-squared at 0,06 means that the model only describes 6% of the variance in the sample, which is rather low. The samples in this regression are the same samples as used in part 4.3.1, meaning that also in this case the limited sample size may cause some bias. This is probably one of the reasons to why the overall R-squared is a bit low for the high litigation risk industries sample.

TABLE 12

Regression based on the modified Jones Model - High vs. Low Litigation Risk Industries

Dependent variable: Discretionary Accruals

	High Litigation Risk Industries			Low Litigation Risk Industries		
	Coefficient	Robust Std. Err.	P> z	Coefficient	Robust Std. Err.	P> z
<i>PreChange</i>	0,0418 **	0,0203	0,039	0,016 *	0,0086	0,063
<i>PostChange</i>	0,0233	0,0153	0,128	0,0130	0,0099	0,191
<i>SameCEO</i>	0,1901 *	0,1106	0,086	0,1557 ***	0,0548	0,004
...						
Overall R-Squared:	0,0594			0,1082		
Number of obs:	140			281		
Number of groups:	39			76		

*Table 12: Separate Regressions of Discretionary Accruals by the modified Jones Model of high- and low litigation risk industries.. ***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively. The rest of the output from this regression can be found in appendix 13 and 14.*

There is a significant change from the year before to the year of a CEO change for both the sample for the high- and the low litigation risk industries as seen by the p-value for *PreChange*. The significance of the high litigation risk industries sample is at the five-percent level, and for the low litigation risk industries sample the significance is at the ten-percent level.

There is no significant change from the year of the CEO change to the year following for neither the high- nor the low litigation risk industries sample. This is not consistent with the regression of the joint samples from part 4.2.2. In the regression with the joint samples the significance was low at the ten-percent level, but it was still significant. In the case of the separate litigation risk industries, even with low p-values they are not significant. Meaning that the separate samples are not able to provide the same evidence of reversal of discretionary accruals in the year following a CEO change. A reason for this may be due to the lack of sample size in this particular regression.

When it comes to the variable for the control group, *SameCEO*, there are some rather interesting results. Both the high- and the low litigation risk industry sample are significant, but the level is quite different at the ten- and one-percent level respectively. The important thing to note is that in both cases the level of discretionary accruals is significantly different in the control group compared to the year of a CEO change for companies undergoing a CEO change. In both cases the coefficient is positive, implying that the level of discretionary accruals is higher in firms during a CEO change regardless of the level of litigation risk in the industry the company is within.

Also in the Modified Jones case a Z-test was conducted to observe whether the coefficients between the two litigation risk industries samples were different. The reasoning behind using this type of test is the same as explained in part 4.3.1. The results from these Z-tests can be found in appendix 16. Just as regression based on the original Jones model from part 4.3.1, there were no significant differences in the coefficients between the high- and low litigation samples for any year in this regression based on the modified Jones model.

4.3.3 Interpretation of the litigation risk regressions

As stated earlier the results from these regressions should be taken with some precaution due to the limited sample sizes. The results from these regressions seem to point in the same direction as the regressions done in part 4.2, with some differences. There are some deviations that should be kept in mind, but even in those cases the p-values have been relatively low, meaning that the different results may easily change if the sample size were larger. Hence, with the fact in mind that the regressions conducted in this part may be biased and should be interpreted with care, what can be drawn from these regressions are mainly that regardless of the level of litigation risk in the industry the way discretionary accruals move during CEO changes seem to follow the regressions from part 4.2. Further the finding in these analyses is that there is no evidence of any statistically significant difference between companies in high- and low litigation risk industries. As stated earlier this may be biased due to the limited sample size, but the results in this thesis concludes that there is no statistical difference between the two groups.

5 Final remarks

5.1 Limitations

Related to the discussion regarding internal- and external validity, as well as propositions for future research, it is important to keep the limitations of the thesis in mind.

First of all, it was decided in 2002 that all firms within the EU should implement the IFRS by 2005 (Also including countries subject to the EEA agreement). This suggests increased comparability between firms countrywide in the EU. However, it also suggests that a generalization to countries not subject to IFRS could be difficult. Another important point related to the subject is that many countries decided to implement IFRS earlier than 2005, which potentially could cause less comparability. The time fixed effects should catch most of this transition, but it is expected to be some noise surrounding this change.

As mentioned in part 2.7 of the thesis, there are some unique characteristics for Norway (Hope and Langli 2010). Specifically, the low reputation risk cause implications, which may prevent a generalization of results to countries on the “other extreme” such as the US. Another unique characteristic, the high labour market protection is also potentially causing less external validity.

In general, there are contrasting studies regarding earnings management in private- compared to public firms (e.g. Burgstahler, Hail, and Leuz 2006; Trueman and Titman 1988), these studies also investigate different markets. Hope and Langli 2010 study the Norwegian market, and argue that private firms inhabit low reputation risk, related to audit. This suggests that auditors will be more protective against earnings management for public firm clients than private firm clients. On the other hand (Trueman and Titman, 1988) suggests that capital market expectations for public companies cause incentives for earnings management. It is thus not clear whether earnings management has the best chance of occurring for private or public firms, and it is hence unlikely that a generalization from public to private firms can be performed.

An important characteristic of our sample is that the majority of them are dependent on the oil price, which increased significantly during the time period of our study. This significant oil price dependency is unique for Norway, and may cause some troubles generalizing the findings outside Norway. Another point worth mentioning in this respect is the financial of 2007 – 2008, which did not severely hurt Norway because the oil price actually rose to a historical top in 2008. The fact that the market of Norway was left relatively untouched as compared to other foreign markets will also cause implications for the generalization of our findings. Again related to the financial crisis, IFRS and NGAAP pose different rules for loss recognition, which may also cause incomparability between companies subject to IFRS and NGAAP.

The sample of the study includes significantly more routine than non-routine CEO changes, which in turn could imply that the effect from CEO changes on earnings management is quite strong. However, it is quite unique for our sample that there are so few non-routine changes, which may have implications for generalization outside of our sample.

Our study investigates discretionary accruals as a proxy for earnings management. The reason for this is that there was too few observed write-downs to conduct a research on the matter. Future research could thus investigate the use of write-downs. Other proposals for future studies include conducting a study on markets with similar characteristics but with a larger sample to ensure internal validity. Similar studies could also be conducted on markets with different characteristics, to eventually investigate what role factors such as litigation risk and labour protection plays. At last, our study does not investigate the difference of earnings management between private- and public firms in Norway, and this is thus an important field for future studies. Suggestions for future studies will be discussed further in section 6.3 of the thesis.

5.2 Potential initiatives

The focus in this thesis has been to find evidence of earnings management by discretionary accruals in a Norwegian context during CEO changes. Hence, not much effort has been put into finding solutions to prevent this occurrence. In this thesis it is argued that earnings management is conducted on the basis of incentives such as individual wealth and reputation. Thus it would be interesting to look into initiatives to counteract these incentives. An option could be to adjust performance targets for discretionary accruals in compensation programs. This should remove or reduce the incentive to conduct earnings management by discretionary accruals, since both the benchmark for their performance as well as the performance targets will not be affected by the level of discretionary accruals. This way bonus would be independent of accruals policies, and this could be a good strategy for long-term compensation as it will remove the impact from spikes in discretionary accruals from events such as CEO turnovers.

6 Conclusion

6.1 Findings

In this study several different analyses were conducted to reveal any occurrence of earnings management by discretionary accruals. The mean-analyses conducted found that there is no significant drop in change of earnings the first year of a CEO change, but there was a significant drop in change of discretionary accruals. It is reasonable that earnings not necessarily follow discretionary accruals as it consists of more than discretionary accruals. This implies that there is a consistent difference in other financial figures in the income statement that hide or reduce the impact by earnings-decreasing management of discretionary accruals. This could also be due to the sample size of this thesis, and a larger sample size could potentially change the behaviour of either discretionary accruals or earnings.

There are in total 8 regression analyses conducted in this paper with several control variables. All of these regressions have a significance level that supports H1 and explain that there is earnings-reducing adjustments of discretionary accruals in the year of a CEO change. Discretionary accruals are an interesting measure, because any reoccurring trend in an abnormal value among independently observed companies indicate that there is an underlying norm causing this abnormality. In the case of CEO turnovers there is a significant increase of earnings-reducing abnormal accruals, which does imply that some degree of earnings management has been conducted. This belief is also supported by regression based on the control group. The evidence from this regression showed a significantly different level of discretionary accruals for all years between companies in the control group and companies with a CEO change. This indicate some degree of earnings management as the level of discretionary accruals is consistently different from the normal level of the control group.

It could be argued that an explanation for the movement in discretionary accruals, as well as the difference from the control group, are some underlying circumstances in companies that are going through a CEO change that are consistently different. Meaning that the CEO change is the result of the same underlying circumstance that caused the abnormal level of discretionary accruals before a new CEO is hired. This may force new CEOs to act by adjusting the level

of discretionary accruals that would result in the adjustments described in our analysis. If this is the case, then a CEO change and the level of discretionary accruals would both be symptoms of some underlying circumstance that we are not aware of. However, if an abnormal level of discretionary accruals are a symptom of some other circumstance, then discretionary accruals should not spike in the year of a CEO change. The earnings-reducing adjustments of discretionary accruals in the first year would be a correction, and the level would then stay about the same after the CEO change. In this thesis the results for the year following a CEO change are not clear. With the exception of the regression based on the modified Jones model the regressions conducted in this thesis showed that there is no significant evidence of earnings-increasing adjustments of discretionary accruals the year following a CEO change. This model has a lower overall R-squared than the original Jones model, meaning it has lower explanatory power than the original Jones model. This indicates that there is not a full reversal as believed according to Hypothesis 2. However, it should be taken into account that for the other regressions the p-values are quite low, even though they are insignificant. A slightly larger sample size may cause these other regressions to also have a significant difference to the year following a CEO change.

The fact that the control group has a significantly different level of discretionary accruals for all years is contradicting the statement that the earnings-reducing adjustment of discretionary accruals in the year of a CEO change is a needed correction. If this adjustment was a correction then the level of accruals in the year of a CEO change as well as the following year should not be significantly different from the control group. A correction implies that the level of discretionary accruals should be at a normal level similar to the level of the control group. Since there are contradictory arguments regarding whether there is a reversal, it is important to keep in mind that the control group had a significantly different level of discretionary accruals at the one-percent level. The p-values for the opposing arguments are pretty low while staying insignificant. Meaning it is more credible that the level is different from the control group than the insignificance being the results of a correction back to a normal level that would be similar to the control group. The level of accruals would need to change even further to be at a level similar to the control group. Still, in this thesis the results from the regressions reject Hypothesis 2. An explanation to this can be that CEOs

reverse their earnings management initiatives by discretionary accruals more gradually over several years following a CEO change. As stated earlier this could be to achieve performance targets that otherwise would be out of their reach, to smooth out earnings in years where earnings otherwise would have been low, or to make it less obvious that they have managed earnings.

When comparing the mean and the regression analysis, they do not reveal the same results. Both types of analysis provide evidence of earnings-reducing adjustments of discretionary accruals from the year before and to the year of a CEO change. Hence, based on all the different analyses conducted, this finding is pretty clear. However, there are some differences in the behaviour from the year of a CEO change to the following year. The mean-analyses find significant evidence of an earnings-increasing adjustment of discretionary accruals, while the results from the regressions are more unclear for the reasons discussed in the last paragraph. Both models are useful in explaining the occurrence. The mean-analysis provides a good general idea of what happens with earnings and discretionary accruals during CEO turnovers. While the regressions do explain the relation between the specific variables better because it controls for other factors besides the direct relation that is being examined. The control variables included in the regression, and the lack of control variables in a mean-analysis, is the main reason why the results are slightly different in these analyses. Hence, the regression should reveal a clearer picture of the different aspects surrounding this occurrence.

The separate analyses of the litigation risk industries samples showed that there is no significant difference between the two groups. It should be kept in mind that the limited sample size may have caused some bias. Hence, the results may change if a larger sample size were analysed. In this thesis they are assumed to be similar according to the conducted analyses, but with the disclosed fact that the sample size in this regression may have been too small to provide meaningful results.

The main finding in this paper is a significant earnings-reducing change in discretionary accruals that indicate earnings management consistent with Hypothesis 1. Further the evidence in this thesis does not support Hypothesis 2

because there is no significant reversal the following year. However, it is believed that the reversal may occur over a longer time-period, so the reversal is conducted when it is most beneficial. Further it is found that the companies undergoing a CEO change are significantly different than companies that are not. Hence, the evidence found in this thesis implies that earnings management by discretionary accruals do occur among companies listed on OSE during a CEO turnover. The exact movements, however, are slightly different than expected.

6.2 Theoretical contribution

Similar to our study, Choi, Jong-Seo, Young-Min Kwak, and Chongwo Choe (2014) find that the new CEO engages in downward earnings management using discretionary accruals. However, there are some differences in this study, mainly that their study is conducted in Korea, and also that they group their CEO changes into four different types.

Contrary to our study, Kuang, Yu Flora, Bo Qin, and Jacco L. Wielhouwer (2014) found that (outside) CEOs engaged in greater income-increasing manipulation in the early years of their tenure. Their study was conducted in the US. Contrary to our study, they specifically separated new CEOs as recruited internally or externally (outside).

Wells, Peter (2000) finds evidence of earnings management efforts in order to reduce income in the year of the CEO change, consistent with the findings of our thesis. However, this study was conducted in an Australian context.

Bengtsson, Kristian, Clas Bergström, and Max Nilsson (2007) studied the CEO turnover effect in a Swedish context. They found no empirical evidence of any differences between routine and non-routine CEO changes. This paper back up this finding, as neither regression found a significant difference in routine and non-routine CEO changes. However, there are rather few observations of non-routine CEO changes, meaning that this particular finding is not representative. Further, Bengtsson, Kristian, Clas Bergström and Max Nilsson (2007) present evidence of a V-shape in earnings, which is similar to our study. However, this V-

shape is explained by both accruals management and write-downs management, differing from our study as this thesis only investigates accruals management.

Our contribution to the earnings management field of research involves the investigation of situation-based earnings management, that is, earnings management in the situation of a CEO change. There are, however, no previous studies conducted in Norway which has a quite unique context (Hope, Langli 2010). This makes the findings interesting as some of the variations could potentially be explained by the uniqueness of the context. By different types of analyses, the field has been thoroughly examined, and should contribute to a better understanding of earnings management by discretionary accruals among companies listed on the Oslo Stock Exchange.

6.3 Suggestions for future research

Earnings consist of more than just discretionary accruals; and in this thesis it was found that other figures should smooth out the impact of discretionary accruals on earnings. Hence one interesting study could be to examine how other figures in the income statement behave over the period of a CEO change. As discussed earlier, write-downs are another tool to manage earnings, and could be interesting to examine further.

Another potentially interesting study would be to do similar analyses with a different or a larger sample. It could be a different sample from another country or a different sample within Norway, such as private companies. Prior literature (Trueman and Titman 1988) states that earnings quality should be higher in public firms, suggesting a lower degree of earnings management in public firms. However, a CEO in a private firm is usually closer to the owner, it could even be the same person, meaning that the agency costs are likely to be lower. This suggests that private firms have a lower degree of earnings management.

It was discussed in part 6.1 that the abnormal change of accruals during a CEO turnover may be a symptom of some underlying circumstance. This could be explored further by examining a longer period leading up to a CEO change, to

reveal whether there are significant events or circumstances in the period leading up to a CEO change.

Similarly, in this thesis the post change period is one year, and it was found that there were no significant change to the year following a CEO change. It was suggested that a possible explanation may be that the reversal happens gradually over a few years. Hence it would be interesting to study a longer post-change period to see how the level of discretionary accruals behave and if it will reach a level similar to the control group.

From the regression based on the litigation risk it was found that there is no significant difference between the two litigation risk samples. Though, this regression was conducted with a limited sample size. It would be interesting to look deeper into the effect of litigation risk on discretionary accruals more in debt within industries in a Norwegian context. The real effects of companies in different litigation risk industries may be different from what was found in this thesis.

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8 Appendix

Appendix 1: Skewness and kurtosis test for normality

Appendix 1					
<i>Skewness and kurtosis test for normality</i>					
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	Joint adj chi2(2)	Prob>chi2
<i>DiscretionaryAccruals</i>	421	0,0018	0,0878	11,38	0,0034
<i>PreChange</i>	421	0,0000	0,0000	.	0,0000
<i>PostChange</i>	421	0,0000	0,0000	.	0,0000
<i>SameCEO</i>	421	0,0000	.	.	.
<i>Litigation</i>	421	0,0000	.	.	.
<i>NonRoutine</i>	421	0,0000	0,0000	.	0,0000
<i>LogMarketBookWin</i>	421	0,0000	0,0000	.	0,0000
<i>ROA</i>	421	0,0000	0,0000	.	0,0000
<i>CFO</i>	421	0,4880	0,0000	40,69	0,0000
<i>LaggedAcc</i>	421	0,6508	0,0000	.	0,0000
<i>LogTAGrowthNorm</i>	421	0,0000	0,0000	72,09	0,0000
<i>LaggedNOA</i>	421	0,0000	0,4111	33,74	0,0000
<i>LogLeverage</i>	421	0,0000	0,0000	.	0,0000
<i>LogAge</i>	421	0,0000	0,0005	51,50	0,0000

Appendix 2: Hausman test

Appendix 2				
Hausman test				
<u>Coefficients</u>				
Variable	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_ b-V_B))
<i>PreChange</i>	0,0229	0,0223	0,0007	0,0012
<i>PostChange</i>	0,0140	0,0141	-0,0001	0,0014
<i>LogMarketBookWi</i>				
<i>n</i>	-0,0027	-0,0027	0,0000	0,0006
<i>ROA</i>	0,0852	0,0856	-0,0004	0,0025
<i>CFO</i>	-0,2568	-0,2487	-0,0081	0,0066
<i>LaggedAcc</i>	-0,0426	-0,0381	-0,0045	0,0049
<i>LogTAGrowthNorm</i>	0,0066	0,0045	0,0021	0,0017
<i>LaggedNOA</i>	-0,0317	-0,0349	0,0033	0,0062
<i>LogLeverage</i>	-0,0024	-0,0018	-0,0006	0,0012
<i>LogAge</i>	0,0269	0,0068	0,0201	0,0204
<i>1999</i>	-0,0160	-0,0134	-0,0026	0,0035
<i>2000</i>	-0,0133	-0,0069	-0,0064	0,0068
<i>2001</i>	-0,0012	0,0069	-0,0082	0,0094
<i>2002</i>	-0,0280	-0,0187	-0,0093	0,0127
<i>2003</i>	-0,0413	-0,0301	-0,0112	0,0167
<i>2004</i>	-0,0327	-0,0192	-0,0134	0,0195
<i>2005</i>	-0,0241	-0,0085	-0,0156	0,0215
<i>2006</i>	-0,0237	-0,0072	-0,0165	0,0236
<i>2007</i>	-0,0580	-0,0414	-0,0165	0,0256
<i>2008</i>	-0,0451	-0,0269	-0,0182	0,0293
<i>2009</i>	-0,0791	-0,0591	-0,0200	0,0327
<i>2010</i>	-0,0646	-0,0419	-0,0227	0,0363
<i>2011</i>	-0,0691	-0,0431	-0,0260	0,0403
<i>2012</i>	-0,0890	-0,0589	-0,0301	0,0443

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

chi2(24) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 10,03
 =
 Prob>chi2 0,9944

Appendix 3: Two sample t-test for change in net income 1

Appendix 3

Two sample t-test: Year t-1 and t

Dependant variable: Change in Net Income

Year	Obs	Mean	Std. Err.	Std. Dev.	95% Confidence Interval	
t	49	-0,3077	0,2437	1,7062	-0,7977	0,1824
t-1	49	0,3165	0,3360	2,3520	-0,3591	0,9921
Diff		-0,6242	0,4151		-1,4481	0,1998
Diff = mean(t) - mean(t-1)					t =	-
					Degrees of freedom =	96
Ho: Diff = 0						
Ha: Diff < 0		Ha: Diff != 0		Ha: Diff > 0		
Pr(T < t) =	0,068	Pr(T > t) =	0,1359	Pr(T > t) =	0,932	

Appendix 4: Two sample t-test for in change net income 2

Appendix 4

Two sample t-test: Year t and t+1

Dependant variable: Change in Net Income

Year	Obs	Mean	Std. Err.	Std. Dev.	95% Confidence Interval	
t	49	-0,3077	0,2437	1,7062	-0,7977	0,1824
t+1	49	0,8125	0,2867	2,0072	0,2359	1,3890
Diff		-1,1201	0,3763		-1,8672	0,3731
Diff = mean(t) - mean(t+1)					t =	-
					Degrees of freedom =	96
Ho: Diff = 0						
Ha: Diff < 0		Ha: Diff != 0		Ha: Diff > 0		
Pr(T < t) =	0,0018	Pr(T > t) =	0,0037	Pr(T > t) =	0,9982	

Appendix 5: Two sample t-test for change in DACC - Jones 1

Appendix 5						
<i>Two sample t-test: Jones Model year t-1 and t</i>						
Dependent variable: Change in discretionary accruals						
Year	Obs	Mean	Std. Err.	Std. Dev.	95% Confidence Interval	
t	49	-0,1499	0,0390	0,2730	-0,2283	0,0715
t-1	49	-0,0602	0,0356	0,2495	-0,1318	0,0115
Diff		-0,0897	0,0528		-0,1946	0,0152
Diff = mean(t) - mean(t-1)					t =	-
					Degrees of freedom =	96
Ho: Diff = 0						
Ha: Diff < 0		Ha: Diff != 0		Ha: Diff > 0		
		Pr(T > t)				
Pr(T < t) =	0,0464	=	0,0928	Pr(T > t) =	0,9536	

Appendix 6: Two sample t-test for change in DACC - Jones 2

Appendix 6						
<i>Two sample t-test: Jones Model year t and t+1</i>						
Dependent variable: Change in discretionary accruals						
Year	Obs	Mean	Std. Err.	Std. Dev.	95% Confidence Interval	
t	49	-0,1499	0,0390	0,2730	-0,2283	0,0715
t+1	49	-0,0489	0,0373	0,2612	-0,1239	0,0261
Diff		-0,1010	0,0540		-0,2081	0,0061
Diff = mean(t) - mean(t+1)					t =	-
					Degrees of freedom =	96
Ho: Diff = 0						
Ha: Diff < 0		Ha: Diff != 0		Ha: Diff > 0		
		Pr(T > t) =				
Pr(T < t) =	0,0322		0,0644	Pr(T > t) =	0,9678	

Appendix 7: Two sample t-test for change in DACC - Mod Jones 1

Appendix 7						
<i>Two sample t-test: Modified Jones Model year t-1 and t</i>						
Dependent variable: Change in discretionary accruals						
Year	Obs	Mean	Std. Err.	Std. Dev.	95% Confidence Interval	
t	49	-0,1534	0,0401	0,2808	-0,2341	0,0728
t-1	49	-0,0599	0,0367	0,2567	-0,1336	0,0138
Diff		-0,0935	0,0543		-0,2014	0,0143
Diff = mean(t) - mean(t-1)					t =	-1,721
					Degrees of freedom =	96
Ho: Diff = 0						
Ha: Diff < 0		Ha: Diff != 0		Ha: Diff > 0		
Pr(T < t) =	0,0442	Pr(T > t) =	0,0885	Pr(T > t) =	0,9558	

Appendix 8: Two sample t-test for change in DACC - Mod Jones 2

Appendix 8						
<i>Two sample t-test: Modified Jones Model year t and t+1</i>						
Dependent variable: Change in discretionary accruals						
Year	Obs	Mean	Std. Err.	Std. Dev.	95% Confidence Interval	
t	49	-0,1534	0,0401	0,2808	-0,2341	0,0728
t+1	49	-0,0484	0,0377	0,2638	-0,1241	0,0274
Diff		-0,1051	0,0550		-0,2143	0,0042
Diff = mean(t) - mean(t+1)					t =	1,9093
					Degrees of freedom =	96
Ho: Diff = 0						
Ha: Diff < 0		Ha: Diff != 0		Ha: Diff > 0		
Pr(T < t) =	0,0296	Pr(T > t) =	0,0592	Pr(T > t) =	0,9704	

Appendix 9: Regression based on the Control group – Jones

Appendix 9				
Regression based on the Jones Model - Control group				
Dependent variable:	Discretionary Accruals			
Variable	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	- 0,0705 ***	0,0260	- 2,72	0,007
<i>CEOChange</i>	- 0,0928 ***	0,0257	- 3,61	0,000
<i>PostChange</i>	- 0,0787 ***	0,0255	- 3,09	0,002
<i>Litigation</i>	- 0,0311	0,0279	- 1,11	0,266
<i>NonRoutine</i>	- 0,0025	0,0579	- 0,04	0,966
<i>LogMarketBookWin</i>	- 0,0027	0,0021	- 1,30	0,194
<i>ROA</i>	0,0856 ***	0,0274	3,12	0,002
<i>CFO</i>	- 0,2487 ***	0,0456	- 5,46	0,000
<i>LaggedAcc</i>	- 0,0381	0,0363	- 1,05	0,294
<i>LogTAGrowthNorm</i>	0,0045	0,0114	0,40	0,692
<i>LaggedNOA</i>	- 0,0349	0,0284	- 1,23	0,219
<i>LogLeverage</i>	- 0,0018	0,0027	- 0,66	0,506
<i>LogAge</i>	0,0068	0,0115	0,60	0,552
<i>1999</i>	- 0,0134	0,0126	- 1,06	0,288
<i>2000</i>	- 0,0069	0,0156	- 0,44	0,657
<i>2001</i>	0,0069	0,0132	0,53	0,599
<i>2002</i>	- 0,0187	0,0157	- 1,19	0,234
<i>2003</i>	- 0,0301 *	0,0160	- 1,89	0,059
<i>2004</i>	- 0,0192	0,0186	- 1,04	0,301
<i>2005</i>	- 0,0085	0,0193	- 0,44	0,658
<i>2006</i>	- 0,0072	0,0215	- 0,33	0,739
<i>2007</i>	- 0,0414 *	0,0227	- 1,82	0,068
<i>2008</i>	- 0,0269	0,0233	- 1,16	0,248
<i>2009</i>	- 0,0591 **	0,0250	- 2,36	0,018
<i>2010</i>	- 0,0419	0,0267	- 1,57	0,117
<i>2011</i>	- 0,0431	0,0291	- 1,48	0,138
<i>2012</i>	- 0,0589 **	0,0292	- 2,01	0,044
<i>Intercept</i>	- 0,8893 ***	0,0664	- 13,39	0,000
Overall R-Squared:	0,1064			
Number of obs:	421			
Number of groups:	115			
Wald chi2:	224,75			
Prob > chi2:	0,0000			
Rho:	0,9209			

***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

Appendix 10: Regression based on the Control group – Mod Jones

Appendix 10				
<i>Regression based on the Modified Jones Model - Control group</i>				
Dependent variable:	Discretionary Accruals			
	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	- 0,1281 ***	0,0472	- 2,71	0,007
<i>CEOChange</i>	- 0,1535 ***	0,0473	- 3,24	0,001
<i>PostChange</i>	- 0,1375 ***	0,0464	- 2,96	0,003
<i>Litigation</i>	0,0187	0,0612	0,31	0,759
<i>NonRoutine</i>	0,0343	0,0700	0,49	0,625
<i>LogMarketBookWin</i>	- 0,0032	0,0021	- 1,56	0,119
<i>ROA</i>	0,0901 ***	0,0310	2,91	0,004
<i>CFO</i>	- 0,2685 ***	0,0443	- 6,05	0,000
<i>LaggedAcc</i>	- 0,0752 *	0,0421	- 1,79	0,074
<i>LogTAGrowthNorm</i>	0,0162	0,0117	1,39	0,166
<i>LaggedNOA</i>	- 0,0485	0,0299	- 1,62	0,106
<i>LogLeverage</i>	0,0003	0,0028	0,11	0,914
<i>LogAge</i>	0,0172	0,0166	1,03	0,301
<i>1999</i>	- 0,0177	0,0126	- 1,41	0,159
<i>2000</i>	- 0,0221	0,0154	- 1,44	0,151
<i>2001</i>	0,0025	0,0146	0,17	0,863
<i>2002</i>	- 0,0296 *	0,0177	- 1,67	0,094
<i>2003</i>	- 0,0411 **	0,0179	- 2,29	0,022
<i>2004</i>	- 0,0262	0,0202	- 1,30	0,195
<i>2005</i>	- 0,0222	0,0212	- 1,05	0,296
<i>2006</i>	- 0,0222	0,0233	- 0,95	0,342
<i>2007</i>	- 0,0475 *	0,0250	- 1,90	0,057
<i>2008</i>	- 0,0386	0,0264	- 1,46	0,143
<i>2009</i>	- 0,0684 **	0,0290	- 2,36	0,018
<i>2010</i>	- 0,0519 *	0,0312	- 1,66	0,097
<i>2011</i>	- 0,0533	0,0349	- 1,52	0,128
<i>2012</i>	- 0,0744 **	0,0350	- 2,12	0,034
<i>Intercept</i>	- 0,8128 ***	0,0751	- 10,83	0,000
Overall R-Squared:	0,0628			
Number of obs:	421			
Number of groups:	115			
Wald chi2:	277,46			
Prob > chi2:	0,0000			
Rho:	0,9738			

***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

Appendix 11: Regression, High Litigation Risk - Jones

Appendix 11				
<i>Regression based on the Jones Model - High Litigation Risk Industries</i>				
Dependent variable:	Discretionary Accruals			
	High Litigation Risk Industries			
	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	0,0393 *	0,0206	1,91	0,056
<i>PostChange</i>	0,0223	0,0149	1,50	0,134
<i>SameCEO</i>	0,0946 **	0,0427	2,22	0,027
<i>NonRoutine</i>	- 0,0771	0,0812	- 0,95	0,342
<i>LogMarketBookWin</i>	0,0146	0,0098	1,49	0,135
<i>ROA</i>	0,1062 ***	0,0300	3,54	0,000
<i>CFO</i>	- 0,2035 ***	0,0758	- 2,68	0,007
<i>LaggedAcc</i>	- 0,0430	0,0547	- 0,79	0,432
<i>LogTAGrowthNorm</i>	- 0,0392	0,0243	- 1,61	0,107
<i>LaggedNOA</i>	- 0,0961 ***	0,0365	- 2,63	0,009
<i>LogLeverage</i>	- 0,0057	0,0042	- 1,35	0,176
<i>LogAge</i>	- 0,0123	0,0240	- 0,51	0,607
<i>1999</i>	- 0,0070	0,0292	- 0,24	0,809
<i>2000</i>	0,0241	0,0302	0,80	0,424
<i>2001</i>	0,0334	0,0312	1,07	0,283
<i>2002</i>	0,0202	0,0375	0,54	0,590
<i>2003</i>	- 0,0065	0,0349	- 0,19	0,852
<i>2004</i>	0,0115	0,0393	0,29	0,771
<i>2005</i>	0,0117	0,0404	0,29	0,772
<i>2006</i>	0,0138	0,0438	0,32	0,752
<i>2007</i>	- 0,0212	0,0456	- 0,46	0,642
<i>2008</i>	- 0,0252	0,0438	- 0,57	0,566
<i>2009</i>	- 0,0481	0,0465	- 1,04	0,301
<i>2010</i>	0,0152	0,0477	0,32	0,749
<i>2011</i>	- 0,0078	0,0529	- 0,15	0,884
<i>2012</i>	- 0,0368	0,0500	- 0,74	0,462
<i>Intercept</i>	- 1,2097 ***	0,1136	- 10,65	0,000
Overall R-Squared:	0,1544			
Number of obs:	140			
Number of groups:	39			
Wald chi2:	3235,24			
Prob > chi2:	0,0000			
Rho:	0,8985			

***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

Appendix 12: Regression, Litigation Risk- Jones

Appendix 12				
<i>Regression based on the Jones Model - Low Litigation Risk Industries</i>				
Dependent variable:	Discretionary Accruals			
	Low Litigation Risk Industries			
	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	0,0146 *	0,0082	1,78	0,076
<i>PostChange</i>	0,0093	0,0101	0,93	0,353
<i>SameCEO</i>	0,1072 ***	0,0367	2,92	0,004
<i>NonRoutine</i>	0,0314	0,0691	0,45	0,650
<i>LogMarketBookWin</i>	- 0,0040	0,0025	- 1,59	0,111
<i>ROA</i>	0,0542	0,0488	1,11	0,266
<i>CFO</i>	- 0,2762 ***	0,0545	- 5,06	0,000
<i>LaggedAcc</i>	- 0,0377	0,0431	- 0,88	0,381
<i>LogTAGrowthNorm</i>	0,0062	0,0136	0,45	0,650
<i>LaggedNOA</i>	0,0251	0,0278	0,90	0,367
<i>LogLeverage</i>	0,0132 *	0,0073	1,81	0,071
<i>LogAge</i>	0,0217	0,0136	1,60	0,110
<i>1999</i>	- 0,0164	0,0145	- 1,13	0,259
<i>2000</i>	- 0,0156	0,0182	- 0,86	0,390
<i>2001</i>	- 0,0036	0,0140	- 0,26	0,794
<i>2002</i>	- 0,0361 **	0,0158	- 2,28	0,022
<i>2003</i>	- 0,0542 ***	0,0181	- 2,99	0,003
<i>2004</i>	- 0,0316 *	0,0178	- 1,78	0,075
<i>2005</i>	- 0,0288	0,0183	- 1,58	0,115
<i>2006</i>	- 0,0277	0,0218	- 1,27	0,204
<i>2007</i>	- 0,0542 **	0,0232	- 2,33	0,020
<i>2008</i>	- 0,0359	0,0246	- 1,46	0,144
<i>2009</i>	- 0,0684 **	0,0277	- 2,47	0,014
<i>2010</i>	- 0,0722 ***	0,0275	- 2,63	0,009
<i>2011</i>	- 0,0755 **	0,0317	- 2,38	0,017
<i>2012</i>	- 0,0879 **	0,0310	- 2,84	0,005
<i>Intercept</i>	- 1,0315 ***	0,0817	- 12,63	0,000
Overall R-Squared:	0,1077			
Number of obs:	281			
Number of groups:	76			
Wald chi2:	173,03			
Prob > chi2:	0,0000			
Rho:	0,9474			

***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

Appendix 13: Regression, High Litigation Risk - Mod Jones

Appendix 13				
<i>Regression of High Litigation Risk Industries - modified Jones Model</i>				
Dependent variable:		Discretionary Accruals		
High Litigation Risk Industries				
	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	0,0418 **	0,0203	2,06	0,039
<i>PostChange</i>	0,0233	0,0153	1,52	0,128
<i>SameCEO</i>	0,1901 *	0,1106	1,72	0,086
<i>NonRoutine</i>	- 0,0799	0,1034	- 0,77	0,440
<i>LogMarketBookWin</i>	0,0110	0,0114	0,96	0,337
<i>ROA</i>	0,0931 ***	0,0324	2,88	0,004
<i>CFO</i>	- 0,2042 **	0,0845	- 2,42	0,016
<i>LaggedAcc</i>	- 0,0693	0,0553	- 1,25	0,210
<i>LogTAGrowthNorm</i>	- 0,0257	0,0276	- 0,93	0,352
<i>LaggedNOA</i>	- 0,1078 ***	0,0410	- 2,63	0,009
<i>LogLeverage</i>	- 0,0026	0,0046	- 0,57	0,571
<i>LogAge</i>	- 0,0375	0,0380	- 0,99	0,324
<i>1999</i>	0,0009	0,0340	0,03	0,979
<i>2000</i>	0,0342	0,0429	0,80	0,425
<i>2001</i>	0,0502	0,0430	1,17	0,243
<i>2002</i>	0,0331	0,0470	0,70	0,481
<i>2003</i>	0,0158	0,0487	0,32	0,746
<i>2004</i>	0,0478	0,0550	0,87	0,385
<i>2005</i>	0,0456	0,0573	0,80	0,426
<i>2006</i>	0,0367	0,0608	0,60	0,547
<i>2007</i>	0,0168	0,0631	0,27	0,790
<i>2008</i>	0,0065	0,0622	0,10	0,917
<i>2009</i>	- 0,0024	0,0688	- 0,04	0,972
<i>2010</i>	0,0629	0,0721	0,87	0,383
<i>2011</i>	0,0407	0,0758	0,54	0,592
<i>2012</i>	0,0127	0,0756	0,17	0,867
<i>Intercept</i>	- 1,1161 ***	0,1330	- 8,39	0,000
Overall R-Squared:	0,0594			
Number of obs:	140			
Number of groups:	39			
Wald chi2:	34746,68			
Prob > chi2:	0,0000			
Rho:	0,9822			

***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

Appendix 14: Regression, Low Litigation Risk – Mod Jones

Appendix 14				
<i>Regression of Low Litigation Risk Industries - modified Jones Model</i>				
Dependent variable:		Discretionary Accruals		
	Low Litigation Risk Industries			
	Coefficient	Robust Std. Err.	z-Statistics	P> z
<i>PreChange</i>	0,016 *	0,0086	1,86	0,063
<i>PostChange</i>	0,0130	0,0099	1,31	0,191
<i>SameCEO</i>	0,1557 ***	0,0548	2,84	0,004
<i>NonRoutine</i>	0,0691	0,0848	0,81	0,416
<i>LogMarketBookWin</i>	- 0,0043 **	0,0021	- 2,05	0,040
<i>ROA</i>	0,0830	0,0563	1,47	0,140
<i>CFO</i>	- 0,3024 ***	0,0493	- 6,13	0,000
<i>LaggedAcc</i>	- 0,0808	0,0556	- 1,45	0,146
<i>LogTAGrowthNorm</i>	0,0107	0,0159	0,68	0,499
<i>LaggedNOA</i>	0,0035	0,0295	0,12	0,905
<i>LogLeverage</i>	0,0167	0,0102	1,64	0,101
<i>LogAge</i>	0,0389 **	0,0182	2,14	0,032
<i>1999</i>	- 0,0228	0,0144	- 1,58	0,114
<i>2000</i>	- 0,0376 **	0,0171	- 2,20	0,028
<i>2001</i>	- 0,0109	0,0163	- 0,67	0,505
<i>2002</i>	- 0,0482 **	0,0196	- 2,45	0,014
<i>2003</i>	- 0,0683 ***	0,0220	- 3,11	0,002
<i>2004</i>	- 0,0479 **	0,0228	- 2,10	0,036
<i>2005</i>	- 0,0504 **	0,0224	- 2,25	0,025
<i>2006</i>	- 0,0462 *	0,0252	- 1,83	0,068
<i>2007</i>	- 0,0659 **	0,0276	- 2,39	0,017
<i>2008</i>	- 0,0536 *	0,0291	- 1,84	0,065
<i>2009</i>	- 0,0900 ***	0,0329	- 2,74	0,006
<i>2010</i>	- 0,0928 ***	0,0333	- 2,79	0,005
<i>2011</i>	- 0,0966 **	0,0393	- 2,46	0,014
<i>2012</i>	- 0,1179 ***	0,0383	- 3,08	0,002
<i>Intercept</i>	- 1,0492 ***	0,1065	- 9,85	0,000
Overall R-Squared:	0,1082			
Number of obs:	281			
Number of groups:	76			
Wald chi2:	199,5			
Prob > chi2:	0,0000			
Rho:	0,9667			

***, ** and * denote that the variables are significant at the one-percent, five-percent, and 10-percent levels, respectively.

Appendix 15: Z-test of high- vs low litigation risk – Jones

Appendix 15
Z-test of coefficients between high- and low litigation risk industries
(Jones Model)

	High Litigation Risk Industries		Low Litigation Risk Industries	
	Coefficient	Robust Std. Err	Coefficient	Robust Std. Err
<i>PreChange</i>	0,0393	0,0206	0,0146	0,0082
<i>PostChange</i>	0,0223	0,0149	0,0093	0,0101
<i>SameCEO</i>	0,0946	0,0427	0,1072	0,0367

$$Z = \frac{\beta_1 - \beta_2}{\sqrt{(SE\beta_1)^2 + (SE\beta_2)^2}}$$

$$H0: \beta_1 = \beta_2$$

$$H1: \beta_1 \neq \beta_2$$

	Z-Values	Results
<i>PreChange</i>	1,1162	H1 Rejected
<i>PostChange</i>	0,7223	H1 Rejected
<i>SameCEO</i>	-0,2221	H1 Rejected

Appendix 16: Z-test of high- vs low litigation risk– Modified Jones

Appendix 16

**Z-test of coefficients between high- and low litigation risk industries
(Modified Jones Model)**

	High Litigation Risk Industries		Low Litigation Risk Industries	
	Coefficient	Robust Std. Err	Coefficient	Robust Std. Err
<i>PreChange</i>	0,0418	0,0203	0,0160	0,0086
<i>PostChange</i>	0,0233	0,0153	0,0130	0,0099
<i>SameCEO</i>	0,1901	0,1106	0,1557	0,0548

$$Z = \frac{\beta_1 - \beta_2}{\sqrt{(SE\beta_1)^2 + (SE\beta_2)^2}}$$

$$H0: \quad \beta_1 = \beta_2$$

$$H1: \quad \beta_1 \neq \beta_2$$

	Z-Values:	Results
<i>PreChange</i>	1,1692	H1 Rejected
<i>PostChange</i>	0,5656	H1 Rejected
<i>SameCEO</i>	0,2783	H1 Rejected

Preliminary Thesis Report
BI Norwegian Business School

Earnings management during CEO
turnovers in Norway

GRA19003 – Preliminary Thesis Report

Study Programme:
MSc in Business,
Business Law, Tax & Accounting

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Date of submission:
15.01.2015

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1.0 Introduction

A variety of research finds a relation between CEO turnover and earnings management (Bengtsson, Bergström and Nilsson, 2007; Healy & Wahlen 1999, to mention a couple). However, most of the research examines countries other than Norway, such as UK, Germany, or Sweden. In this paper we will study the degree of earnings management for companies in Norway during a CEO turnover, among companies listed on the Norwegian Stock exchange (hereafter OSE) specifically.

Given previous literature, this phenomenon may occur related to other officer changes as well. For example, one might expect observing an earnings management effect in the event of a CFO change. However, we expect the earnings management effect during a CEO turnover to be dominant in comparison with other officer-changes, and thus choose to mainly investigate this circumstance.

In many markets, it is perceived a fact that earnings are being managed in the event of a CEO turnover. There are, however, not much research on this phenomena conducted in Norway, and we therefore want to address this gap. It is important to be aware of specific characteristics in each market/country, and control for these if necessary to gain sufficient external validity. Most notably, Norway is a low litigation environment (Hope & Langli, 2010) - that is, the risk of litigation is low, and thus lowering the “barrier” for conducting earnings management. In addition, the accounting standard for companies listed on OSE is IFRS, giving a few other implications than for countries using GAAP standards. These characteristics makes Norway an interesting setting to examine earnings management during a CEO turnover, as there may be a higher probability of earnings management to happen in this setting.

The rest of this chapter will further discuss our motivation behind the thesis, our selected research questions and hypothesis. As we also need to properly define earnings management as a concept, this will be done in section 2, where also incentives and various methods to conduct earnings management will be discussed. In section 3 the literature review will further reflect upon previous research in the field of earnings management. Finally, in section 4, research design, data collection, and empirical models will be elaborated on.

1.1 Motivation

We find it fascinating how earnings management during a CEO turnover seems to be so common according to previous literature. It is debatable whether this rent-seeking behaviour creates any value for shareholders. Hence it seems to be an increased amount of agency cost when a new CEO is hired. However, even though this phenomenon happens at the cost of shareholders, seemingly few measures are done to discourage this behaviour. We find this very interesting and are curious of the extent of this phenomenon in major Norwegian firms during a CEO turnover.

1.2 Hypothesis development

As previously mentioned it seemed interesting to enlighten the extent of this phenomenon among Norwegian companies. Hence we want to explore the usage of earnings management during CEO turnover in Norwegian companies listed on OSE. There are a variety of different research questions that can be explored regarding this concept in the context of a CEO turnover. In order to try to fill the gap in current research concerning this in a Norwegian context (OSE), we define the following research questions (RQ):

RQ1: *To what extent are new CEOs managing earnings during their tenure year for companies listed at OSE?*

RQ2: *How do abnormal discretionary accruals and write-downs behave in the period surrounding a CEO turnover?*

Based on prior literature it is expected that Norway, as a low litigation environment with IFRS-based accounting, to inhabit the right circumstances for earnings management. To detect earnings management this study will use the cross-sectional and time-series versions of the Jones model and the Modified Jones model. These models find and distinguish between the change in discretionary and nondiscretionary accruals based on lagged total assets. The resulting trend of the discretionary accruals will reveal the abnormal discretionary accruals, and it is in this part of the accruals that earnings management may be conducted. These models, and others, will be discussed more in depth in part 4.3 of this paper.

Since we expect earnings management to take place in companies undergoing CEO turnover listed on OSE, this would be reflected by negative abnormal discretionary accruals in the year the new CEO is hired. The reasoning behind this statement is that it is seen as common practice that new CEOs are not measured by their first year of tenure. This was the case with Telenor in 2015, when newly appointed CEO Sigve Brekke conducted a write-down of Telenor's ownership in Vimpelcom (P. Framstad 2015). It is seen as reasonable to blame poor performance on old management. Either in the belief that poor performance by the old officer has lagged results, or that a restructuring with increased costs were needed to clean up after old management. Hence new CEOs has an opportunity and an incentive to reduce earnings their initial year of tenure as they are seen as less responsible for the performance throughout this year. This year of low performance will also create a lower benchmark for future performance reviews for the new CEOs, which is another incentive to keep the earnings low their initial year of tenure. To capture this phenomenon the following hypotheses' are developed:

H1: *In the tenure year of a new CEO abnormal discretionary accruals will have a negative sign*

H2: *In the tenure year of new CEO abnormal write-downs will have a negative sign*

In line with the belief that earnings are managed in Norwegian companies during a CEO turnover, the abnormal discretionary accruals are expected to rise back to normal, or even higher than before, the following year(s). There can be several reasons to why this occurs due to actions done to manage earnings. First of all, earnings can naturally fall back to normal, when the new CEO has initiated cost increasing initiatives to reduce the benchmark for their performance reviews. This is often the case with write-downs, which is a non-recurring event that may have no impact on future earnings. Since there is an (artificial) increase in earnings after the new CEO is hired it may seem like he has improved the performance of the company. When looking at earnings management related to accruals, CEOs might create a "cookie jar" that can be used to reach future period performance targets, and thus boost the earnings in the following year(s) by reverting the

accruals he conducted in the initial year of his tenure (Moehrl, 2002). The CEO may have an incentive to do this to reach future period performance targets. To capture this expectation the following hypotheses' are developed:

H3: *In the year(s) preceding a CEO turnover abnormal discretionary accruals will have a positive sign*

H4: *In the year(s) preceding a CEO turnover abnormal write-downs will have a positive sign*

These hypotheses' make out a V-shape for the trend of abnormal discretionary accruals and write-downs in the years surrounding a CEO turnover.

2.0 Earnings Management

Many terms are used for the concept of earnings management, such as creative accounting, earnings smoothing, income smoothing and cosmetic accounting. In this paper we will stick to the term earnings management for this concept, and we agree with the definition of earnings management developed by Healy & Wahlen 1999, but extend the definition due to potential incentives related to regulations:

“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, influence contractual outcomes and avoid potential regulations that depend on reported accounting numbers.”

2.1 The Horizon problem

Horizon problem theory states that when CEOs perceive their own tenure as limited, they do not necessarily make decisions that are in the best interest of the firm and shareholders. Rather, they will approach the end of their tenure as the “end of the firm”, and (often sub optimally) make decisions maximizing firm value up until this point (Dechow & Sloan 1991). This means that managers that

expect to have a short tenure are likely to engage early in aggressive earnings management. According to Kuang et al., 2014 this is particularly present when specialists CEOs are hired (e.g. turnaround or interim specialists) because they expect a shorter tenure. We do recognize that this is an issue related to earnings management during a CEO turnover, but the horizon problem related to earnings management will not be pursued in this paper.

2.2 Incentives

In order to develop a research design, it is necessary to first investigate the incentives for earnings management. This is primarily because the research has to be conducted in situations where these incentives are strong, to eventually isolate earnings management.

The first incentive for earnings management is related to capital market expectations and valuation. Corporate managers will have incentives to smooth reported income for rational reasons (Trueman & Titman, 1988). Secondly, contracts also create incentives. In essence, lending contracts creates incentives for earnings management (Watts & Zimmerman, 1978); management compensation contracts may also incentivize earnings management (Dechow & Sloan, 1991). At last, regulations will incentivize earnings management (Healy & Wahlen, 1999). There also exist several other incentives, but the three mentioned above will serve as the main incentives in the context of this paper as they are instrumental for earnings management during a CEO turnover.

2.3 Earnings management background

Earnings can be managed in a variety of ways, and are mostly managed by earnings, accruals or write-downs. Accounting statements are strictly regulated, but due to certain valuation issues (ex. valuing specific intangible assets such as brand name) regulations allow a certain degree of subjectivity where management are free to make assumptions. It is within this freedom of subjectivity that earnings management is possible. If someone has an incentive for opportunistic behavior it is this flexibility that enables them to take advantage of the situation. The common regulations for companies worldwide are US-GAAP and IFRS. Companies listed on OSE are required to follow the IFRS standards. Since we base our study on companies listed on OSE all financial statements analysed in this paper have been conducted according to IFRS. Tendeloo & Vanstraelen, 2005

find that companies under IFRS with hidden reserves have no significant difference in discretionary accruals than companies under GAAP. However, they do find that there is an increased magnitude of discretionary accruals for companies under IFRS that does not have hidden reserves. Discretionary accruals are, as presented earlier and as will be described in depth in 4.3 of this paper, the part of accruals where earnings can be managed. This means that the probability of earnings management happening in companies under IFRS are not lower than for companies under GAAP. Hence companies on OSE make out an interesting market to test for earnings management during a CEO turnover, as IFRS may further enable such behaviour.

2.4 Earnings management methods

Just as there are several incentives to manage earnings, as described earlier, there are several ways of which earnings can be managed. These will be described below.

2.4.1 Earnings

Generally, earnings are the overall variable to investigate regarding earnings management. The variable can be managed both upwards- and downward by changing income and costs. Typically this is done by accruing income or taking on a “cost baths” such as write-downs. In the specific context of a CEO change, one would typically observe a V-shaped pattern in earnings, where the new CEO would manage earnings downwards giving the “blame” to the previous CEO. This can later be reversed for personal benefit in the future due to the different reasons as described in the incentives part (2.2) of this paper.

2.4.2 Accruals

Accruals can be used as a tool to manage earnings. Specifically, it is often used to move profits and losses between different accounting periods. A central measure related to this will be unexpected accruals, which is simply the difference between accruals in period t and period $t-1$. This difference can serve as a measure for “abnormal” accruals, and can give good indications of whether earnings management has occurred. Accruals in period t are defined as net operating profit after interest and tax less cash flow from operations. The critical objective of the

analysis related to earnings management will be to isolate and measure management's effect on financial reporting by adjustments in accruals.

2.4.3 Write-downs

In addition to accruals, write-downs are frequently used to take on so-called “cost baths” or shift expenses from future periods to current periods (Wells 2002). There is a close relationship between these “cost baths” and write-downs, as write-downs are the primary instrument for conducting such “cost-baths”. It is common that these “cost-baths” are committed in the first year of new CEOs for different reasons. In some cases write-downs can be value creating by “cleaning up” the company after old management, by e.g. getting rid of unprofitable or unused assets, creating a healthier business for future earnings growth. However it can also be used to artificially boost future earnings by taking on a lot of future cost, and blaming the bad performance on old management. If large write-downs are very apparent in the CEO turnover period, this might give indications of earnings management as reduced earnings in the tenure year give a lower benchmark for the future performance reviews for the new CEO. Unexpected write-downs follow the same methodology as unexpected accruals, being the difference between write-downs in period t and period $t-1$.

3.0 Literature review

There are several articles that provide a variety of general earnings management definitions and explanations. Merchant and Rockness, 1994, presents one of the early definitions of earnings management, which later has been adjusted by other scholars. Merchant, 1990 states that earnings management comes in two forms; smoothing and falsifying. Healy and Wahlen, 1999 presents maybe the most used definition of earnings management (the one we adopted and adjusted). Another study by Graham, 2004 that examined executive behavior (CFOs), found that 78% would sacrifice long-term value to smooth earnings. He also states that these top executives strive to maintain predictability in earnings and disclosures. This literature thus presents us with understanding and definitions of general earnings management.

Various literatures prove that the phenomena of earnings management related to CEO turnover are highly present in many markets. Bengtsson, Bergström and

Nilsson, 2007 discuss the use of accruals and write-downs for earnings management related to CEO turnovers in Sweden. They find that the incentives to use earnings management for boosting compensation contracts are economically significant. Specifically, their research states that the new CEO attributes poor performance on their predecessors by taking on a “Big bath”/”Cost-bath” for personal benefit. Further, literature also proves that the phenomena of earnings management related to CEO turnover are present to a higher degree earlier rather than later in the tenure. While studying differences between internal and external hired CEOs and earnings management, Kuang et al., 2014 finds that CEOs in general seem to be more engaged in earnings management right after being hired, compared to in the long term. Pourciau 1993 makes an important distinction between routine and non-routine turnovers, which often will serve as a determinant for the degree of earnings management. According to Hudson, 2012, the compensation committees are aware of these earnings management incentives, and thus base CEO compensation less on accruals at their terminal years. Suggesting some mitigation efforts at the end of the CEO tenure. The implications for this is that the former CEO would pay little attention to adjusting accruals when they are getting closer to the end of their tenure.

According to Kuang et al., 2014, CEOs recruited from the outside has stronger incentives to engage in earnings management. Also, CEO successors of external background may encounter greater pressure from the board and the market to demonstrate their managerial ability (Freidman & Saul 1991; Shen & Cannel 2002). In addition, short-tenured CEOs report earnings more aggressively than long-tenured CEOs (Ali and Zhang 2013), this study rely on research by Hermalin and Weisbach 1998. Dechow & Sloan 1991 discusses the horizon problem related to executive incentives, more specifically it investigates whether CEOs in their final year manage discretionary investment expenditures to improve short-term earnings performance.

Another study by Pourciau, 1993 investigates earnings management related to non-routine executive changes. In particular, the study investigates the relation between CEO changes and discretionary accounting choices. The definitions used for non-routine and routine executive changes follows from Vancil, 1987. Vancil’s article also describes the situation in which a good performing CEO eventually obtains combined CEO and chairman titles. With the former CEO as

chairman ready to step in if necessary, it is easier to terminate the new CEO if the firm perform poorly. This process is termed “Succession process” (Vancil, 1987).

Many articles have suggested avoiding using compensation contracts. Graham, Harvey & Rajgopal, 2004 states that earnings, and not cash flows, is the key metric perceived by outsiders. Ashiq & Wein, 2014 states that there are less earnings management in firms with greater internal and external monitoring. Further, Dechow & Sloan, 1991 found that CEOs tend to reduce their R&D spending the last year of their tenure. They also found that this reduction in R&D spending can be mitigated through enforced stock ownership for the CEO through remuneration policies. Hettihewa, Samanthala & Wright, 2010 lists and explains several incentives and motives for earnings management. This explains an environment where newly hired CEO may have opportunistic behavior to manage earnings. Tendeloo & Vanstraelen, 2005 finds no difference in earnings management behavior between IFRS and US-GAAP, but some different results when companies had hidden reserves.

Generally, earnings management is done through management of accruals and write-downs. According to Merchant, 1990; Jones, 1991; Pourcaui, 1993; McNichols, 2000 accruals are perceived to be the most important tool for earnings management. According to Kuang et al., 2014, some CEOs are hired as “specialists” - that is, turnaround specialists who then have a short-term focus (The horizon problem). However, this will not be a part of our study as we only look at the years surrounding a CEO turnover. This means we will not classify the expected length of the tenure for a new CEO.

When it comes to the empirical research of earnings management, Bengtsson, Bergström & Nilsson, 2007 uses a Whitney-Mann U test in their study (See section 4.0 for further elaboration) to spot potential differences between routine/non-routine in the use of write-downs as a tool to manage earnings. Further, Hettihewa, Samanthala & Wright, 2010 states that the Jones Model is made more descriptive of actual events by relaxing the assumption that nondiscretionary accruals are constant. Jones, 1991 already recognizes this limitation of the model. However, a modification of the Jones model (Dechow 1995) was designed to measure discretionary accruals with error when managerial discretion is exercised over revenues to eliminate this bias of the Jones model, 1991. Kuang et al., 2014 states that the Modified Jones model can favourably be

applied to estimate the discretionary part of accounting accruals. Bartov, Gul & Tsui, 2000 provides an extensive article where they evaluate the Jones-, Healy-, Industry-, Modified Jones- and DeAngelo method. The Modified Jones model proves to be the most powerful test of earnings management, according to Dechow, Sloan and Sweeney, 1995. The article further finds that cross-sectional modified Jones Model results in larger sample sizes and is thus less subject to survivorship bias.

There exist studies that are quite similar to ours, i.e. Bengtsson, Bergström & Nilsson, 2007 who examine the CEO Turnover effect in a Sweden. There are also examples of several other similar studies but these are in other countries than Norway. Norway has a few interesting characteristics that distinguishes this study from other studies outside of the country. Specifically, Norway has a low-litigation risk setting, and also has a quite strong labour protection. All in all, this creates an interesting context to investigate earnings management for new CEOs in companies, since this context gives earnings management the best “chance” of occurring. We try to fill the gap in literature by investigating whether earnings management will flourish in this kind of unique environment. As limited research has been provided when it comes to the subject of Norway, conducting this research based on new CEOs among companies listed at OSE will provide valuable information on the topic of earnings management.

4.0 Research design

Our research is focused on earnings management among new CEOs in companies listed on OSE. The research question and hypothesis’ is of a nature so it is most suitable to conduct a quantitative research. To acquire sufficient evidence of earnings management among new CEOs in companies listed on the OSE secondary data will be the primary data source. This research requires data from many companies for the study to be of a high general validity, so it is able to be generalized and representative for companies listed at OSE. The study will contain internal validity if it sufficiently explains the earnings management phenomena among the observed companies. The study at hand may also provide external validity for companies within Norway, and maybe even in other countries where they are required to report accounting values according to the IFRS. Meaning the study may be able to be generalized for companies outside of the

observed dataset. However, internal validity is required for external validity to hold.

4.1 Control Variables

To improve the validity of this study all observed companies will be classified according to the industry where they operate. Classifying the observed companies in different industries will also capture industry specific trends in accruals or write-downs if there are any. By controlling for industry specific trends in accruals, this should prevent some omitted variable bias. There are several industry classifications such as Fama-French 12-industry classification, and SIC. However, in this paper companies will be classified according to the GICS model, developed by MSCI and Standard & Poor's, as this is officially the current industry classification model used on the OSE.

Previous literature characterizes a CEO turnover as either routine or non-routine. In accordance with Vancil 1987, a routine turnover is structured and well planned. These turnovers typically involve the CEO retiring and entering the board of directors, whilst a new CEO is recruited internally. Non-routine turnovers, on the other hand, are unplanned and thus often involve inadequate amount of time. As suggested by Pourciau 1991, the structure of the routine turnover often reduces incentives and opportunities for earnings management. Related to non-routine turnovers, it is suggested that the environment surrounding the turnover provides incentives and opportunities for earnings management. In addition, it is often difficult to structure the turnover in a way that minimizes the risk of earnings management, since they are mainly unplanned. Hence, it is crucial to distinguish between and control for non-routine and routine CEO turnover as this may cause omitted variable bias.

Whether it will be a routine or non-routine CEO turnover may be a deciding factor to whether an internal or external candidate will be hired as a new CEO. Outside/external CEOs exhibit a stronger desire to demonstrate superior performance, immediately after taking the helm (Friedman & Saul 1991). For reasons just explained, a control variable for internal or external hire will be added. If this variable is excluded, our studies could potentially suffer from omitted variable bias.

For all our control variables, we will conduct tests to see if their correlation with earnings management is significant. This can potentially provide us with interesting and valuable findings.

4.2 Data collection

Since a quantitative research will be conducted focused on OSE, secondary data concerning companies within Norway will make out the most relevant data source. Companies listed on OSE are required to provide yearly accounting reports in line with IFRS. Hence companies listed on this exchange will provide comparable and reliable accounting data, and annual statements will be collected for relevant listed companies. This should provide consistency in our results, since different accounting principles/standards give different accounting data and would bias our study.

Regarding the time frame of the study, we think that data from the previous 10 fiscal years would be necessary and sufficient. The financial crisis in 2008 could potentially cause bias that may hurt the validity of the study. However, it is important to note that Norway were quite isolated from this economic recession as the high oil price stimulated the economy. Due to this reason, we will first examine all 10 years, and then later control for potential bias caused by the crisis.

Given the nature of our study, using accruals as one of the main indicators of earnings management; we will omit banks from our dataset. In general, we will have to exclude all financial-services companies, as these generally have no/little PPE and accounts receivable, which is needed to apply the Jones model.

There are also a variety of databases that will be useful for our research. The Bloomberg database can provide extensive data on companies, indexes, and industry specific data. The Atekst database will be used to get access to news articles from Norwegian media houses.

4.3 Empirical Model

One of the most common methods used to identify earnings management is the Jones Model, or a modification of this method. This model is based on measuring the amount of discretionary accruals while controlling for a firm's economic circumstances. It is within the discretionary accruals that managing earnings can be conducted. It is not possible to get exact number of earnings management from

this part of the accruals, but abnormal changes in discretionary accruals can be a good indicator of earnings management. The reasoning behind this statement is that CEOs or other managers evaluate and assume different outcomes of the company's future when they adjust accruals. Since this is based on personal experience, opinions and a lot of uncertainty, it is impossible to distinguish between the part of adjustments done to accruals that are based on real expectations, and the adjustments that are done to manage earnings for personal benefit. However, other models exist that are viable to measure earnings management. Studies conducted by Dechow, Sloan & Sweeney, 1995 test and suggest that 5 different models are able to detect earnings management, namely the Jones Model, the Modified Jones, the Healy Model, the DeAngelo model, and the Industry Model. They found the Modified Jones Model to be the most powerful one. This study was criticized, which motivated Bartov, Gul & Tsui, 2000 to make an additional study to test these models. They also conducted both a time-series and cross-sectional test of both the Jones Model and the Modified Jones model. By doing this they found supporting evidence that 4 out of the 5 to successfully detect earnings management, the one that failed was the DeAngelo model. By extended research they found evidence of the cross-sectional versions of Jones and Modified Jones to be the best models in detecting earnings management.

With this in mind we intend on use the cross-sectional versions of Jones model, and the Modified Jones models, in our research to detect earnings management in a Norwegian context. Even though the cross-sectional versions of these models were found to be the most powerful models, we intend to look at the time-series versions as well because there is a trade-off between the two versions (Bartov, Gul & Tsui, 2000).

In the coming part the Jones- and the Modified Jones model are presented. The abbreviations used in the formulas are explained in the footnote¹. In the formulas

¹ NDA_t is nondiscretionary accruals in year t scaled by lagged total assets
 $\alpha_1, \alpha_2, \alpha_3$ are firm-specific parameters
 a_1, a_2, a_3 are OLS estimators of $\alpha_1, \alpha_2, \alpha_3$
 A_{t-1} is total assets at the end of year $t - 1$
 TA_t is total accruals at the end of year t
 PPE_t is gross property, plant and equipment at the end of year t
 ΔREV_t is the change in revenue from the end of year $t - 1$ to the end of year t
 ΔREC_t is the change in net receivables from the end of year $t - 1$ to the end of year t
 ε_t is the firm-specific discretionary portion of total accruals

all independent variables will be obtained through secondary accounting data, the parameters will be obtained by an OLS estimation as seen in formula (3).

The Jones model can be seen bellow. This formula describes the amount nondiscretionary accruals in the event year t. The model tries to explain the part of total accruals that are “fixed” to sustain the current level of a company’s operation based on its economic circumstances.

$$NDA_t = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_t}{A_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) \quad (1)$$

Figure 1: Jones model

The formula for the Modified Jones model (as seen bellow) is very similar to the one for the Jones model; it describes the amount of nondiscretionary accruals in year t. The only difference is the subtraction of change in receivables from the change in revenue. This is done to eliminate some conjectured tendencies that can appear due to ignoring the changing requirements in accruals needed for different levels of receivables. Explained differently, the Modified Jones model takes into account that the amount of net receivables influences the amount nondiscretionary accruals that are needed.

$$NDA_t = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) \quad (2)$$

Figure 2: Modified Jones model

The following formula is used to estimate the firm specific parameters α_1 , α_2 and α_3 , and also to find the firm specific discretionary accruals, ε_t . It is noteworthy to state that the α_1 , α_2 and α_3 are the ones obtained from the regular Jones model for both the Jones- and the Modified Jones model. By examining the discretionary accruals, the specific change in discretionary accruals can be observed ($\varepsilon_t - \varepsilon_{t-1}$). By examining the trend of the firm specific change in discretionary accruals, during a CEO turnover, abnormal movements of discretionary accruals will be revealed. If these movements behaving according to our hypotheses’ this will indicate earnings management during the CEO turnover period.

$$\frac{TA_t}{A_{t-1}} = a_1 \left(\frac{1}{A_{t-1}} \right) + a_2 \left(\frac{\Delta REV_t}{A_{t-1}} \right) + a_3 \left(\frac{PPE_t}{A_{t-1}} \right) + \varepsilon_t \quad (3)$$

Figure 3: Total accruals scaled by lagged total assets based on OLS estimation

Regardless of the particular model the idea of the measurement is the same. The models locate the abnormal, or unexpected, part of discretionary accruals compared to non-discretionary accruals, which are all based on historical numbers. Both models control for the economical circumstances in the firm by including changes in Revenue and PPE by lagged Total Assets. The only difference is that the Modified Jones model also includes the changes in Receivables to eliminate the conjectured tendency of the Jones Model.

Write-downs, on the other hand, have to be handled slightly different. These costs are non-recurring unexpected events, meaning no level of write-downs are needed to maintain operation. Hence write-downs are not distinguished between nondiscretionary and discretionary, as there is no required level of write-downs needed for the company to operate. This means that the Jones- and the Modified Jones model are not used to measure abnormal write-downs, contrary to accruals. Instead abnormal write-downs are simply measured by the change from year $t-1$ to year t .

It is expected that new CEOs manage earnings to create (artificial) poor performance the year of tenure. They can blame this on old management and later revert the adjustments to harvest personal benefits. The models in our study will be used to examine the trend of discretionary accruals and write-downs a few years prior to, the year of, and in years preceding a CEO turnover. In line with our hypothesis, the abnormal accruals and write-downs are expected to be negative in the year of a CEO change, and are expected to be positive in the year(s) following the CEO turnover. Hence we should observe a V-trend in the discrete accruals and write-downs in the year of CEO turnover, similar to a Swedish study conducted by Bengtsson, Bergström & Nilsson, 2007.

The shape will be tested to see whether it has a significant V-shape. There are several methods to test whether the discretionary accruals make out such a shape; some are the non-parametric sign test, the t-test, or the Whitney-Mann U test. The nonparametric sign test is the simplest one, testing whether paired observations are consistently different or equal. This test can be used to measure whether the abnormal discrete accruals and write-downs are more likely to make out a V-shape from the year $t-1$ throughout year $t+1$ compared to the theoretical opposite case (a Λ -shape). However, this test is only useful when comparison can only be expressed in terms of “higher”, “lower” or “equal”, and not when observations

can be expressed in numerical values. In general the sign test has very few assumptions so it is generally applicable, but lack statistical power compared to alternative models. This is where a t-test, or a Whitney-Mann U test, will prove to be useful. Both of these models are able to detect consistent differences when observations are expressed with numerical quantities. The major difference between these models is that the Whitney-Mann U test is a nonparametric test, meaning it makes no assumption about distribution, while the t-test assumes a normal distribution. In turn the t-test is more efficient when the distribution is actually normally distributed, even though the Whitney-Mann U test is nearly as efficient in the case of a normal distribution. While we are writing this report we do not know exactly how the observations will be distributed. Hence the test we will be using for the study will be decided at a later time, as the distribution of the observations will be the determinant for which test that should be used.

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