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# **The relationship between earnings management and audit fees in the Nordic region**

Does involvement in ESG activities matter for this relationship?

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**ABSTRACT:**

Tämä Pro Gradu tutki harkinnanvaraisilla jaksotuserillä tehdyn tuloksenohjauksen (accrual earnings management) ja tilintarkastuspalkkioiden suhdetta pohjoismaisissa listayhtiöissä. Tuloksenohjauksen ja tilintarkastuspalkkioiden välisen suhteen lisäksi tarkasteltiin, onko yhtiön ESG-pannisteluilla kontrolloivaa vaikutusta tuloksenohjauksen ja tilintarkastuspalkkioiden välillä. Tutkimuksen tarkastelujaksona oli 2011-2021 ja tutkimuskohteena 45 pohjoismaisissa pörssiin listattua yhtiötä. Näin ollen tutkimuksessa käytettiin tietoja yhteensä 450:stä tilikaudesta (firm years). Tutkimusmenetelmänä oli kvantitatiivinen tutkimus. Harkinnanvaraiset jaksotuserät identifioitiin Modified Jones -mallilla. Varsinainen analyysi toteutettiin tekemällä kaksi regressioanalyysiä SPSS data-analytiikkasovelluksella. Tutkimuksen tuloksista ei voitu päätellä onko harkinnanvaraisten jaksotuserien määrällä vaikutusta tilintarkastuspalkkioihin. Kuitenkin, havaitsimme että yhtiöt, jotka ovat tehneet enemmän ESG panostuksia, ohjaavat tulostaan vähemmän kuin yhtiöt, joiden ESG panostukset ovat vähäisemmät.

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**KEYWORDS:** Earnings management, audit fees, auditing, ESG, accrual earnings management

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## **1. Introduction**

In this chapter, research and related topics are introduced. The topic is discussed briefly, background is understood and goals for pro gradu research are set. The research questions and hypothesis will be introduced also.

### **1.1 Background and importance for academia**

Earnings management and its relationship to audit fees have increased its relevance in academic research in recent years. This study contributes to academia by researching accrual earnings management and its relation to audit fees in the Nordic market which consists of Finland, Sweden, Norway, Denmark, and Iceland. Unique in this study is the application of ESG (environmental, social, and corporate governance) variable, which is a moderator within the regression analysis.

The study of earnings management began in the 1980s with the first published peer-reviewed articles. In the 1990s, the research developed, and important academic papers were published. Many of which are still today important for earnings management research. For example, Jones (1991) model was introduced. This Pro Gradu uses a modified version of Jones model in the research part.

### **1.2 Delimitations of the research**

This study has certain limitations. According to Choi et al. (2022) auditors tend to charge higher fees for both accrual earnings management and real earnings management. From a theoretical perspective, the paper focuses on accrual earnings management, one of the approaches in earnings management. Two main approaches of earnings management studies are accrual earnings management and real earnings management. Real earnings management is discussed within the theoretical framework section, but the

research conducted in this paper does not contain the application of real earnings management.

This pro gradu research decided to focus research on accrual earnings management in order to understand if accrual earnings management independently affects audit fees in the Nordic region. This study also uses only one method to analyze whether the firm under inspection utilizes accrual earnings management or not. This may limit the quality of conclusions when analyzing the amount of accruals within a researched data set.

We expect that in our research the relationship between audit fees and earnings management is lower than it would be if the analysis is conducted with a real earnings management approach. This is because prior literature has found that auditors tend to charge more when a company is applying real earnings management strategies rather than when accruals are used, for example Choi et al. (2022). From a geographical perspective, this study is delimited within the Nordic region. The dataset used in this research contains data from listed large companies within Finland, Sweden, Norway, Denmark, and Iceland. However, the sample contains only 45 companies which means a representation of Nordics as a whole may be limited. The sample size is limited due to the lack of data available for Corporate Social Responsibility metrics.

### **1.3 Hypothesis development**

To form a hypothesis, we refer to prior research on earnings management and audit fee research. Choi et al. (2011) and (2022) have found that accrual earnings management has a less significant effect on audit fees than real earnings management actions. Choi et al (2022) used a sample containing non-financial companies from 24 countries, data was extracted from Compustat. Therefore, we form the hypothesis 1:

***H1:** Discretionary accrual earnings management's effect on the amount of audit fee is negative.*

Hypothesis 2 is based on Kumari and Pattanayak (2017) who found that the functional corporate governance systems tend to decrease the amount of earnings management by company executives. As ESG score is higher for companies that have effective corporate governance, it is expected that those companies also manage earnings less.

*H2: Involvement of ESG activities has a positive effect on the relationship between accrual earnings management and audit fees.*

#### **1.4 Structure of the research**

This research paper examines the relationship between accrual earnings management and audit fees in the Nordic region. The main research question is: do auditors charge higher fees from companies with higher discretionary accrual earnings management? Unique in this research is the introduction of ESG scores (environmental, social, and governance) as a variable in the regression analysis. According to the authors' knowledge, there is no prior research in the Nordics connecting earnings management and ESG scores. The goal of this study is to create an understanding of how auditors charge fees from a client when they apply discretionary accrual earnings management and does ESG score affect audit pricing in this relationship.

The structure of this research is formed following. First, needed financial statement data, audit fees, and ESG scores are gathered from companies in the Nordic region from the period 2010-2021. With this period, we can analyze the time after the financial crisis of 2008. The financial crisis was a watershed moment in global financial markets that made it a natural point in time to begin research. Secondly, the amount of discretionary accruals is estimated with a modified Jones model introduced by Dechow et al. (1995). Thirdly, the relationship between discretionary accruals, audit fees, and ESG scores is analyzed by conducting regression analysis. We also implement a set of control variables to final

regression, variables are introduced in the data section of this paper. The final conclusion for this research is formed by analyzing the results of linear regression.



## **2. Theoretical framework on earnings management**

In this chapter, earlier research conducted on earnings management and its relation to auditor fees is discussed. Discussion begins with earnings management and theories related to it with a focus on accrual and real earnings management. Secondly, discussion continues with theories related to audit fees and how this literature is relevant for this paper.

### **2.1 Accrual and real earnings management**

The literature on earnings management dates back to the mid-1980s and early 1990s. Healy (1985) introduced the first model used in academia to estimate earnings management, a year later, DeAngelo (1986) developed Healy's model by restricting the estimation period to the previous year's observation. Jones (1991) discusses company earnings management efforts during import relief investigations. Her study concludes that firm management tends to make income-decreasing accruals when the firm is under import relief investigation. Jones's (1991) research is a milestone paper in earnings management literature. The model that Jones developed in her research is often used and further developed in later literature about earnings management. According to Schipper (1989), earnings management can be interpreted as a management's effort to intervene in financial reporting to achieve private gain.

Earnings management is usually divided into two main groups. Real earnings management and accrual earnings management. According to Healy and Wahlen (1999), earnings management can be identified in situations when company 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." Incentives for management to participate in earnings management activities can vary.

Management may be incentivized in the short term to improve earnings even if the action may lead to a long-term decrease in profit potential. For example, the sale of an asset from the balance sheet may lead to inflated profit in the short term. However, the sale of an asset may decrease the company's operational ability in the long run. Such an action by company management may be in the short-term interest of management but may conflict with the long-term interest of other stakeholders. According to Healy and Wahlen (1999), earnings management occurs in companies for various reasons, such as management's tendency to influence stock market expectations, increase compensation, or decrease the likelihood of debt covenant activation.

Another type of earnings management is accrual management. In accrual earnings management company executives aim to enhance corporations financial performance by utilizing accrual accounting entries. For example, revenue may be recorded earlier than real economic activity occurs. Opportunities within accrual accounting can be used also in expenses and other income statement line items. Also balance sheet entries can contain estimation-based accruals. Example of balance sheet entry could be activation of an asset. According to Chan et al. (2015) accrual earnings management carries more risk for company executives as auditors and other regulators are likely to not accept improper accrual entries. Chan et al. (2015) explains that real earnings management may deviate from optimal business operation, but auditors tend to accept more real earnings management efforts than accrual earnings management.

Choi et al. (2022) studied how audit fees differ for companies utilizing either real or accrual earnings management. Their study found that audit fees tend to be higher for companies utilizing real earnings management techniques than for companies utilizing accrual earnings management techniques. Choi et al. (2022) used dataset that contained companies from 24 different countries. These countries contain also Nordic countries excluding Iceland. Therefore, this pro gradu research partially repeats Choi et al. (2022) research. Uniqueness comes from application of ESG, more in the research section. Also, more robust legal regimes were found to be in favor of higher audit fees when a company

is involved in real earnings management activities. Choi et al. (2022) also found that for different audit companies, the effect varies. Big 4 auditors (Ernst & Young, PricewaterhouseCoopers, KPMG, and Deloitte) tend to charge the highest fees when the audit client applies real earnings management or accrual earnings management in practice. For smaller audit companies the effect is milder. Big 4 auditors charge higher fees because they have larger reputational and litigation risks (Choi et al., 2022). Choi et al. (2022) study results must be interpreted cautiously because they did not have access to audit work hourly data. This means they cannot be sure if the higher fee is the result of more hours spent on engagement due to earnings management conducted by management or are the fees higher regardless of the total hours spent on the engagement.

Zang (2012) studies do firm managers substitute real earnings management and accrual earnings management when managing company earnings. His study discusses management incentives to trade off real earning management activity with accrual earning management activity. According to Zang (2012), literature written on earnings management prior to his study focuses mainly on accrual earnings management activities rather than on real earnings management. Firm management tends to utilize accrual earnings management over real earnings management (Zang, 2012). Also, according to Zang (2012), firm managers use accrual earnings management and real earnings management as substitutes. Both methods are used in different situations and evaluated by the firm's management.

Company management can manage earnings in multiple ways. According to Roychowdhury (2006), real earnings management can occur for example by following activities: sales manipulation, reduction of discretionary expenditures, or overproduction. According to Roychowdhury (2006), sales manipulation can occur, for example, by management's offering "limited time" price discounts or other tempting purchase terms towards the end of a fiscal period. Price discounts can also occur as longer, interest-free payment terms, which can be interpreted as a discount. Reduction of discretionary expenditures can occur when the management of a firm reduces expenses such as marketing, research

and development, or general maintenance expenses. Usually, reduced expenses are not directly related to revenue generation but non-essential expenses in the short term.

Through overproduction, the company's management can also manage real earnings. According to Roychowdhury (2006), increased production overhead costs can be divided into a larger unit population that decreases fixed cost per unit. This leads to a decreased total cost per unit, improving operating margin through the lower reported cost of goods sold. Roychowdhury (2006) is referenced in multiple academic publications, for example, by Zang (2012).

Choi et al. (2018) researched auditors' willingness to increase or decrease audit fees when the organization audited is pursuing real earnings management in their practices. They assessed a large sample of US companies that are listed on the NYSE, AMEX, and NASDAQ stock exchanges. Choi et al. (2018) found that companies that implement real earnings management practices tend to pay higher audit fees than companies that do not implement such practices. Their findings support that the auditors require a larger premium in the audit fee for signing auditor reports for a company which increases the auditor's litigation risk. Choi et al. (2018) also noted that auditors are evidently able to detect accrual earnings management through high-quality audits, however detecting real earnings management may be more challenging.

Chi et al. (2011) studied the relationship between audit quality and real earnings management. They divided auditors into "city-level" and "national-level" operators meaning that city-level auditors are smaller local auditors and national-level auditors are larger auditors auditing larger and more important companies. Chi et al. (2011) found that companies audited by city-level auditors tend to pursue more real earnings management efforts. Also, they found that the longer the audit tenure, the higher amount of real earnings management practices the audited entity is using.

Huang et al. (2020) investigated the relationship between litigation risk and real earnings management. According to their study litigation towards company management was an effective practice to prevent real earnings management efforts. Their sample consisted of companies operating under the “Ninth Circuit” (United States Court of Appeals for the Ninth Circuit”. However, their study also noted that the increased litigation risk may not be the most effective way to decrease the real earnings managed by the company directors.

Becker et al. (1998) researched the relationship between earnings management and audit quality. They hypothesized that the companies which are audited by Big 6 (currently Big 4) auditors tend to report lower discretionary accruals than the companies that are audited by non-Big 6 auditors. Becker et al. (1998) found that their hypothesis is correct and lower quality auditors (non-big 6) accept higher discretionary accruals in the audited financial statements than the big 6 auditors. They made a conclusion that the Big 6 auditors are higher quality auditors than the non-big 6 auditors. The reasoning for such a conclusion is that high-quality auditors (big 6) can detect earnings management efforts with their audit procedures.

Blankley et al. (2012) research the relationship between financial statement restatements and abnormal audit fees. They focus on the research period after the application of the Sarbanes-Oxley Act in 2002. Overall, their sample contains the period from 2002 to 2009 and all companies within a sample are audited by “Big N” auditors. Blankley et al. (2012) hypothesize that future restatements of financial statements are negatively associated with abnormal audit fees in the audited year. Their conclusion is in line with the hypothesis and research results indicate that abnormal audit fees result in fewer future financial statement restatements. Blankley et al. (2012) note that the result is logical as the auditor is incentivized to work harder on an engagement that is clearly profitable in comparison to an engagement that has a lower fee.

Chan et al. (2015) studied how company management applies earnings management after their compensation includes “clawbacks” (compensation recovery policy), which means that the manager’s compensation can be recouped by the board if financial statements are found to be misstated. They hypothesize that the companies utilizing a “clawback” policy apply less accrual-based earnings management and more real transactions-based earnings management. Chan et al. (2015) used a sample that constitutes of firms that are not financial companies that belong to the Russell 3000 index. Their main conclusion from the research was that “clawbacks” decreases management's motivation to apply earnings management efforts, however, “clawbacks” do not fully deter earnings management.

Commerford et al. (2016) were interested in auditor comfort and real earnings management. They study auditor comfort by interviewing auditors and using the “auditor comfort framework” to validate the results of their interview. During their research, they focus on auditor's tools to identify real earnings management, understand if real earnings management creates discomfort for an auditor, and what kind of procedures an auditor may conduct after real earnings management is identified within financial statements. Commerford et al (2016) results indicate that the auditors are aware of real earnings management and identify it through ordinary audit procedures. Auditors face discomfort when real earnings management is identified, and they decrease it by multiple different actions. If the auditor's discomfort is significant, the auditor may even resign from the financial statement audit engagement.

Greiner et al. (2017) studied the relationship between audit fees and aggressive real earnings management. They hypothesize that aggressive real earnings management efforts are positively correlated with audit fees. Greiner et al. (2017) found out that their hypothesis is solid and research results support it. The conclusion is that heavy real earnings management efforts result in higher audit fees.

## 2.2 Earnings management estimation models

Earnings management estimates have been conducted through various models over time since the beginning of academic research within the field. The first model was introduced by Healy in 1985 and followed by DeAngelo in 1986. The famous Jones model was introduced in 1991 and a modified version of it by Dechow et al. in 1995. In addition, there are multiple applications of these models by different academics, for example, the so-called *Industry model* was introduced by Dechow and Sloan in 1991. This research paper utilizes the modified Jones model in the research and hereby we introduce more in detail the original Jones model (1991) and the modified model by Dechow et al (1995) below.

Jones (1991) introduced her earnings management estimation model in the breakthrough academic paper published in 1991. The model is based on the assumption that non-discretionary accruals are constant. The concept also assumes that revenues are non-discretionary. The Jones model aims to remove revenue accruals that are based on discretionary revenues. An example could be revenue recorded at the end of the financial year for which the cash is not received, and therefore the management has entered trade receivable (discretionary accrual) on a balance sheet. The accuracy of the Jones model is limited to assumptions about revenue non-discretionary. The model is biased to estimate earnings management toward zero due to the extraction of the discretionary component of accrual. Jones (1991) acknowledges this limitation within the original research paper.

The modified Jones model was first introduced by Dechow et al. (1995). The goal of the modified Jones model is to eliminate bias within the original Jones model. The modified Jones model aims to estimate the non-discretionary accruals during the financial year. The modified Jones model basically assumes that credit sales within a period are the result of earnings management. According to Dechow et al. (1995), earnings management is easier through discretionary accruals on revenue.

### 2.3 Audit research

The company whose financial statements are audited pays fees to the auditor for the work related to the issuance of audit opinion. Audit fees have been studied in relation to earnings management and also from a wide variety of other perspectives. According to Abbott et al. (2006), audit fees are generally broken down into two sections. The first element is a resource component that includes the actual work auditor needs to conduct in order to gather audit evidence. The second element is an expected future loss component that includes the potential for future loss that the auditor may suffer for auditing financial statements for a certain period. The auditor may face losses for the issuance of the auditor's opinion through litigation and potential penalties.

In academic research, audit fee is found to contain different components that are called audit fee framework. According to Houston et al. (2005), the audit fee framework consists of three main components. The first component includes ordinary audit work and other resources needed to conduct audit procedures. The second component includes potential loss from future litigation that the auditor may face after the issuance of the auditor's opinion. The third component includes the potential future loss or profit that may occur after conducting the audit procedures for a certain audit client.

$$E(tc) = [cq + (E(d) \times E(r))] + [E(g) \times E(l)] + [E(t) \times E(z)]$$

*Audit fee model according to Houston et al. (2005)*

*where*

*E(tc) = total expected cost*

*c = the per unit cost of external auditor resources*

*q = the quantity of resources used by the auditor*

*E(d) = expected present value of possible future losses incurred by client stakeholders associated with undetected material misstatements in this period's financial statements*

*E(r) = expected likelihood that the auditor will be held responsible for stakeholder losses associated with undetected material misstatements in this period's financial statements*



*E(g) = expected present value of possible losses from future litigation by being associated with this period's financial statements due to factors other than undetected material misstatements*

*E(l) = expected likelihood that auditor will be held responsible for losses associated with this period's financial statements due to factors other than undetected material misstatement*

*E(t) = expected present value of possible profits or losses associated with business opportunities caused by factors other than litigation as a result of being identified with this period's financial statements*

*E(z) = expected likelihood of a business opportunity caused by factors other than litigation as a result of being identified with this period's financial statements*

Simunic & Stein (1996) studied the impact of litigation risk on audit pricing. Their conclusion was that the Big 6 (currently known as the Big 4) audit firms take litigation risks into account when pricing audit work and audits are not underpriced. However, since Simunic & Stein (1996) major auditing firms have gone bankrupt through litigation-related reasons and there are only 4 major audit firms left from the big 6 at the time of publication.

Bedard & Johnstone (2004) studied the relationship between earnings manipulation risk, corporate governance risk, and audit pricing. Their main findings were that higher risk related to earnings management leads to a larger work amount for the auditor which leads to a higher audit price.

Another approach to audit fee research represents for example Abbott et al. (2003). Their research investigates the characteristics of an audit committee and its effect on the amount of audit and non-audit fees. Abbott et al. (2003) find out that the audit committees with independent directors that meet a minimum of four times a year have lower non-audit service fee ratios.

Frino et al. (2023) studied the relationship between information asymmetry and audit fees. Their approach expects that other audit service providers may have less information than others, which leads to information asymmetry. This information asymmetry may lead to higher quoted offers for those auditors who have limited information. Auditors with less information regarding the prospective audit client would quote higher prices because they have to calculate higher risk premiums than those who have sufficient information. Frino et al. (2023) studied 218 listed US companies over the period 2006 to 2014. They found out that information asymmetry results in inflated audit fees.

Mohd Kharuddin and Basioudis (2018) investigated audit fee premiums between national and city-level industry leaders in the UK. Their research period is from 2006 to 2014 and therefore contains time before, during, and after the great financial crisis. Their conclusion is that the Big 4 auditors which have industry leadership status on a city- and national-level have audit fee premiums in comparison to non-industry leader counterparties.

Defond et al. (2005) published about how audit research has developed since the inception of the Sarbanes-Oxley Act in 2002. The Sarbanes-Oxley Act of 2002 was reformative legislation in the US after Enron and Worldcom accounting scandals from the early 2000s. Defond et al. (2005) paper is a review of academic research after the Sarbanes-Oxley Act. They conclude that the Sarbanes-Oxley Act may not have been necessary by recognizing that the failure rate for audits was low already before major accounting scandals.

## **2.4 The moderating effect of ESG**

This Pro Gradu investigates the moderating effect of ESG (environmental, sustainability, and governance) on the relationship between earnings management and audit fees. Therefore, in this subchapter, we discuss prior research conducted between ESG and earnings management to explain why moderating effect exists. One popular way to measure a corporation's ESG performance is through ESG score. Thomson Reuters

(Refinitiv) publishes ESG score that is used widely in academic research and also in this Pro Gradu. Thomson Reuters ESG score collects 400 different ESG measures and uses 178 most important of those in order to form an ESG score for the company. Environmental measures include resource use, emissions, and innovation-related measures. Governance measures include management, shareholders, and CSR (corporate social responsibility) related matters. Social measures include workforce, human rights, community, and product responsibility related measures.

According to Gavana et al. (2022), the majority of earnings management and ESG research finds a negative relationship between ESG performance and earnings management practices. However, there is no consensus within research as a positive relationship has been also found in some research papers, Gavana et al. (2022). Companies that have profound and high-quality accounting practices tend to have less aggressive earnings management efforts, Gavana et al. (2022). On the other hand, companies with less effective accounting methods tend to apply more aggressive earnings management activities, Gavana et al. (2022). A high ESG score indicates that the company management is more likely to behave ethically and takes stakeholder interests into account while making accounting decisions. Gavana et al. (2022) researched the relationship between related party transactions and earnings management. Their study found that there is a significant positive relationship between related party transactions and accrual-based earnings management. Earlier research regarding related party transactions and earnings management did not find a positive relationship.

Kumaraks and Pattayanak (2017) found that corporate governance structures help organizations to restrict earnings management practices. Their study focused on Indian commercial banks. Governing bodies and behavior of those that limited the magnitude of earnings management were board size, board independence, audit meetings, and management's remuneration. They also found that the quality of corporate governance is related to capital market performance. Well-organized companies with proper

corporate governance structures tend to perform better and business development is based on sustainable terms.

Beasley (1996) studied the relationship between the board of directors' characteristics and financial statement fraud. Earnings management efforts by corporations management may be illegal and therefore from an ESG perspective, research regarding financial statement fraud is relevant for this pro gradu. Beasley (1996) found out that companies that have more external members on the board of directors tend to conduct less financial statement-related frauds. External members means that the board member is not an employee of the firm.

Therefore, as involvement in ESG activities helps to decrease a company's involvement in earnings management, we think that it will negatively moderate the relationship between earnings management and audit fees.

### 3. Methodology

This chapter contains four different subsections. First, we connect earlier research on the topic to research conducted in this paper. Secondly, we discuss the dataset used in this research. Thirdly, we discuss the variables analyzed in this research. The last section discusses the methodology used to conduct research.

#### 3.1 Measurement of Earnings Management

This paper builds on previous research on accrual earnings management research and introduces new variables for earnings management research. The amount of accrual earnings management is estimated by utilizing modified Jones model, Ecker et al. (2013). In addition, ESG scores are used to moderate the effect of audit fees and discretionary accruals. For example, Choi et al. (2022) studied a similar relationship between accrual earnings management and audit fees. The difference between this pro gradu and Choi et al. (2022) is that the dataset used is different, and real earnings management is not used as a variable in this research. The estimation of the value of discretionary accruals is done according to Ecker et al. (2013). Modified Jones model is originally introduced by Dechow et al. (1995). The model is an enhanced version of the original Jones model introduced by Jones J.J (1991).

$$NDA\tau = \alpha_0 \left( \frac{1}{A_{t-1}} \right) + \alpha_1 (\Delta REV_t) + \alpha_2 (PPE_t)$$

*Original Jones model, according to Dechow et al. (1995)*

*where*

*NDA $\tau$  = Nondiscretionary accruals*

*$\Delta REV_t$  = Revenues in year  $t$  less revenues in year  $t-1$  scaled by total assets at  $t-1$*

*PPE $t$  = Gross property plant and equipment in year  $t$  scaled by total assets at  $t-1$*

*A $t-1$  = Total assets at  $t-1$*

$\alpha_1, 2$  and  $3 =$  firm-specific parameters

A new variable used in this research is the ESG score. ESG score is used to understand its moderation effect between discretionary accrual and audit fee. According to the author's knowledge, no prior research conducted on accrual earnings management analyses the relationship between accrual earnings management, audit fees, and ESG score. With geographical limitations to Nordic countries, this is a unique approach to accrual earnings management research.

$$\frac{TACC_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \alpha_3 \frac{PPE_t}{A_{t-1}} + \varepsilon_t$$

*Modified Jones model, according to Ecker et al. (2013)*

where

$TACC_t =$  Total accruals

$A_{t-1} =$  Total assets

$\Delta REV_t =$  Revenue

$\Delta REC_t =$  Accounts receivable

$PPE_t =$  Net property, plant, and equipments

$\varepsilon_t =$  Discretionary accruals

### 3.2 Variables

This research uses a total of 39 variables that are used to estimate discretionary accruals and analyze its relationship to audit fee and ESG score. The variables used to estimate discretionary accruals are current assets, current liabilities, cash, debt of current liabilities, depreciation / amortization, total assets, revenue, receivables and PPE (property, plant and equipment). These variables are gathered for 45 different companies from 2010 to 2021.

In order to calculate discretionary accrual these variables are formulated to further variables. Lag and delta are calculated with SPSS statistical tool for each variable mentioned. With lag and delta variables calculated, amount of discretionary accrual by a firm year was estimated by calculating modified Jones model according to Ecker et al. (2013). In addition to variables related to estimation of discretionary accrual, dataset contains variables for audit fee, ESG score and revenue growth rate.

To analyze moderation effect of ESG score in the middle of discretionary accrual and audit fee, variable named "INT" is calculated which is a product of ESG score and audit fee. A list of all variables can be found in appendix 2. All financial statement based variables and audit fees are denoted as thousands of USD in the utilized dataset. ESG scores is a number between 1-100, higher figure indicates better application of environmental, social and governance within the corporation during financial year.

### **3.3 Dataset**

In this research paper, 45 Nordic companies are analyzed. Data from 2010 to 2021 is gathered and analyzed from each company. Variables used are current assets, current liabilities, cash, a debt of current liabilities, depreciation/amortization, total assets, revenue, receivables, PPE (property, plant, and equipment), audit fees, and ESG score. The first eight variables mentioned are used to calculate the value of discretionary accruals by entity each year.

The dataset is gathered from three different sources. Audit fees are gathered from Audit Analytics, ESG score from Refinitiv Eikon, and other variables from the Orbis database. Dataset is limited to only 45 companies with data from 2010-2021. The reason for limited amount of companies is the availability of ESG score. All financial statement variables, including audit fees, are noted as USD.

### **3.4 Methods**

This subchapter will explain the methodology of how the research was conducted.

The first step of the research was the gathering of data. The data was gathered from three different sources that are explained in subchapter 3.2. The second part of the research was the estimation of discretionary accruals according to the modified Jones model. Modified Jones model was calculated according to Ecker et al (2013). The modified Jones model is used also in the wide range of other academic research related to accrual earnings management. For example, Choi et al. (2022) used modified Jones model to estimate the amount of discretionary accruals in their research. The third and final part of the research was the conduction of regression analysis with discretionary accruals as a dependent variable and audit fee, ESG scores, total assets and revenue growth rate as an independent variable. The moderation effect of ESG score between discretionary accrual and audit fee was analyzed.

#### **3.4.1 Estimating discretionary accruals**

Estimating discretionary accruals according to the modified Jones model DeChow et al. (1995) and Ecker et al. (2013) was conducted with the data-analysis software SPSS. Firstly, dataset containing financial statement data was imported to SPSS containing variables from 45 Nordic companies for the period 2010-2021. In addition to this, ESG scores and audit fees were imported for the same companies and periods. The first part of discretionary accrual calculation is to calculate deltas for current assets, cash, current liabilities, debt in current liabilities, revenue, and receivables. To calculate deltas, also lag, meaning the difference between firm-years had to be calculated for the same variables. After calculating deltas, total accruals were calculated according to Ecker et al. (2013). After total accruals and deltas were calculated, discretionary accruals were calculated according to the modified Jones model, Ecker et al. (2013), and DeChow et al (1995).



### **3.4.2 Regression analysis and correlation**

After the amount of discretionary accruals were estimated for each company and year, it was possible to analyze the relationship between the amount of discretionary accrual and audit fee and ESG scores. Linear regression analysis was conducted in the SPSS data-analysis tool. SPSS has built-in linear regression functionality, which was used in the analysis. For the analysis two separate regressions were performed. In the first regression (regression 1) dependent variable was audit fee and independent variables were total assets, the amount of discretionary accrual and revenue growth rate. The second regression (regression 2) analyzed the moderation effect of ESG Score between audit fee and the amount of discretionary accrual. In this regression dependent variable was audit fee and independent variables were ESG Score, the amount of discretionary accrual, interrelation between audit fee and ESG score, revenue growth rate and total assets.

In addition, correlation analysis was conducted between respective variables. Correlation analysis was conducted by using SPSS's functionality to drive Pearson's correlation between same variables that were used in the regression analysis.

## 4. Empirical results

In this chapter a walkthrough of results is conducted with SPSS statistical analysis tool. Regressions 1 and 2 are presented with tables that include descriptive statistics, correlation analysis and results summary. The results from are discussed in detail.

### 4.1 Descriptive statistics, general results

In this subchapter we conduct detailed walkthroughs. We begin by presenting the results from the first regression and continue with the second regression. Also, the analysis of correlations is included within this chapter.

#### 4.1.1 Regression 1

This subchapter presents the results of regression 1 and related correlation analysis. Results are presented via three separate tables. The first table explains the descriptive statistics, the second table discusses results of correlation analysis, and the third table presents the results of regression analysis itself.

**Table 1.** Descriptive statistics, regression 1

<b>Variable name</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Standard Deviation</b>	<b><i>n</i></b>
<b>Audit Fee</b>	4381,56	26,80	33086,67	4267,05	450
<b>Total Assets</b>	6,9474	6,0500	8,2300	0,43725	450
<b>Discretionary accrual</b>	0,1099	-0,5251	0,6934	0,2271	450
<b>Revenue growth rate</b>	3,89%	0,00%	989%	44,21%	450

Table 1 shows the descriptive statistics of the variables used in regression 1. The audit fee was used as dependent variable and independent variables were total assets,

discretionary accruals and revenue growth rate. Audit fees are represented in thousands of Euros, the mean was 4381,56, min 26,8, max 33086,67 and standard deviation 4267,05. The  $n$  value presenting total firm-years analyzed was 450. The  $n$  value does not contain the whole testing period between 2010 and 2021 because the first year does not have value for the revenue growth rate. The reason for this is that to calculate the revenue growth rate, the historical data from 2009 was not available and therefore it was not possible to calculate revenue growth rate for that year. The  $n$  is same for all variables as analysis can be carried out only if all variables have available values.

Total assets represent logarithm of total assets in thousands of Euros. The mean for total assets was 6,9474, min 6,0500, max 8,2300 and standard deviation 0,43725. The discretionary accrual is represented in thousands of Euros. The mean for discretionary accruals was 0,1099, min -0,5251, max 0,6934 and standard deviation 0,2271. The revenue growth rate was presented in percentage change between prior and current fiscal year. The mean for revenue growth rate was 3,89%, min 0,00%, max 989% and standard deviation was 44,21%.

**Table 2.** Correlation, regression 1

		<b>Audit Fee</b>	<b>Total Assets</b>	<b>Discretionary Accrual</b>	<b>Revenue Growth Rate</b>
<b>Pearsons Correlation</b>	<b>Audit Fee</b>	1,000	0,226	0,67	0,128
	<b>Total Assets</b>	0,226	1,000	0,318	0,067
	<b>Discretionary accrual</b>	0,067	0,318	1,000	0,095
	<b>Revenue growth rate</b>	0,128	0,067	0,095	1,000
<b>Sig.</b>	<b>Audit Fee</b>	.	<0,001	0,78	0,003
	<b>Total Assets</b>	0,000	.	0,000	0,078
	<b>Discretionary accrual</b>	0,078	0,000	.	0,022
	<b>Revenue growth rate</b>	0,003	0,078	0,022	.
<b>n</b>	<b>Audit Fee</b>	450	450	450	450
	<b>Total Assets</b>	450	450	450	450
	<b>Discretionary accrual</b>	450	450	450	450
	<b>Revenue growth rate</b>	450	450	450	450

Table 2 presents the results of Pearson's Correlation analysis that was conducted with SPSS analysis tool. In Pearson's correlation analysis value 1,00 means perfectly positive correlation and -1,00 means perfectly negative correlation.

The correlation is positive between audit fee and all other variables. The correlation between audit fee and total assets is 0,226 that indicates positive correlation, but still the correlation is relatively mild. The significance of this correlation pair is <0,001 that indicates high significance.

The correlation between audit fee and discretionary accrual is 0,67 that indicates positive correlation, which is the largest positive correlation between audit fee and other

variables. However, the significance of the correlation between audit fee and discretionary accrual is 0,78 that is the worst significance between audit fee and other variables. The correlation between the audit fee and revenue growth rate is 0,128 that indicates positive correlation. However, the correlation is relatively mild. The significance of the relationship between audit fee and revenue growth rate is 0,003 that indicates a relatively significant relationship.

According to the results of the correlation analysis we can conclude that the audit fee tends to be higher when the amount of discretionary accrual is higher.

**Table 3.** Model summary, regression 1.

<b>Variable</b>	<b>Coefficients</b>	<b>Unstandard-</b>	<b>Standardized</b>	<b>t-value</b>	<b>Sig.</b>
	<b>standard error</b>	<b>ized Beta</b>	<b>Beta</b>		
<b>Dependent variable</b>	Audit fee				
<b>Constant</b>		-11881,235			
<b>Total sets (ta)</b>	As- 471,861	2179,512	0,223	4,619	<0,001
<b>Discretionary accrual (da)</b>	910,771	-284,362	-0,015	-0,312	0,755
<b>Revenue growth rate (rg)</b>	444,423	1108,968	0,115	2,495	0,013
<b>Adjusted R<sup>2</sup></b>	0,058				
<b>Model F-stat</b>	F- 10,209				
<b>Model sig.</b>	<0,001				

$$y = -11881,235 + 2179,512 (ta) + -284,362 (da) + 1108,968 (rg)$$

Table 3 explains the results of the regression. Overall model significance is  $<0,001$ , which means overall model is significant at 99,9% confidence interval. Adjusted  $R^2$  is 0,058 that means independent variables in the model explain 5,8% of the change in dependent variable (Audit fee).  $T$ -value for total assets is 4,619, for discretionary accrual -0,312 and for revenue growth rate 2,495. Significance for different independent variables variate. Total assets significance is  $<0,001$  that means variable is significant at 99,9% confidence interval. This can be concluded as highly significant. Discretionary accrual significance is 0,755 which means that variable is significant at 24,5% confidence interval. This is a low confidence level and therefore we can't conclude whether the amount of discretionary accrual affects the amount of audit fee. The significance for revenue growth rate is 0,013 which means that variable is significant at 98,7% confidence interval. This can be concluded as highly significant.

The main finding for model 1 is that the amount of discretionary seems to be affecting negatively to the amount of audit fee. When the amount of audit fee increases one unit, the amount of discretionary accrual decreases -284,362 USD. The results are not statistically significant and therefore we are not able to conclude if the result is valid.

#### **4.1.2 Regression 2**

This subchapter presents the results of regression 2 and related correlation analysis. Results are presented via three separate tables. The first table explains the descriptive statistics, the second table discusses results of correlation analysis, and the third table presents the results of regression analysis itself.

**Table 4.** Descriptive statistics, regression 2.

<b>Variable name</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Standard Deviation</b>	<b>n</b>
<b>Audit Fee</b>	4381,56	26,80	33086,67	4267,05	450
<b>ESG Score</b>	66,95	11,63	93,31	13,83	450
<b>Discretionary accrual</b>	0,1099	-0,5251	0,6934	0,2271	450
<b>INT2</b>	0,1046	-3,2900	5,6700	1,0495	450
<b>Revenue growth rate</b>	3,89%	0,00%	989%	44,21%	450
<b>Total Assets</b>	6,9474	6,0500	8,2300	0,43725	450

Table 4 shows the descriptive statistics of the variables used in regression 2. The audit fee was used as dependent variable and independent variables were ESG score, discretionary accrual, INT2 (the multiplication of audit fee and ESG score), revenue growth rate and total assets. The dependent variable, audit fees, are represented in thousands of Euros, the mean was 4381,56, min 26,8, max 33086,67 and standard deviation 4267,05. The *n* value presenting total firm-years analyzed was 450. The *n* value does not contain the whole testing period between 2010 and 2021 because the first year does not have value for the revenue growth rate. The reason for this is that to calculate the revenue growth rate, the historical data from 2009 was not available and therefore it was not possible to calculate revenue growth rate for that year. The *n* is same for all variables as analysis can be carried out only if all variables have available values.

Total assets represent logarithm of total assets in thousands of Euros. The mean for total assets was 6,9474, min 6,0500, max 8,2300 and standard deviation 0,43725. The discretionary accrual is represented in thousands of Euros. The mean for discretionary accruals was 0,1099, min -0,5251, max 0,6934 and standard deviation 0,2271. The revenue growth rate was presented in percentage change between prior and current fiscal year. The mean for revenue growth rate was 3,89%, min 0,00%, max 989% and standard deviation was 44,21%. The mean for ESG Score was 66,95, min 11,63, max 93,31 and

standard deviation was 13,83. The mean for variable INT2 was 0,1046, min -3,2900, max 5,6700 and standard deviation was 1,0495.

**Table 5.** Correlation, regression 2.

		<b>Audit fee</b>	<b>ESG Score</b>	<b>Discretion-ary accrual</b>	<b>INT2</b>	<b>Revenue growth rate</b>	<b>Total Assets</b>
<b>Pearsons</b>	<b>Audit fee</b>	1,000	0,273	0,67	-0,0155	0,128	0,226
<b>Correla- tion</b>	<b>ESG Score</b>	0,273	1,000	0,103	-0,184	0,015	0,445
	<b>Discretion-ary accrual</b>	0,067	0,103	1,0000	-0,121	0,095	0,318
	<b>INT2</b>	-0,155	-0,184	-0,121	1,000	0,060	-0,111
	<b>Revenue growth rate</b>	0,128	0,015	0,095	0,060	1,000	0,067
	<b>Total Assets</b>	0,226	0,445	0,318	-0,111	0,067	1,000
	<b>Sig.</b>	<b>Audit fee</b>	.	<0,001	0,078	<0,001	0,003
	<b>ESG Score</b>	0,000	.	0,015	0,000	0,373	0,000
	<b>Discretion-ary accrual</b>	0,078	0,015	.	0,005	0,022	0,000
	<b>INT2</b>	0,001	0,000	0,005	.	0,101	0,009
	<b>Revenue growth rate</b>	0,003	0,373	0,022	0,101	.	0,078
	<b>Total Assets</b>	0,000	0,000	0,000	0,009	0,078	.
<b>n</b>	<b>Audit fee</b>	450	450	450	450	450	450
	<b>ESG Score</b>	450	450	450	450	450	450
	<b>Discretion-ary accrual</b>	450	450	450	450	450	450
	<b>INT2</b>	450	450	450	450	450	450
	<b>Revenue growth rate</b>	450	450	450	450	450	450
	<b>Total Assets</b>	450	450	450	450	450	450



Table 5 represents the Pearson's correlation analysis of regression 2. For the sake of clarity, in this chapter we only analyze the correlation results for variables ESG Score and INT2. Correlation results for variables Audit Fee, Discretionary accrual, revenue growth rate and total assets were analyzed under table 2.

First, ESG Score and its relationship to other variables is discussed. For this pro gradu we are interested in the relationship between ESG Score and discretionary accrual. The correlation between these two variables is positive 0,103 and relationship is significant at level 0,015. The relationship is positive but still mild.

Secondly, we analyze the correlation for variable INT2. The correlation between variable INT2 is negative with all other variables but revenue growth rate. Also, significance is below 0,05 that indicates high significance with all other variables other than revenue growth rate. For this pro gradu research the relationship between INT2 and discretionary accrual is interesting. The correlation between these variables is -0,121 that means ESG Score multiplied with Audit fee would have negative impact on the amount of discretionary accrual.

**Table 6.** Model summary, regression 2.

<b>Variable</b>	<b>Coefficients</b>	<b>Unstandard-</b>	<b>Standardized</b>	<b>t-value</b>	<b>Sig.</b>
	<b>standard error</b>	<b>ized Beta</b>	<b>Beta</b>		
<b>Dependent variable</b>	Audit fee				
<b>Constant</b>		-9224,003			
<b>Total sets (ta)</b>	As- 511,566	1202,955	0,123	2,352	0,019
<b>Discretionary accrual (da)</b>	893,861	-345,706	-0,018	-0,387	0,699
<b>Revenue growth rate (rg)</b>	434,601	1213,752	0,126	2,793	0,005
<b>INT2 (INT)</b>	194,608	-485,405	-0,114	-2,494	0,013
<b>ESG Score (ESG)</b>	15,599	60,848	0,197	3,901	<0,001
<b>Adjusted R<sup>2</sup></b>	0,104				
<b>Model F-stat</b>	F- 11,459				
<b>Model sig.</b>	<0,001				

$$y = -9224,003 + 1202,955 (ta) + -345,706 (da) + 1213,752 (rg) + -485,405(INT) + 60,848 (ESG)$$

Table 6 explains the results of the regression. Overall model significance is <0,001, which means overall model is significant at 99,9% confidence interval. Adjusted R<sup>2</sup> is 0,104 that means independent variables in the model explain 10,4% of the change in dependent variable (Audit fee). T-value for total assets is 2,352, for discretionary accrual -0,387, for revenue growth rate 2,793, for INT2 (multiplication of audit fee and ESG Score) -2,494

and for ESG score 3,901. Significance for different independent variables varies. Total assets significance is 0,019 that means variable is significant at 98,1% confidence interval. This can be concluded as highly significant. Discretionary accrual significance is 0,699 which means that variable is significant at 30,1% confidence interval. This is a low confidence level and therefore we can't conclude whether the amount of discretionary accrual affects the amount of audit fee in this model. The significance for revenue growth rate is 0,005 which means that variable is significant at 99,5% confidence interval. This can be concluded as highly significant. The significance for INT2 is 0,013 which means that variable is significant at 98,7% confidence interval. This can be concluded as highly significant. The significance for ESG Score is <0,001 which means that variable is significant at 99,9% confidence interval.

The overall finding from regression 2 summary is the significance of variable INT2. As the variable is significant at 98,7% confidence interval, we can conclude that moderator variable ESG Score has effect on the amount of discretionary accrual. The unstandardized beta for discretionary accruals is -345,706, this would indicate that change of one unit in audit fee would lead to decrease of 345,706 USD in the amount of discretionary accrual. Discretionary accrual is not statistically significant and therefore results cannot be trusted.

## **4.2 Methodology assumptions**

This subchapter will explain what kind of assumptions must be considered when reviewing the results of the research. The main assumption that must be considered when interpreting the result of this research is the viability of the models used in the research. The modified Jones model, which was used to calculate the value of discretionary accruals, may contain errors. Also, the validity of data is assumed to be correct as it is gathered from relatively trustworthy sources, but still, it may contain errors.

### 4.3 Hypothesis testing

This subchapter will explain how the hypothesis formed earlier applies to the results of the research. Hypothesis was formed in section 1.3, see further details of hypothesis formation there.

*H1: Discretionary accrual earnings management's effect on the amount of audit fee is negative.*

*H2: Involvement of ESG activities has a positive effect on the relationship between accrual earnings management and audit fees.*

First, we will analyze hypothesis 1 and how our research results apply to it. Within hypothesis 1 we estimated that discretionary accrual earnings managements effect on the amount of audit fee is insignificant. From the Pearson's correlation that was conducted within our regression 1, we can see that the correlation between the amount of discretionary accrual and the amount of paid audit fee is 0,67. This means that there is mild positive correlation. When looking at the results from the regression (table 3), we can see that the null hypothesis is rejected between the discretionary accrual and audit fee. Therefore, we can conclude that the amount audit fees are not able to explain the change in the amount of discretionary accrual. According to our model audit fee is affected by the amount of discretionary accrual. Therefore, we cannot conclude whether hypothesis 1 is valid or not.

Secondly, we will analyze hypothesis 2 and how our research results apply to it. Within hypothesis 2 we estimate that the companies involved in ESG activities have a positive effect between accrual earnings management and audit fee. To test this hypothesis, we formed regression 2. In the Pearson's correlation analysis (table 5) within regression 2, we can see that INT2 variables correlation with discretionary accrual is -0,121 that means correlation is negative. Therefore, we can conclude that the companies with higher ESG score have negative correlation between accrual earnings management and audit fees. Hypothesis 2 is supported by the findings of our model.

#### **4.4 Interpretation and generalization**

From the results of regression 1 and regression 2 we can make some interpretations and generalizations. From a practical point of view we can conclude that for auditors making pricing decisions, the amount of accrual earnings management by prospective client seems to be irrelevant factor. Therefore, it may be that the auditor is pricing potential litigation risk with different metrics than the amount of accrual earnings management made by the prospective client. It is also possible that the audit methodology to identify risks related to accrual earnings management and methods of answering that risk are sufficient to decrease potential litigation costs to a reasonable level for auditor.

From the auditor's client perspective, it can be concluded that the decision to manage earnings by accruals is not going to affect the cost of a financial statement audit. From a shareholder perspective this may be a risk as company management may pursue more aggressive earnings management efforts if the auditor accepts more earnings management. Though the fact that there is limited relationship between the amount of accrual earnings management and audit fee, it does not mean that the auditor is not taking on account accrual earnings management when conducting audit procedures. It may be possible that the auditor takes sufficient actions towards potential risks related to accrual earnings management even when it is not directly priced into the auditor's engagement agreement with client.

In general results presented within this pro gradu research paper do not create a strong link between the auditors pricing and accrual earnings management. However, it was noted that the high ESG score creates negative effect between the amount of audit fee and accrual earnings management. It may be that the companies that are aware of their ESG responsibilities are not willing to risk a potential decrease in the ESG scores by inflating financial results with accruals.

## 5. Conclusion

This Pro Gradu research conducted two regression analyses. The first analysis found that the relationship between the accrual earnings management and the amount paid audit fee is limited. This study was not able to confirm if the auditor charges higher fee for auditing financial statements that contain higher amount of accrual earnings management. An interesting finding in this research paper was the result of the second regression analysis. The results found out that companies with higher ESG score have milder correlation between the amount of accrual earnings management and audit fee. With this finding we can see that the companies that have taken actions to prioritize ESG matters in their operation tend to use less aggressive accounting tools to shape financial results.

This pro gradu research is in line with prior research findings. For example, Choi et al. (2022) found out that the relationship between accrual earnings management and audit fees may be limited when comparing the relationship between real earnings management and audit fees. Research conducted in this paper does not answer the relationship between real earnings management and audit fees and therefore it could be a good idea for further research to understand the real earnings management in the Nordics.

### 5.1 Importance of the results

Results of this pro gradu are important for the academics and practitioners in the Nordic countries interested in the relationship between earnings management and audit fees. Interested parties may be academics researching topic who aim to research relationships in accrual earnings management and audit fees further. Also, researchers interested in corporate management may find these results insightful and deeper understanding of behavior of corporate management in the Nordics can be built on results from this pro gradu. Academics interested in auditors pricing decision can also find insights from this research.

From a practitioner's perspective this pro gradu may be interesting for parties making decisions on audit pricing or deciding corporate action. Corporate management may find it insightful to understand how their behavior and decisions potentially affect the cost of financial statement audit. Auditors may find it insightful to understand how the relationship works between auditors pricing decision and corporate's behavior.

All parties studying the results of this pro gradu must remember that there are certain limitations in this research. Reviewing other, especially peer-reviewed, articles must be taken into account before making any conclusions or actions based on the findings presented in this research paper.

## **5.2 Limitation**

This pro gradu had certain limitations that may affect the findings. Main limitation in this research paper was the availability of data. Basic financial statement data for companies located in the Nordics was well available. The limited information was related to the availability of ESG scores. The companies that had ESG score and other needed data available for the 10-year period used in this research was only 45. This represents only a fraction of all companies that are listed on the stock exchanges of Nordic countries. Therefore, the sample used may be biased and results may not present Nordics as a whole.

## **5.3 Further research**

Research conducted in this pro gradu research can be taken further in multiple ways. Firstly, from the Nordic perspective, conducting similar research with larger dataset could be interesting. Utilizing ESG score decreased the sample size significantly in this research. If researchers focus purely on the relationship between accrual earnings management and audit fee, similar research could be done with larger dataset from Nordic

countries. This pro gradu did not take any approach towards analyzing the second main earnings management method, real earnings management. Further research could look into the relationship between real earnings management and audit fees in the Nordic region. According to authors knowledge, there is no research between the relationship of real earnings management, audit fees and ESG score in the Nordic region. This pro gradu also used only listed companies in the research. It could be interesting to conduct similar research with non-listed companies and analyze if results are different.



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## Appendices

### Appendix 1. SPSS dataset

Contact author for the full dataset, all variables from Appendix 2 are columns in a dataset. Below is a snapshot of the dataset. NOTE: This snapshot does not contain all the data used in the analysis, appendix is only a minor part of the whole dataset used.

Company	Year	Current As-sets	Current lia-bilities	Cash	Current lia-bilities (Debt)
Fortum Oyj	2021	113435583,8	113515998,4	8545469,32	9648622,019
Fortum Oyj	2020	27029316,27	25095407,77	2329034,47	2303265,385
Fortum Oyj	2019	3916171,89	1982800,742	1523330,202	640337,9166
Fortum Oyj	2018	3828881,929	3404086,715	637765,3214	1243470,627
Fortum Oyj	2017	7097454,878	2492144,515	3816171,244	918663,4736
Fortum Oyj	2016	7427185,498	1977490,774	1769833,161	673569,6187
Fortum Oyj	2015	10462406,39	2223125,271	3580734,092	1134425,334
Fortum Oyj	2014	5221846,6878	2509545,939	2439128,104	1339152,961
Fortum Oyj	2013	5327463,165	5146801,07	1723874,956	2900247,227
Fortum Oyj	2012	3805149,464	3495090,475	1270582,155	1422313,149
Fortum Oyj	2011	3607392,904	3154527,941	945840,8223	1196857,402
Fortum Oyj	2010	3381016,17	4524064,342	743315,536	1152406,461

## Appendix 2. Variables, SPSS

No.	Name of variable
1	Company name
2	Year
3	Current assets
4	Current liabilities
5	Cash
6	Debt of current liabilities
7	Depreciation / Amortization
8	Total assets
9	Revenue
10	Receivables
11	PPE (Property, plant and equipment)
12	Audit fee
13	ESG score
14	LagCA (lag of current assets)
15	DeltaCA (delta of current assets)
16	LagCash (lag of cash)
17	DeltaCash (delta of cash)
18	LagCL (Lag of current liabilities)
19	DeltaCL (delta of current liabilities)
20	LagDCL (lag of debt of current liabilities)
21	DeltaDCL (delta of debt of current liabilities)
22	TACC (total accruals)
23	LagTA (lag of total assets)
24	LagREV (lag of revenue)
25	DeltaREV (delta of revenue)
26	LagREC (lag of receivables)
27	DeltaREC (delta of receivables)
28	TACC_div_lagTA (total accruals divided by lag of total assets)
29	term1
30	term2
31	term3
32	DACC (discretionary accrual)
33	NDACC (non-discretionary accrual)
34	RES_1 (residual)
35	Rev_growth_rate (rate of revenue growth)
36	ZESG Score
37	ZAudit Fee
38	INT2 (product of ESG score and audit fee)
39	TotalAssetsLOG