The effect of audit quality on earnings management: evidence from the Netherlands

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Abstract

The main aim of this master thesis research is to examine whether there is a significant effect of audit quality on the level of earnings management. Prior literature suggests that audit quality depends on multiple characteristics. In this study, the characteristics auditor size, auditor independence and auditor tenure have been used to measure audit quality. The level of earnings management is measured by using a discretionary accruals estimation method: the Modified Jones model introduced by Dechow et al. (1995). The effect of audit quality on earnings management is expected to be negative, as a qualitatively good audit is expected to constrain earnings management. This effect is examined by employing a multiple regression model controlling for firm size, firm leverage, sales growth and industry, using a sample of 52 Dutch listed firms in 2016. The results suggest that, in a Dutch context, the level of earnings management is not directly affected by audit quality. This could imply that audit firms should improve their performance and that regulatory agencies should improve their supervision in order to enhance audit quality and restrain earnings management. Although prior (international) research predominantly does show significance, the absence of significance in this study could be explained by the relatively small sample size or the context in which the study takes place.

Keywords:

External auditing, audit quality, earnings management, discretionary accruals, Modified Jones model

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1. Introduction

Financial statement auditing has been an important research topic of all times. In 1931, Philips was one of the first firms to introduce the external auditing concept. At the time, there was no legal obligation for publishing annual reports. The Philips supervisory board decided that it was time that the board of directors needed more supervision. This decision led to an external accountant auditing the financial statements. During this process, mutual agreements set the foundation for the rules of the game. These rules were written down and offered handholds for other firms.

In the academic literature, Ball and Brown (1968) examined the usefulness and relevance of releasing accounting numbers by investigating how financial statement information affect share prices. It was assumed that financial statement information prepared under then existing accounting rules was meaningless (Robertson, 2014). Ball and Brown's research is seen as ground-breaking and revolutionary as they were the first to empirically prove accounting information is correlated to changes in share price. Looking back on their own work, Ball and Brown argue that the acknowledgment of financial statement relevance changed the attitude towards investing and financial markets (Ball and Brown, 2014).

With the relevance of information retrieved from financial statements scientifically proven, the reliability and credibility became more important. This credibility and reliability is provided by auditing. The objective of auditing is to conduct the audit of financial statements in such a way that the statements are free of material misstatement due to error or fraud. This is done by applying professional care and obtaining sufficient audit evidence (PCAOB, 2010). Auditing thereby increases credibility assuring that financial statements are free of misstatements. DeAngelo (1981) argues that the quality of the audit depends on the joint probability that the auditor will discover a breach in a client's system, and report the breach. Hence, the likeliness that these misstatements are detected and reported depends on the quality of the audit.

The degree to which financial statement users can rely on an audit opinion depends on the quality of the audit performed (Christensen et al., 2016). Despite the importance of audit quality, researchers continue to debate the definition, composition, and measurement of audit quality (Bedard, Johnstone and Smith, 2010; Defond and Zhang, 2014; Francis, 2011; Knechel et al, 2013). Mainly due to several large accounting scandals over the past decades, such as the Enron case, the topic of audit quality and auditor independence has received a lot of attention in both political and academic discussions. These fraud cases have also caused the current number of academic publications to grow immensely (e.g. Li and Lin, 2006; Rockness, 2005; Knechel, 2016).

Partly due to these fraud cases, the auditing sector also experienced huge regulatory

changes in the decade 2000-2010 (Knechel, 2016). Aiming to assure audit quality and to protect investors from fraudulent situations in the future, the Sarbanes-Oxley Act (hereafter: SOX) was mandated by the United States government in 2002. The SOX' main goal is to protect investors by "*improving accuracy and reliability of corporate disclosures made pursuant to the securities laws"* (p. 1) (Sarbanes-Oxley Act, 2002). Overseeing the enforcement of the SOX, The Public Company Accounting Oversights Board (hereafter: PCAOB) was appointed.

Whereas the PCAOB oversees the US auditing industry, the governmental institution the Autoriteit Financiële Markten (AFM) is responsible for overseeing Dutch accounting firms. The AFM supervises whether the audits performed by accounting firms comply with regulation. In 2014, the AFM published the results of their audit quality research, concluding that 18 out of 40 audits were graded 'insufficient' (AFM, 2014). This is an alarming high number as 45% of the audits investigated did not fully comply with the set audit quality standards.

Alongside regulatory attention, the topic audit quality has gained increasing interest in the academic literature. For example, in a recent study, Christensen et al. (2016) argue that audit quality relies on audit firm size, available time and resources. Next to governmental institutions and academic researchers, big four accounting firms have also shown their interest by publishing reports reviewing their perception of audit quality (KPMG, 2016; PwC, 2016). These projects demonstrate widespread interest in understanding and improving audit quality.

Eimers and ten Klooster (2010) addressed the relevance of audit quality and the changes of the auditing process in the Netherlands. Past fraud cases have made the society and public bodies believe that auditors are lacking a moral compass. The current world requires the accountants to not only judge financial statements, but also to deliver transparent information of societal importance. This changing role of the accountant requires broadly oriented educated professionals, cooperation with specialists and innovative reporting standards. Furthermore, Millenaar et al. (2017) observes that, in order to improve audit quality, a change of culture is needed in the Dutch auditing sector: trust needs to be restored. Encouraged by the AFM and the Nederlandse Beroepsorganisatie voor Accountants (NBA), the Dutch accounting firms published a report proposing 53 measures to improve the quality of the audit (NBA, 2014).

Despite auditing and audit quality being redefined into regulation in for example the SOX and NBA reports, the measurement of audit quality remains to be debated (Bedard, Johnstone and Smith, 2010; Defond and Zhang, 2014; Christensen et al., 2016; Knechel, 2016). One example is given by DeAngelo (1981), who argues that audit quality consists of two main constructs: auditor independence and auditor knowledge. Both influence the likelihood an auditor discovers errors in a client's financial statements, or corrects and reveal a client's error when it is discovered.

Next to the definition of audit quality, its various effects have been studied, e.g. audit quality and earnings predictability (Hussainey, 2009), audit quality and audit firm size (Boone et

al., 2010). There is plenty of literature available studying the differences between certain audit quality standards and audit quality effects, but literature mostly focuses on the definition and the characteristics of audit quality by providing frameworks and arguably complex models (Christensen et al., 2016). This paper contributes by providing an overview of available audit quality frameworks in the literature review.

To quote Lin and Hwang (2010): "*Financial statements should reflect the true economic condition and operating results of the entity."* This implies that the value of a firm is linked to its reported financial statements (Lin and Li, 2006). The fact that a firm's value is determined by its financial statements creates incentives for management to present statements which differ from the actual situation to maximize either firm and/or manager's personal wealth (Matsumoto, 2002). This is referred to as 'earnings management' (Schipper, 1989). Burgstahler and Dichev (1997) provide evidence of firms managing reported earnings to avoid earnings decreases and losses. Auditing reduces information asymmetries between managers and stakeholders by allowing an outsider to verify the validity of financial statement. The effectiveness of auditing and its ability to constrain earnings management, is determined by the quality of the audit (Becker et al., 1998). Thus, ensuring high quality audits should reduce earnings management as much as possible (Lin and Li, 2006). But would this assumption also hold up for the Dutch auditing industry?

In this master thesis I will examine the effect of audit quality on earnings management for Dutch listed firms. Following prior literature, audit quality is proxied by three characteristics: auditor independence, auditor tenure and auditor size. Earnings management is proxied by estimated discretionary accruals. This study examines 52 Dutch listed firms in 2016 on the characteristics of their audit quality and their magnitude of earnings management. The effect of the audit quality characteristics on earnings management is examined by performing a multiple regression analysis

Empirical results on this topic thus far have been mixed. First, prior studies suggest that earnings management decreases as auditor independence increases (e.g. Lin and Hwang, 2010). Second, results on the effect of auditor size and auditor tenure on earnings management have been mixed (Becker et al., 1998; Francis et al., 1999; Myers et al., 2003; Hohenfels, 2016). However, no academic literature was found studying this effect in Dutch context.

The empirical results of this study show that there is no significant effect of audit quality characteristics (auditor independence, auditor size and auditor tenure) on earnings management in a Dutch context. The insignificant results show consistency with studies of Davidson et al. (2005), Bédard et al. (2004) and Mitra (2007). Davidson et al. (2005) investigated the effect of audit quality on earnings management in an Australian context without finding significant results. Bédard et al. (2004) also investigated this effect and failed to report significant results. Furthermore, Mitra (2007) concludes that auditor's fees do not have significant effect on the

magnitude of earnings management. These studies all show consistency with this studies results.

The structure of this thesis is organized in the following chapters: Chapter two contains the literature review. Discussing the available literature regarding audit quality and earnings management, hypotheses will be formulated. Chapter three discusses the research methodology, the variables used and the sampled data. Chapter four presents all the empirical findings and provides additional analyses. Finally, chapter five contains concluding remarks, discusses the results in perspective to existing literature, addresses this study's limitations and provides suggestions for further research.

2. Literature review & hypotheses

2.1 AUDITING

2.1.1 The definition

Defining auditing can be quite easy. According to the Cambridge dictionary the definition of auditing is as follows: "*to make an official examination of the accounts of a business and produce a report*". While this definition would serve for most purposes, in the context of this research a deeper understanding of the auditing process will be valuable.

The first research discussing external auditing dates from the beginning of the previous century (Woolf, 1912). External auditing was referred to as producing some sort of certificate, in which the auditor confirmed and certified that stated amounts were fair or correct or something of the sort (Church et al. 2008). Eimers and ten Klooster (2010) propose a more recent definition of auditing: *'The providing of an independent judgement regarding financial statements for the benefit of stakeholders'* (p. 6).

Academic scholars debate over the role of the external auditor and the definition of external auditing. Knechel et al. (2013) propose a more extended definition of auditing which is as follows: *'An audit is an economically motivated professional service designed to reduce the information risk of stakeholders that relies on the knowledge and skills of experts used in a systematic process that considers the idiosyncratic needs of a client where the outcome is unobservable and subject to market constraints and regulatory forces'* (p. 219). With this definition, Knechel et al. (2013) recognize four different constructs, namely: 1) audit value depends on its use as a risk management tool by stakeholders, 2) audit outcome is inherently uncertain and ultimately unobservable, 3) the audit process characteristics depend on the client and 4) expertise is the ultimate source of value in an audit. In order to fully understand the auditing process and the use of auditing, these four characteristics need explanation. Considering the first characteristic, Knechel et al. (2013) assume that compliance with standards is not the only factor adding value to auditing. Stakeholders will not buy audits for it to solely meet auditing standards. Knechel et al. (2013) argue that in order to create economic value, an audit will need to exceed regulatory auditing standards. Second, inspectors and auditors may have different perspectives on an audit and the quality of the audit. Both can be equally right (or wrong), each can reach valid conclusions about the audit. The conclusions of the inspector will mostly be complementary to those of the auditors. This leads to the auditor investing valuable effort into trying to anticipate what an inspector will want to see. This is time that can be used to examine more substantive issues regarding the audit engagement. Next, the third characteristic is an effect of the second. Auditors may adjust their auditing process to the inspectors needs, or what they want to see. This could harm the quality of the audit, as it is no longer adjusted to client's needs but to inspector's. The fourth characteristic implies that judgment cannot be

standardized or regulated out of the process. In the end, the quality of auditor judgment determines the quality of the audit. With the absence of professional expertise, auditing may have limited value. Combining these four characteristics, the foundation is laid for any professional financial service (Knechel et al., 2013).

Furthermore, Holm (2007) researched the role of the auditor and states that it is closely related to the subject of the audit, the financial statements and its credibility. The role of the auditor is once more defined as it is stated that by examining financial statements and underlying documents, the financial auditor can catch small problems before they become issues of higher scale.

2.1.2 The process

Scholars try to bridge the gap between theory and practice by researching many different aspects of the auditing process, for example: The economic value of the auditing process (Knechel, 2013), the role of the auditor (Holm, 2007; Church et al., 2008) and the auditor and investors' perceptions of auditing (Christensen et al., 2016).

Christensen et al. (2016) illustrate a framework (Figure 1) of the auditing process proposed by Knechel et al. (2013). Knechel et al. argue that the auditing process consists of four stages, namely: inputs, process, outputs and opinion and post-opinion. The framework suggests that auditing is an ongoing process and therefore should not be viewed as a pass/fail report, which it is commonly criticized for (Church et al., 2008).

First, the inputs part would be all the resources needed for an audit. Inputs cannot be defined in strictly quantitative terms, as it also contains the abilities and expertise of the audit team, the audit technology and the methodology being applied (Christensen et al., 2016). The quality of the audit is greatly influenced by the inputs into the audit process (Knechel et al., 2013). Moreover, Knechel et al. argue that in general, literature suggests that the quality of the inputs increase the quality of the judgements, thus increase the audit quality.

The process part of auditing consists of a number of phases. In a very general sense this includes risk assessment, internal control evaluation, testing and review (Knechel et al., 2013). The risk assessment determines the nature, extent and timing of planned procedures and typically involve the assessment of fraud risks and strategic risk assessments. The internal control mechanisms are evaluated and the results discussed with the clients. In the testing phase, audit material is obtained and tested, using different methods varying from firm to firm.

The last part of the auditing process is the output and opinion part. Literature traditionally viewed this part as positive when there was a lack of negative outcomes (e.g. restatements or litigation) (Knechel et al., 2013). It is argued that the outcome of an audit is uncertain and unobservable and therefore researchers turn to indirect but measurable proxies for audit outcomes. One of the outcomes of the auditing process is the auditor's report. In the Netherlands, the auditor's report contains either a positive, negative or a disclaimer of opinion indicating that

the auditor is unable to express an opinion regarding audited statements (AFM, 2017).

The final stage, the post-opinion stage involves the reviewing work by the regulator, the deficiencies with regulation, and peer- and internal inspections (Christensen et al., 2016).

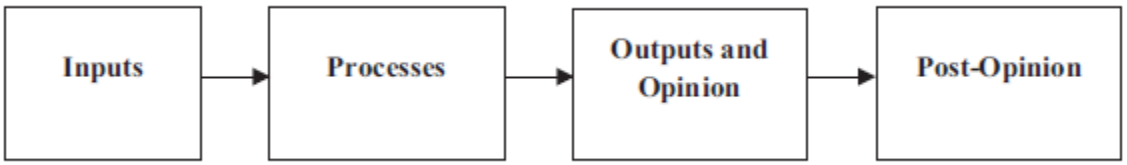

Figure 1: The auditing process (Christensen et al., 2016)

2.1.3 Auditing in the Netherlands and the Dutch auditing sector

The auditing process in the Netherlands has seen tremendous changes over the last decade. Eimers and ten Klooster (2010) emphasize on the current dynamic environment and the required transparency of accounting firms. The authors mention that the globalization and the digitalization of Dutch trade and industry lead to an increasing demand of one global financial reporting standard. Moreover, these developments lead to stakeholders demanding more transparency, more extended information and a higher frequency of financial reports. This also shows in recommendations given by the Raad voor Jaarverslaggeving (RJ) regarding the current complexity of the auditing process. The goal of these recommendations was to offer a handhold for Dutch accounting firms. The RJ stated that Dutch auditing firms needed to comply to the regulation, but in addition it is recommended to address the following aspects: 1) Consider the environmental, social and economic aspects of the subject organisation, 2) in the additional information, explain the distinction between the internal operational management, as well as the (international) chain in which the organisation operates, 3) address the current state of the execution of social policies (RJ, 2009).

With regard to the auditing sector, Boot and Wallage (2015) argue that the Netherlands is no exception to the rest of the world as the big four accounting firms hold a monopoly position. The big four audit firms are accountable for 76 percent of the total revenues in the Dutch auditing sector (AFM, 2014). The choice is limited as every big four firm has expert knowledge in certain sectors (e.g. traditionally KPMG is noted for their expertise in corporate finance, whereas EY is noted for their banking and insurance expertise). Regulation determines that every ten year firms are mandated to rotate between audit partners (AFM, 2014). Whereas specific sector expertise was previously considered to be a competitive advantage, the mandatory firm rotation has caused these advantages to be less important. Moreover, big four accounting firms have also started to offer legal services, also making them competing with law firms (Boot and Wallage, 2015).

2.1.4 Regulation

From a regulatory point of view, two auditing standards have been globally adopted, namely the GAAP in North America, and the International Financial Reporting Standards (IFRS) in the EU and large parts of the rest of the world (Burnett et al. 2014). In order to achieve convergence of global accounting standards, the U.S. Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) have worked together for many years. Henri, Ling and Yang (2009) investigate the comparability of both standards and conclude that the two standards are nowhere near reconciliation. However, both accounting systems have known enhanced comparability over the last years but significant differences remain (Barth, 2012). Both standards have been much debated and do not necessarily provide for sufficient regulation which painfully came forward in the Enron fraud case in 2002.

Restricting the traditional auditing standards, The SOX was mandated in 2002. This was mainly due to increasing investor concern regarding financial statements credibility (Ziaee, 2014). After the controversial Enron fraud scandal leading to their bankruptcy, control system failures were evident in both Enron and the auditing firm. Valued documents were proven to be destroyed. The Enron case eventually led to the downfall of their accounting firm Arthur Andersen LLP (Rockness, 2005). Fraud cases remain to be one of the biggest triggers of media attention. The Enron fraud scandal in particular is one of the main reasons of the SOX introduction (Rockness, 2005). The SOX has set the groundwork for audit quality, as it made audit committees directly responsible for the appointment, compensation and oversight of the external auditor. This particular responsibility increase is directly linked to enhancing audit quality (GAO, 2003).

In the Netherlands, the Autoriteit Financiële Markten (AFM) is responsible for supervising the auditing industry. The AFM investigates whether ‘OOB-accountantsorganisaties’ (audit firms auditing organisations that hold public interest) comply with the WTA (Wet toezicht accountantsorganisaties). The AFM furthermore investigates whether accounting firms have made sufficient progress regarding the proposed changes in the audit quality report by the NBA (NBA, 2014). The AFM and NBA all work from their own perspectives, yet serve the same purpose: restoring the trust in the accounting profession (AFM, 2017).

2.2 AUDIT QUALITY

2.2.1 The definition

DeAngelo (1981) uses the widely adopted definition of audit quality as in "*the market assessed joint probability that a given auditor will both discover a breach in a client's system, and report the breach"* (p.186). This fundamentally breaks down audit quality into two main constructs: (1) the likelihood of discovering misstatements, and (2) acting appropriately, reporting the discoveries (DeAngelo, 1981). DeAngelo's (1981) work has set the foundation for audit quality research. Prior to DeAngelo's (1981) work, audit quality was never explicitly named and it was generally considered unfair to distinguish between the largest eight and all other Certified Public Accountant (CPA) firms as long as professional standards and qualifications were maintained (Arnett and Danos, 1979). In fact, the American Institute of Certified Public Accountants (AICPA) argued that auditor size should be irrelevant in the selection process of an auditor, justifying the reasoning that auditor size does not affect audit quality.

Contrarily to this belief, DeAngelo (1981) was the first to argue that larger audit firms provide a higher level of audit quality. This is substantiated by his research into audit fees, arguing that the larger the auditor's clientele and the smaller the client as a fraction of the auditor's total clientele, the less incentive for the auditor to behave opportunistically, thus the likeliness of improving of the perceived audit quality increases. In more recent literature, Knechel (2016) expands on DeAngelo's (1981) prior work by rephrasing the definition of audit quality into two constructs: 1) auditor knowledge (likelihood of discovering misstatements) and 2) auditor independence (likelihood of disclosing the discovered misstatements). Generally, these two constructs are treated as separate aspects of the audit, as both traits are considered positively related to audit quality. Knechel's research contributes to the existing literature by stating that these two constructs are related to each other, impacting the extent of changes in audit regulation and audit process influencing audit quality.

2.2.2 Audit quality frameworks

In the post-SOX era extensive research has been performed into audit quality. Audit quality has been modelled by researchers such as Francis (2004), and Christensen et al. (2016). These audit quality frameworks typically contain audit quality indicators related to the inputs, process, output and context of the audit. These frameworks contribute by giving clear insight in the factors that influence the quality of the audit (AFM, 2014). Audit quality frameworks have been developed by both scholars and regulatory institutions.

Francis (2004) argues that audit quality is inversely related to audit failure. The higher the audit failure rate, the lower the quality. Francis (2004) furthermore states that the most convincing evidence of an outright audit failure occurs when there is litigation against the auditors. Although Francis' definition may seem fitting, measuring audit quality with its failure

rate is not that reasonable. There have been around 1000 documented lawsuits in the period of 1960-1995 which means 28 lawsuits per year given a population of around 10.000 publicly listed companies in the US (Palmrose, 1999). With the number of successful lawsuits being even smaller, civil litigation is a questionable measure of audit quality (Francis, 2004). Francis expands on audit failure by adding business failure rates, but argues that auditors of bankrupt companies are sued only 25% of the time. Thus, the audit failure rate measured as civil litigation procedures or business failures is very small.

Moreover, Francis (2004) argues that an audit failure occurs in two circumstances: first, when GAAP principles are not enforced by the auditor (GAAP failure) and second, when an auditor fails to issue a qualified audit report in the appropriate circumstances (audit report failure). In these two cases, financial statements can be considered misleading. Francis includes earnings restatements as an indicator of audit failure. The amount of restatements has been examined over the 1990s and it is concluded that a majority of these restatements are adjustments of accounting estimates, and not straightforward audit failures (Francis, 2004). This is supported by the lack of SEC action against the restatements, indicating most restatements cannot be interpreted as audit failures. Thus, all evidence of audit failure indicators point to very low failure rates. Known audit failures with material consequences are relatively infrequent (Francis, 2004).

Francis' subsequent work (2011) mentions that audit quality could also simply be explained as "binary audit quality", the likeliness of the audit to pass or fail (Francis, 2011). An audit failure in this regard occurs when the auditor is not independent in fact, or incorrectly issues a clean audit report due to the failure of collecting sufficient evidence. In this case, a "good audit" is achieved when the auditor complies with auditing standards and issues the correct opinion regarding the client's financial statements.

The UKs Financial Reporting Council (FRC) was the first to develop an audit quality framework based on existing regulation in 2008 (Knechel, 2013). The FRC identified five key drivers of audit quality (Figure 3): (1) the culture within an audit firm; (2) the skills and qualities of audit partners and staff; (3) the effectiveness of the audit process; (4) the reliability and usefulness of audit reporting; and (5) factors outside the control of auditors affecting audit quality. Next to identifying five key drivers, the FRC extended their model with connecting parameters of audit quality to the key drivers. Moreover, in addition to the FRC framework, another framework was developed by the IAASB (2011). The IAASB discussed audit quality from both the auditor's and investor's perspective noting that audit quality is influenced by (1) input factors (auditor attributes); (2) outputs (auditor reports); and contextual factors (laws and regulations) (Knechel, 2013).

The FRC model received a fair bit of criticism. Holm (2012) addresses the incompleteness of the FRC framework by arguing that additional issues had to be addressed in

order to improve and ensure audit quality. Holm (2012) argues that four issues remained largely unaddressed: expertise and professionalism of auditors, commercialization, the transparency of the audit and the lack of regulatory attention. Holm's (2012) analysis shows that audit firms have mainly focused on issues which possibly do not pose a threat to the commercial interest of audit firms. He adds that the drivers identified by the FRC are not based on any systematic analysis of audit failures. Holm critically analyses the FRC framework and comments

Figure 2: Audit Quality Framework by the FRC, 2008 (Knechel, 2013)

that it may be insufficient since stakeholder's perspectives are not considered. This model is an example of defining audit quality within regulation. In this research academic frameworks have been used as source to define and measure audit quality.

Furthermore, Christensen et al. (2016) performed research into audit quality from both the auditor and the investor's perspective. From these perspectives, Christensen et al. (2016) identified several different parameters of audit quality. Appendix I contains a visualization showing both sample group's audit quality definitions rated by perceived importance. Interesting is that both groups' expectations and perceptions of audit quality differ substantially. Both sample groups were surveyed in the current regulatory and legal environment referred to as the post-SOX era. The results show that investors highly value having well-trained, competent auditors. This is measured with auditor experience, inspection results and the size of the audit firm. One of their primary findings is that individual auditor characteristics influence audit quality.

Moreover, restatements, SEC enforcement actions, and the frequency of audit committee meetings are indicators of audit quality (Christensen et al., 2016). Christensen et al. furthermore stress that investor-valued characteristics mainly reside on the inputs and process part of the framework. Auditors, on the contrary focus mainly on GAAS compliant audits. Christensen et al. (2016) add that this would be on the input side of the framework too, however auditors appear to focus more on the output and opinion part because this is what they are judged upon. This

difference in perspectives of audit quality is referred to as the 'expectations gap' (Church et al., 2008).

2.2.3 The expectations gap

Empirical results on the expectations gap have been mixed. Kelly and Mohrweis (1989) found that users and auditors continue to differ in their expectation of the overall level of responsibility by the auditor. On the contrary, Innes et al. (1997) mention of a narrowing of the gap since the issuance of the Statement of Auditing Standards 600. Even more so, Church et al. (2008) report modest improvements in recent years. These results imply that the expectations gap has existed for a long time, and implies that there is still room for improvement, despite various measures undertaken.

Church et al. (2008) furthermore state that there is a bothersome concern that the auditor's report provides little to no communicative value. This is especially the case when investors and auditors expectations do not align and have different perceptions of the audit process (i.e. "the expectations gap"). Church et al. (2008), examine this expectations gap. This users' confusion over the auditors' responsibilities and as to what an audit entails calls for explanation (Defond and Zhang, 2014).

One of the characteristics of this expectations gap is that the auditors mainly focus on the input and process part of the auditing process. The quality of the input is determined by the audited firm's financial reporting system statements (Defond and Zhang, 2014).

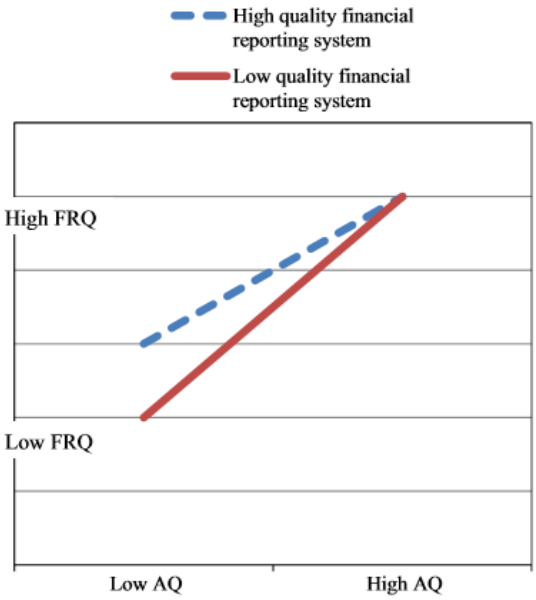

Figure 3: Relationship between a firm's financial reporting quality and audit quality (Defond and Zhang, 2014)

Figure 4 illustrates how Defond and Zhang (2014) associate audit quality with the firm's financial reporting quality (FRQ). The quality of the audit highly depends on the documentation provided by the audited firm. In case of low financial reporting quality, auditors have more preparation work, resulting in less audit effectiveness. On the contrary, if the subject firm delivers higher quality financial statements, fewer adjustments need to be made making it easier to perform higher quality, more effective audits (Defond and Zhang, 2014).

2.2.4 Regulation

Knechel's (2016) reasoning that more regulation is better than less, shows in the interest from regulators auditing quality receives. Projects seeking to define, measure and evaluate audit quality are on the agendas of many supervising (governmental) both European and American institutions: the International Auditing and Assurance Standards Board (IAASB, 2013), the PCAOB (PCAOB, 2012a, 2013, 2014) the AICPA (AICPA, 2014) and the Centre for Audit Quality (CAQ, 2012). The Government Accountability Office (hereafter: GAO) defines audit quality as follows: "*In accordance with Generally Accepted Auditing Standards (GAAS) to provide reasonable assurance that the financial statements are (1) presented in accordance with GAAP, and (2) not materially misstated whether due to errors or fraud"* (p.13).

The Sarbanes-Oxley Act (2002) is arguably the most important change in regulation of recent times. The SOX most notorious mandate is that external auditors are now obliged to include a report on the effectiveness of firm's internal controls over financial reporting in the annual report (Gates and Leuschner, 2007). Furthermore, it is required to attach a certification of the accuracy of the firm's periodic reports given by the CEO and CFO and account for the maintaining of an independent audit committee, banning all non-audit services provided by the auditing firm (Sarbanes-Oxley Act, 2002). Many researchers devoted to studying the effects of the SOX since its enactment (e.g. Hansen et al., 2009; Dey and Simon, 2010). Nevertheless, the overall effect of SOX on publicly traded firms remains debated (Kamar, Karaca-Mandic, and Talley, 2009).

Shortly after the SOX enactment, the PCAOB was appointed to oversee the auditing industry. This board supervises the enactment of the SOX by inspecting auditors, establishing auditing standards and fining lawbreakers (PCAOB, 2004). Palmrose (2013) argues that SOX established the PCAOB "*to oversee the audit of public companies that are subject to the securities laws, and related matters, in order to protect the interest of investors"* (p. 777). Furthermore, Palmrose (2013) evaluates the role and effectiveness of the PCAOB over the past decade and acknowledges that the PCAOB has improved audit quality by further expanding on older standards and developing new standards. Some even consider these legislative requirements for audit committees as one of the major influences of audit service post-SOX (Palmrose, 2013).

As the SOX and its enforcement by the PCAOB lead to more strict regulation in the US,

Europe uses a more principle-based framework with IFRS. A question that continues to rise, is how the adoption of either IFRS or US GAAP affects accounting quality. Iatridis (2010) investigated the difference between the two accounting standards and examines the effect for United Kingdom firms. Iatridis' most prominent finding reveals that IFRS leads to more fair value relevant accounting measures. Moreover, Henry, Lin and Yang (2009) find that significant differences between the US GAAP and IFRS exist, for example companies that adopt IFRS report higher net profitability than their US GAAP counterparts. However, despite various convergence efforts, both the US GAAP and IFRS accounting regimes do not provide for a unified audit quality model (Iatridis, 2010).

In the Netherlands, the AFM is responsible for safeguarding the audit quality of Dutch auditing firms. Because the big four firms are part of an internationally operating network, the AFM cooperates with foreign supervising institutions within the European Economic Area (EEA). Moreover, the AFM has covenants with supervisors outside of the EEA (such as the PCAOB). In their investigation from 2014, the AFM refers to audit quality frameworks (containing audit quality indicators) published by the IAASB and PCAOB. The AFM argues that these frameworks contribute to gaining a better understanding of improving audit quality. In 2014, the AFM performed a research into audit quality in the Netherlands. The results were insufficient. These results showed that Dutch auditing firms failed to perform audits complying with the required quality standards proposed in the audit quality frameworks. For example, the auditor failed to gain sufficient insight in internal control systems, flag significant risks and failed to perform enough testing for drawing well-founded conclusions (AFM, 2014). Mainly due to the supervision of the AFM, the auditing firms were mandated to enforce certain measures to improve the quality of the audit using the frameworks by the IAASB and PCAOB as handhold (AFM, 2014).

Regulation provides for much intercontinental discussion and scientific research tends to contribute to the discussion by criticizing existing models (Holm, 2010), examining the differences between models (Iatridis, 2010) or the information content (Shahid et al., 2015). As Knechel (2016) argued, audit quality depends on regulation as they set the standard. However, in the end accounting firms are commercialized, wishing to deliver higher standard services than their competitors (Sori et al., 2010).

2.2.5 Characteristics

The guidelines and measures of audit quality are set forth in academic and regulatory frameworks. These academic frameworks show that audit quality is multidimensional (e.g. auditor competence, independence and applying professional care). Because of this multidimensionality, Balsam et al. (2003) argue that auditor quality is inherently unobservable, and no single auditor characteristic can be used to proxy for it.

On the contrary, Lin and Hwang (2010) mention that, since audit quality may be affected

by a number of factors, it is not surprising that researchers have used various measures to proxy for audit quality in prior studies (Lin and Hwang, 2010). Their research shows that audit firm size, auditor independence and auditor tenure are often used as audit quality proxies (Lin and Hwang, 2010). Moreover, prior research shows that audit quality is determined by these characteristics, e.g. DeAngelo (1981) mentions that audit quality improves in case of the involvement of a big four firm (auditor size), Frankel et al. (2002) argue that auditor independence affects the quality of the audit and others argue that auditor tenure influences audit quality (e.g. Beck et al., 1988; Lys and Watts, 1994).

DeAngelo (1981) was one of the first to suggest the use of audit firm size as proxy for audit quality. The assumption that bigger firms provide higher audit quality was later adopted by many other scholars (e.g. Francis et al., 1999; Huang et al., (2007). Multiple academic studies imply audit fees (and therefore audit firm size as the big four are relatively expensive) affect audit quality. For example, Defond and Zhang (2014) argue that firm size is crucial in achieving high quality audits, especially in case of larger clients. Christensen et al. (2016) motivate the use of the proxy auditor firm size by stating that it provides for one publicly observable measure. Christensen et al. (2016) add that investors associate strong global networks with higher audit quality. In one of their conducted interviews, one partner even suggested that "*by definition the firm would have to be large to perform a quality audit of a large organization, because only a few firms can actually have the resources and ability to audit the largest companies that are located in multiple jurisdictions*" (p. 1663).

Prior studies also show that an impairment of auditor independence can be the direct result of higher auditor fees. High fees paid by a company to their auditor increase the economic bond which may impair the auditor's independence. An impairment of auditor independence is generally seen as harmful to the quality of the audit (e.g. Frankel et al., 2002; Li and Lin, 2005). This strengthening of the economic bond between auditor and client would increase the auditor's incentive to consent to pressure from the client, including pressure to allow earnings management. Moreover, the SEC acknowledged that the common expectation of the auditor being independent would ensure more reliable financial statements (SEC, 1999). Hence, auditor independence is the second proxy of audit quality in this study.

Third, auditor tenure is used as a proxy for audit quality. Prior literature suggests that the length of the auditor-client relationship can potentially impact the quality of the audits. This issue revolves around two competing arguments (Knechel et al., 2013): 1) short tenure means an auditor has less knowledge of a client versus 2) long tenure may mean that an auditor's objectivity is impaired. Research' results in this area have been mixed, e.g. Myers et al (2003) show that longer auditor tenure is associated with lower earnings management whilst Davis et al. (2009) show that auditor tenure is associated with higher earnings management in both long and short situations. Lin and Hwang (2010) argue that impaired independence results in poorer audit

quality (Lin and Hwang, 2010). On the other hand, others claim that an increase in auditor tenure may lead to the auditor being better at assessing risks of material misstatements as the knowledge increases (Arens et al., 2005). Hence, auditor tenure is the final proxy of audit quality in this study.

2.3 EARNINGS MANAGEMENT

2.3.1 The definition

Earnings management has received considerable attention by regulators and the press (Xie et al., 2003). Healy and Wahlen (1999) define earnings management: *"Earnings management occurs when managers used judgment in financial reporting and in structuring transactions to alter financial reports to either mislead stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers."* (p. 368). The usage of the word mislead here implies that earnings management include fraudulent activities. Simply put, someone is doing something that harms (deliberately or unintentional) someone else (Lo, 2007). Since Healy and Wahlen's (1999) study, evidence of earnings management has only mounted (Cornett et al., 2008). For example, Cohen et al. (2004) found that earnings management steadily increased from 1997 until 2002. Academic research has focused on management's incentives to adjust earnings (e.g. Becker et al., 1998; Healy and Wahlen, 1999; Loomis, 1999), the different types of earnings management (e.g. Bartov and Cohen, 2009) and the consequences (e.g. Dechow et al., 1995; Ewert and Wagenhofer, 2005).

2.3.2 Types

Bartov and Cohen (2009) distinguish two types of earnings management: transaction-based earnings management and accrual based earnings management. Transaction-based earnings management has a direct effect on the operational cash-flow, caused by actions undertaken by the management. Van Beest and Knoops (2011) argue that accrual based earnings management includes financial reporting behaviour which drives the financial results in such a way that suits them best. This includes the manipulation of accruals without it having a direct effect on cash flows (Bartov and Cohen, 2009).

Accrual-based earnings management is a form of an accounting action, in which certain accruals are manipulated without a direct cash flow effect. This would include under-accruing of expenses such as bad debt, a delay of asset write-offs, or recognizing revenues prematurely. This accrual-based form of earnings management has received significant attention in the literature (Bartov and Cohen, 2009).

On the contrary, transaction-based earnings management (also: real earnings management) directly influences the cash-flow and is a real economic action. This type of earnings management is defined as management actions with respect to real operating and investing activities, which deviate from normal business practices, where the primary objective is to achieve certain reporting objectives (Bartov and Cohen, 2009). Examples of real earnings management would be the cutting of discretionary expenses, overproducing or providing price discounts, and certain credit terms in order to boost reported short-term income.

2.3.3 Incentives

Earnings management is also explained by Becker et al. (1998) who define earnings management as the incentives of managers to "adjust" earnings to maximize firm and/or manager wealth. These incentives generally derive from underlying contracts explicitly based on reported earnings. Healy and Wahlen (1999) mention that the primary motive of earnings management is to influence contractual outcomes by misleading financial statement users. Loomis (1999) adds that managers' incentives are usually based on their companies' financial performance, and therefore it may be in their self-interest to give the appearance of better performance through earnings management. Moreover, Lo (2007) states that there is another motive for earnings management: management reports inflated earnings because inflated earnings are expected of them. Thus, satisfying expectations might be an incentive for committing earnings management. Loomis (1999) confirms this by arguing that earnings management is a tool to ensure that firms meet earnings expectations.

2.3.4 The effects

Furthermore, the effects of earnings management have been studied. Dechow et al. (1995) study firms that have engaged in earnings management and are under SEC investigations. They prove that firms that engage in earnings management experience a 9% stock price decline in the two years after the announcement of the investigation. Moreover, Ewert and Wagenhofer (2005) express their concern about firms manipulating their operations to manage earnings experiencing a decline in their subsequent operating performances. Prentice (2007) notes that many large-scale frauds begin with small and seemingly inconsequential earnings management. Extreme cases of earnings management have led to the downfall of some major corporations (Kaplan et al., 2007).

2.3.5 Earnings management in the Netherlands

There is a substantial difference in legislation and organizational structure between the US and Western Europe (Leuz et al., 2003), Dutch listed firm's earnings management incentives can differ to those from the US. For example, Francis (2016) argues that a countries legal environment plays an important role in the level of earnings management. Moreover, adoption of the IFRS or US GAAP has impact on earnings management (Ball et al., 2003; Leuz et al., 2003). Hence, due to the adoption of IFRS in the Netherlands, compared to the US GAAP, the Netherlands provide for a different setting than the US.

Leuz et al. (2003) perform a cross-country examination of earnings management in 31 countries, including the Netherlands. They argue that countries with strong investor protection, dispersed ownership and large stock markets show lower levels of earnings management. In their research, the Netherlands scores a 16.5 which is higher than common law countries such as the US (2.0), Canada (5.3) and Australia (4.8). However, other code law countries such as Germany (21.5) and Switzerland (22.0) show higher levels of earnings management. Comparable west

European countries that share a high legal score generally have higher levels of earnings management (Germany, 21.5; Belgium, 19.5; Switzerland, 22). An exception to this are the Scandinavian countries (Denmark, Norway, Sweden and Finland), all having a legal score of 10 but experiencing far less earnings management with scores ranging from 5.1 to 16.0. Thus, according to Leuz et al. (2003), the level of earnings management in the Netherlands is higher than the United States, although the Netherlands score lower than other Western European (excluding Scandinavian) countries. Graham et al. (2005) explains this by arguing that US managers are more willing to take economic measures than their European peers. European managers prefer accounting measures to achieve earnings targets.

Francis et al. (2016) examine the relationship between a countries legislation and earnings management. They conclude that earnings management is more severe in countries with stronger legal systems. This implies that the Netherlands should experience relatively high level of earnings management which is consistent with the results of Leuz et al. (2003). This is contradicted by Maassen (1999), as he states that Dutch listed firms make use of a two-tier system separating the supervisory and executive board, where the supervisory board controls the executive board and the executive board takes care of the day-to-day business. This should lower the level of earnings management as the supervisory board is independent and the agent has less room to pursue his own targets (Scott, 2009).

Furthermore, the IFRS influence earnings management. It is perceived that higher quality financial reporting reduces earnings management (Ball et al., 2003). However, subsequent studies found that the adoption of IFRS did not necessarily lead to less earnings management (Tendeloo and Vanstraelen, 2005; Jeanjean and Stolowy, 2008) but other studies did prove that the SOX made earnings management in the US decrease (Cohen et al., 2008; Jiang et al., 2010). Hence, academic literature generally points to one direction: there is a substantial difference between the United States and the Western of Europe regarding the level of committed earnings management.

2.3.6 Observing earnings management

Lin and Hwang (2010) argue that, regardless of the adopted definition, earnings management is initially unobservable. However, their meta-data analysis contains 48 studies examining the relationship between audit quality and earnings management. In prior literature, various proxies have been used to measure earnings management: fraud cases, restatements, abnormal accruals and discretionary accruals (e.g. Abbott et al., 2000; Lin et al., 2006; Antle et al., 2006). However, discretionary accrual models dominate earnings management literature (Lin and Hwang, 2010). Moreover, Dechow et al. (1995) mention that the analysis of earnings management mostly focuses on management's use of discretionary accruals.

Other employed measures include earnings restatements or reported fraud cases (Lin and Hwang, 2010). The restatements method is employed by Lin et al. (2006) whom argue that this

is, contrarily to the discretionary accrual method, a more direct observable measure of earnings management. The estimation of the discretionary accruals involves certain assumptions. Although the discretionary accruals methods are applied in various studies (Bédard et al., 2004; Klein, 2002; Xie et al., 2003), Dechow and Dichev (2002) argue that the reliability of the estimated accruals decrease as the magnitude of the error increases. Instead, the use of earnings restatements as measurement instrument for earnings management are of particular interest because restatements provide for an explicit acknowledgement of material omissions or misstatements in prior financial statements (Abbot et al., 2004).

Nevertheless, of the examined measurement instruments by Lin and Hwang (2010), the discretionary accrual method is used the most, dominating academic literature. Accruals are defined as: *The difference between net income and cash from operations."* (p.6.) (Mohanram, 2003). However, Mohanram (2003) argues that using total accruals as proxy for earnings management can be too simplistic, since firms can have high accruals because of sales growth, or PPE additions. Therefore, researchers have tried to distinguish two accrual components: discretionary and non-discretionary accruals (Jones, 1991). On the one hand, the non-discretionary accruals are accruals obtained from regular firm activities. On the other hand, the discretionary accruals are an observable measure for either up- and downwards earnings management (Mohanram, 2003). Multiple models have been developed for estimation of the discretionary accruals (e.g. Healy, 1985; DeAngelo, 1986, Jones, 1991; Dechow et al., 1995). Moreover, the terms abnormal, discretionary or predicted accruals have been interchangeably induced by application of earnings management in research (Francis and Wang, 2008; Peasnell et al., 2000b; Huang et al., 2008; Bekiris and Doukakis, 2011).

2.4 HYPOTHESIS DEVELOPMENT

Auditors are responsible for verifying that the financial statements are fairly stated and in conformity with GAAP, and determine whether these financial statements reflect the 'true' economic conditions and operating results of the entity. Thus, this verification of the auditor adds credibility to the financial statements. Moreover, the auditor is required to discuss the quality of the financial statements, not just the acceptability (Lin and Hwang, 2010). Managers having various incentives to mislead stakeholders by altering the financial statements would endanger the reflection of the 'true' economic conditions in the financial statements. Hence, a quality audit is expected to reduce the information risk that the report contains material misstatements, and constrain earnings management (Knechel et al., 2013). Audit quality in the Netherlands in this study is proxied by three characteristics: auditor size, auditor independence and auditor tenure.

2.4.1 Auditor size

Various studies mention auditor size to be a characteristic of audit quality (e.g. Becker et al., 1998; Francis et al., 1999). Furthermore, multiple studies examine the relationship between earnings management and auditor firm size (e.g. Lennox, 1999).

Becker et al. (1998) argue that big six auditors are better able to detect earnings management because of their superior knowledge, and act to detect and report earnings management in order to protect their reputation. High profile audit firms tend to restrain earnings management thereby enhancing transparency and quality of the audited financial statements. Moreover, Krishnan (2003) argues that large audit firms have greater incentives to protect their reputation due to their larger client base, and therefore higher risk to lose clients. Both Becker et al. (1998) and Francis et al. (1999) report a negative effect of big six auditors on earnings management. Yet, Bédard et al. (2004) and Davidson et al. (2005) fail to report such an effect. Nevertheless, Lin and Hwang (2010) argue that there is a negative relationship between the big 4/5/6 and earnings management. Moreover, using a sample of over 7.000 Indian firms, Houqe et al. (2017) examine the relationship between audit quality and earnings management by distinguishing between big four and non-big four auditors. Their findings suggest that high audit quality reduces earnings management. Tendeloo and Vanstraelen (2008) examined the effect of audit quality (proxying audit quality with auditor size) on earnings management in a cross-country study. Using a sample of private companies (including 1.022 Dutch private companies) they also find that audits performed by big four audit firms result in less earnings management. Considering these prior findings, the following hypothesis is tested accordingly:

H1: With an increase of auditor size the level of earnings management of Dutch listed firms declines

2.4.2 Auditor independence

The independence of the auditor and the audit committee has experienced increasing academic focus (Li et al., 2008). Prior studies contend that high fees paid by the company to the auditor increase the economic bond between the auditor and the client, thus the fees may impair the auditor's independence (Frankel et al, 2002; Li and Lin, 2005). This impaired independence in turn results in poorer audit quality and allows for greater earnings management, resulting in lower financial reporting quality. Moreover, Lin and Hwang (2010) report of a positive effect of total fees (decreasing independence) on the occurrence of earnings management. Hence, as the auditor independence increases, the level of earnings management is expected to decrease. In order to examine this effect, this study's second hypothesis (H2) is as follows:

H2: With an increase in auditor independence the level of earnings management of Dutch listed firms declines

2.4.3 Auditor tenure

The third hypothesis covers the effect of auditor tenure on earnings management. There is an ongoing debate on the effect of auditor tenure on the impairment of auditor independence. However, regulators have decided that auditor tenure does affect the quality of the audit. Therefore, recently the European Parliament introduced the mandatory audit firm rotation: EU legislation now requires Public interest Entities (PIE) to rotate audit firm every ten years (PwC, 2015). However, academic literature shows mixed results on the effect of auditor tenure on earnings management.

Hohenfels (2016) reports a positive effect of auditor tenure on earnings management, arguing that investors perceive a potential impairment of audit quality as the tenure increases which would affect earnings quality. On the other hand, as auditor tenure increases, the auditor should become better at recognizing material misstatements by gaining experience and better insights into the clients' business strategies and internal financial reporting process (Arens et al., 2005). Furthermore, Myers et al. (2003) report of a negative relationship between auditor tenure and earnings management.

Lin and Hwang (2010) argue that all of the 48 studies they have included in their meta-analysis report of a negative relationship between auditor tenure and earnings management. Hence, there is strong evidence that as the auditor tenure increases, earnings management decreases. The benefits of a longer tenure recognized by Arens et al. (2005) seem to outweigh the independence impairment. Thus, the next hypothesis is as follows:

H3: With an increase of auditor tenure the level of earnings management of Dutch listed firms declines

Moreover, prior research suggests that auditor independence is associated with auditor tenure (Beck et al., 1988; Lys and Watts, 1994). It is suggested that the relationship between auditor independence and earnings management is different with longer or shorter auditor tenure. In support of this assumption, Arens et al. (2005) suggest that auditor independence is indeed influenced by auditor tenure. Hence, there is indication of an interaction effect between this research' variables auditor tenure and auditor independence and its effect on earnings management. This is hypothesized as follows:

H4: With an increase or decrease in auditor tenure, the relationship between auditor independence and earnings management differs

2.5 CAUSALITY MODEL

The model presented below represents the causal model of audit quality and earnings management, illustrating this research' expected effects of the audit quality characteristics on earnings management. The independent variables for this research are auditor independence, audit firm size, auditor tenure and the interaction variable between auditor independence and auditor tenure. The dependent variable is earnings management. This study's first hypothesis examines the relationship between auditor size and earnings management. The second hypothesis examines the relationship between auditor independence and earnings management. The third hypothesis examines if there is a negative relationship between auditor tenure and earnings management. The interaction effect is examined in the fourth hypothesis, investigating the combined effect of auditor tenure and auditor independence on earnings management.

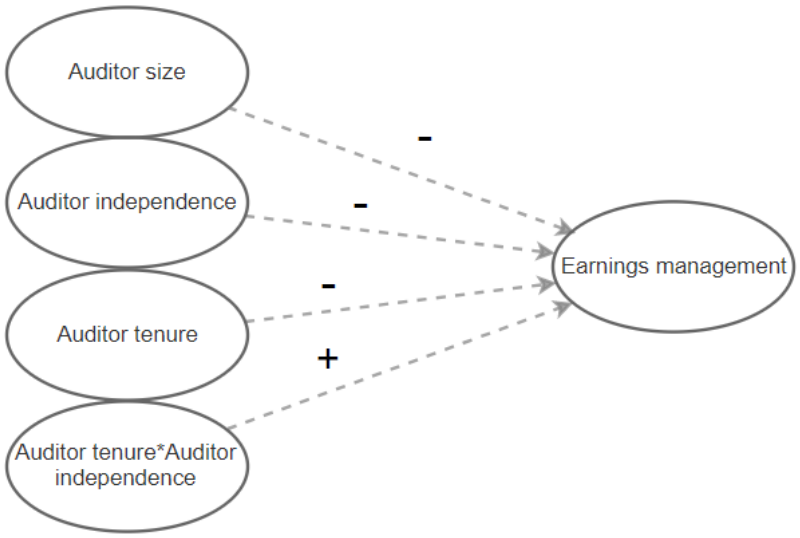

Figure 5: Causal model

3. Research methodology & data

3.1 RESEARCH APPROACH

Kothari (2004) argues that the purpose of research defines the research approach. The purpose of this research is to identify a relationship between the characteristics of the independent variable audit quality and the dependent variable earnings management. This research is performed by using a hypothesis-testing approach. The relationship between two variables is explained. This examination of a causal relationship between variables is termed explanatory research (Saunders, 2009). Thus, this study can be categorized as explanatory. Explanatory research has certain advantages but also suffers from disadvantages.

On the one hand, Saunders (2009) argues that explanatory research offers the advantage of reproduction if necessary. Another advantage is that there is little room for subjectivity, since the data leaves little space for personal interpretation. On the other hand, explanatory research inevitably has disadvantages. First, there is the case of coincidence. Causal relationships may be explained statistically while upon occurring it is just coincidence. Second, causal research findings may not provide for much certainty, as there is the impact of a wide range of factors and variables in a social environment which cannot be controlled. Third, while the relationship is established, identifying the cause and the impact can be difficult to accomplish (Dudovskiy, 2016).

3.2 METHODS

3.2.1 Model specifications

This research aims to examine the effect between audit quality and earnings management. Lin and Hwang (2010) state that most prior literature typically employs multiple regression models to investigate the effects of one or more independent variables on earnings management. These regression models generally have the following form [3.3.1]:

$$EM_t = \beta_0 + \beta_1 X_{1,t} + \beta_2 X_{2,t} + \ldots + \varepsilon_{x,t} \quad [3.3.1]$$

In these models, *EM* is earnings management, and *X* represents either an independent variable, or a control variable and *t* represents a point in time.

Consistent with prior literature (Lin and Hwang, 2010), this research will employ a multiple regression model. Multiple linear regression is defined as: *"A mathematical technique used to model the relationship between multiple independent predictor variables and a single dependent outcome variable"* (p. 1) (Marill, 2004). The multivariate analysis in this study is performed by estimating the coefficients in the following regression model:

$$EM_{it} = \beta_0 + \beta_1 BIG4_{it} + \beta_2 IND_{it} + \beta_3 TEN_{it} + \beta_4 IND_{it} * TEN_{it} + \beta_5 SIZE_{it} + \beta_6 LEVR_{it} + \beta_7 SG_{it} + \beta_8 INDUSTRY_{it} + \varepsilon_{it} \quad [3.3.2]$$

A variable overview for the equation [3.3.2] is available in Table 1 (p. 34). This study examines data from 2016, therefore *t* represents data from the year 2016 for sample firm *i*. By employing this regression model, the four hypotheses of this study will be tested accordingly. The variables BIG4, IND and TEN are added to the model to test the first three hypotheses, and in order to test the interaction effect of IND and TEN the interaction variable IND*TEN is added to the model.

Moreover, an additional test is performed to strengthen the results of the first hypothesis. Ajekwe and Ibiamke (2017) investigate the difference in earnings management for firms audited by big four and non-big four auditors. In their research, an independent sample t-test is applied. The application of the independent samples t-test analysis allows for proving whether the differences between the means of both sample groups are significant. Hence, in addition to the regression, an independent samples t-test is used as robustness test to show whether this difference is significant or not, strengthening the results of the first hypothesis.

3.2.2 Model validity

The model validity is assessed by checking a number of assumptions regarding the goodness of fit of the linear regression model (Sheather, 2009). The following assumptions are tested accordingly: 1) there is a linear relationship between the outcome variable and the independent variable. This is checked by plotting the standardized residuals versus the predictor showing whether there is a linear or curvilinear relationship, 2) multiple regression assumes that the variables are normally distributed, 3) no multicollinearity, which is tested with the VIF-statistic. A measure of the linear dependence (correlation) between two variables is the Pearson correlation coefficient (ρ) (Wilcox, 2004). This unit's values range lies between -1 and 1 indicating a total negative linear relationship (-1) to a total positive linear relationship (1). This coefficient is widely adopted in the sciences however is at best a measure of association, not causation (Good and Hardin, 2012). This research uses the Pearson correlation coefficient to indicate to what extent the variables are correlated with each other. This correlation is the result of changes in other variables that cause changes in both dependent and independent variable.

3.2.3 Multicollinearity

A number of important issues arise when strong correlation exists among the independent variables. This is often referred to as multicollinearity. Multicollinearity is one of the main problems in multiple linear regression (Good and Hardin, 2012). In this particular case regression coefficients reflect incorrect values and many of the predictor variables are not statistically significant. The correlation amongst the predictors increases the variance of the estimated regression coefficients (Sheather, 2009). The multicollinearity is determined by calculating the Variance Inflation Factor (VIF). Scientists debate about the VIF cut-off value as

to which certain variables should be excluded. For example, O'Brien (2007) states that most often employed is the ground rule that VIF values of 10 or higher indicate excessive multicollinearity. However, Sheather (2009) argues that any value above 5 indicates multicollinearity. If exceeding, the associated regression coefficients (the Pearson coefficient) are likely to be poorly estimated.

3.3 VARIABLES

Looking to empirically examine the relationship between the independent and dependent variables audit quality and earnings management, both will be operationalized into measurable units. It should be noted that, while these variables have been chosen on the basis of theory and prior evidence, like other accounting research they are inevitably limited the extent that they may not be exhaustive (Larcker and Rusticus, 2010). Thus, it is most certainly possible that there may be other variables that can potentially affect earnings management, as this depends on numerous parameters. Therefore, due to data unavailability and time restraints, not all variables and theoretical links can be included in the model (Chenhall and Moers, 2007). The relationship between audit quality and earnings management is examined by operationalizing these variables. Moreover, prior literature suggests that there are various other effects influencing the level of earnings management (e.g. Lin et al., 2006). These effects will be controlled for by adding them as control variables.

3.3.1 The independent variable: audit quality

This research tests the relationship between three characteristics of audit quality and earnings management. The independent variable is proxied to auditor size (BIG4), auditor independence (IND) and auditor tenure (TEN). These characteristics are mentioned by Lin and Hwang (2010) and mentioned to be often used as proxies for audit quality in scientific research.

Auditor size is the first observable proxy for audit quality. DeAngelo (1981) argued that the quality of the audit is determined by the size of the auditor due to availability of resources and various other reasons (Christensen et al., 2016). In this research, the first proxy of audit quality is measured with a dummy variable (BIG4). If the sample firm is audited by a big four audit firm the value for this variable is 1, if otherwise, this is 0.

Second, auditor independence is used as proxy for audit quality. Auditor independence is measured by the total monetary amount of audit fees, as they may impair the auditor's independence (Frankel et al., 2002). The usage of audit fees as proxy for auditor independence is consistent with studies by Abbott et al. (2006) and Antle et al. (2006) and. In this study a natural logarithm of the auditor's fees is used, consistent to the methodology applied by Abbot et al. (2006) and Huang et al. (2007).

Third, auditor tenure is used as proxy for audit quality. The effect of auditor tenure on earnings management has been debated (Myers et al., 2003). In this study, auditor tenure is

measured as the number of subsequent years the current auditing firm has audited the sample firm. This is consistent to Myers et al.'s (2003) approach.

3.3.2 The dependent variable: earnings management

The dependent variable, earnings management is measured by calculating the discretionary accruals. Dechow et al. (1995) mention the widely adopted use of discretionary accruals models in the earnings management literature. In these models, the non-discretionary component of the total accruals is estimated. After deducting the non-discretionary accruals component from the total accruals the discretionary accruals remain. Dechow et al. (1995) mention the following equation [3.3.3] for calculating the total accruals:

$$TA_{it} = (\Delta \mathrm{CA}_{it} - \Delta \mathrm{CL}_{it} - \Delta \mathrm{Cash}_{it} + \Delta \mathrm{STD}_{it} - \mathrm{Dep}_{it}) \quad [3.3.3]$$

With this equation having the following parameters:

TA_t	=	Total accruals in year t for firm i
ΔCA_t	=	Change in current assets in year t for firm i
ΔCL_t	=	Change in current liabilities in year t for firm i
$\Delta Cash_t$	=	Change in cash and cash equivalents in year t for firm i
ΔSTD_t	=	Change in debt included in current liabilities in year t for firm i
Dep_t	=	Depreciation and amortization expense in year t for firm i

This equation will be applied for computing the total accruals. After calculating the total accruals, literature provides different models for estimating the non-discretionary accruals component: e.g. the Industry model (Dechow and Sloan, 1991), the Healy (1985) model, the DeAngelo (1986) model, the Jones (1991) model and the Modified Jones Model (Dechow et al., 1995).

The Industry model

Dechow and Sloan (1991) apply the Industry model for estimating earnings management. Instead of directly modeling the determinants of firms' non-discretionary accruals, the Industry model assumes that the variation in determinants is common for all firms in the same industry (Dechow et al., 1995). The Industry model is expressed in the following equation (Dechow and Sloan, 1991):

$$NDA_t = \gamma_1 + \gamma_2 median_I(TA_t) \quad [3.3.4]$$

$median_I(TA_t)$ = The median value of total accruals scaled by total assets in year t for all non-sample firms in the same 2-digit SIC code

Both γ_1, γ_2, are estimated using OLS on the observations in the estimation period. Because this model also assumes that the non-discretionary accruals are of constant fashion, it has less power than the Modified Jones model (Dechow et al., 1995). For this reason, the Industry model is not

much used in literature, instead most research uses variations of the Modified Jones model (Xie et al., 2003; Davidson et al., 2005; Cornett et al., 2008)

The Healy (1985) model

Healy (1985) implied that managers manage accruals generally to hide poor performance or shift a portion of unusually good earnings to subsequent years. For example, if the market price of a firm's products decline in the middle of one year, it could hurt the firm's profitability. Thus, the firm's current-period earnings reflect only 50% of the permanent decline in earnings. If the manager acts opportunistically, he might generate a positive discretionary accrual that would offset the negative shock to non-discretionary earnings experienced currently. This discretionary accrual is expected to reverse in the future (Guay et al., 1996). Healy (1985) assumes that earnings management occur in every period, either upwards or downwards. Healy then argues, that the average of total accruals of the estimation period is a valid representative of the non-discretionary accruals. Thus, the non-discretionary component is estimated on the basis of past total accruals, assuming that the non-discretionary accruals have a constant pattern. Healy's model is expressed in the following equation [3.3.5] (Dechow et al., 1995):

$$NDA_{it} = \frac{\sum_{it} TA_{it}}{T_i} \qquad [3.3.5]$$

NDA_{τ}	=	Estimated non-discretionary accruals in year t form firm i
TA_t	=	Total accruals in year t for firm i
T	=	Number of years included in the estimation period for firm i

However, Guay et al. (1996) compare non-discretionary accrual models and find that the Healy model is not effective in isolating discretionary accruals due to opportunism, firm performance or noise. They furthermore argue that the average explanatory power of the Healy model, the DeAngelo model and the Industry model is considerably less than the Jones (1991) and Modified Jones (Dechow et al. 1995) model. Furthermore, Dechow et al. (2011) argue that the assumption that non-discretionary accruals are constant is unlikely to be empirically descriptive, because they change with firm's underlying business activities (Kaplan, 1985; McNichols, 2000). Furthermore, Dechow et al. (2011) argue that Healy's model does not incorporate any determinants of non-discretionary accruals.

The DeAngelo (1986) model

The Healy model (1985) and the DeAngelo (1986) model have common features, as they both use the total accruals as starting-point for estimating the non-discretionary accruals. DeAngelo (1986) expanded on the Healy model, by setting the comparison timeframe to the previous year, and assuming that there was no earnings management in the year prior to measurement. Thus, the equation [3.3.6] for the DeAngelo Model is as follows:

$$NDA_{it} = TA_{it-1} \quad [3.3.6]$$

However, Dechow et al. (1995) mention that the difference in both models lies in the estimation period. If non-discretionary accruals follow a white noise process around constant means, the Healy model is more appropriate. If the non-discretionary accruals follow a more randomized pattern, the DeAngelo model would be more appropriate. Dechow (1994) argues that non-discretionary accruals are unlikely to be random and likely follow a white noise process. Moreover, it has been suggested by Kaplan (1985) that the level of non-discretionary accruals respond to economic circumstances, and failure to account for these circumstances in these models will cause inflated errors.

The Jones (1991) model

Jones (1991) expands on the assumption that non-discretionary accruals follow economic circumstances. This model accounts for the effect of economic circumstances by including the revenues and the changes in the tangible assets. Jones' model therefore proposes a relaxation of the assumption that non-discretionary accruals are constant. Jones (1991) includes the change in revenues and the level of gross property, plant and equipment (hereafter: PPE) as determinants of non-discretionary accruals. Moreover, all of the variables are scaled by lagged total assets to avoid heteroscedasticity. This is consistent with prior research (Kothari, 2005). The corresponding equation [3.3.7] to the Jones Model is as follows (Jones, 1991):

$$NDA_{it} = \alpha_1 \left(\frac{1}{A_{it-1}}\right) + \alpha_2(\Delta REV_{it}) - \alpha_3(PPE_{it}) \quad [3.3.7]$$

NDA_t = Estimated non-discretionary accruals in year *t* scaled by total assets in year *t-1* for firm *i*
ΔREV_t = Revenues in year *t* less revenues in year *t-1* scaled by total assets in year *t-1* for firm *i*
PPE_t = Gross property plant and equipment in year *t* scaled by total assets in *t-1* for firm *i*
A_{t-1} = Total assets at in year *t-1* for firm *i*
$\alpha_1, \alpha_2, \alpha_3$ = Firm-specific parameters

The firm-specific parameters are calculated by denoting the Ordinary Least Squares (OLS) estimates of $\alpha_1, \alpha_2, \alpha_3$ based on time-series observations. Dechow et al. (1995) argue that the Jones (1991) model is successful at explaining around one quarter of the variation in total accruals.

The main issue of the Jones model is that it has low power in case firms manipulate revenue through the misstatement of accounts receivable (Guay et al., 1996). Because the original Jones model includes the changes in accounts receivables as a determinant of nondiscretionary accruals. Therefore, in order to mitigate this issue, Dechow et al. (1995) introduced the so called Modified Jones model.

The Modified Jones (1995) model

As Dechow et al. (1995) identified several problems concerning the Jones (1991) model, they introduced the Modified Jones model. To mitigate the problem of changes in account receivables being categorized as a determinant of nondiscretionary accruals, Dechow et al. proposed to use cash revenue to be used in place of reported revenue (Dechow et al., 1995; Guay et al., 1996). Therefore, a small alteration of the equation as shown in [3.3.7] occurs:

$$NDA_{it} = \alpha_1 \left(\frac{1}{A_{it-1}}\right) + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) + \alpha_3(PPE_{it}) \quad [3.3.8]$$

ΔREC_t = Account receivables in year t less account receivables in year t-1 for firm i

The Modified Jones model also includes a cross-sectional analysis instead of the time-series analysis in the Jones model. Firm specific parameters are calculated for every industry using industry-code classifications (e.g. the NACE Rev. code classification). Furthermore, the error term ε_{ijt} is included covering for the margin of error within this statistical model. After calculating the total accruals, specific parameters for every industry are calculated using the total accruals as dependent variable. This results in the following equation:

$$TA_{ijt} = \beta_1 \left(\frac{1}{A_{ijt-1}}\right) + \beta_2(\Delta REV_{ijt}) - \beta_3(PPE_{ijt}) + \varepsilon_{ijt} \quad [3.3.9]$$

TA_t = Total accruals in year t for firm i in industry j scaled by total assets in year t-1
A_{t-1} = Total assets in year t-1 for firm i in industry j
ΔREV_τ = Changes in revenues in year t for firm i in industry j scaled by total assets in year t-1
PPE_τ = Gross property plant and equipment in year t for firm i in industry j scaled by total assets in year t-1
$\beta_1, \beta_2, \beta_3$ = Firm-specific parameters

Dechow et al. (1995) emphasize on changes to the original model, stating that that revenues are adjusted for the change in account receivables in the event period in order to avoid measurement error and a cross-sectional approach is applied to avoid bias.

Although both the Jones and Modified Jones model have been employed commonly (Wu, 2014), a number of studies have pointed out that these models present various problems. Bernard and Skinner (1996) argue that abnormal accruals using the Jones-type models reflect measurement errors because normal accruals are misclassified as abnormal accruals. Moreover, Kothari et al. (2005) prove that the Jones and Modified Jones model are more likely to cause measurement errors for firms experiencing extreme levels of performance. This is a problem, because firms experiencing extreme levels of performance are more likely to engage in earnings management (Guay et al., 1996). Furthermore, the Jones and Modified Jones model both assume that firms within the same industry in the given year have a homogeneous accrual-generating process (Wu, 2014).

Thus, possible improvements to these models have been suggested and include adding cash flows from operations (DeAngelo et al., 1994), return on assets (Kothari et al., 2005), controlling for firm performance (Holthausen et al., 1995; Kothari et al., 2005) and Hribar and Collins (2002) use cash flow statement data to check the robustness. Kothari et al. (2005) control for firm performance by adding the return on assets to tackle the type 1 errors in the Modified Jones model (Kothari et al., 2005). Moreover, supporting the Modified Jones model, Guay et al. (1995) argue that the Healy (1985) model, the DeAngelo (1986) model and Industry model are ineffective in partitioning discretionary accruals which are linked to opportunism, firm performance or noise.

The Modified Jones (1991) model is widely adopted. Dechow et al. (1995) analyse the ability of the Healy, DeAngelo, Jones, Modified Jones and Industry model to detect earnings management. The authors find that all of the tested models are arguably well-specified, however all have low testing power. Their research provides evidence for the Modified Jones model to have the highest test power.

Calculating the discretionary accruals

In this study, the discretionary accruals are calculated as input for the earnings management variable. A variation of the Modified Jones model (based on time-series instead of cross-sectional) is applied for calculating the discretionary accruals. The application of time-series calculation of the discretionary accruals is consistent to the original model by Jones (1991). However, the inclusion of trade receivables as of Dechow et al. (1995) in the Modified Jones model increases testing power.

The application of this model includes performing a stepwise calculation: calculating the total accruals for every sampled firm in 2016 using the equation as shown in [3.3.3], obtaining firm-specific parameters by regressing the equation as shown in [3.3.9], plugging in the obtained parameters in the model equation as shown in [3.3.8] and finally, deducting the calculated non-discretionary component from the total accruals.

First, the total accruals are computed using the equation as shown in [3.3.3]. These total accruals are used as a basis for calculating the earnings management estimate: the discretionary accruals.

Second, the firm-specific parameters are estimated. Defond and Jiambalvo (1994) argue that if estimating the discretionary accruals using the cross-sectional Modified Jones model the sample needs to contain at least 6 observations matched on year and industry. In this research the sample size is too limited to perform such a cross-sectional regression. However, with the available data it is possible to estimate regression coefficients based on a time-series. The time-series approach is consistent to the traditional Jones Model (1991) which was also developed with a time-based approach. Jeter and Shivakumar (1999) argue that for a time-series approach, it is wise to use as many firm-year observations as possible. The minimum firm-year

observations used in this study is 8. Hence, disregarding the industry aspect *j* in equation [3.3.9] due to data availability constraints, the firm-specific parameters are calculated based on a time series requiring at least 8 firm-year observations per firm, with 2016 as last available year. The maximum of retrievable years from the ORBIS database is 9. Hence, the sampled firms all require to have 8 or 9 firm-year observations prior to 2016.

In contrast to cross-sectional data, this approach does create firm-specific coefficients (Jeter and Shivakumar, 1999). However, this approach does make the model lose power since cross-sectional observations produce more reliable estimated coefficients compared to their time-series counterparts (Dechow et al., 1995). Moreover, deducting the account receivables from the revenues as done in the Modified Jones model should reduce measurement error (Dechow et al., 1995) and is therefore included in the calculation of the discretionary accruals.

Third, these calculated firm-specific parameters are plugged into the equation as shown in [3.3.8], using the figures from 2016. This produces the non-discretionary accruals component for the year 2016 for every sampled firm.

The final step includes the deduction of the calculated non-discretionary accruals component from the total accruals. The remainder, being the discretionary accruals, is the input for the dependent variable earnings management. This is clarified in the following equation:

$$DA_t = TA_t - NDA_t \qquad [3.3.10]$$

DA_τ	=	Discretionary accruals in year t
TA_τ	=	Total accruals in year t
NDA_t	=	Non-discretionary accruals in year t

Moreover, the alternative models (with the exception of the Industry model) for calculating the non-discretionary accruals are used as robustness tests.

3.3.3 Control variables

Although a disadvantage of this study includes that it is likely that not all variables and theoretical links can be included in the regression model, the likeliness of other variables influencing the examined effect will be reduced as much as possible. These effects will be controlled for with the help of control variables.

First, firm size (SIZE) is included as control variable. Prior studies consistently include firm size as control variable studying effects on earnings management (Badolato et al., 2014; Chen et al., 2011). It is argued that smaller firms are more likely to engage in earnings management as larger firms have more developed internal control systems (Ali and Zhang, 2015). Hence, a negative relationship is expected.

Second, the next control variable is leverage (LEVR). Leverage is included in order to help ensuring that outside factors related to debt, such as debt commitments are minimized

(Farouk and Hassan, 2014; Lin et al., 2006). Moreover, prior studies find that firm leverage and external financing are related to earnings management (Becker et al., 1998; DeAngelo et al., 1994). Debt covenants' criteria stimulate managers' incentives for committing earnings management (Dechow et al., 1995). Therefore, a positive relationship is expected between the debt ratio and earnings management.

The third control variable is sales growth (SG). Sales growth is expected to be positively related to earnings management. For example, Shin et al. (2015) suggest that companies with higher sales growth are more likely to have higher net profit margins, allowing for more room for earnings management. Doukakis (2014) argues that high growth firms are more likely to engage in accrual-based earnings management. This is consistent with prior studies' empirical results (Klein, 2002; Cohen et al., 2008; Bagnoli and Watts, 2000).

Finally, as of Chen et al. (2011), the industry effect is also controlled for in the final control variable (INDUSTRY). The industry effect is controlled for by coding the categorical variable of industry classification into dummy variables.

3.3.4 Variables overview

All the variables and their proxies used in the multivariate regression equation [3.2.1] are summarized in Table 1 on the next page.

Table 1: Variables overview and predicted signs

Variable	Description	Type	Measured as	Expected relationship
EM	Earnings Management	Dependent	Natural logarithm of the discretionary accruals.	
BIG4	Auditor Size	Independent	Dummy variable (0-1). This variable contains a "1" if sample firm was audited by a big four firm, "0" if otherwise	Negative (-)
IND	Auditor Independence	Independent	Natural logarithm of the total of audit fees in the current year	Negative (-)
TEN	Auditor Tenure	Independent	Number of years the auditor has audited the firm's financial statements	Negative (-)
IND*TEN	Auditor Independence * Auditor Tenure	Independent	Interaction variable of auditor independence and auditor tenure	Positive (+)
SIZE	Firm Size	Control	Natural logarithm of total assets	Negative (-)
LEVR	Firm Leverage	Control	Ratio of total debt to total assets (debt ratio)	Positive (+)
SG	Sales Growth	Control	Current year sales minus previous year sales divided by the current year sales	Positive (+)
INDUSTRY	Industry	Control	Categorical variable. Sampled firm’s industry classification. Coded into nine dummy variables controlling for the Industry effect	

3.4 DATA

The required financial data and qualitative information is primarily extracted from the ORBIS database. The input for the variable auditor's fees (IND) cannot be extracted from this database and is obtained by downloading annual reports from the sampled firm's website and manually searching through the files.

First, the search query is restricted to Dutch listed firms in 2016. The year 2016 is chosen in order to investigate recent earnings management developments. This results in 153 unique firms. The second criteria is the exclusion of financial institutions (insurance companies, banks etc.) because financial statements from the financial sector differ significantly to those operating in regular production and services sectors. Financial institutions produce untypical accounting records and have substantially different working capital structures (Klein, 2002).

Furthermore, because of the time-series approach of the calculation of the firm-specific parameters, at least 8 preceding firm-year observations containing sufficient financial data are required. This requirement excluded a substantial amount of data. Moreover, the required input for the multiple parameters in the final model's equation suffered from limited availability. For example, the requirements for the ΔREC parameter excluded a large amount of data. Table 2 shows that additional financial data requirements limited the sample size substantially.

In addition, input for the audit quality variable requires the auditor's fees to be reported. In 2013, the Dutch Raad voor de Jaarverslaggeving (RJ, 2013) has mandated that the monetary amounts of auditor's fees paid to the auditor must be visible in annual reports of listed firms. All the selection criteria eventually lead to a sample size of 52 unique firms. Table 2 summarizes the data selection procedure:

Table 2: Data selection procedure

Criteria	N
Active publicly listed firms in The Netherlands in 2016	153
Exclude: Financial institutions (Insurance, banks, etc.)	-32
Exclude: Insufficient availability of financial data	-69
Sample size	**52**

4. Results

4.1 DESCRIPTIVE STATISTICS

Descriptive statistics are used to provide basic features of the data. The descriptive statistics of the dependent earnings management variables, independent audit quality variables and the control variables are all presented in Table 3.

Table 3: Descriptive statistics

Variable	N	MEAN	STDEV	MEDIAN	MIN	MAX
Dependent variables						
DA (MJ)	52	0.066	0.133	0.031	0.001	0.878
DA (J)	52	0.043	0.069	0.024	0.001	0.363
DA (H)	52	0.005	0.037	0.001	0.001	0.264
DA (DA)	52	0.007	0.049	0.001	0.001	0.353
Independent variables						
BIG4	52	0.900	0.298	1.00	0	1
IND (EUR)	52	3,321,027	4,336,297	1,838,000	66,000	20,182,000
TEN	52	3.88	3.09	3.00	1	14
Control variables						
SIZE (EUR*1000)	52	8,387,065	16,741,948	2,504,584	16,108	104,343,000
LEVR	52	0.606	0.183	0.555	0.204	0.94
SG	52	0.011	0.143	0.016	-0.330	0.397

The mean of the discretionary accruals calculated with the first model is 0.066. This is somewhat comparable with descriptive statistics from Myers et al. (2003) and Chen et al. (2011). The minimum and maximum of observed discretionary accruals are 0.001 and 0.878. The second model recognizes slightly lower amounts of discretionary accruals with a mean of 0.043 and standard deviation of 0.069. Moreover, the table shows that both the Healy and the DeAngelo model recognize substantial lower amounts of earnings management than their Jones counterparts. Due to methodology, no comparable descriptive statistics specifically for Dutch earnings management statistics were obtained. For example, Tendeloo and Vanstraelen (2008) examine earnings management in the Netherlands amongst other countries, but use different earnings management measurement methods.

The natural logarithm of the discretionary accruals allows for an easier visualization of the higher and lower values. The histograms of the dependent variable computed by the four different models are included in Appendix II, all showing a normal distribution. The Modified Jones model has the highest mean. The other models having lower means indicates that all three models typically recognize lower levels of earnings management.

The variable BIG4 indicates whether a firm is audited by a big four firm or non-big four firm. In this sample, this mean value indicates that 90% of the sample is audited by a big four

firm. The variable auditor independence (IND) is expressed in euros and represents the paid auditor's fees by sampled firms. The mean value of 3,321,027 indicates that the average auditor's fee paid by the sampled firms amounts up to over three million euro. The minimum auditor's fee paid by sampled firms is 66,000 and the maximum amounts up to 20,182,000. The tenure (TEN) variable has a mean of 3.88, indicating that the average auditor tenure in this sample is slightly below four years. The maximum auditor tenure of 14 is remarkable, since the mandatory firm rotation requires firms to rotate between auditors every ten years. This is explained by the sample containing five observations with an auditor tenure above ten years, which are all obliged to switch of external audit firm this year.

The means of SIZE, LEVR, and SG are respectively 8,387,065; 0.606 and 0.011. The smallest sampled firm hold a total asset value of 16,108 thousand euro, and the biggest firm in the sample represents a total asset value of 104,343 million euro.

4.2 CORRELATION

The correlation coefficients of all the variables are presented in Table 4. Pearson's Correlation coefficient (r) is a measure of the strength of the association between the variables. The results of the correlation matrix show to what extent variables correlate with each other. The correlation matrix is one of the instruments to address the issue of multicollinearity. Generally speaking, it is assumed that a perfect linear relationship results in a Pearson correlation coefficient of 0.7

The audit quality characteristics (TEN; IND; SIZE) are somewhat correlated with the discretionary accruals. This is also shown in research done by for example Myers et al. (2003) and Lin and Hwang (2010). Moreover, there is correlation between BIG4 and IND and correlation between BIG4 and SIZE. The significant correlation coefficient of auditor independence (IND) and auditor size (BIG4) (r = 0.343*) is also consistent with expectations, since auditor's fees are generally higher when the firm is audited by one of the big four firms (Defond and Zhang, 2014). The BIG4 and SIZE correlation is also in line with expectations, as larger firms are more likely to have a big four auditor (DeAngelo, 1981). Moreover, the audit quality characteristics show correlation with the discretionary accruals. This is consistent with for example Becker et al. (1998) who argue that earnings management is correlated with auditor size. The results are also somewhat consistent with Frankel et al. (2002), as they show that an impairment of auditor independence (higher auditor's fees) influence the discretionary accruals. This would lead to poorer audit quality and allow for greater earnings management.

The first control variable, firm size (SIZE) is expected to negatively correlate with earnings management, as larger firms have more developed internal control systems (Ali and Zhang, 2015). However, in Dutch context, it seems that larger firms commit more earnings management than smaller firms. Most statistic correlations do not exceed a value of 0.6. Although the correlation matrix gives indication as to what extent variables correlate to each

other individually, there is no control for the effect of other variables. The multiple linear regression model employed in this study will control for these effects.

Table 4: Pearson correlation coefficients (N=52)

	DA (MJ)	DA (J)	DA (H)	DA (DA)	TEN	IND	BIG4	SIZE	LEVR	SG
DA (MJ)	1									
DA (J)	0.651**	1								
DA (H)	0.692**	0.490**	1							
DA (DA)	0.745**	0.525**	0.889**	1						
TEN	0.150	0.049	0.083	-0.048	1					
IND	0.654**	0.642**	0.610**	0.662**	-0.005	1				
BIG4	0.439**	0.306*	0.412**	0.482**	0.018	0.343*	1			
SIZE	0.768**	0.652**	0.652**	0.688**	0.062	0.206*	0.446**	1		
LEVR	.094	0.096	0.142	0.146	-0.155	0.330*	0.006	0.274	1	
SG	-0.152	-0.041	-0.185	-0.228	0.192	0.090	-0.098	0.019	-0.048	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

4.3 MULTIPLE LINEAR REGRESSION RESULTS

The OLS model's regression results and the effect of each separate variable are presented in Table 5. The dependent variable earnings management is expressed in discretionary accruals calculated with the Modified Jones model. Furthermore, the strength of the model is expressed in the Adjusted R^2 statistic. With these results the four hypotheses are tested accordingly. Following Kothari et al. (2005), the discretionary accrual variables are winsorized at the top and bottom 1%. The industry effect is controlled for with the addition of nine dummy variables consistent to Chen et al. (2011).

Table 5: Regression results

	DEPENDENT: EM (Discretionary accruals)				
INDEPENDENT	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
Intercept (Constant)	-9.810***	-9.385***	-10.360***	-10.094***	-12.316***
BIG4		0.809			1.071
IND			-0.890		-0.847
TEN				0.086	0.565
IND*TEN					-0.077
CONTROL					
SIZE	2.374***	2.244***	3.006***	2.345***	3.024***
LEVR	-2.225	-2.127	-2.005	-1.945	-1.641
SG	-2.202	-2.246	-2.451	-2.491	-2.733
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.545	0.540	0.542	0.547	0.534
F-statistic	6.336***	5.789***	5.838***	5.922***	4.747***
Highest VIF	1.330	1.655	1.855	1.371	136.235
N	52	52	52	52	52

***. Correlation is significant at the 0.01 level (2-tailed.
**. Correlation is significant at the 0.05 level (2-tailed).
*. Correlation is significant at the 0.10 level (2-tailed).
The Industry Fixed Effect is included using dummy variables for all 9 industry categories. The Yes indicates that every industry is included.
All variables are defined in Table 1.

The overall model statistical power expressed in the Adj. R^2 proves to be significant for every model. All model's Adj. R^2 statistic exceed the value of 0.5. This significance shows that the variance of the dependent variable explained by the independent and control variables significantly differs from zero. The dummies generated for the INDUSTRY variable prove to be insignificant for all industry dummies and are denoted as Industry Fixed Effect. The Yes shows that all nine industry dummies are included in the model. The highest VIF value is included to address the multicollinearity concern.

4.3.1 Auditor size and earnings management

The first hypothesis tests the relationship between auditor size and the level of earnings management. Model 2 in Table 5 tests this hypothesis. The insignificant β value of 0.809 shows that the auditor size (audited by either big four or non-big four) does not influence the level of earnings management. This causes the first hypothesis to be rejected. Although prior results on the effect of audit quality on earnings management have been mixed, these results contradict prior work of Tendeloo and Vanstraelen (2008), Becker et al. (1998) and Houqe et al. (2017). Failure to report of a relationship with earnings management is consistent with findings by Davidson et al. (2005) and Bédard et al. (2004) whom also fail to find an association between earnings management and the use of big four or non-big four auditors. Tendeloo and Vanstraelen (2008) do suggest that the level of earnings management by firms audited by big four firms is higher than that of firms audited by non-big four firms. This is a remarkable situation and only occurs in the Netherlands and the United Kingdom and is suggested to be related to low tax alignment.

4.3.2 Auditor independence and earnings management

The second hypothesis tests the relationship between auditor independence measured as the auditor's fees, and the level of earnings management. Following prior literature (e.g. Frankel et al., 2002; Li and Lin, 2005), it is expected that higher levels of auditor independence result in lower earnings management. Model 3 presented in Table 5 tests this hypothesis. Higher auditor's fees result in lower independence, so this effect has to be read inversely. The insignificant β value of IND (-0.890) indicates that there is no relationship between auditor's fees and the magnitude of earnings management. This value is insignificant and therefore no unambiguous conclusions can be drawn from this statistic. Hence, the insignificance causes there to be no support for the second hypothesis, which is why it is rejected.

These results show consistency with prior research by Mitra (2007) who fails to report of a significant relationship between auditor's fees and earnings management. However, these results contradict prior work of Frankel et al. (2002) and Li and Lin (2005) whom argue that the level of earnings management declines as auditor independence increases. It also contradicts prior work of Becker et al. (1998) whom argue that auditor's fees do affect earnings management, as higher quality (more expensive) audits provide more reliability and better earnings management detection. No specific research was found investigating this relationship in Dutch context. Hence, regarding the Dutch context this study shows that auditor independence does not affect the magnitude of earnings management.

4.3.3 Auditor tenure and earnings management

The third hypothesis examines the relationship between auditor tenure (TEN) and earnings management. Auditor tenure is measured in years. Model 4 in Table 5 presents the results on the

testing of the third hypothesis. The corresponding correlation coefficient holds an insignificant value of 0.086. This causes the third hypothesis to be rejected.

These insignificant results contradict prior literature, although preceding work has shown mixed results. On the one hand, Beck et al. (1988) and Lys and Watts (1994) argue that longer auditor tenure leads to an impairment of independence allowing for higher magnitudes of earnings management. On the other hand, Lin and Hwang (2010) argue that the majority of prior literature concerning this topic has implied that the relationship between auditor tenure and earnings management is negative, since the likeliness of recognizing material misstatements increases as auditor experience increases (e.g. Arens et al., 2005).

4.3.4 Auditor tenure, auditor independence and earnings management

The fourth hypothesis tests the interaction effect of auditor independence and auditor tenure (IND*TEN) on earnings management. The insignificant negative β value (-0.077) presented in model 5 in Table 5 indicates that there is no difference in the relationship between earnings management and auditor independence interacting with auditor tenure. These results show no support for the final hypothesis, hence it is rejected. This does not align with expectations as literature suggests that impaired independence (by increased tenure) results in higher magnitudes of earnings management (Lin and Hwang, 2010). In Dutch context, this does not seem to be the case.

4.3.5 Control variables

The effect of the control variables on earnings management is shown in Model 1 in Table 5. The control variable SIZE (β = 2.374***) has a significant effect on the level of earnings management committed. This indicates that firm size seems to have a substantial effect on the explained variance in the dependent variable. In all the models, with the addition of multiple audit quality independent variables, this effect stays significant. The positive value indicates that bigger firms are more likely to engage in earnings management, which is against the expectations based on prior work of Ali and Zhang (2015) whom argue that more developed control systems in bigger firms should increase avoiding earnings management. The remainder of the control variables have insignificant effects on the dependent variable.

4.3.6 Multicollinearity

The multicollinearity is tested with the VIF statistic. Although there is an ongoing discussion about the VIF threshold values to respect, researchers typically use the rule VIF > 10 indicating excessive multicollinearity (Kennedy, 1992; Hair et al., 1995; Henseler, 2015). However, other researchers use other rules of thumb, such as VIF > 20 or even VIF > 40 (O'Brien, 2007). The VIF statistic only exceeds 10 (VIF = 136.235) in model 5. This indicates that this model has excessive multicollinearity of two or more independent variables. Further examination shows that the variables TEN and the interaction variable IND*TEN both show high VIF statistic

results. Hence, since this VIF value is above 10 when the interaction variable is included, it can be assumed that the model holds more statistical power if one of these two variables (TEN or IND*TEN) is excluded (e.g. Model 2,3,4,5).

4.4 ROBUSTNESS CHECKS

Lin and Hwang (2010) show that measurement of earnings management through the discretionary accruals is widely adopted. To test the power of the selected discretionary accruals model, the discretionary accruals calculated with the Healy (1985), DeAngelo (1986) and Jones (1991) model are added as robustness checks to this study. Although, prior literature does imply that these models hold less explanatory power than the Modified Jones model (Dechow et al., 1995), it is still interesting to assess whether the results differ from the original analysis. Additionally, some of the control variables are measured differently. Following Lin et al. (2006) firm size can also be proxied by market value of total equity (market capitalization). Moreover, Ali and Zhang (2015) use the total asset growth instead of sales growth to control for firm growth. Moreover, the return on assets is added as additional control variable as of Badolato et al. (2014). These control variables will be replaced accordingly to test whether they have any significant effect. Finally, in addition to the multiple regression, an independent samples t-test is performed in order to provide more support for the first hypothesis. Adding an independent samples t-test is consistent with methodology applied by Ajekwe and Ibiamke (2017).

4.4.1 Alternative dependent variables

The alternative models for measurement of the dependent variable earnings management have been specified in equations [3.3.5], [3.3.6] and [3.3.7]. Healy (1985) argues that the non-discretionary accruals can be estimated by calculating an average of the total accruals for an estimation period, and subtracting that average from the current year's total accruals. DeAngelo (1986) calculates the discretionary accruals based on previous year's accruals. The original Jones (1991) model is a simplified version of the Modified Jones model (Dechow et al., 1995) which does not account for the changes in account receivables.

Appendix III contains the multiple regression results with the dependent variable calculated with alternative discretionary accrual models. The results are generally robust to those of the initial analysis. However, there is a slight difference in Adj. R^2 values. All three alternative models have lower Adj. R^2 values than the Modified Jones model. This implies that these models bear lower explanatory power compared to the Modified Jones model used in the initial analysis. This is robust to the research by Dechow et al. (1995). The effect of the independent variables do not show much difference compared to the results as discussed in section 4.3. The effect of the control variable firm size is consistently significant.

The most important finding is that if calculating discretionary accruals with the Jones (1991) model, the auditor independence becomes of significant influence to the discretionary

accruals (β = 2.710*) with a corresponding p value of 0.09. This would cause the second hypothesis to be accepted. Thus, if calculating the discretionary accruals with the Jones model situation H2 would have been accepted with a 90% confidence interval.

4.4.2 Alternative control variables

The literature also provides for different measures of the included control variables. Ali and Zhang (2015) replace sales growth with total asset growth (TAG) in their earnings management research. Lin et al. (2006) use the log of the market value of total equity (market capitalization) (MVE) instead of total assets for firm size. Some research also controls for firm performance examining earnings management, typically using return on assets as a control variable (e.g. Badolato et al., 2014). Thus, return on assets (ROA) is added to this analysis as robustness test. The results of these tests are included in Appendix IV.

The replacement of the SG and SIZE control variable with TAG and MVE did not result in notable differences. Replacing the control variables does not have significant impact when compared to the results of the initial regression model. The control variable MVE is statistically significant at the 0.01 level, which is consistent with the results of the control variable SIZE in the initial model. Both the LEVR and the replacement of SG, TAG remain insignificant. The impact of the total asset growth (TAG) on the level of earnings management is negligible. The addition of the ROA variable is presented in the lower panel of the Table in Appendix IV. The return on assets show a significant negative relationship with earnings management, which is consistent to the work of Badolato et al. (2014) whom expected a negative relationship. Thus, in Dutch context, Badolato et al.'s assumption holds.

4.4.3 Independent samples t-test

In addition to the regression model, to emphasize on the difference of earnings management by firms audited by either a big four or non-big four firm, an independent sample t-test is performed. The results are presented in Appendix V. The results of this test imply that there is a significant difference between the means of both groups. This indicates that the difference between the two sample groups (split into big four and non-big four) is significant. However, as can be seen in the table, the group of big four firms is highly overrepresented. Therefore the reliability of this test can be questioned.

4.4.4 Model validity and additional analyses

To test the validity of the OLS multiple regression model, a number of assumptions is tested. These assumptions have been explained in the methodology section. In order to assess the linear relationship between the variables, the normal P-P plot of the dependent variable is included in Appendix VI. The plot shows a straight linear curve, with the data-points following a straight line. Therefore, it can be assumed that the linearity of the regression model is somewhat established. The multicollinearity is tested with both the Pearson correlation matrix and the VIF

statistic. The VIF statistic is included in the regression's results (Table 3; Appendix III and Appendix IV). No excessive multicollinearity is found in all the models but Model 5.

To test for heteroscedasticity the standardized residuals are plotted against the predicted value. This scatterplot is included in Appendix VI. If this scatterplot reveals identifiable patterns, it is assumed that the variables show heteroscedasticity. However, if this plot does not show identifiable patterns the variables are assumed to be homoscedastic. This is the case in the scatterplot. Therefore, the dependent variable is homoscedastic and no additional analyses (e.g. Breusch-Pagan and Koenker tests) are required.

Additional, more complex estimation methods such as the fixed effects or random effects model cannot be applied since the dataset does not contain panel-data. Therefore, the effect of group variation cannot be determined since there is only one observation for the last available year. The fixed effects model investigates time-varying effects within a certain category. The random effects model sees group effects as random and assumes differences across entities to have influence on the dependent variable. The dataset used for the multiple regression model in this study consists of 52 specific firm-year observations (from 2016) with time-invariant cross-sectional data, with one observation per firm. Hence, both methods cannot be employed.

5. Conclusions

5.1 FINDINGS AND IMPLICATIONS

This thesis research examines the effect of audit quality on the earnings management of Dutch listed firms. Audit quality is operationalized in three different characteristics: auditor size, auditor independence and auditor tenure. Earnings management has been proxied by a firm's discretionary accruals in 2016 calculated with a time-series variation of the Modified Jones model (Dechow et al., 1995). This relationship is examined by drawing a sample of 52 firms listed on the Dutch stock exchange in 2016. Consistent with prior literature (Lin and Hwang, 2010), a multiple linear regression model is employed using the ordinary least squares method.

5.1.1 Summary of findings

The investigation of the relationship between audit quality and earnings management is done by the testing of four hypotheses. These hypotheses cover the examination of the effect of audit quality characteristics on a subject firm's earnings management.

The first hypothesis tests the relationship of auditor size and earnings management. It is determined whether it has any effect on earnings management if a firm is audited by a big four or non-big four auditor. This hypothesis is rejected because the empirical results show no significant relationship between auditor size and the magnitude of earnings management. In addition, to determine whether there is a significant difference between both sample groups an independent sample t-test is performed having significant result, but the reliability is to be questioned. Despite prior research' findings (Becker et al., 1998; Francis et al., 1999; Tendeloo and Vanstraelen, 2008 and Houqe et al., 2017), this study does not provide significant results of the relationship between auditor size and earnings management. However, these results do show consistency with the findings of Bédard et al. (2004) and Davidson et al. (2005) whom both fail to report a significant negative relationship.

The second characteristic of audit quality, auditor independence, is proxied by the auditor's fees as Frankel et al. (2002) and Li and Lin (2005) argue that the auditor's fees result in an impairment of the auditor's independence. The empirical results suggest that the effect of auditor independence on earnings management is insignificant. This contradicts prior work of Frankel et al. (2002) and Li and Lin (2005).

The effect auditor tenure on earnings management is examined in the third hypothesis of this research. Auditor tenure is measured as the subsequent years an auditor has audited the sampled firm. The relationship between auditor tenure and earnings management is expected to be negative. Empirical results of this study show that for Dutch listed firms an increase or decrease in auditor tenure does not have effect on the level of earnings management. Hence, the third hypothesis is rejected. Prior empirical results have been mixed, yet all significant. Lin and Hwang (2010) argue that earnings management should decline as firm tenure increases. On the

contrary, Hohenfels (2016) reports a positive relationship between auditor tenure and earnings management arguing that investors experience an auditor independence impairment. The empirical results of this study do not show consistency with prior literature. It can be assumed that in Dutch context, auditor tenure does not affect the magnitude of earnings management.

The fourth hypothesis examines the effect of auditor tenure on auditor independence and tests whether this interaction effect has a positive effect on earnings management. Expectations derived from prior literature imply that as auditor tenure increases, auditor independence decreases and earnings management increases. The insignificance of the corresponding correlation coefficient also causes there to be no support for this hypothesis.

Thus, in the context of this study, examining Dutch listed firms, it cannot be assumed that the characteristics of audit quality (auditor independence, auditor size and auditor tenure) are of significant influence to the level of earnings management that a firm commits.

5.2 THEORETICAL AND PRACTICAL IMPLICATIONS

This study has provided valuable insights to the current available audit quality and earnings management literature. Specifically for the Dutch context, where earnings management thus far prove to be scarce. This study enriches the current literature in multiple ways. First, by employing a country-specific context research for audit quality and the level of earnings management. Second, it specifically investigates the differences between firms audited by big-four offices and non-big four offices and their level of earnings management. Third, by employing different proxies of earnings management and performing multiple validity checks it investigates the explanatory power of each specific measurement instrument. The results have shown consistency with prior research of multiple researchers. First, Mitra (2007) who argues that there is no significant relationship between auditor's fees and earnings management. Second, Bédard et al. (2004) and Davidson et al. (2005) whom both fail to report a negative relationship between auditor size and earnings management.

Besides theoretical, this study has some practical implications considering recent developments in the Dutch auditing industry. First, the recently introduced mandatory firm rotation in the Dutch Audit Profession Act requiring firms to maintain an eight year auditor rotation period has heavily influenced the audit profession and market. This study shows that the auditor tenure does not significantly affect the level of earnings management which was a major concern of the committees which worried that an increased tenure would lead to a quality impairment (EY, 2016). Second, increased regulation aimed to stimulate competition between big four and non-big four firms (EY, 2016). However, this study's provided evidence did not show any significant differences in big four and non-big four audit quality. The results of investigated relationship does not have enough impact to make valid assumptions about the effect of auditor size and earnings quality. Hence, it cannot be concluded whether the increased regulation has been effective disrupting the current competitive environment in the auditing

branch. Furthermore, from a practical point of view, auditors can now assume that within the Dutch context, there is no significant relationship between proposed variables of audit quality and earnings management. The findings of this study are also consistent with the results presented in the report by the AFM since evidently, the audit quality of big four organisations is lacking as it does not affect the level of earnings management in the Netherlands as it should. Moreover, it is suggested that audit firms should improve their performance and it may also imply that regulatory agencies should improve their supervision over audit firms, to enhance audit quality and help detect and prevent management manipulation in earnings.

Despite the fact that this study prove no significant effect of audit quality characteristics on earnings management, implications for practice and further assumptions are hard to hold up. Although this study has not shown evidence for the hypotheses, prior literature has had ambiguous significant results. This study is executed in limited context and did not prove any significant effects of the independent audit quality variables. Thus, it may be hard to base decisions in practice off this study's results.

5.3 RESEARCH LIMITATIONS

Although the results of this study provide some valuable insights, some of its caveats need to be addressed. First and foremost, the accuracy of the discretionary accrual models have been highly debated (e.g. Dechow et al., 1995; Subramanyan, 1996 and Kothari et al., 2005). Dechow et al. (1995) mention the requirement of the Modified Jones model to use cross-sectional time-series data. Due to limited availability this requirement could not entirely be fulfilled. Therefore, the betas used have been estimated based on the available data. Moreover, proxying earnings management by discretionary accruals remains an estimation and despite the accuracy and reliability of the models being scientifically proven, results should always be treated with caution. In addition, it is possible that managers apply other earnings management techniques outside of the measurement range of the discretionary accruals. For example, managers could engage in classification shifting or expectations management rather than accrual-based earnings management (Doukakis, 2014). Graham et al. (2005) provides evidence that suggests that managers are much more willing to engage in real earnings management than accrual-based earnings management. This study has solely focused on the detection of accrual based earnings management and therefore may not be fully representative.

Second, the Dutch context of this study limits the applicability of the results. Because the level of earnings management is highly reliant on the institutional and regulatory differences across countries (Leuz et al., 2003), the results of this study might not be applicable to the situation in other countries. Moreover, cross-country differences in audit quality (as investigated by Choi et al., 2008) may also bias this research results when applying to other countries.

Third, due to limited data availability, a relatively small sample size remained. The drawn sample of 52 Dutch listed firms might cause this research results to be biased. The required input

for the independent audit quality variables is generally only published by the largest firms, thus this research results would be less applicable or even not applicable if examining the situation for smaller firms. Moreover, the effect of the SIZE variable has been consistently significant whilst other tested variables remain insignificant. This might indicate that this control variable distorts the rest of the analysis. However, the inclusion of firm size is consistent with many other prior papers and is hard to neglect and simply exclude from the research.

Fourth, although various effects have been controlled for with control variables, there may be other incentives that affect earnings management. For example, managers might commit to earnings management in order to gain personal advantages (e.g. receiving bonuses at certain profitability benchmarks) or in order to keep investors satisfied by avoiding decreasing stock prices. These are all examples of earnings management incentives and are not controlled for in this study.

Moreover, the results of this study should be interpreted with caution, since no significant results were obtained. The likeliness of falsely rejecting hypotheses (type I error) has increased due to sample, methodology, time and empirical setting restrictions. Also, again, the choice of control variables might be of influence to the obtained results (Doukakis, 2014).

5.4 DIRECTIONS FOR FURTHER RESEARCH

The findings and limitations open up several areas for future research. Although the findings prove to be insignificant, the empirical results still provide for some implications that future research can emphasize on.

First, further research might focus on the effectivity of the discretionary accrual models within the Dutch context. If this effectivity can be scientifically supported, various effects on earnings management can be studied within the Dutch regulatory context.

Second, finding other proxies of real earnings management (such as reporting quality, timeliness, restatements) instead of solely focusing on accrual-based earnings management might have different, more valid results. Moreover, various discretionary accruals models could be employed such as the Kothari et al. (2005) model, or accruals quality (Dechow and Dichev, 2002) to check whether the results are robust. Also, qualitative methods could be employed next to the regression methods. Qualitative methods could provide valuable insights to the minds of the managers and stakeholders, and explanations regarding manager's incentives can be obtained. This could emphasize on how people actually perceive audit quality and to what extent they think it affects the level of earnings management. This could also prove more helpful for obtaining insights regarding real earnings management.

Third, since this study is limited to the Dutch regulatory environment, further research might investigate the cross-country differences of audit quality and earnings management. Leuz et al. (2003) study earnings management cross-country and they conclude that the differences highly depend on a country's regulation and regulatory environment. Therefore, further research

can emphasize on these differences and whether it affects the quality of the audit.

Fourth, this research is limited to a relatively small time-frame, whereas a longitudinal cross-sectional study might have far more reliability. In order to make more valid and reliable assumptions on earnings management, future studies could examine longer time-series and more extensive cross-sectional data. This could also help with estimating more reliable firm-specific parameters applied in the Modified Jones model.

Finally, this research has focused on larger listed firms due to data availability. Therefore, the results do not hold up for the earnings management of small and medium enterprises. Future research could also investigate the effect of audit quality on the earnings management of Dutch small and medium enterprises.

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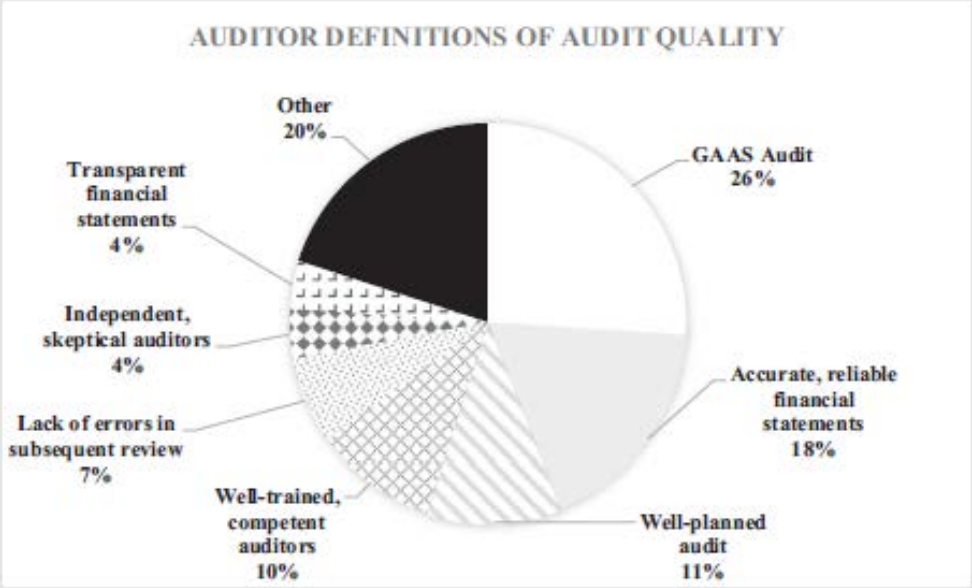
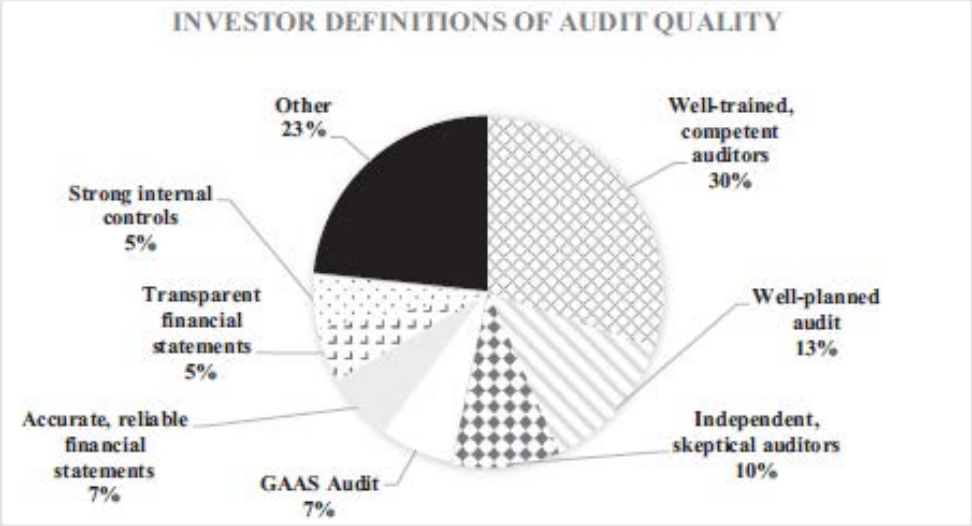
Appendices

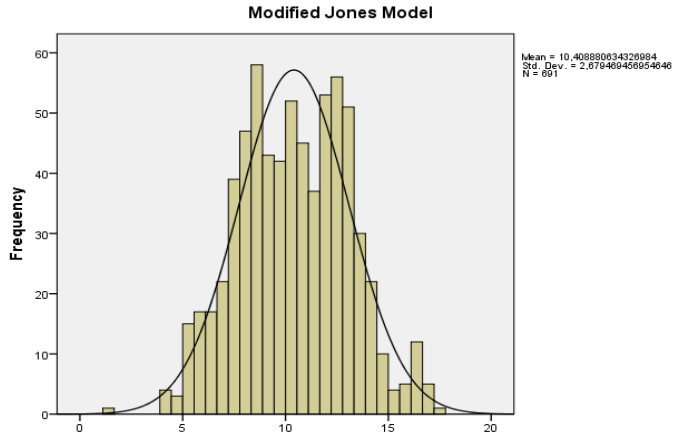
APPENDIX I: AUDITOR'S AND INVESTOR'S DEFINITION OF AUDIT QUALITY

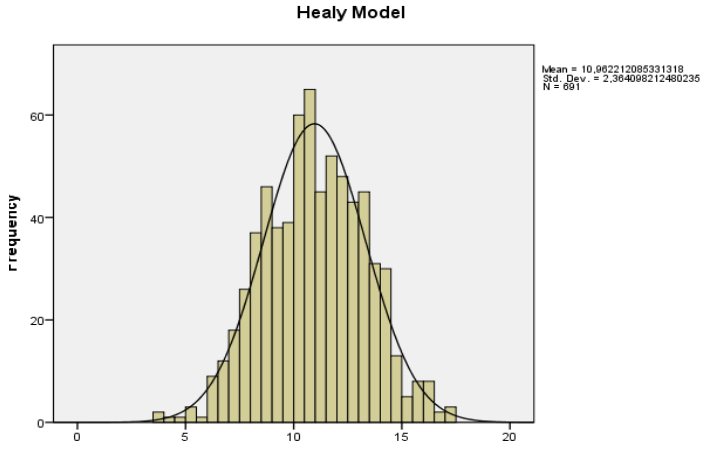
By Christensen et al. (2016)

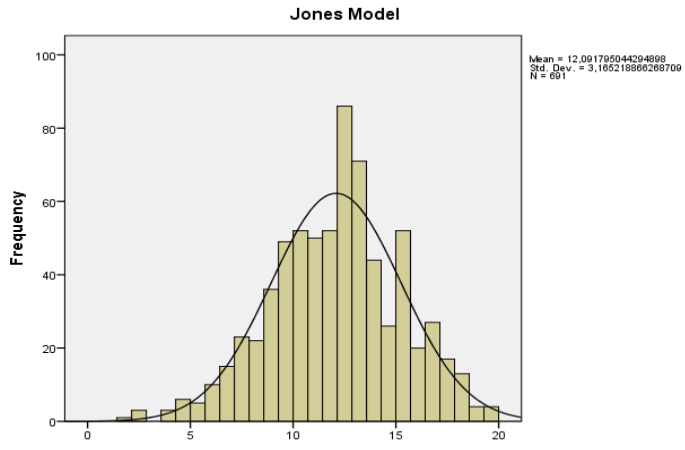


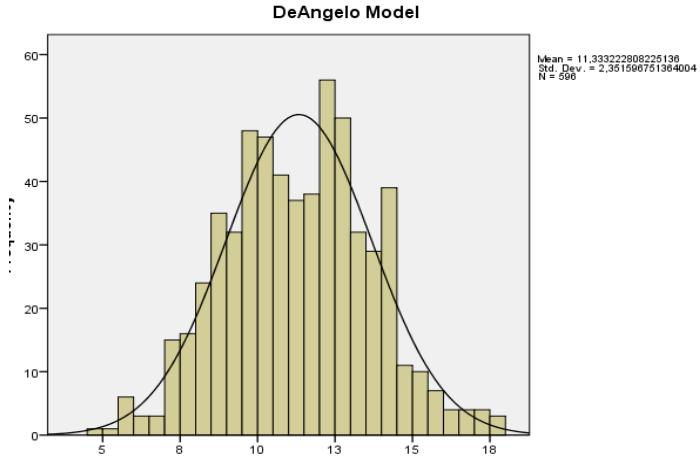


APPENDIX II: DISTRIBUTION OF DEPENDENT VARIABLES









APPENDIX III: ROBUSTNESS CHECK I

Robustness check I: Alternative earnings management models

DEPENDENT: Healy (1985) model					
INDEPENDENT	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
Intercept	-4.005	-3.267	-3.966	-4.207	-1.676
BIG4		1.407			1.546
IND			0.064		0.000
TEN				0.061	0.165
IND*TEN					-0.018
CONTROL					
SIZE	1.702***	1.476****	1.657*	1.682***	1.234*
LEVR	-0.841	-0.670	-0.857	-0.642	-0.558
SG	-3.930	-4.008*	-3.912*	-4.136*	-4.180*
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.388	0.397	0.372	0.380	0.360
F-statistic	3.824***	3.686***	3.414***	3.501***	2.835***
Highest VIF	1.330	1.655	7.746	1,853	107.650
N	52	52	52	52	52
DEPENDENT: DeAngelo (1986) model					
Intercept	-7.221**	-6.547*	-7.380**	-7.118**	-8.244
BIG4		1.284			1.497
IND			-0.257		-0.557
TEN				-0.031	0.300
IND*TEN					-0.054
CONTROL					
SIZE	2.067***	1.861***	2.249**	2.077***	2.407**
LEVR	-0.758	-0.602	-0.695	-0.861	-0.572
SG	-2.505	-2.576	-2.577	-2.399	-2.594
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.485	0.490	0.472	0.473	0.485
F-Statistic	5.199***	4.927***	4.653***	4.669***	3.761***
Highest VIF	1.330	1.655	7.746	1.371	136.235
N	52	52	52	52	52

***. Correlation is significant at the 0.01 level (2-tailed.

**. Correlation is significant at the 0.05 level (2-tailed).

*. Correlation is significant at the 0.10 level (2-tailed).

The Industry Fixed Effect is included using dummy variables for all 9 industry categories. The Yes indicates that every industry is included.

All variables are included in Table 1

APPENDIX III: ROBUSTNESS CHECK I (CONTINUED)

DEPENDENT: Jones (1991) model					
		-		-	
Intercept	-11.117***	10.916***	-10.264**	11.060***	-17.984**
BIG4		0.384			-0.606
IND			1.411		2.710*
TEN				-0.017	1.751*
IND*TEN					-0.277
CONTROL					
SIZE	2.629***	2.567***	1.627***	2.635***	1.689*
LEVR	-1.832	-1.785	-2.181	-1.888	-2.605
SG	-1.642	1.663	-1.246	-1.583	-0.757
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.504	0.492	0,236	0.491	0.504
F-Statistic	5.532***	4.956***	5,390***	4.944***	4.320***
Highest VIF	1.330	1.655	1,855	1.371	136.235
N	52	52	52	52	52

***. Correlation is significant at the 0.01 level (2-tailed.
**. Correlation is significant at the 0.05 level (2-tailed).

*. Correlation is significant at the 0.10 level (2-tailed).
The Industry Fixed Effect is included using dummy variables for all 9 industry categories. The Yes indicates that every industry is included.
All variables are included in Table 1

APPENDIX IV: ROBUSTNESS CHECK II

Robustness check II: Alternative control variables and inclusion of ROA

	DEPENDENT: Earnings management (Modified Jones)				
INDEPENDENT	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
Intercept	3.848***	3.730**	1.570	2.781	0.237
BIG4		0.410			0.078
IND			0.667		0.687
TEN				0.151*	0.265
IND*TEN					-0.018
CONTROL					
MVE	2.068***	2.162***	1.789**	2.294***	1.866**
LEVR	-0.243	-0.241	-0.861	0.130	-0.412
TAG	0.000	0.000	0.000	0.000**	0.000
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.448	0.453	0.439	0.473	0.432
F-statistic	4.618***	4.142***	4.201***	4.663***	3.488***
Highest VIF	1,482	2.042	6.811	1.471	147.668
N	52	52	52	52	52
	DEPENDENT: Earnings management (Modified Jones)				
Intercept	3.537**	3.529**	3.341	2.385***	0.829
BIG4		0.027			-0.323
IND			0.058		0.262
TEN				0.161	0.587
IND*TEN					-0.067
CONTROL					
MVE	2.341***	2.335***	2.300***	2.405***	2.477***
LEVR	0.195	0.194	0.140*	0.614*	0.613
TAG	0.000	0.000	0.000	0.000	0.000
ROA	-8.682*	-8.666*	-8.598*	-9.122**	-9.629*
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.484	0.470	0.470	0.516	0.475
F-statistic	4.836***	4.343***	4.344***	5.019***	3.776***
Highest VIF	1.984	1.983	6.981	1.989	146.335
N	52	52	52	52	52

***. Correlation is significant at the 0.01 level (2-tailed.

**. Correlation is significant at the 0.05 level (2-tailed).

*. Correlation is significant at the 0.10 level (2-tailed).

The Industry Fixed Effect is included using dummy variables for all 9 industry categories. The Yes indicates that every industry is included.

All variables are included in Table 1

APPENDIX V: ROBUSTNESS CHECK III

Independent Samples T-Test			
	N	MEAN	STDEV
Non-big four	4	11.117	2.303
Big four	46	7.124	1.527
Levene's Test			
F-Statistic	1.214		
p value	0.276		
T-Test (equal variances assumed)			
T-statistic	3.384		
p value	0.001		

APPENDIX VI: MODEL VALIDITY