

Auditor Switching and the Effects on the Analyst Forecast

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Preface

This study is conducted between March and July 2023 as a requirement for the accounting, auditing and control master's degree at Erasmus University. The focus is on examining the effects of audit switching on the accuracy of an analyst forecast. Methods and literature from previous studies are considered to enhance the credibility and reliability of the study.

Previous research in this area has been limited, with few studies exploring the relation between switching auditors and audit quality or other studies examining how the analyst forecast is affected. While no studies directly look at the effect of audit switching on analyst forecasts, the study of Behn, Choi & Kang (2007) looks at the effect of audit quality on analyst forecast error. In other words, some studies examine the individual effects of audit switching on audit quality and audit quality on analyst forecast error, but there is no direct link.

I want to express my gratitude to Dr Jochen Pierk, my coach, for his guidance and assistance in improving and refining this study. He consistently provided prompt and precise feedback, promptly addressing my inquiries. The valuable support and guidance have been instrumental in shaping this study into its current form.

Disclaimer: The content of this thesis (proposal) is the sole responsibility of the author and does not reflect the view of either the supervisor, second assessor, Erasmus School of Economics or Erasmus University.

Abstract

This research investigates the relation between audit switching and the accuracy of analyst forecasts. The research is done by taking 846 US observations from 2000 until 2020. The research uses three hypotheses that help dissect the possible relation between audit switching and analyst forecast accuracy. This research found no significant relation between audit switching and analyst forecast error. The findings suggest that the relation of audit switching on analyst forecast error depends on other factors, such as auditor resigning or switching between Non-Big 4 to Big 4. The suggestions are that firms that switch from Non-Big 4 to Big 4 have a significant positive association with analysts having a lower forecast error. Higher audit quality and more transparent financial statements can have this effect. Also, the effect of audit switching after the audit firm resigns is positively associated with increased analyst forecast error. Previous research mainly focuses on the effects of audit switching on audit quality or the effects of audit quality on analyst forecast accuracy. The results done by this research fill a gap in the existing research by connecting the two ends. This research has implications such as a relatively small dataset and a large data frame, so it could be prone to biases.

Keywords: Audit, audit switch, analyst forecast error, Big 4, Non-Big 4, auditor resigning.

Table of contents

1. Introduction	5
1.1 Background	5
1.2 Prior research.....	5
1.3 Research question.....	6
1.4 Data Sources and Structure of the Study.....	7
2. Literature review and hypotheses development	8
2.1 Auditing and Auditor	8
2.2 Audit switching	8
2.3 Audit quality.....	9
2.3 Analyst forecast.....	10
2.4 Previous Research	11
2.5 Hypotheses overview	12
3. Research design and Methodology	13
3.1 Methodology	13
3.2 Variables.....	14
3.21 Dependent variable.....	14
3.22 Independent variable	15
3.23 Moderating variables.....	15
3.24 Control variables.....	15
3.3 Data	17
3.4 Data description.....	17
4. Results and Analysis	19
4.1 Correlation matrix	19
4.2 Regression analysis	20
5. Conclusion.....	23
6. Discussion	24
6.1 Implications.....	24
6.2 Future research.....	24
References	26

1. Introduction

1.1 Background

There are multiple instances where regulatory bodies introduce new rules to enforce a higher audit quality for the benefit of third-party users and mainly to prevent fraud. For instance, the US government responded to the Worldcom fraud by introducing the Sarbanes-Oxley Act (SOX Act) in 2004 to prevent future financial frauds in the US capital market. The newly introduced SOX Act enforces publicly listed companies to change the engaged audit partners and review partners every five years (SEC, 2003). The implementation of the European counterpart, the 8th EU Company Law directive in 2006, has mandated specific requirements for European Union countries. According to the directive, the key audit partner must rotate from the audit engagement every seven years (The European Parliament and the Council of European Union, 2006). The European Union responded after the Financial crisis by approving a new audit regulation in 2013. This newly introduced audit regulation requires listed firms and audit firms in the EU to switch mandatory after ten years of engagement (Deloitte, 2013). The US counterpart, Public Company Accounting Oversight Board (PCAOB), has looked at the option of also including a mandatory auditor switching after ten years of engagement but has yet to implement the same for the US financial markets. Not willing to implement mandatory audit switching shows that the claimed benefits that researchers and regulatory bodies state are disputable. This phenomenon has gathered interest from researchers and practitioners to see the effects of audit switching on different aspects. These regulatory bodies have a common goal; making the market more transparent for all market participants. Audit switching has an direct impact on audit quality by improving on auditor tenure (Chee W. Chow & Steven J. Rice, 1982).

A good indication of market transparency is the accuracy of an analyst forecast. An analysts forecast is a future prediction of a company's financial numbers, in this research the EPS. Audit switching can have an indirect impact on analyst forecast through the audit quality, but there is also a direct link. Audit switching can affect the work of analyst. This is through the ease or difficulty of the analyst's work, so by having better quality financial statements, the analyst's work is made more accessible, so more time to spend on analysing data instead of gathering data and fact-checking it (Bradshaw, 2011). Also if the analyst perceives the auditor to be more trustworthy (lower tenure), the analyst will use a lower error rate or be less conservative, making the analyst forecast more accurate. Making it a interesting discussing if audit switching should be mandated.

1.2 Prior research

Previous research has discussed multiple aspects, such as the effect of audit switching on auditor independence, audit quality, stock price or firm reputation.

For instance, Gietzmann & Sen (2001) show in their paper the positive sides of audit switching for audit firms by concluding that even if the audit rotation is seen as costly, the increase in auditor independence will outweigh the cost. They include a side note stating that it only covers relatively large clients.

Some papers highlight the negative side of audit switching. The paper of Chee W. Chow & Steven J. Rice (1982) concludes the shorter an audit tenure, taking audit switching into consideration that it is associated with lower earnings quality. Meaning that the audit report is of lower quality and less transparent to the investors and analysts.

Other researchers that also emphasise the positive effects of audit switching on audit quality are the papers of Johnson et al., 2002; Myers et al., 2003; Ghosh & Moon, 2005. These papers look at the relationship between audit switching and the investors' perception by looking at the company's stock price.

There is also research done by Knechel (2007), who examines the relationship between audit switching between Big4 and Non-Big4 and looks at the market's reaction in the sense of abnormal returns.

These different researches are the base of this paper; it builds on the existing theoretical background and expands the questions that already have been answered.

1.3 Research question

In this paper, there will be a search for a relationship between two concepts. These concepts have been extensively measured in previous research but have never been put together. Audit switching, mandatory or voluntary, on either side, has been discussed in previous research, and the concept analyst forecast, in this case, the EPS estimates, has also been discussed.

This paper will look at what effect audit switching has on the analyst forecast. So the research question that will be answered in this paper is as follows;

What is the effect of audit switching on the analyst forecast accuracy?

In this case, the independent variable "audit switching" will be measured by looking at audit firm changes per company to identify if there has been an audit switch. There will also be an additional independent factor differentiation in switching from Non-Big 4 to Big 4 to see if the existing research can be confirmed. There will also be a differentiation between an auditor resigning and the company them self that chooses to switch.

To understand how this paper has found its ground, the base for this question will be linked to previous research.

Based on previous research, the hypotheses can be categorised into three groups. The following hypotheses are derived from the previously mentioned researchers' conclusions;

H1: There is a negative effect of audit switching on analyst EPS forecast error.

H2: Audit switch from Big4 to Non-Big 4 audit firm will have a positive significant impact on the analyst forecast and vice versa.

H3: Auditor-initiated audit switch will have a significant positive impact on the analyst forecast error.

After performing multiple regressions, this research finds no significant relation between audit switching and analyst forecast error. The findings suggest that the relation of audit

switching on analyst forecast error depends on other factors, such as auditor resigning or switching between Non-Big 4 to Big 4. The suggestions are that firms that switch from Non-Big 4 to Big 4 have a significant positive association with analysts having a lower forecast error. Higher audit quality and more transparent financial statements can have this effect. Also, the effect of audit switching after the audit firm resigns is positively associated with increased analyst forecast error. Meaning a less accurate analyst forecast. This has probably to do with the fact that an auditor resigning is seen as negative by the market participants and more risk equals higher error.

1.3 Contributions and Motivations

The importance of a research paper is based on two aspects: public relevance and academic relevance.

The public relevance of the research question mainly lies in the fact that discovering a relationship between audit switching and the effect on analyst forecasts can give an insight into what impacts the analyst forecast accuracy and what effects an audit switch has on multiple factors. Analyst forecast error is seen as the reliability of an analyst to predict the future as accurately as possible. Retail investors use an analyst forecast to assess their investment decisions. Since these analyst forecasts can influence investment decisions, they can indirectly impact investment flows. Therefore, analyst forecasts must be accurate and transparent. In other words, ensuring a low analyst forecast error provides a fair depiction of the company's future value is of societal importance. Searching for a relationship between the implementation of new regulations, such as audit switching, and the accuracy of analyst forecasts of societal relevance.

The result of this paper can also be helpful for policymakers because they can see what effects audit switching has on factors other than audit quality. They can consider the test results when considering a new audit switching rule. For instance, making audit switching mandatory or not through regulations.

The academic relevance is what this paper adds to the existing research because research that is already done is abundant to do or to read for other researchers.

The main difference is that no prior research looks at the effect of audit switching on analyst forecasts. The existing research mainly focuses on the effect of audit switching on other dependent variables than analyst forecasts. Also, the previous research does not look at non-mandatory specifically. Previous research does exist on topics such as the effect of audit switching on audit quality or audit quality on analyst forecast error. These mentioned comparisons are different from this paper.

Taking all the mentioned previous research into consideration, this paper will contribute to the existing literature by examining the relation between non-mandatory audit switching and analyst forecast error.

1.4 Data Sources and Structure of the Study

This paper will make use of datasets that are available on WRDS. The data is collected from Audit Analytics and I/B/E/S. The current sample consists of 846 observations that consist of

US firms. The US sample is used to analyse the effect of non-mandatory audit switching. The data will also be used to answer other sub-questions, such as if there is an effective difference between switching from Big 4 to Non-Big 4. Also the effect of audit switching because of auditor resigning will be considered.

The remainder of the research paper is structured as follows. Part 2 will be about the literature review and hypothesis development. Part 3 will describe the data used and the research design. Part 4 will be about the data analysis and will discuss the results of the models. Part 5 will be about the conclusion and discussion of this paper and will include recommendations about future research by looking at the paper's current limitations and implications.

2. Literature review and hypotheses development

This second chapter will provide an overview of the concepts necessary to understand this research paper and fully grasp the underlying theory. In the following subcategories, the underlying theory will be discussed; Auditing and Auditor, Audit switching, Audit quality, and Analyst forecast. Besides that, these concepts will be explained, and there will also be a summary of what the current research has to say about audit switching and its effects on analyst forecasts. At the end of this chapter, the hypothesis development will be explained by including opinions from previous research.

2.1 Auditing and Auditor

The terms Auditing and Auditor are used in most academic papers about the accounting field, but what do these terms exactly mean in those contexts? Auditing is described by Mautz (1964) as *“concerned with the verification of accounting data, with determining the accuracy and reliability of accounting statements and reports”*. The confirmation of the numbers in the financial statement is done by reviewing objectively internal and external available information; this is called auditing. An auditor is a professional who performs the audit. The one responsible for reviewing and assessing an organisation's financial records, statements, transactions, and processes to guarantee their accuracy, adherence to regulations, and dependability. The auditor ensures that the verification of the accounting numbers happens independently and thoroughly so the external parties can rely on the trustworthiness of the companies' financial statements.

2.2 Audit switching

Audit switching or audit rotation are interchangeable when used as a term. Audit switching will be used in this research, but the meaning is the same for both terms. Audit switching can be divided into multiple categories. The main differentiation is mandatory and non-mandatory audit switching. Mandatory switching is a form of audit switching enforced by the local regulatory body that aims to improve auditing as a whole. Mandatory audit switching means that the audit firm or partner and engaged firm need to switch after a certain period by law. Non-mandatory audit switching is referred to as audit switching when the engaged company or audit firm voluntarily wants to switch. This can have multiple underlying reasons. The audit firm can decide not to continue to audit that firm, which is called resigning from a client, or the firm does not want to continue with the audit firm, which is called dismissing the auditor. Fontaine, Ben & Herda (2013) paper describes the underlying reasons for a client

engaged in a voluntary audit switch. They find that if the client perceives the auditor to have low availability and hereby has a lower quality auditor-client relationship, the firm is more likely to switch the audit firm. They also eliminate the existing concern that audit firms have; they state that a competitor's lower audit fees are not the main reason for a client to switch from audit firms. The paper of Knapp & Elikai (1990) looks at the reasons for audit switching from the auditors' perspective and concludes that an audit switch is motivated by information suppression by the clients' management. The paper of Weiss & Kalbers (2013) concludes that an auditor is more likely to resign if the auditor-client relation is misaligned.

The second differentiation is within the category of mandatory audit switching. Mandatory audit switching can be divided into two types of mandatory audit switching. The first one that is mentioned is audit partner switching. It is described by the SOX act as follows: *“It shall be unlawful for a registered public accounting firm to provide audit services to an issuer if the lead (or coordinating) audit partner (having primary responsibility for the audit), or the audit partner responsible for reviewing the audit, has performed audit services for that issuer in each of the X previous fiscal years of that issuer.”* (Section 203, Sarbanes-Oxley Act, 2002). An engaged audit partner needs to switch from the audited firm after a certain period.

The other mandatory audit switching is mandatory audit firm switching, which refers to switching between an audit firm and an audited company. So the whole audit firm has to switch. The SOX describes it as; the *“imposition of a limit on the period of years in which a particular registered public accounting firm may be the auditor of record for a particular issuer”* (Section 207, Sarbanes-Oxley Act, 2002). The form of non-mandatory audit switching will be used in this paper and will be researched further.

2.3 Audit quality

Authorities have the goal of decreasing information asymmetry between different parties. Changing and implementing new regulations have the goal to achieve less information asymmetry. Companies, investors and audit firms are market participants with different goals. The differentiation in goals leads to different information needs and information emitting. The theory that can be used in this example is adverse selection. Adverse selection theory explains that one party has more information than another. In this research, the parties that are highlighted by this theory are the investors (the ones with less information) and the companies (the ones with all the information); the audit firm interacts here as an information intermediary. Because of the information difference, the insiders in a company (managers) know more about the quality of their company and the prospects of the company than the outside investors know. Financial reports are a method to decrease the information asymmetry that investors and company managers have. To ensure that what companies claim is accurate and representative of the company's achievements in that year, auditors verify the numbers in a financial report. The auditor is an intermediary that must ensure that the financial reports are accurate and free from false claims or misstatements.

What does the term Audit quality mean? The definition is expressed by DeAngelo (1981) by stating the following; *“The quality of audit services is defined to be the market-assessed joint probability that a given auditor will both (a) discover a breach in the client’s accounting system, and (b) report the breach.”* In other words, audit quality is the probability of

discovering a misstatement in a financial report and also reporting the misstatement. Titman and Trueman (1986) describe the definition of high-quality audit as an audit that improves the reliability of financial statements information and allows investors to make a more precise estimate of the firm's value.

2.3 Analyst forecast

An analyst forecast is an estimation made by an analyst. This forecast regards a company's future performance or financial indicators. The analyst looks at factors such as the company's financial statements, industry trends, market conditions, and other relevant information to predict future earnings, revenue, expenses, and key financial metrics. In other words, the analyst is dependent on external available information (Bradshaw, 2011). Usually, these analysts work for investment banks, brokerage firms, analyst platforms or other financial institutions. In this research, the financial analysts that make use of financial statements and predict the EPS for a firm are considered. The analysis that is made in an analyst forecast is used by investors, fund managers, and other market participants. Commonly to evaluate the potential value of a company's stock or to guide their investment decisions. Analyst forecasts can have an impact on stock prices and investor sentiment, as they provide valuable insights into market expectations. They share a professional view on estimation. The release of actual results compared to these forecasts can influence market reactions. However, it is crucial to recognise that analyst forecasts are subjective opinions and do not guarantee accuracy (Bradshaw, 2011). Different analysts can have different perspectives and implement diverse methodologies, resulting in a wide range of forecasts.

Analyst forecasts can have an impact on investment flows and market reaction, but what factors determine an analyst forecast? Analyst forecast has been extensively researched in previous academic papers. The paper of Brown et al. (1987) describes that the accuracy of an earnings forecast depends on the difficulty and complexity of the forecasting task. The paper of Lang & Lundholm (1996) finds that the larger the firm that the analysts are analysing, the more accurate the forecast is. The fact that analysts make use of externally available information is an essential bridge to this research. Audit quality determines the quality and transparency of the financial statements. These statements are used by the analyst that makes up a financial forecast. The paper of Behn, Choi & Kang (2008) tries to find a relationship between audit quality and analyst forecast. They look at the analyst forecast error, and analyst forecast dispersion compared to different audit quality levels. The proxies for audit quality in this paper are auditor size and audit specialisation. The paper does find a relationship in the sample where Big 4 audited financial statements lead to higher forecast accuracy and lower dispersion. The same result can be seen by looking at financial statements that are audited by Non-Big 4 specialised auditors. The paper assumes that Big 4 audit firms (size auditor) and specialised auditors have a higher audit quality and deliver a higher quality financial report. The paper of Behn, Choi & Kang is based on the assumption of previous papers where they state that high audit quality reduces the intentional and unintentional measurement errors in historical earnings; this increases the reporting reliability of the financial statements. Analysts use these historical earnings to predict future earnings in their analyst forecast reports, making the forecast more accurate and less dispersed when the audit quality is high. The direct impact is assumed mostly through the ease or difficulty of the analyst's work, so by having better

quality financial statements, the analyst's work is made more accessible, so more time to spend on analysing data instead of gathering data and fact-checking it. (Bradshaw, 2011).

Summarising the points written above, a higher audit quality can lead to a more accurate and less dispersed analyst forecast.

2.4 Previous Research

This paragraph will explain the opinions of previous research and how it can help answer the main research question. Also, the conclusions of this paragraph will be the basis for the hypothesis that is formed in the upcoming paragraph 2.5.

The subject of audit switching has divided opinions on the overall benefit of implementing the mandatory form. Previous research mainly looks at the effectiveness of audit switching on audit quality. Audit switching has focused on decreasing the audit tenure. The audit quality can be dependent on multiple factors. Previous research discusses the factors and how they impact audit quality. The research paper of Cameran (2014) discusses that having a long auditor tenure may lead to developing a relationship between the auditor and firm, which can lower the auditor's independence and objectivity. Having lower independence and objectivity can lower the audit quality and eventually lower the quality of the financial reports (DeAnglo, 1981).

The paper of Ebimobowei & Keretu (2011) aligns with the results of the research of Cameran (2016). They found in their research that audit switching improves the auditors' independence and introduces a fresh look at the clients' information and reports. This will eventually lead to a higher audit quality. Their paper mainly focuses on mandatory audit switching, and they suggest that switching auditors regularly will improve the working environment of auditors by preventing the engaged auditor from getting too familiar with one specific client, leading to a decrease in auditor independence.

Another paper that discusses the relationship factor between auditors and the firm is the research paper of Jackson (2008). The paper highlights that when auditors are engaged for an extended period with the same client, it causes the manager and auditor to become too aligned, leading to an increase in auditor dependence.

Considering these points, including the ones that higher audit quality leads to lower forecast error and dispersion, hypothesis one can be formed; *“There is a negative effect of audit switching on analyst EPS forecast error.*

The assumption here is that audit switching will lead to higher audit quality and higher audit quality will lead to lower analyst forecast error. But there is also a direct link between audit switching and having an impact on analyst forecast. The previous research and their findings can be found in paragraph 2.3.

Audit switching also has its downside. The paper of Jackson (2008) has described the client-auditor relationship problem but also emphasises that performing an audit switch will lead to losing client-specific knowledge. The loss of client-specific knowledge will lead to investing more time and effort in the new client to gain the specific knowledge, leading to an increase in cost for the client. Also, a paper highlighting the downside of audit switching is the

research of Carcello & Nagy (2004); they have found that fraudulent financial reporting is more likely to happen in the first three years an auditor is engaged when a regular audit switch occurs.

The other distinction that previous papers make is between Big 4 and Non-Big 4 regarding audit quality. Most of the previous audit literature associates Big 4 with higher audit quality than Non-Big 4 audit firms. The paper of DeAngelo (1981) argues that no single client has enough influential power when it comes to a large audit firm compared to a Non-Big 4 audit firm, making the Big 4 audit firm have a lower chance of compromising their independence. Dupuch and Simunic (1980) find the same result in their paper; they emphasise that larger audit firms have a higher reputation that they need to hold, so there is tighter quality control. They also state in their paper that larger audit firms usually have more opportunities to offer a more robust training program and standardised methodologies leading to a higher quality audit than Non-Big 4 firms. Also, a more recent paper states the same results regarding higher audit quality. In their research, Che, Hope & Langli (2019) find that the Big 4 audit effect comes from three sources. First, being able to recruit Non-Big 4 partners who deliver higher audit quality than other non-Big-4 partners. Secondly, enhanced learning takes place, and they have higher incentives to monitor better. Taking the conclusions of these papers and combining with the fact that higher audit quality leads to lower analyst forecasts, hypothesis three is formed as follows; "*Audit switch from Non-Big 4 to Big4 audit firm will have a positive significant impact on the analyst forecast and vice versa.*"

The last hypothesis (3) is derived from the fact that non-mandatory audit switches can be initiated from two sides. The auditor can resign and demand an audit switch. Conversely, the client can dismiss the auditor and switch from one auditor to another. The paper of Catanach et al. (2011) and Whisenant, Sankaraguruswamy & Raghunandan (2003) find in their research that auditor resignation is more likely to be associated with risk indicators. Suppose the general assumption is that a forecast has a higher error with more risk factors; the following hypothesis can be derived. In that case, the *Auditor-initiated audit switch will have a significant positive impact on the analyst forecast error.* Meaning that if an audit switch is auditor initiated, there will be a higher chance of having a higher analyst forecast error.

The study of Griffin & Lont (2010) finds that investors generally respond negatively to auditor resignation announcements, while the market reaction to dismissals is often considered insignificant. The negative investor response to resignation announcements is primarily down to two reportable event disclosures: auditor–client disagreements and non-reliance on management statements. These disclosures, which indicate potential issues with financial reporting or disagreements between auditors and the client, tend to lower investor confidence and contribute to the observed negative market reaction. This also indicates uncertainties in the predictability of an analyst's forecast, leading to the hypothesis mentioned above.

2.5 Hypotheses overview

Based on previous research, the hypotheses can be categorised into three groups. The following hypotheses are derived from the previously mentioned researchers' conclusions;

H1: There is a negative effect of audit switching on analyst EPS forecast estimate error.

H2: Audit switch from Non-Big 4 to a Big 4 audit firm will have a positive significant impact on the analyst forecast and vice versa.

H3: Auditor-initiated audit switch will have a significant positive impact on the analyst forecast error.

3. Research design and Methodology

In this chapter, the fundamentals of this research will be discussed based on four sub-paragraphs. In the first paragraph *Methodology*, there will be an analysis of this paper's methodology in which this study's research approach will be outlined. After this, the paragraph *Sample Description* will be discussed, where the data retrieving and sample selection outlining will take place. In the last paragraph, *Variables*, there will be a discussion about the independent and dependent variables used in this research and what controlling variables there will be.

3.1 Methodology

In this paragraph, the Methodology will be discussed of this research paper. The type of study that will be used to answer the main research questions is the quantitative research approach. Quantitative research in this paper means that the relation between non-mandatory audit switching and analyst forecast error will be analysed by collecting, analysing and interpreting numerical data. The data analysis will be done in RStudio by using statistical techniques. Below in the equation, the model can be seen that will be used to create an OLS regression. The method of this research follows previous literature about how to conduct the test, the paper of Jackson, Moldrich & Roebuck (2008), also uses a linear regression model to test the effect of audit switching on another variable. Also making use of an linear regression makes the interpretation easier for the reader. This statistical test is used to estimate the causal effect of an intervention by looking at a dummy variable that indicates before and after an event. This will indicate whether the difference before and after an event is significantly different. The event, in this instance, is the audit switch. This will be a dummy variable that is indicated with 1 if an audit switch has happened and zero if the audit switch has not taken place yet. There will be three different regressions to test the effects of this event and eventually answer the main research question. All three regressions include the fixed effects of Industry.

The first model will test the first hypotheses. And here by addressing the main research question; “What is the effect of audit switching on analyst forecast accuracy? The dummy variable audit switching and previously mentioned control variables are added. This model will also be used to answer Hypothesis 1.

$$\text{Analyst forecast error} = F \left(\alpha_0 + B_1 \text{Audit switch} + \sum_{j=1}^n \beta_j \text{CONTROL}_{i,t} + \varepsilon_{i,t} \right)$$

The second model will test if there is a significant difference in analyst forecast accuracy when switching between Big 4 and Non-Big 4. This will be tested by including a moderating variable with audit switching and Big 4.

Analyst forecast error

$$= F \left(\alpha_0 + B_1 \text{Audit switch} + B_2 \text{Big 4} + \sum_{j=n}^n n \beta_j \text{CONTROL}_{i,t} + \varepsilon_{i,t} \right)$$

The last and third models will test the third hypothesis, and this will be done by including a moderating variable called "Auditor resigning" this will expose if the accuracy of the analysts' forecast significantly differs if the initiator is the audit firm itself.

Analyst forecast error

$$= F \left(\alpha_0 + B_1 \text{Audit switch} + B_2 \text{Auditor resigning} + B_3 \text{Big 4} + \sum_{j=n}^n n \beta_j \text{CONTROL}_{i,t} + \varepsilon_{i,t} \right)$$

3.2 Variables

The following paragraph introduces the variables that are used for testing the proposed hypotheses regarding the connection between non-mandatory audit switching and analyst forecast error. Firstly, the variables are introduced, followed by an explanation of the proxy that will be used for each variable.

3.21 Dependent variable

The dependent variable, also called the outcome variable, is the "Analyst forecast error". The analyst forecast error is measured by looking at the accuracy of the Earnings per share (EPS) forecast that analysts have made for the upcoming year based on the available financial and non-financial information. The accuracy of the Analyst forecast error is calculated by taking the absolute value of the following subtraction; actual eps – predicted eps (Bradshaw, 2011). The calculation of the Analyst forecast error can be found in the equation below. The Analyst forecast error is a continuous quantitative measure. This means that the variable can be any number, positive or negative. In this research, the focus lies on the deviation, also called the magnitude of the Analyst forecast error. To better understand the dependent variable, the data of the analyst forecast error will be converted to an absolute value. Also to scale the Analyst forecast error the absolute error is proportioned to the size of the Forecast EPS. This allows the deviation to be relative to the size of the Forecast EPS. By looking at the dependent variable "Analyst forecast error", this research tries to capture the accuracy of analysts' work. It is also seen as a measure to see if the market is informative and transparent; in other words, are the measures that regulatory bodies take effectively. This paper will reflect if non-

mandatory audit switching has a positive or negative effect on the analyst's work. This is reflected in the accuracy. If the analyst forecast error magnitude does not show significant deviation after an audit switch, it can be concluded that the switch has no significant impact on the analyst forecast error.

$$\text{Forecast error} = \frac{|\text{Actual EPS} - \text{Forecast EPS}|}{\text{Forecast EPS}}$$

3.22 Independent variable

The independent variable also called the explanatory variable, is the audit switch in this research. The audit switch is a dummy variable that will be indicated with 0 or 1. Further in this research called "Audit switch". The 1 will indicate when there has been a non-mandatory audit switching taking place. The variable explains if the auditor has resigned or if the client has dismissed an auditor. In other words, the dummy variable indicates when a firm and engaged auditor switch from each other voluntarily. The "Audit switch" does not account for audit switches that the regulatory bodies have implemented or have mandated. These audit switches are called mandatory. The previous researcher used the mandatory or non-mandatory audit switches as an independent variable to see the effect or benefit of switching audit firms. Usually, the independent variable is the same in this type of research, but they mainly look at different outcome variables.

3.23 Moderating variables

By following the research method of the paper of Jackson et al. (2008) and Carey & Simnett (2006), the moderating variable "Big 4" should be added. They conclude that the difference between Big4 and Non-Big4 is significant enough to affect the quality of the financial statement. The assumption here is that Big 4 auditors provide a higher quality of audit services than Non-Big 4 auditors. This is in line with the researchers Tepalagul & Lin (2015). The Big4 auditors here are Deloitte & Touche (Deloitte), PricewaterhouseCoopers (PwC), Ernst & Young (EY), and KPMG. So to research the effects of audit switching in combination with audit firm type, the moderating variable "Big 4" is created. The moderating variable is a dummy variable where "1" denotes when the firm switches from Non-Big 4 to Big 4 and "0" if they remain Big 4 or switch to Non-Big 4. The results will answer the second hypothesis of this paper.

The second moderating variable that will be added is the variable "Auditor Resigning". The research paper of Wells & Loudder (1997) found that when an audit switch happens by resigning, it often triggers a negative reaction in the market. Market participants, including analysts, view the resignation of auditors as a detrimental factor affecting the company's outlook. Increasing the risk and uncertainty. This dummy variable will be denoted as "1" for resigning and "0" otherwise.

3.24 Control variables

This research will make use of multiple control variables. The control variables are selected by examining previous research on this topic. The main reason to use control variables in the model is to address and control for potential confounding factors that may impact the relationship between the independent and dependent variables. If no control variables are

added, it can cause multiple other issues, like increased Type 1 and 2 errors or spurious relationships and overall decreased internal validity. The inclusion of control variables helps researchers isolate the specific effect of the independent variable, making sure that other variables do not influence any observed relationship with the dependent variable. By carefully accounting for these factors, the researchers can enhance the accuracy and validity of their findings, enabling a more precise understanding of the relationship between the variables of interest. In other words, it will help this research paper find a more precise relationship between the variables of interest and the independent variable.

In this research paper, the following control variables will be added to perform the analysis as accurately as possible and to minimise effects from other variables that could cause biases.

The first control variable that will be added to the model is "*Firm size*". Firm size is expressed in the total asset of a firm. The paper of Carey & Simnett (2008) describes in their research that relatively larger firms are more likely to be stable over time and have a significantly lower chance of going bankrupt. Jackson et al. (2008) also argue that larger firms have more assets at their disposal. This means that if they have hard times ahead, they can sell more and more easily than smaller firms, leading to a lower chance of bankruptcy and lower volatility.

The control variable, "*Leverage*", is the ratio of total liabilities to total assets. This variable is added because the paper of Carey & Simnett (2006) argues that firms that have a high leverage indicate to the external parties that they are more likely to experience a higher level of risk.

The control variable "*Loss*" will also be added to the model to mitigate the emphasised risk that the paper of Chalmers et al. (2012) describes. The researcher states that firms that had a loss in the previous year are more difficult to predict for the upcoming year. The increased difficulty in the analysis for forecasting the upcoming years leads to a lower analyst forecast quality. The dummy variable will indicate 1 if the company had a loss in the previous year and 0 if the company did have positive earnings.

The control variable "*Market volatility*" will be added to the model to get a complete picture. Market volatility can lead to a more difficult time for analysts because predicting in a changing or unstable environment is more challenging and can lead to a lower quality of analyst forecasts. The paper of Chahine, Daher & Saade suggests this previously mentioned phenomenon in their research. Market volatility is a continuous variable and is extracted from the VIX index.

The variable "*Industry*" is added as a fixed effect; this variable indicates the industry that the firm operates in. The variable is a two-digit SIC code that categorises the firms in different industries. The control variable is added to the model because industries can vary in the volatility of risk and predictability. Making the analyst forecast accuracy possible to depend on the firm's industry.

3.3 Data

The sample that will provide data to execute this research is collected through Wharton Research Data Services (WRDS); the excess is provided by Erasmus University. The information about the non-mandatory audit switching is downloaded from the database Audit Analytics. The analyst forecast predictions and actual values are downloaded from the database I/B/E/S. The Market volatility (VIX) information is downloaded from the database CBOE Indexes. The literature papers that are used in this research are downloaded from the online library of Erasmus University. All the data sources and links can be found in the bibliography.

3.4 Data description

The data from all the databases consists of data points from January 2000 until January 2020. The extensive time frame is deemed mandatory because audit switches do not happen often so to get a sufficient number of data points a larger data frame is needed. The data is made of the financial information of the year of audit switching and one year prior to that (y-1) per firm.

The data consists of US firms. The US regulations do not have a mandatory audit switching in place; this allows this research to be done on US firms. The data is filtered following the steps that will be summarised in this paragraph. First, the data of the non-mandatory audit switches is downloaded from WRDS. After that missing and nonlogical values are completely deleted. For example “total asset” of zero is deemed nonlogical. The data consists of 6080 observations. The analyst forecast dataset from the I/B/E/S database is downloaded and filtered the same way as described. This leaves 1 048 575 observations left of the original. The database from CBOE indexes is filtered similarly but does not consist of any missing values where deemed needed. The total observations of this database are 6039 observations. The fundamental information that is deemed needed, like total asset or net income profit or loss, is downloaded from the database Compustat North America. This dataset consists of 213 914 observations.

The Audit analytics and I/B/E/S datasets are merged based on their TICKER identifier and fiscal year. The CBOE index dataset is added by matching the fiscal years. After that, all the missing values (NA) including the corresponding row are removed from the database. This has left 846 useful observations. After this merged dataset has been created, the dataset is cleaned by removing the excess columns deemed unnecessary. This has filtered out unnecessary information like company name or Cusip code. The data also has been checked on outliers and any skewness that prevents it from being not normally distributed. The data has been winsorised in this process.

The data descriptive statistics of the total dataset will be displayed in Table 1, this will summarise the information about the collected data and create an overview. The total amount of observations, the mean, standard deviation, minimum and maximum will be displayed for each variable. From Table 1 it can be derived that more than half of the audit switches are from Non-Big 4 to Big 4, this can be seen by the 0.5563 in the mean column. Also it can be seen that less than two percent of the audit switches happen because of an Auditor resigning (0.0158). Furthermore, the statistics indicate that almost 40% of the firms are making a loss in

either the pre or post year of audit switching. The overview will give an insight into the data that is used to perform the analysis.

Table 1: Descriptive statistics complete dataset

	N	Mean	Median	Std. Dev.	Min.	Max
Dependent variable:						
Analyst forecast Error	846	0.4916	0.1100	1.0207	0.0025	4.1000
Independent variable:						
Audit switches	846	1.0000	1.0000	0.0000	0.0000	1.0000
Moderating variable:						
Big 4	846	0.5563	1.0000	0.0000	0.0000	1.0000
Auditor Resigning	846	0.0158	0.0000	0.0000	0.0000	1.0000
Control variables:						
Loss	846	0.3874	0.0000	0.4875	0.0000	1.0000
Firm size	846	2443.47	543.52	4475.74	19.21	17511.5 6
Market volatility	846	18.98	18.22	6.0220	9.77	29.99
Leverage	846	0.5499	0.5484	0.2717	0.1143	1.0607

4. Results and Analysis

This chapter will discuss the outcomes of the various models that have been outlined in the previous chapter. The chapter will describe per model the outcomes and what they mean.

4.1 Correlation matrix

Table 2 gives an overview of the correlation found in this study between the different dependent variables, control variables and moderating variables. The correlation of 0.4168 between Loss and Error suggests a strong relation between the two variables. This strong positive relation can also be found in previous literature. The paper of Chalmers et al. (2012) describes that a company that has had a loss in the previous year is more difficult to predict, and this analysis can also be made by looking at the correlation table. The other correlation that aligns with previous research is the correlation between Firm size and Error. The negative correlation of -0.1279 indicates a negative relation between the two variables, meaning that a larger Firm size will most likely be associated with a lower Error. This is in line with the paper that Carey & Simnett (2006) wrote; they conclude that larger firms are more stable over time and this makes them easier to predict. This phenomenon can be seen by a lower Error. The correlation between Big 4 and Error is -0.1388. This indicates that there is a reverse relation between the two variables. This is in line with previous research. Firms that are audited by Big 4 give more confidence to the users of financial statements and increase the accuracy of the analyst estimate if the conclusion of the papers of Jackson et al. (2008) and Carey & Simnett is followed.

The correlation that goes against the conclusions of previous papers is the Error and Market volatility one. The magnitude and sign indicate that higher Market volatility is associated with a lower Error. This is the opposite of the paper analysed in this research; Chahine, Daher & Saade suggest in their paper that higher Market volatility leads to analyst forecast Error. Also, the correlation between auditor resignation and Error is against the results of previous research. The negative sign suggests a reverse relation between the two variables. Previous research has shown that if an auditor resigns, it triggers a negative reaction in the market, so the uncertainty should have a positive correlation with Error if previous research is followed. The paper of Wells & Loudder (1997) is one example of research concluding that.

The correlation between Leverage and Error is positive, but at 0.0056, it can be safe to say that is relatively small compared to the other variables.

Table 2: Overview of the correlation between the variables

		Error	Loss	Firm size	Market Volatility	Leverage	Big4	Auditor Resigning
1	Error	1.000	0.4168	-0.1279	-0.0506	0.0056	-0.1388	-0.0148
2	Loss		1.000	-0.1371	0.0276	-0.1412	-0.1387	-0.0551
3	Firm size			1.000	-0.0321	0.2123	0.3453	-0.0408
4	Market volatility				1.000	-0.0242	0.1481	-0.0219
5	Leverage					1.000	0.0512	-0.0187

6	Big4	1.000	0.0706
7	Auditor Resigning		1.000

4.2 Regression analysis

This paragraph will outline the regressions used in this research to examine the relation between the different variables. The three models that are used will each provide an answer to the previously mentioned hypothesis. Model 1 will examine the effect of Audit switching on Analyst forecast errors. Model 2 builds on where Model 1 left and adds a moderating variable called Big 4 to the regression. Model 3 has in addition, the moderating variable Auditor Resigning. Table 3 provides an overview of the statistics of the three models.

The first model that will be discussed is model 1; the model tries to explain the relation between Audit switching and Analyst forecast error. The model is without any moderating variables. This model does include control variables and industry-fixed effects. The control variables Loss, Firm size, Market volatility and Leverage are added to the model. Table 3 provides the results of the run regression. The coefficient of Loss, Leverage and Market volatility are all significant at a 5% level. The control variables Loss and Leverage are both significant at a 1% level. This means that all three have a significant effect on the analyst forecast accuracy; this is in line with previous research. Because this paper is all about the effects of audit switching on analyst forecast accuracy, these variables are used as control variables. The positive effect that these variables would have been mitigated. The coefficient of 0.0106 indicates a slightly positive effect of audit switching on analyst forecast accuracy. This is also an insignificant interpretation. Meaning that model 1 does not find any relation between audit switching and the accuracy of analyst forecast in this model, meaning that H1: “There is a negative effect of audit switching on analyst EPS forecast estimate error”, suggest cannot be supported.

Model 2 is model 1, but includes the moderating variable Big 4. This moderating variable is included to test hypothesis 2. Model 3 includes the moderating variable Big 4 to examine whether the effect of audit switching on analyst forecast accuracy varies depending on whether a Big 4 firm currently audits the company or not, with the assumption it was not before the audit switch. Model 3 shows that the coefficient of the moderating variable Big4 is significant and negative. This implies that companies audited by Big 4 firms have higher accuracy in analyst forecasts. The result is in line with previous research. Here by can be concluded that there is enough evidence for H2 not to reject it. So H2: “Audit switch from Non-Big 4 to Big4 audit firm will have a positive significant impact on the analyst forecast and vice versa” can be concluded from the results.

Model 3 builds upon Model 2 by including an additional moderating variable, 'Auditor Resigning'. This variable is included to examine whether the effect of audit switching on analyst forecast accuracy varies depending on whether the company experiences an auditor resignation. The results from Model 3 show that the coefficient of the moderating variable 'Auditor Resigning' is significant and positive at a 1% level. This suggests that when a

company experiences an auditor resignation, it leads to lower accuracy in analyst forecasts. The positive coefficient aligns with previous research, indicating that such a change in the audit firm results in a more difficult-to-predict forecast, shown by the higher error. Therefore, based on the significant positive coefficient of 'Auditor Resigning', it can be concluded that there is enough evidence to support Hypothesis 3: “Auditor initiated audit switch will have a significant positive impact on the analyst forecast error”.

In summary, Model 3, which includes both 'Big 4' and 'Auditor Resigning' as moderating variables, provides valuable insights into the complex relation between audit switching and analyst forecast accuracy. The significant coefficients for both moderating variables indicate that the impact of audit switching on analyst forecasts is influenced by the presence of Big 4 auditors and the occurrence of an auditor resignation, supporting Hypotheses 2 and 3, respectively. These findings contribute to a better understanding of how auditors' characteristics and changes in audit firm type affect the accuracy of analyst forecasts. The results of just an audit switch are insignificant. The R-squared shows an increase from 0.28 to 0.30 from model 1 to model 2 and 3, meaning the explanatory value of the model increased slightly with adding the moderating variables.

Table 3: The association between audit switching, including some moderating variables and Analyst forecast Error using linear regression analysis.

	Model 1	Model 2	Model 3
Constant	-0.1040 (-0.159)	-0.1761 (-0.273)	-0.1951 (-0.301)
Audit switch	0.0106 (0.138)	-0.1212 (-1.094)	-0.1200 (-1.080)
Firm size	0.0193 (-1.573)	0.0496 (-0.390)	0.0568 (-0.445)
Loss	0.5472*** (5.039)	0.5095*** (4.731)	0.5115*** (4.735)
Leverage	1.0390*** (5.290)	1.046*** (5.407)	1.056*** (5.435)
Market volatility	0.4296** (-2.350)	0.4259* (-2.366)	-0.4264* (2.365)
Big4		-0.5550*** (4.054)	-0.5519*** (4.012)

Auditor Resigning			0.0836*** (0.127)
Industry-fixed effects	Yes	Yes	Yes
Observations	846	846	846
Pseudo R ²	0.2807	0.302	0.305
F-value	2.518	2.667	2.631

* p<0.1, **p<0.05, ***p<0.01 indicate that p-values are significant at the 10%, 5%, and 1% level, respectively.

5. Conclusion

When regulatory bodies imply, new rules such as mandatory audit switching, because they see the benefits of audit switching for the market participants. It is not always clear what the effects will be, and this study tries to examine the association between audit switching and the accuracy of analyst forecasts. To explore this relation, the research question guiding the investigation was formulated as follows: *What is the effect of audit switching on the analyst forecast accuracy?* Three hypotheses support the research question.

The first hypothesis is that audit switching has a negative effect on analyst forecast error, implying that an audit switch would make the analyst forecast more accurate. The results from the test that were performed did not find such a relation in the data that was used. The exciting literature does mention that audit switching can be positive for audit quality, but there are mixed results in this field. Some researchers claim that audit switching is only beneficial under mandatory circumstances, mainly when the switch is made from a Non-Big 4 audit firm to a Big 4 audit firm. On the other hand, other researchers argue that the benefits of audit switching are not solely dependent on these factors and can be realised without being mandatory or involving a change to a Big 4 firm. The second hypothesis tries to test this claim if any audit switching that happens from Non-Big 4 to Big 4 significantly impacts the accuracy of analysts' predictions. This one is indeed significant, thereby proving that if an audit switch happens from a Non-Big 4 to a Big 4, it can positively enhance the accuracy of analyst forecasts. The results are in line with some researchers.

The last part of this research includes the effect of an auditor resigning on analyst forecast accuracy. By including the moderating variable "Auditor Resigning", the third hypothesis is tested. The data analysis leads to the following conclusion: if a firm their auditor does resign and there is an audit switch, it can harm the accuracy of analysts' forecasts. The change in the accuracy of the analyst's forecast has to do with the fact that an auditor resigning is a negative signal to the market, and this leads to higher risk and more volatility, meaning a more difficult-to-predict forecast.

The concluding remarks are that audit switching can impact analyst forecast error, but only when combined with other requirements, such as the switch must happen from Non-Big 4 to Big 4 or that an audit switch is happening because the auditor resigned. In other words this research did not find any significant relation between audit switching and analyst forecast error.

6. Discussion

6.1 Implications

This study does try to find a relation between audit switching and the accuracy of analyst forecasts by collecting and analysing the available data. The study encounters a few limitations that should be considered when reading the research and looking at the results. Firstly, the data collected and used from I/B/E/S and Audit Analytics consist of 582 observations after merging the two datasets. The used data is also US only, making it difficult to conclude other countries. The regulation difference between the US and EU makes it incomparable. The original datasets before merging comprised around one million and seven thousand observations. Hence, the first limiting factor is the relatively low number of observations left after merging. The data consisted of missing values and had compatibility issues around the merging ID (Ticker). The relatively low observations are also because audit switching only happens sometimes, which explains the seven thousand usable audit switching that has taken place between 2000 and 2020. Secondly, the research can have biases. Biases in this research can misrepresent the effects of audit switching on analyst forecast accuracy. The model used in this research tries to mitigate the biases as much as possible. However, biases like firm reputation and what information analysts use for that company are unclear because of the lack of available data. Thirdly the reason behind the switch must be clarified to the outside world. The involved parties do not have to give up the reason for switching. This research assumes that the audit switching has been taking place voluntarily. The auditor resigning data is the only extra factor available, limiting the research in expanding its conclusion. Having the reason behind an audit switch can have an extensive impact on the analyst's perception. An analyst can access this information, so it is an influential factor. The last implication is that the EPS analyst forecast is only taken of the year before the switch to indicate a significant difference; this makes the model sensitive to any external factors that can impact the EPS analyst forecast.

6.2 Future research

For future researchers, it can be beneficial to consider these implications. For the first implication, enlarging the dataset by using a larger time frame or getting access to a more extensive database would solve the low observation issue. Access to the restricted EU database would solve the problem of just having US market data. Rather than relying solely on data from a single country, incorporating data from various countries can account for legal frameworks and cultural context disparities. Doing so can enhance the study's generalizability, as the outcomes may vary across countries. Considering the cross-country differences in legal regimes and cultural norms, examining a broader range of countries can help to create valuable insights into the impact of audit switching. It enables researchers to assess how diverse factors, such as regulations and practices, influence the relationship between audit switching and analyst forecast error. This comparative approach enhances the robustness and applicability of the research findings, providing a more comprehensive understanding of the phenomenon.

The issue of biases is more challenging to solve, but adding the previously named variables would reduce the likelihood of it. Having a survey go around and getting to know the reason for an audit switch would be interesting for future research. Also, making the differentiation

between mandatory and non-mandatory audit switches, because analysts expect a mandatory audit switch, it is interesting to see if it makes a difference in their forecast accuracy.

Also, considering multiple years of EPS forecast before and after the audit switching date could be interesting for future research. It could expose external trends or give more depth to the research by looking at the patterns the accuracy of EPS forecast follows.

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