The effect of the Coronavirus pandemic on audit fees and audit quality

ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

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Name: Vinay Thakoerdin

Student ID   510748

Supervisor: Dr. Yijun Li

Second assessor: Dr. Jaeyoon Yu

Abstract

This thesis examines the effect of the Coronavirus pandemic on audit quality and examines whether audit fee pressure is the case during this event. The assumption is that audit fee pressure and audit quality have a relation with each other. The Coronavirus outbreak started in December 2019 in China. In 2020 the virus was spread to the rest of the world and the pandemic began. This thesis is analysing the difference in audit fee pressure and audit quality in 2020 and 2019. The year 2020 is the central year and 2019 is the control year. This thesis focuses entirely on US audits. Audit fee pressure is measured by the "audit fee pressure model" that is derived from Ettredge et al. (2014). Audit quality is measured with the "Modified Jones Model" by the discretionary accruals. This research provide insights about that audit fee pressure is not the case during the pandemic. However, the evidence is not conclusive. This research also provides conclusive evidence of a decline in audit quality in 2020. Based on this, I show that the Coronavirus pandemic haves a negative effect on US audits. Auditors can consider these results and use them as a basis to improve the quality.

Key words: Coronavirus pandemic, audit quality, audit fee pressure

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1. Introduction

Over the last century there have been different kinds of drastic events. In this research, drastic events are events that have economic consequences for companies. An Event like the most recent Coronavirus pandemic have a lot of effect on companies and people worldwide. Other events that are comparable with this event are the Economic Recession in 2007, Spanish flu outbreak in 1919 and Ebola outbreak in 2014. During these events a lot of businesses have gone bankrupt or are in substantial debt. The government supports companies in need through grants. However, this is not always sufficient to achieve a stable profit. In bad times it is obvious that companies want to survive and stay profitable. Companies could try manipulating the books, so it seems that a drastic event has no impact on the financial numbers. Companies can also present worse numbers than the actual numbers. In this way the financial numbers will look better the next year and they could attract investors or attract more credit from the bank. The accounting term for this practise is called "Big Bath accounting" (Chai & Tung, 2002).

Managers can also try to maximise their bonus compensation by manipulation of the earnings (Guidry et al., 1999). Other researchers have found out that managers manipulate earnings downwards during events with economic consequence to defer the income in the future (Healy, 1985). During events like the Economic Recession, it is necessary that auditors ensure that the financial numbers give a good reflection of the financial picture of a company, else this can lead to decreasing confidence of investors (Bleibtreu & Stefani, 2018).

In 2017 researchers have concluded that the Economic Recession had effect on the auditor's independence (Ettredge, Fuerherm, Guo, & Li, 2017). The auditor's independence has indirect impact on audit quality. If an auditor is not independent, they can oversee potential material misstatements of the client, because they have a less critical view. This is an example of previous research which has demonstrated that an event with economic consequence had effect on audits. However, this research does not elaborate on auditor independence during the Coronavirus pandemic. Other researchers found out that the Economic Recession caused an increase of audit fee pressure. In other words, the event caused budget pressure also called 'irregular auditing'. This had a direct effect to the accounting profession and the businesses who are audited in general (Willet & Page, 1996).

Also, the introduction of social distancing is a consequence of the Coronavirus pandemic. Social distancing is causing that audits must be conducted from a distance. The consequence is that audit firms must invest in digital programs. For example, "Microsoft Teams" to communicate with clients. These costs should be processed in the audit fees. Recent research has shown that social distancing had effect on the going concern assessment, audit procedures, audit human capital and audit effort. In the present the Coronavirus is affecting the whole world. A lot of companies are being funded by the government to stay on their feet. During this period, it is important to maintain high audit quality and to prevent audit fee pressure (Albitar, Gerged, Kikhia, & Hussainey, 2020).

This thesis is about the issue whether auditors can maintain a high audit quality and can counter audit fee pressure during the Coronavirus pandemic. The Coronavirus outbreak started in December 2019 in China. In 2020 the virus was spread to the rest of the world and the pandemic began. Further in this year there were lockdowns and actions to contain the virus, which influenced businesses. This is also the year when the pandemic started in the United States (hereafter: US), which is the main focus of this research.

It is interesting to know what the effect is of the Coronavirus pandemic on audits. Like mentioned above previous research have shown a decrease in audit quality during the Recession. This event also caused a worldwide impact, just like the Recession. This differs from the Spanish Flu outbreak and Ebola outbreak which mainly effected Europe and Africa. However, if the Recession is set against the pandemic there are also differences. Firstly, the introduction of working at home and the use of digital tools changed the approach of the audit. Another factor is that the government provides support packages for companies. The latter was not case during the Recession, which point out that companies had to sustain themselves. This provides a distinction from previous studies on events and audit quality.

The focus of this thesis is the capability of auditors of timely adjusting to the circumstances to maintain a high audit quality during the Coronavirus pandemic. The circumstances during this event are more complex because of increasing risks characteristics and potential audit fee pressure. The expectation is that increasing risks characteristics will lead to additional costs in the audit fees, because of the additional work that is performed. Thus, this thesis is also investigating the audit fees. Also, regulations like social distancing and evaluation on grants provided by the government could lead to more audit effort, resulting in higher audit fees.

The main goal of this research is to make assumptions about potential effects of the Coronavirus pandemic on audit quality and audit fee pressure. The downside is that there is limited data available about this pandemic because it started in December 2019 and this research started in 2021. For this reason, there is a lack of long-term data.

This research is investigating the audit quality and audit fees during the Coronavirus pandemic. The following research question is answered in this thesis:

Research Question: Does the Coronavirus pandemic influence the audit quality and audit fees?

To answer the main question, it is divided in sub-questions:

1. Is there a relation between audit fee pressure and the Coronavirus pandemic?
2. Is there a positive or negative relation between audit quality and the Coronavirus pandemic?

This research is a contribution to a broad range of prior literature about the financial crisis and other events that have an impact on audits in general. There are researchers that have examined the risk characteristics of audits before and after the Economic Recession. They concluded that the risk characteristics overall stayed the same. This gives indications that the risk assessment is not adjusted in time during a drastic event. The big 4 firms for example accepted more clients with higher risk with the consequence of more auditor business risk. In such times it is important to have a strict audit quality and be aware of threats of the audit quality. (Schroeder & Hogan, 2013).

This is the first research to investigate the Coronavirus pandemic and to measure the consequence on the audit quality and audit fees of companies of the US. As mentioned above the pandemic differs from other events that are examined in the past, because of the introduction of social distance, the use of digital tools and government support. This makes it interesting to know whether the audit quality remains at a sufficient level. The expectation is that auditors are more critical during events, and they can adjust timely to the circumstances. This research is examining this expectation. In this way this research gives a contribution to the accounting professional and literature about how to respond to events with economic consequences in general. This research also gives insights about how to react to comparable events that can occur in the future.

Chapter 2 describes the theories that are applied as a framework for audit quality and audit fees. First, chapter two describes the definitions of audit quality and audit fees and elaborates which proxies/models are the most appropriate for these variables. This is the theoretical basis for this research.

Chapter 3 contains the hypotheses development, which describes the hypotheses that are empirically tested with the extracted data of US companies. Furthermore, this chapter clarifies the hypotheses.

Chapter 4 describes the methodology that is used for this research, regarding to the audit fees and audit quality.

Chapter 5 contains the results of the analysis of the empirically tests that are used to examine the association between audit quality and audit fees during the Coronavirus pandemic. This chapter also confirms or rejects the stated hypotheses.

Chapter 6 contains the overall conclusion of the research.

2. Theoretical background

This chapter will discuss the theoretical framework underlying this research. On the basis of this framework this thesis will formulate hypotheses in chapter 3. Section 2.1 will describe audit quality. Section 2.2 will describe the components of audit fees. Paragraph 2.3 will describe the relation of events with audit quality and audit fee pressure.

2.1 Audit quality

The definition of audit quality is: The quality of audit services is defined as the market's perception of the probability that auditors will detect deficiencies in the clients accounting system and report about these deficiencies (DeAngelo, 1981).

For this research, it is important to have a sufficient measurement for audit quality. Researchers have measured audit quality with different methods. A proxy that is often used to measure audit quality is "Earnings Management". Earnings management can be measured by the discretionary accrual method. If the financial statements contain a high quantity of discretionary accruals this gives indications of earnings management or in other words, the management is controlling the result. Discretionary accruals are the accruals that can be engineered by the management. A high-quality audit services should lead to a decreasing quantity of discretionary accruals or earnings management (Schipper, 1989). Accruals can be divided into non-discretionary and discretionary accruals. A certain level of accruals is expected for every company, based on the scale on which it operates and the value of its assets. The non-discretionary accruals can not be controlled by the management. The discretionary accruals can be used to steer its accruals and thereby its results (Bauwhede 2003). Past research has shown that earnings management and audit quality have a direct connection (Francis, 2011). Different kinds of accruals models try to examine whether there is a connection between the discretionary accruals and earnings management.

The total accruals are described as the gap between the net income before extraordinary items and cash flow from operations (Becker, DeFond, Jiambalco, and Subramanyan, 1998). Since only the total accruals can be measured, the discretionary accruals will have to be estimated with a OLS regression. The non-discretionary accruals are calculated by subtracting the estimated discretionary accruals (DA) of the total accruals (TA).

2.1.1 Detection of audit quality models

This section will discuss, which model is sufficient to measure audit quality. Different researchers have developed accruals models. This section will discuss the most relevant accruals models and balance them with each other. The models in question concern DeAngelo model (1986), Healy model (1985), Jones model (1991) and Modified Jones model (1995).

2.1.1.1 DeAngelo model (1986)

This section will discuss the DeAngelo model. This model defines the discretionary accruals as the change in the total accruals during a particular time-period. DeAngelo model is assuming that the most current period is not containing any earnings management or discretionary accruals and can be used as proxy for non-discretionary accruals. Kaplan (1985) discussed this assumption and stated that the non-discretionary accruals are never equal to zero. Following this model may have the consequence that non-discretionary accruals could classify as discretionary accruals.

2.1.1.2 Healy model (1985)

The Healy model is the first accrual model that is estimating deviations from normal levels of accruals. This model separates the earnings into non-discretionary accruals, discretionary accruals, and cash flows. This component is measured by taking the average total accruals from a period, where is assumed that the non-discretionary accruals are constant and therefore TA=DA. Kaplan (1985) also discussed this assumption because non-discretionary accruals change if economic conditions are changing, and non-discretionary accruals are never constant.

2.1.1.3 Jones model (1991)

The Jones model is a more advanced model, which is trying to take account with changes in a firm's economic conditions on non-discretionary accruals. This model is using the changes in "Revenues", "Plant, Property and equipment (PPE)" to predict the total accruals. The revenues are used to control for the unmanaged level of current accruals. PPE is used to control for the portion of the total accruals associated to the depreciation's expenses. So, the Jones model compared to the DeAngelo model is using more components to improve the estimations of the accruals. By adding more variables in the model, it is possible to adapt the non-discretionary accruals by economic conditions. However, Dechow et al (1995) discussed the weakness of this model because there is assumed that revenue changes only contain non-

discretionary accruals, while sales manipulation for instance is the impact of the presence discretionary accruals.

2.1.1.4 Modified Jones Model (1995)

A Model that is frequently used in previous research is the Modified-Jones model. As described in the previous section the criticism on the Jones model is that this model excludes the impact of sales manipulation. Researchers have found out that earnings management can occur trough sales manipulation (Marquardt and Wiedman 2004). To take account with this order Dechow et al. (1995) changed the estimation formula of the Jones model (1991). They included the change in the net receivables scaled by the total assets. The result is that estimation of the accruals will no longer be biased by sales manipulation. Research have concluded that the Modified Jones Model is the most proficient method to detect manipulations of accruals (Dechow et al, 1995).

2.2 Audit Fees

Audit fees are defined as the monetary fees audit firms received from delivering audit services. In other words, the price that is paid for the audit service. The audit fees are determined by the size of the client, inherent risk, and audit complexity (Simunic, 1980; Hay, 2013). As mentioned above during drastic events client become a higher risk. Higher risk clients need a higher quality audit. The consequence is a larger audit effort and higher audit fees (Corbella, Florio, Gotti, & Mastrolia, 2015). Risk is important component because it is hard to determine. This component reflects to companies that are performing worser that in the past. The consequence is that the risk for the auditor is higher, and this causes a higher audit fee (Hay et al.,2006). Another factor is improvement in the operating performance. If a company grows or expands the audit fee can also be increased, because of the improvement of the complexity of the audit service. Audit fee is an important subject to investigate because it has an associating with the audit quality. If the audit fees are high enough the audit service can be performed with a good audit quality. If the audit fees are too low this can cause a low audit quality because there is not enough budget. In practise, it is difficult to determine what kind of audit fee is consent. An alternative for this is hourly billing, but client do not want this uncertainty about the audit costs.

Also, the performance of the client is a determinant of the audit fee. If there is more profit generated, there is required a more extensively revenue recognition and more time. Other

factors that are related to the audit fees are growth and the fiscal year-end. Companies that in general experience a lot of grow are more complexed, which lead to more risk and higher audit fees. Fiscal year-end is a factor because most companies end their fiscal year on December 31st. In this season also called the busy season there is a high demand of audits. This causes higher audit fees (Gonthier-Bescacier & Schatt, 2007).

In 2000 the Securities and Exchange Commission (SEC) obligated it for firm to disclose their audit fees (Francis, Wang, Mayhew, 2005). The data regarding audit fees is available within Wharton Data Services. The level of the audit fees depends on different factors like the growth of the company, assets and the complexity of the business as mentioned above. For this research the audit fee is measured in the relative way by looking at the associating with the revenue.

The determination of the quantity of the audit fee is an important subject to get more insight if there is possible audit fee pressure effect during an event. Researchers have investigated this subject and find out that the quantity of the audit services and unit price are factors to determine the audit fees. Shortly the expected time to perform the audit is crucial for the determination of the audit fees (Simunic, 1980).

2.2.1 Audit fee pressure

Audit fee pressure is the case when a client is trying to pressure the auditor to reduce the audit fee. Reducing the audit fee causes that the auditors have fewer time to perform the audit. Previous research suggests that there is an increase in audit fee pressure during economic downturns. In 2010 the Public Company Accounting Oversight Board (PCAOB) also had attention for this subject and had concerns about companies that pressure audit firms to reduce the audit fee. This pressure can reduce audit procedures and can influence the audit quality (PCAOB, 2010). Houston (1999) found out that when audit fee pressure is the case this affects the auditor's responsiveness to risk (Beardsley, Lassila, Omer, 2019). Ettredge et al (2014) found out that during the Economic Recession of 2008 there were more misstatements among client that exerted fee pressure.

This research is applying the same method, regarding to the audit fee pressure model that is applied in the research "Fee pressure and audit quality" written by Michael Ettredge, Elizabeth Emeigh Fuerherm and Chan Li. The beforementioned researchers have investigated audit fee pressure during the Economic Recession by looking at cost drivers for audit fees.

They calculated a benchmark fee based on these cost drivers and than compared it with the actual fee. If the actual fee equals or exceeds the benchmark fee, the conclusion is that there is no fee pressure. In a situation where the audit fee cost drivers are increased, and the actual fee is lower than the benchmark fee there are indications of audit fee pressure. Fee pressure also is the case when there is a fee reduction and no corresponding decrease in the audit fee cost drivers. This research is using the same methodology the researchers mentioned above used. A multivariate model is used to map the various audit fee cost drivers. The audit fee pressure proxy is derived from a log-log audit fee model.

2.3 The Event: The Coronavirus outbreak

The Coronavirus pandemic is a drastic event. This event has a lot of impact on companies. The lockdown forced a lot of companies to be closed and the introduction of social distancing caused that audits have do be performed at a distance. To perform an audit at distance it will lead to changes in audit procedures and audit fees. For example, audit firms must invest in digital programs like Microsoft Teams to communicate with companies. Also, a lot of companies receive grants from the government, because of sales decline due to the Coronavirus pandemic. These grants must be processed correctly in the financial statements, with the consequence that there is needed more audit effort.

Another factor for more audit effort is the increase in time an auditor needs to perform the audit. Normally, the auditor visits the client and there is direct communication. During the pandemic communication takes place through applications like Microsoft Teams or Microsoft Outlook. Communication in this way takes more time and effort. These costs must be processed in the audit fees charged to the companies and should create an increase in audit fees. If there is no increase in the audit fees, this can indicate audit fee pressure. This is the case when a client is trying to pressure the auditor to reduce the audit fee. Reducing the audit fee causes that the auditors have fewer time to perform the audit, which indirectly also effect the audit quality.

Previous research has shown that an event like the Recession had caused audit fee pressure (Ettredge, Fuerherm, Guo, & Li, 2017). However, during the Coronavirus pandemic the government provide grants for companies. These grants ensure that companies are

compensated for the loss caused by the pandemic. Therefore, there is expected that there is no association of audit fee pressure during the Coronavirus pandemic.

It is also a challenge to maintain high audit quality with the work-home-strategy. Research have concluded that social distancing influences the going concern assessment, audit procedures, audit human capital and audit effort (Albitar, Gerged, Kikhia, & Hussainey, 2020). It is understandable that the audit procedures are influenced because there is no physical visit to the client. For example, visiting the annual stock inventory is not always possible. As a result, audit firms need to innovate and conduct such work through digital tools. For instance, the use of drones. The downside is that not all auditing companies are already so innovated. For this reason, audit quality is expected to decline during the Coronavirus pandemic.

In other studies researchers have examined that there could be a lack of criticism in the auditing profession during a crisis or event (Humphrey, Loft, & Woods, 2009). The Coronavirus pandemic is obviously a unique event. Never has a virus such an impact on the entire world. The previous study concluded that a crisis or event have a negative relation with the Recession, which mainly caused economic damage. In the case of the Coronavirus pandemic, the economic damage is limited.

It is also important that auditors remain critical and properly implement the applicable reporting laws and regulations regarding to the financial statements. For now, companies receive grants from the government to stay afloat. At some point, the grants run out and the continuity of the companies will be an issue. It is important for auditors to remain a high audit quality to detect such issues on time. On the other hand, it is also possible that an event is occurring because of the implementation of a low-quality audit. Researchers have found out that there is an associating with low value of external audits and accounting scandals. In the research is concluded that there is a higher risk of accounting scandals when there is a low external audit. This is an example where low audit quality can lead to a drastic event (Sercu, Bauwhede, & Willekens, 2006). It is crucial that the audit quality remains high during the Coronavirus pandemic, otherwise this can lead to scandals.

To our knowledge there is no academic research that investigates the impact of the Coronavirus pandemic on the audit fees and audit quality of companies of the US. Therefore, this paper is an addition to the auditing literature. As of present, few studies have been done on the impact of the Coronavirus outbreak on audit quality. For example, there has been

research about the impact of the Coronavirus Pandemic on audit quality in Jordan. However, this study is very limited and is based on telephone contact with six audit firms. The firms that are contacted by the researcher confirmed that the Coronavirus pandemic affected the audit quality in Jordan. For example, it was harder for auditors to collect proper evidence by social distancing, which can lead to false audit opinions (Saleem, 2021). Another research that is done about this subject is about the impact of the Coronavirus pandemic on audit quality on Saudi auditors. The researcher found out that there is a significant impact on audit fees, audit measures, going concern opinion and human resources (Akrimi, 2021). However, this research is also limited and is based on eighty-nine Saudi auditors. This thesis is focusing on US firms and is using a larger sample. The Coronavirus pandemic is an event that is occurring in the present. The downside is that there is limited data available because the pandemic started on December 2019 and is still occurring in the present. For this reason, there is a lack of long-term data. In contrast there is enough pre-data available.

3. Hypothesis Development

Based on the theorical framework that is discussed in the previous chapter, this section will formulate the hypotheses. These hypotheses will give an answer to the following research question:

"Does the Coronavirus pandemic influence the audit quality and audit fees?"

As mentioned in the theoretical background events can have consequences for the audit quality. Another consequence is that audit fee pressure can also occur during this time. This is the case when a client is trying to pressure the auditor into reducing the audit fee. Reducing the audit fee causes that auditors have fewer time to perform the audit, which indirectly also effect the audit quality. Another factor is the decrease in receivables for the audit firm. This can cause that auditing firms accept risky client to generate any revenue. The Coronavirus pandemic is causing an increased risk by clients. It is necessary that auditors adjust their risk assessment to maintain high audit quality. This research will examine audit fee pressure during the Coronavirus pandemic and will research if there is positive relation.

Based on the above, this thesis investigates the following hypotheses:

H1: There is a positive relation between audit fee pressure and the Coronavirus pandemic.

This thesis first investigates whether audit fee pressure have occurred during the Coronavirus pandemic. The method that is used in this research is based on the audit fee pressure model used in the research "Fee pressure and audit quality" written by Michael Ettredge, Elizabeth Emeigh Fuerherm and Chan Li. Based on hypothesis one, this thesis is investigating whether there is a positive relation between audit fee pressure and the Coronavirus pandemic. This will give more insights about whether there occurred audit fee pressure during the pandemic. It should be considered that the government are providing grants to support companies. This is what the government is doing to compensate losses for companies due to the pandemic. Therefore, the expectation is that audit fee pressure is not the case during the pandemic. However, previous research has shown a positive relation between an event with an economic impact like the Recession and audit fee pressure. For this reason, it is necessary to investigate the audit fee pressure during the pandemic.

H2: There is a negative relation between audit quality and the Coronavirus pandemic.

Explanatory note hypothesis 2

The second step is to investigate whether there is a decrease in audit quality during the Coronavirus pandemic. Unlike the research "Fee pressure and audit quality", where the misstatements are used to measure the audit quality, the Modified Jones Model is applied. The reason for this, is because previous research has concluded that the Modified Jones Model is the most proficient method to detect manipulations of accruals (Dechow et al, 1995). Based on hypotheses two, there is expected that there is a negative relation between audit quality and the Coronavirus pandemic. The reason for this expectation is related to the actions against the pandemic. Actions like working from home and social distance, make it more complicated to conduct an audit. For instance, a physical visit is not always possible. Due to these aspects, it is expected that this will have a negative impact on audit quality.

4. Research design

This chapter will describe the research design and methodology. Section 4.1 will explain the conceptual model, which is the basis of this research. The following sections will explain the methodology, sample, and regression models.
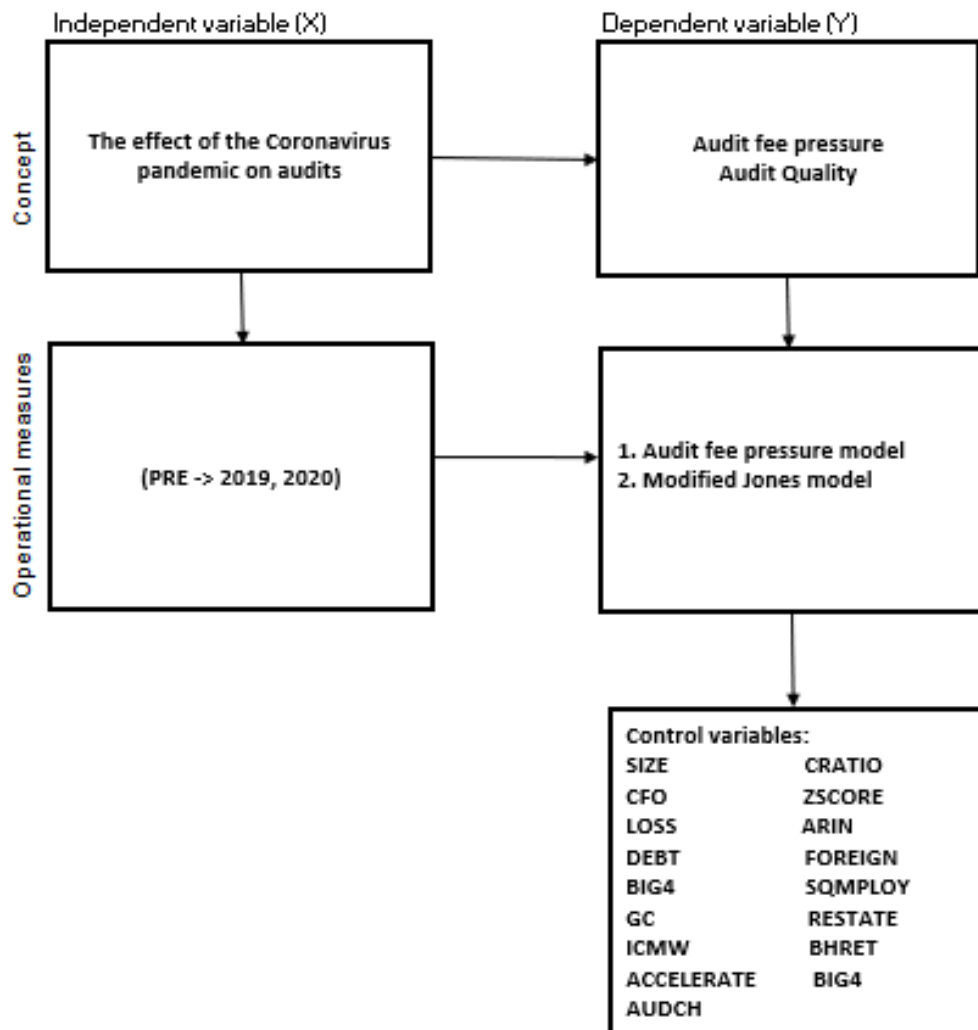
4.1 Conceptual model

This thesis is examining the effect of the Coronavirus pandemic on the audit quality and audit fee pressure by applying an event study.

This thesis is examining the following components that are displayed in the "Libby" box. See table 2 for the definitions of the control variables

Figure 1
Libby box

The effect of the Coronavirus pandemic on audits is measured by looking at if there is audit fee pressure during and a decrease in audit quality during the event. This thesis is measuring the audit fee pressure by an audit fee model and the audit quality by the Modified Jones Model. Section 4.3.1 and 4.3.2 will explain these models. The models mentioned before are applied in the year before the Coronavirus pandemic started, which is 2019 and the year 2020, which is the year when this event started to have an impact on the world.

4.2 Sample selection and Data

A sample is obtained from public companies that has been extracted from Audit Analytics and Compustat from 2019 and 2020. The disadvantage is that there is no long-term information available about the event. The sample consist of firms from the United States. The Coronavirus outbreak affects more countries than the US, but this research is focusing on US-firms. The reason for this is the Wharton Research Data Services (WRDS) databank only provides the necessary data for these firms. So, due to data availability the sample consists of US-firms only. Financial services firms are excluded in this sample because they deviate from normal business operations. The industry can be characterized by all firms within the four-digit Standard Industry Classification code (SIC code).

Table 1
Sample selection

Companies covered by Audit Analytics and Compustat	9.254
Less: Financial services (SIC 6000-6999) and companies with no TIC-number	2.728
Less: companies without current year (2020) and previous year (2019) audit fees data	50
Less: companies without necessary audit and financial data	2.791
Companies with all necessary data 2020 to investigate hypothesis 1	3.685
Companies with all necessary data 2020 to investigate hypothesis 2	3.760
Companies with the same TIC-number year 2019 (for benchmark purposes)	4.255
Companies with the same TIC-number year 2018 (for investigating hypothesis 2)	2.157

Note: Table 1 reports the sample selection process. The sample consists of US companies included in Audit Analytics and Compustat database. Companies with missing data and financial service companies are excluded.

4.3 Methodology

To find out whether there is audit fee pressure and decrease in audit quality two measurements are used in this research. The measurement for audit fee pressure is the benchmark fee. In a normal situation the auditors should increase the audit fee when the complexity of the audit is higher. For example, when there is a drastic event with economic consequence this could make the audit more complicated. This will lead to more audit effort and therefore it is necessary to require more audit fee. The benchmark method will examine the year before the event and during the event. If there is an increased complexity for example by a drastic event the fee should be higher. If there is no reaction and the fee stays stable or lower there are indications for fee pressure. The altitude of the audit fees is based on different kind of factors. The size of the company, risk and complexity are such kind of factors. For example, if a company is getting smaller, then there are fewer accounting entries to examine. This can cause a decrease in audit fees.

On the other hand, the audit fee can increase, when a company is getting more complex. For instance, when a company has acquired another company. This will cause more work for the auditor. Auditors often respond to the before mentioned factors by increasing/decreasing the audit fees (Raghunandan & Rama,2006; Simunic, 1980).

4.3.1 Audit fee pressure model

For this research the research "Fee pressure and audit quality" written by Michael Ettredge, Elizabeth Emeigh Fuerherm and Chan Li is used as guideline. The beforementioned researchers have investigated audit fee pressure during the Economic Recession by looking at several cost drivers. They calculated a benchmark fee by the cost drivers and than compared it with the actual fee. If the actual fee equals or exceeds the benchmark fee, the conclusion is that there is no benchmark fee. In a situation where the audit fee cost drivers are increased, and the actual fee is lower than the benchmark fee there are indications of audit fee pressure. Fee pressure also is the case when there is a fee reduction and no corresponding decrease in the audit fee cost drivers. This estimation of the benchmark fee is based on the data of 2019. This research is using the same methodology the researchers mentioned above used. A multivariate model is used to map the various audit fee cost drivers. The audit fee pressure proxy is derived from a log-log audit fee model.

The following model is used:

$$Ln(AUDITFEE) = \beta_0 + \beta_1 Ln(AT) + \beta_2 LOSS + \beta_3 CRATIO + \beta_4 ZSCORE + \beta_5 CFO + \beta_6 ARIN + \beta_7 FOREIGN + \beta_8 SQEMPLOY + \beta_9 GC + \beta_{10} ACCELERATE + \beta_{11} ICMW + \beta_{12} RESTATE + \beta_{13} BHRET + \beta_{14} BIG4 + \beta_{15} AUDCHG + \epsilon_t \ (1)$$

The first control variable that is included is the variable "Size" (*LnAT)*. If a company is a larger there is needed more audit effort. The total assets are an indicator for size of a company and is a significant predictor of audit fees (Picconi and Reynolds, 2013). In general, larger companies need more audit effort and have higher assets. Also, there are control variables included for financial factors like a companies reported losses *(LOSS),* the probability of bankruptcy score *(ZSCORE),* the current ratio (*CRATIO*) and the operating cash flow (*CFO*). The reason for this is because companies with worse financial conditions have more financial risk with the consequence that more audit effort is needed. Like mentioned above companies that are more complex have higher audit fees. For complexity model 1 includes the presence of foreign transactions (*FOREIGN*), accounts receivables and inventories (*ARIN)* and the square root of employees (*SQEMPLOY)*. These variables are included because it is related to the resources an auditor has to deploy to audit all risky or material components. Also, there is included a variable for returns on stocks *(BHRET)*. Companies which in general have positive stock returns have lower audit fees (Whisenant et al, 2003). There are included variables which are connected with the audit. These are Accelerated filers (*ACCELERATE*), internal control material weakness (*ICMW*), issuance going concern opinion (*GC*) and restatements (*RESTATE*). The variable "*ACCELERATE*" is included because accelerated filers are in general larger companies and have shorter reporting deadlines. This indicated that the companies may be under greater scrutiny from regulators. The variables *GC*, *ICMW* and *RESTATE* are included because when this is the case it will lead to more audit effort. For example, if there is an internal control material weakness the auditor has to perform more work because of the audit risk factors. Further the variables type of auditor (*BIG4)* and auditor change (*AUDCHG*). Big 4 auditors in general have a relation with fee premiums and auditor change can lead to change in the audit fees due to negotiation (Whisenant et al, 2003).

In the research by Ettredge et al. (2014) there are used more variables in the multivariate regression. This research has deviated by omitting some variables like geographic segment (*SEG*), reporting lag (*RLAG*) and Industry Opportunity Set (*IOS*) because the lack of data of 2020 during the time the data is extracted. This is also a is limited research there are applied

sufficient enough variables for each audit fee cost driver. This is sufficient enough to make assumptions about audit fee pressure.

4.3.2 Audit quality model

As mentioned before this research uses the Modified Jones Model developed by Dechow et al (1995). This model divides the total accrual into the discretionary accruals and non-discretionary accrual. This thesis is using the discretionary accruals as the proxy for audit quality. This is a common proxy for audit quality and data about this proxy is available within the used database. Discretionary accruals are accruals that can be influenced by the financial manager. Therefore, this can lead to earnings management. If there is an increase in discretionary accruals there can be more possibilities for earnings management. This indicates a decrease of audit quality (Bartov et al, 2000).

To measure the discretionary accruals the following steps are followed:

1. To following formula is used to determine the total accruals:

$$TACC_t = \Delta CA_t - \Delta Cash_t - \Delta CL_t + \Delta STD_t - Dep_t \ (2)$$

$TACC_t$ *Total accruals in year $_t$*

ΔCA_t *Change in current assets in year $_t$*

$\Delta Cash_t$ *Change in cash and cash equivalents in year $_t$*

ΔCL_t *Change in current liabilities in year $_t$*

ΔSTD_t *Change in short term debt included in current liabilities in year $_t$*

Dep_t *Depreciation and amortization expense in year $_t$*

2. The following regression is used to determine the parameters:

$$\frac{TACC_t}{A_{t-1}} = \beta1 \frac{1}{A_{t-1}} + \beta2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \beta3 \frac{PPE_t}{A_{t-1}} + \epsilon_t \text{ (3)}$$

TA_t *Total accruals scaled by lagged total assets at t-1*

A_{t-1} *Total assets at t-1*

ΔREV_t *Revenues in year t less revenues in year t-1 scaled by total assets at t-1*

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

ϵ_t *Error term*

3. The following formula is used to calculate the discretionary accruals:

$$DACC_t = TACC_t - NDACC_t \text{ (4)}$$

$DACC_t$ Discretionary accrual in year t

$TACC_t$ Total accruals in year t

$NDACC_t$ Non-discretionary accrual in year t

3. To following formula is used to estimate the non-discretionary accruals:

$$NDACC_t = DACC_t - TACC_t \text{(5)}$$

$NDACC_t$ Non-discretionary accrual in year t

$DACC_t$ Discretionary accrual in year t

$TACC_t$ Total accruals in year t

Based on the above-mentioned formulas the discretionary accruals are calculated. By including control variables this thesis will examine whether there is an associating with audit quality and the Coronavirus pandemic. The control variables are fee pressure, size, operating cash flows, and debt. Fee pressure is included because as mentioned before fee pressure and audit quality have an indirect impact on each other. The control variable "*SIZE*" is included because larger companies have more advanced control systems and are capable to use more resources for financial reporting. This means that larger clients in general have a higher audit quality. Researcher have found out that there is a positive associating between the discretionary accruals and the firm size (Newton et al., 2013). The natural logarithm of total assets is the indicator of the variable Size (*SIZE).* This is often used as an indicator of the size in several previous research. The next control variable is the operating cash flow (*CFO).* This variable is included because companies with poor financial conditions have a higher risk of bankruptcy. This leads to more audit effort (Ettredge et al., 2014). Also, the variable debt (*DEBT)* is included because firms with external financing may have greater incentive to manage earnings. Firms with more debt are also associated with a low audit quality (Richardson et al., 2002). This indicates that a firm with more debt has higher discretionary accruals. The operating cashflows and debts are divided by the total assets, which is done is most researchers that use these variables (Carey and Simnett, 2006). Lastly the control variable (*BIG4*) is included, as a dummy variable where 1 stand for the presence of a big four auditor and zero otherwise. In general audits performed by the big four are associated with higher audit quality (Hussainey, 2009). This thesis is applying the following multivariate regression based on the information mentioned above:

Audit quality = β_0 + β_1FEEPRESSURE + β_2SIZE + β_3CFO + β_4DEBT + β_5BIG4 + ϵ_t (6)

Audit quality   *The proxy for audit quality are the discretionary accruals*

Fee pressure   *Fee pressure measure scaled by total assets*

Size   *Natural logarithm of total assets*

CFO   *Operating cash flows divided by total assets*

DEBT   *Debts divided by total assets*

BIG 4   *1 for BIG 4 and zero otherwise.*

4.3.3 Summary of the definitions of the variables

Table 2
Definitions of variables

Variable	Definitions
LN(AUDITFEE)	Natural logarithm of total audit fees paid to the auditor
Ln(AT)	Natural logarithm of total assets
LOSS	Indicator for loss, equals 1 for company reporting losses and zero otherwise
CRATIO	The current ratio calculated by dividing the current assets by the current liabilities
ZSCORE	The probability of bankruptcy score. The Z-score is calculated by the following formula: -4,3 – 4,5 * (net income/ total assets) + 5,7 * (total debt/ total assets) – 0,004 * (current assets/current labilities) (Zmijewski, 1984)
CFO	The cash flow is calculated by the operating cashflow divided by total assets in year t
FOREIGN	Indicator for foreign transactions, equals 1 if the company has foreign transactions zero otherwise
ARIN	Accounts receivable plus inventories divided by the total assets
SQEMPLOY	The square root of the quantity of employees in year t
GC	Equals 1 if the company received a going concern modified opinion in year t and zero otherwise.
ACCELERATE	Indicator for if the company is an accelerated filer. Equals 1 if this is the case, zero otherwise.
ICMW	Indicator for internal control material weakness. Equals 1 when the company reported this and zero otherwise.
RESTATE	Equals 1 when the company announced restatements and zero otherwise.
BHRET	Buy and hold stock returns in year t
BIG4	Indicator for whether the auditor is a big four firm. Equals 1 for BIG 4 and zero otherwise.
AUDCHG	Indicator for whether there has been an auditor change. Equals 1 for auditor change and zero otherwise.
DEBT	Debts divided by total assets
$TACC_t$	Total accruals
ΔCA_t	Change in current assets year t
$\Delta CASH_t$	Change in cash and cash equivalents in year t
ΔCL_t	Change in current liabilities in year t
ΔSTD_t	Change in short term debt included in current liabilities in year t
DEP_t	Depreciation and amortization expense in year t
Ta_t	Total accruals scaled by lagged total assets at t-1
A_{t-1}	Total assets at t-1
ΔREV_t	Revenues in year t less revenues in year t-1 scaled by total assets at t-1
PPE_t	Gross property plant and equipment in year t scaled by total assets at t-1
DACC	Discretionary accruals
NDACC	Non- discretionary accruals

5. Results and analysis

This chapter will describe the results of the regression analysis and the corresponding descriptive statistics. This thesis is investigating two hypotheses to give an answer to the following research question:

Does the Coronavirus pandemic influence the audit quality and audit fees?

5.1 Results hypothesis 1

This thesis is investigating the effect of the Coronavirus pandemic on audit fees by the following hypothesis:

H1: There is a positive relation between audit fee pressure and the Coronavirus pandemic.

Using Stata, the following multivariate regression has been extracted

$$Ln(AUDITFEE) = \beta_0 + \beta_1 Ln(AT) + \beta_2 LOSS + \beta_3 CRATIO + \beta_4 ZSCORE + \beta_5 CFO + \beta_6 ARIN + \beta_7 FOREIGN + \beta_8 SQEMPLOY + \beta_9 GC + \beta_{10} ACCELERATE + \beta_{11} ICMW + \beta_{12} RESTATE + \beta_{13} BHRET + \beta_{14} BIG4 + \beta_{15} AUDCHG + \epsilon_t\ (1)$$

Table 3
Benchmark fee 2020 set against the actual fee 2020

2020	
N= 3.685	
Firms with indication positive audit fee pressure	828 firms
Firms with no indication audit fee pressure	2.857 firms
Mean companies audit fee pressure	$ 456.359
Median companies audit fee pressure	$ 175.473

Note: Table 3 shows the results of the benchmark fee 2020 set against the actual fee in 2020 for companies from the US. Companies that exerted audit fee pressure have a lower actual fee in 2020, than the calculated benchmark fee. The benchmark fee is calculated based on several cost drivers mentioned in model 1 and data of 2019. This table displays that 828 firms of the 3.685 firms potentially exerted audit fee pressure, which is 22%.

On the basis of these components, a benchmark fee is calculated and set against the actual fee in 2020 for each firm. The results of table 3 gives an indication that 828 of the companies exerted fee pressure in 2020, which is 22%. The median of fee pressure is $ 175.473. To calculate the fee pressure measure it is scaled by the total assets.

Table 4
Descriptive statistics for fee pressure metric

	2020			2019			Differences in means	
	N= 3.685			N= 4.255				
	Mean	Median	Std. Dev	Mean	Median	Std. Dev	p-Value	t-statistic
Panel A: Comparison fee pressure metric for 2020 vs. 2019								
Fee pressure	-0,284	0,002	5,433	-0,030	0,001	1,179	0,190	-1,312

Note: This table is a follow-up of table 3 and shows descriptive statistics for the audit fee pressure metric during 2020 and 2019. The audit fee pressure metric is scaled by the total assets. The difference in means is also displayed.

In December 2019 the Coronavirus outbreak began in China and the news spread out. This is the last month of 2019 and in 2020 the Coronavirus outbreak began in the US. Therefore, only the years 2019 and 2020 are included in the sample. In table 4 the differences of the means are displayed compared to 2020. In 2020 the Coronavirus outbreak had effect in the US, so this is the principal year. The expectation is that there will be no predominant fee pressure in 2020 compared to the years before. From table 4 can be inferred that the mean of 2020 is more negative than the mean of 2019. The mean in 2020 is -0,284 compared to the mean in 2019 which is – 0,030. Less negative means indicate no audit fee pressure during 2020. On the other hand, the median is increased with 0,001 to 0,002 in 2020. This gives a contradictory effect. However, the change of the mean is higher than the change of the median. Based on the mean there can be concluded that there is no audit fee pressure in 2020. Another point to consider is that there is no significance associating. As mentioned earlier, the same methodology is used as in the study "Fee pressure and audit quality" written by Michael Ettredge, Elizabeth Emeigh Fuerherm and Chan Li. In this research a significance was demonstrated. The reason for this difference can be due to the use of a different population in this research.

To demonstrate the effect of the Coronavirus pandemic on audits, it is useful to know if there is audit fee pressure. The actions against the pandemic like lockdowns and social distancing has created financial pressure for companies, which can lead to audit fee pressure. Audit fee pressure caused that an auditor has less effort to perform the audit, than what is actually required. This will lead to lower audit quality, which is further analysed by hypothesis 2. See table 5 for the results of the log-log model.

Table 5
Log-log audit fee model (1)

Variables	Pandemic period (2020)		Pre-pandemic period (2019)		(3) = (1) – (2)
	(1)		(2)		
	Coeff	t-Stat	Coeff	t-Stat	Difference
Intercept	10,328	199,72***	10,562	215,88***	-0,234**
LnAT	0,441	49,57***	0,409	49,73***	0,032***
LOSS	0,181	7,16***	0,180	6,72***	0,001***
CRATIO	-0,010	-7,10***	-0,011	-5,09***	0,001***
ZSCORE	-0,002	1,57	0,003	2,78***	-0,005***
CFO	-0,156	-5,15***	-0,010	-2,91***	-0,146***
ARIN	0,889	11,73***	0,234	5,39***	0,655***
FOREIGN	-0,022	-0,70	0,000	0,01	-0,022
SQEMPLOY	0,043	7,44***	0,046	9,12***	-0,003***
GC	-0,015	-0,92	-0,008	-0,88	-0,007
ACCELERATE	0,056	1,65**	0,142	3,90**	-0,086**
ICMW	-0,028	-0,87	-0,014	-0,77	-0,014
RESTATE	-0,332	-1,26	0,096	2,45**	-0,428**
BHRET	-0,000	-0,26	0,000	1,66*	0,000**
BIG4	0,505	15,89***	0,455	13,74***	0,050***
AUDCHG	-0,287	-7,16***	-0,356	-8,35***	0,069***
N	3.310		3.713		
F value	1145***		1227***		
R-squared	0,819		0,812		
Adjusted R^2	0,818		0,811		

*Note: The dependent variable is the natural logarithm of the total audit fees. See table 2 for the definitions of the variables and table 1 for the sample selection process. Table 5 shows the results of the multivariate model (1), investigating the effect of audit fee pressure during the Coronavirus pandemic by the determinants of audit fees for US companies. Column 1 shows the results of 2020(pandemic period) and Column 2 the results of 2019 (pre-pandemic period). Column 3 reports the differences in the coefficients. *** < 0,01 level, ** <0,05 level and * < 0,10 level.*

An important factor of the regression model is the explanatory power of the regression model. The regression model has an adjusted R-square of 0,818, which means that 81,8% of the variance in "LnAUDITFEE" is explained by the independent variables. The F-test has the p-Value 0,000 and is therefore significant. This implies that the independent variables are explaining the dependent variable to a certain extent. The next step is to assess to what extent the direction of the found relation are in line with the expectations.

Table 5 displays the significant variables. Variable LnAT is significant with a reliability of 99% and has a β of 0,441. This indicates that an increase of 0,01 of total assets lead to an increasement of fees of 0,00441. The coefficient of *SIZE* is increased during the pandemic with 0,032 in 2020 and is statistically significant at $p < 0,01$. Greater coefficients support the argument that auditors adjust their audit fees if a company grows. The coefficient of *LOSS* is increased with 0,001 to 0,181 and is statistically significant with $p < 0,01$. This indicated that auditors perform more work or effort if companies are reporting losses. The variable *CRATIO* gives the same view. The coefficient of this variable is also increased with 0,001 to -0,010 in 2020. On the other hand, the variable *CFO*, gives a contrasting view. The coefficient is decreased with 0,146 to -0,156 in 2020 and is also statistically significant at $p < 0,01$. This indicates that if the operating cash flows increases the audit fees will not be increased also. To find out whether auditors charge higher audit fees when the complexity of the company increases during the pandemic, I look at the coefficients of the variables *ARIN* and SQEMPLOY. The coefficient of *ARIN* is increased with 0,655 to 0,899 in 2020 at $p < 0,01$. The coefficient of SQEMPLOY decreased with 0,003 to 0,043 at $p < 0,01$. This gives a contradictory picture. However, the reaction on the coefficient *ARIN* is much stronger. This indicated that auditors charge higher audit fees when the complexity is increased of companies. The coefficient of the variable *ACCELERATE* decreased in 2020 with 0,086 to 0,056 at $p < 0,05$. This is a control variable that is included for audit risk, and this indicates that when a company is an accelerated filer the audit fees is decreased in 2020. The coefficient of *BIG4* is increased with 0,050 to 0,505 in 2020 at $p < 0,01$. *AUDCHG* is increased with 0,069 to – 0,287 in 2020. These effects support the assumption that BIG4 auditors in general have a relation with fee premiums and auditor change can lead to changes in the fees (Whisenant et al, 2003). The results show that BIG4 auditors charge more audit fees and that an auditor change led to higher audit fees. Based on this information I show that there are no indications of audit fee pressure. A point of interest is that the descriptive statistics of the fee pressure metric are insignificant (see table 4), which means that the hypothesis 1 cannot be accepted or rejected. In the research of Ettredge et al. (2014) there was a significance associating with an independent variable. The reason for this may be due to this research is focusing on US-firms in 2019 and 2020. The research of Ettredge et al. (2014) is conducted in 2014. So, the research is conducted six years after the Recession, which causes that the data in the databases are more complete about this event. This research is conducted during the Coronavirus pandemic in 2021/2022, with the disadvantage that there is the possibility the data is not complete yet.

5.1 Results hypothesis 2

This thesis is investigating the effect of the Coronavirus pandemic on audit quality by the following hypothesis:

H2: There is a negative relation between audit quality and the Coronavirus pandemic.

This thesis is investigating hypothesis 2 by the following multivariate regression:

Audit quality = β0 + β1FEEPRESSURE + β2SIZE + β3CFO + β3DEBT + β4BIG4 + ϵ_t (6)

As mentioned in chapter four the data is extracted from Compustat and Audit Analytics database. This thesis includes the years 2019 and 2020, where 2020 is the central year and 2019 the previous year. Table 6 shows the descriptive statistics of the scaled total accruals (TACC) that is regressed by the following regression:

$$\frac{TACC_t}{A_{t-1}} = \beta1 \frac{1}{A_{t-1}} + \beta2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \beta3 \frac{PPE_t}{A_{t-1}} + \epsilon_t \ (3)$$

The R-squared gives an indication about how the variation of the dependent variables are explained by the independent variable. The R-squared is 0,192, which means that 19,2% of the total accruals are explained by the three terms. The R-squared number is relatively low, which indicates that the explanatory power of the model is insufficient. The adjusted R-squared is the R-squared value adjusted to the number of variables. The adjusted R-squared is 19,1%, which is also relatively low. However, the overall model is highly significant because the probability of the F-statistic is 0,0000, which implies that the combination of the independent variables is explaining the dependent variable. Table 6 shows the coefficients that are obtained to calculate the discretionary component of the total accruals, which is the proxy for audit quality. This table displays the results of the regression for all the independent variables. The β1, β2 and β3 coefficients are presented in this table, which gives indication of the direction and the significance of these components. The direction of the coefficient determines the effect of the independent variable on the dependent variable. So, term 1 (1/At – 1) and term 3 (PPE/At – 1) have a negative effect on the total accruals, while term 2 (REV-REC/ At - 1) has a positive effect. The coefficient values are β1= - 0,413, β2 = 0,668 and β3= -0,071. The interpretation of these coefficient is that if the independent variable At – 1 is increased with 1, the dependent variables TA will decrease by 0,413.

The same methodology is applicable on the other independent variables. The P-value of the coefficient displays the significance level of the test, and it gives an indication of the probability of the occurrence of a given event. When the p-value is low this implies that there is an association between the dependent variable and independent variable. The significance level has a reliability of 95%. All the independent variables of table 6 show a strong significant association. The next step is to use the coefficients of table 6 and predict the *DACC* using a OLS-regression. After this the non-discretionary accruals can be calculated by simply subtracting the discretionary accruals of the total accruals.

The regression results of table 7 show that the variables *CFO* and *DEBT* are significant variables. This indicates that changes in these variables lead to changes in the discretionary accruals and therefore also the audit quality. The coefficient of variable *CFO* is increased to 0,171 in 2020 at $p < 0,01$. This indicates that companies with higher operating cashflows have higher discretionary accruals in 2020. The coefficient of the variable *DEBT* is decreased to - 0,171 in 2020 at $p < 0,01$. This indicated that companies with higher debts have less discretionary accruals. This means that the audit quality is higher for companies with more debts. The second hypothesis states that the Coronavirus pandemic have a negative impact on the audit quality. As previous mentioned the proxy for audit quality are the discretionary accruals. The higher this value, indicates a lower audit quality. In this research two regression are regressed, one based on the data 2020 and the other based on the data of 2019. Table 8 shows the descriptive statistics of the *TACC, NDACC* and *DACC*. The mean in year 2020 for the *DACC* is 0,046 and the median is 0,036. The mean of the *DACC* in 2019 is 0,004 and the median is – 0,008. These statistics indicate that the discretionary accruals are higher in 2020, because the mean and median of 2020 are more positive. A more positive mean or median stands for a higher number of discretionary accruals. Also, the statistics of the *NDACC* shows that the mean and median are more negative in 2020, which indicates that the non-discretionary accruals are decreased. The proxy for audit quality in this research are the discretionary accruals and a higher number of discretionary accruals indicate a decrease in audit quality. So, the statistics of table 8 indicate that the audit quality is decreased in 2020 compared to 2019. A point of interest is that the statistics of the *DACC* and *TACC* are not significant. The component *NDACC* on the other hand is significant with a reliability of 99%. As mentioned above the non-discretionary accruals are decreased in 2020, which means that the discretionary accruals are increased. Based on this knowledge hypothesis 2 can be accepted.

Table 6
Coefficients model 3

Variable	Pandemic period (2020)				Pre-pandemic period (2019)			
	Coeff.	Std. Error	t-Stat	p-Value	Coeff.	Std. Error	t-Stat	p-Value
Term 1	-0,413	0,050	-8,19	0,000***	-0,561	0,024	-23,41	0,000***
Term 2	0,668	0,027	25,22	0,000***	-0,027	0,012	-2,22	0,027**
Term 3	-0,071	0,019	-3,80	0,000***	-0,057	0,006	-9,03	0,000***
	2020	*2019*						
N	3.760	2.157						
F-statistic	297,65	283,22						
R-squared	0,192	0,282						
Adjusted R^2	0,191	0,280						

Note: This table shows the coefficients that are required to calculate the discretionary accruals. See model 3. Term 1,2 and 3 are the components of this model. *** < 0,01 level, ** <0,05 level and * < 0,10 level.

Table 7
Regression model 6 results

Variable	(1)			(2)		
	Pandemic period (2020)			Pre-pandemic period (2019)		
	Coefficient	t-statistic	p-Value	Coefficient	t-statistic	p-Value
Intercept	0,108	2,97	0,003***	0,021	1,79	0,073*
Fee pressure	-0,142	-0,70	0,442	-0,013	-0,85	0,625
Size	-0,002	0,23	0,926	-0,310	-0,78	0,438
CFO	0,109	2,63	0,008***	-0,207	-11,77	0,000***
DEBT	-0,171	-13,29	0,000***	-0,076	-10,55	0,000***
BIG4	0,009	0,20	0,845	-0,023	1,66	0,098*
	2020	*2019*				
N	3.760	2.157				
F-statistic	56,59	38,83				
R-squared	0,057	0,067				
Adjusted R^2	0,056	0,066				

Note: The dependent variable = the discretionary accruals. This table shows the variables that have an associating with the discretionary accruals, which is the proxy for audit quality. Changes in these variables will lead to changes in the audit quality. Column 1 shows the results of 2020(pandemic period) and Column 2 the results of 2019 (pre-pandemic period). See table 2 for the definitions of the variables. *** < 0,01 level, ** <0,05 level and * < 0,10 level.

Table 8
Descriptive statistics TACC, NDACC and DACC

Variable										
	2020					2019				
	Mean	Std. Dev	Median	N	p-Value	Mean	Std. Dev	Median	N	p-Value
TACC	-0,023	1,394	-0,034	3.760	0,637	-0,055	0,325	-0,049	2.157	0,245
NDACC	-0,069	0,606	-0,053	3.760	0,218	-0,058	0,165	-0,036	2.157	0,005***
DACC	0,046	1,252	0,036	3.760	0,744	0,004	0,279	-0,008	2.157	0,321

Note: This table shows descriptive statistics of the TACC, NDACC and DACC of 2020 vs. 2019. These components are connected to each other. DACC is the proxy for audit quality and is estimated by a OLS-regression. See table 2 for the definitions of the variables. *** < 0,01 level, ** <0,05 level and * < 0,10 level.

6. Conclusion

The purpose of an audit is to obtain reasonable assurance about the financial statements and to get certainty that these financial numbers reflect a true and fair view of the reality. After the audit the auditor gives the auditor's opinion in the form of a report. For the performance of the audit the auditor receives a fee. If the audit fees and the audit effort are not in line with each other, this can affect the audit quality. Therefore, there is a relation with the audit fees and audit quality. Previous research about events with economic impact like the Recession have shown that there is a relation with events and the audit quality and audit fees (Ettredge et al., 2014). This research is designed to determine the effect of the Coronavirus pandemic on the audit quality and audit fees. The research question is:

Research Question: Does the Coronavirus pandemic influence the audit quality and audit fees?

To answer the research question, it is divided in the following sub-questions which are answered below:

1.   Is there a relation between audit fee pressure and the Coronavirus pandemic?

2.   Is there a positive or negative relation between audit quality and the Coronavirus pandemic?

This thesis is examining the following hypothesis:

H1: There is a positive relation between audit fee pressure and the Coronavirus pandemic.

To investigate this hypothesis a benchmark fee was calculated. This benchmark fee is based on the data of the previous year and several cost drivers that are mentioned in model 1. The benchmark fee is set against the actual fee in 2020. If the benchmark fee is higher than the actual fee, this can give signals of potential audit fee pressure. The result which are displayed in table 3 shows that 828 firms exerted audit fee pressure, which is about 22% of the sample. A point of interest is that the descriptive statistics of the fee pressure metric are insignificant (see table 4), which means that the hypothesis 1 cannot be accepted or rejected. On the other hand, the results from the regression that is displayed in table 5 shows that the variables *LnAT, LOSS, CRATIO, CFO, ARIN, SQMPLOY, ACCELERATE, BIG4* and *AUDCHG* are significant. This indicates that changes on these variables can have significant effect on the audit fees.

Summarized this research gives insight about whether audit fee pressure was the case in 2020, which was the first year the pandemic started having effect on the US. However, there is not found any conclusive evidence of audit fee pressure. For this reason, there cannot be made any assumptions.

In the present there have not been studies about if audit fee pressure occurred during the Coronavirus pandemic for US companies. The research by Ettredge et al. (2014) is used as guideline for this research. In this research audit fee pressure was investigated during the Recession. This research had shown significant associating of audit fee pressure and the Recession. However, this research is conducted six years after the Recession. This can be a potential reason for why audit fee metric of this research is insignificant. This research is conducted during the Coronavirus pandemic and the pandemic is still occurring in the present. For this reason, there is a lack of long-term data. This can be a potential reason why the results of the audit fee pressure metric are insignificant. Another subject, which can be a consequent of audit fee pressure is the audit quality during the Coronavirus pandemic. It is interesting to know whether the audit quality is decreased during the pandemic. Therefore, this thesis is investigating the following hypothesis:

H2: There is a negative relation between audit quality and the Coronavirus pandemic.

The audit quality was measured by the discretionary accruals based on the Modified Jones Model. In order to test hypothesis 2 two regressions are regressed, 2020 (central year of the pandemic) and 2019 (pre-year pandemic). The results from the regression that is displayed in table 7 shows that the variables *CFO and DEBT* are significant at $p < 0,01$. This indicates that changes on these variables can have significant effect on the discretionary accruals, which is a proxy for audit quality. The descriptive statistics of table 8 displays that there is a negative relation between audit quality and the Coronavirus pandemic because the discretionary accruals are increased in 2020 compared to 2019. The statistics of the DACC and TACC are insignificant which implies that the findings are not binding. However, the statistics of the NDACC are significant. The mean and median of the non-discretionary accruals are more negative or lower. This indicated that the non-discretionary accruals are decreased in 2020. If the non-discretionary accruals are decreased, this implies that the discretionary accruals are increased. This is conclusive evidence of a decrease in audit quality during the Coronavirus pandemic. Based on this information the hypothesis can be accepted.

Limitations and Future research

This research is a contribution to previous research by investigating the effect of a drastic events on the audit quality and audit fees for US-firms. The reason for US-firms has to do with the availability of data. This thesis has examined the audit fees by an audit fee model and the audit quality by an accrual model. This study provided insight about whether audit fee pressure is the case during the Coronavirus pandemic. However, there is no conclusive evidence of audit fee pressure during the pandemic. In contrast there is found conclusive evidence that the audit quality is decreased during the pandemic.

A possible explanation for the insignificant results in the audit fee pressure metric is the limited data availability because the research is conducted in 2021/2022. During these time data about 2020 is not complete yet as not all audits have been concluded at the time of the data extraction. Especially the audits that took longer than average during the Coronavirus pandemic could provide valuable data. Future research should conduct this research after the Coronavirus pandemic is ended. Then, there can be extracted a larger sample of a broader period. Another potential solution can be, including more correlated omitted variables in the regression.

As mentioned before the components DACC and TACC were insignificant (see table 8). Potential reasons for this could be that in this research only the Modified Jones model is used. Dechow et al. (1995) discussed about that there are more models that measure the aggregated discretionary accruals. However, like mentioned in the literature review several researchers have stated that this model is the most proficient, but they indicate that there are various limitations. For a more complete picture, it is desirable to compare results from multiple models. Also, this thesis used year-level data. Quarterly data can be more effective and desirable to use. In this way the periods around the pandemic can be examined precisely, possibly leading to new results. In terms of geography, this research is focusing on the US. It may be interesting to do follow-up research about audit fees/ audit quality before and after the pandemic at different country levels. In this way there can be investigated where the Coronavirus pandemic effected the most and were not. This can give more insight about how certain countries manage the pandemic.

7. References

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