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Master Accounting and Auditing

The impact of COVID-19 on critical audit matter disclosure

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Abstract

This research examines the effect of the COVID-19 pandemic on the disclosure of critical audit matters of large accelerated filers in the United States between 2019 and 2020. This research extends prior literature by examining critical audit matter disclosure in the recent COVID-19 pandemic. To analyze this effect, a negative binomial regression model is used to examine the impact of COVID-19 on the number of critical audit matters disclosed. The results of the main hypothesis indicate an increase in critical audit matters as a result of the COVID-19 pandemic. This increase is statistically significant. This also holds true for the companies in the retail industry relative to other industries. However, the results of the industry-specific regression models regarding the healthcare and hospitality industry led to rejecting the hypotheses, implying there is no effect for these industries. The increase in critical audit matters disclosed shows an increase in auditor conservatism as a result of the COVID-19 pandemic.

Keywords: Critical audit matters, COVID-19, Auditor conservatism, United States.

Contents

1. Introduction

Almost three years after the United States enforced widespread pandemic procedures to reduce the spread of the illness, U.S. administration of President Joe Biden stated in January that it will end COVID-19 emergency declarations on May 11, 2023 (Pager & Sun, 2023). The outbreak of the COVID-19 pandemic had effects on society, primarily regarding health and safety and obligated governments to take severe actions as a means to slow down the infection rate and death toll in countries around the globe. Simultaneously, these severe actions had substantial influence on peoples' lives, public policies, society and the economy, in countries globally (Leoni et al., 2021). Several professions around the world, which also include the accounting and auditing profession had also been affected by these events. The Association of Chartered Accountants (ACCA) (2020) recommended that auditors should conduct extra audit procedures to aid in the evaluation of the events caused by COVID-19 (Hategan et al., 2022).

One particular area of interest is the disclosure of critical audit maters (CAMs), which provide information regarding the most challenging and significant aspects of the audit and are intended to improve the communicative value of the auditor report (Seebeck & Kaya, 2022). The audit report contains the auditor's opinion as to whether a company's financial statements are prepared in accordance with accounting standards and are free from material misstatements whether due to fraud or error. Due to constant criticism regarding the lack of information regarding complicated or onerous information in the orthodox audit reports, the PCAOB (Public Company Accounting Oversight Board) issued Accounting Standard (AS) 3101 on June 1, 2017. This standard compels auditors to report CAMs and auditor tenure in their audit reports and is intended to have these reports contain more audit engagement-specific information (Li & Luo, 2023). AS 3101 mandates CAM disclosure for audits of fiscal years ending on or after June 30, 2019, for large accelerated filers. Other companies that are subject to certain requirements are mandated to disclose CAMs for audits of fiscal years ending on or after December 15, 2020 (AS 3101, n.d.).

Furthermore, the Public Company Accounting Oversight Board (PCAOB) issued a press release in 2020 regarding audits approaching completion in 2020, which stated that Covid-19 could impact the auditor's report, for instance in establishing and reporting CAMs (PCAOB, 2020). This implies that the auditors need to take the effects of COVID-19 into consideration when establishing the auditor's report, which in turn indicates some level of auditor conservatism. The impact of crises on auditor conservatism is not a new phenomenon. For instance, in a study on how the 2008 global financial crises affected auditor conservatism in the United States, researchers found that auditors became more conservative by issuing higher percentages of going concern opinions. This increased number of going concern opinions results from the increase in the number of financially distressed firms during the crisis and holds true for both Big 4 and non-Big 4 accounting firms (Beams & Yan, 2015). Another example is the events of 2001 and 2002 in which several major companies collapsed (e.g., Enron, WorldCom, etc.), which led to major alterations to the auditing profession in the U.S. (Geiger et al., 2005). Research has found that there was a substantial change in auditors' decisions, which resulted in them being more conservative following these events in 2001

and 2002 (Feldmann & Read, 2010). This indicates that past crises have had significant influence on increased auditor conservatism. Elshafie (2023) found that conservative auditors have a higher chance of reporting CAMs. Following these studies, an increase in auditor conservatism could also be expected for auditors reporting CAMs during COVID-19.

The Covid-19 pandemic has had several implications for various industries, such as in the healthcare sector, where the American Hospital Association approximated $202 billion in losses for America's hospitals and healthcare system in 2020 (Kaye et al., 2021). Furthermore, the retailing sector has also suffered great losses due to decrease in consumer behavior as a result of the lockdown and social distancing policies (Sheth, 2020). This resulted in several retail firms filing for bankruptcy, while others innovated to keep their business running (Wang et al., 2020). The hospitality sector also suffered dramatically due to travel restrictions, lockdown and social distancing policies forcing hospitality businesses into temporary closure, after which the reopening process slowly allowed the businesses to recover (Gursoy & Chi, 2020). The purpose of this research is: (1) to examine how the COVID-19 pandemic has affected the disclosure of CAMs in general, and (2) in different industries, specifically the healthcare, retail, and hospitality sectors. Therefore, the following research question can be formulated:

How has the Covid-19 pandemic affected the disclosure of critical audit matters in different industries, such as healthcare, retail, and hospitality in the United States?

The main research question above can be divided into four hypotheses, each indicating the effect of COVID-19 on the different industries. These are formulated as follows:

H1: The COVID-19 pandemic will generally increase the number of CAMs disclosed across all industries in the United States.

H2a: The COVID-19 pandemic will increase the number of CAMs disclosed in the healthcare industry more compared to other industries.

H2b: The COVID-19 pandemic will increase the number of CAMs disclosed in the retail industry more compared to other industries.

H2c: The COVID-19 pandemic will increase the number of CAMs disclosed in the hospitality industry more compared to other industries.

This research contributes to investors' decision making by providing them with insights to make informed decisions about investing in companies in different industries before and during the COVID-19. Furthermore, it also allows investors to determine whether CAMs provide useful information for investing in times of crises. The research also contributes to auditors by providing them with information regarding the impact of COVID-19 on CAM disclosures in different industries and how these are related to other industries. For example, companies in the healthcare industries may have more CAMs than companies in the retail industry. If this is indeed the case, auditors may need to adjust their approach to CAM reporting depending on the industry and the extent to which COVID-19 has affected the company's operations and financial performance. Furthermore, the research also contributes to regulators by providing insight into how COVID-19 has affected CAM reporting in

different industries, which will allow them to develop more specific and targeted guidance on CAM reporting. They can then identify areas where additional audit analysis is needed to ensure more accuracy and completeness in CAM disclosure.

By examining the impact of the COVID-19 pandemic on the disclosure of critical audit matters, the research question contributes to the understanding of the pandemic's broader economic impact and the measures required to mitigate its adverse effects. After the outbreak of the COVID-19 pandemic regulatory bodies and Big-4 accounting firms issued several instructions to inform auditors of the implications when conducting their audit in these harsh times. Due to the limited period, there has been a finite amount of recently published literature in this regard. Although there have been some studies that have examined the impact of COVID-19 on the disclosure of critical audit matters (Hategan et al., 2022) and audit quality (Albitar et al., 2021), these have primarily focused on Europe. This research adds to these studies by examining the impact in the United States.

2. Literature review and hypotheses development

2.1. Impact of COVID-19 on Financial Reporting and Audit Practices

The COVID-19 pandemic has had severe negative consequences to the development of the global economy. Its economic and social effects have been wider and more extreme than the 2008 financial crisis or the Ebola pandemic (Passetti et al., 2021). Forcing many businesses to close, the pandemic guided nearly all industry sectors to face extraordinary disturbances in supply and demand. Retailers for example, faced several short-term concerns such as those associated with health and safety, the supply chain, the labor force, cash flow, consumer demand, sales, and marketing (Donthu & Gustafsson, 2020). Leoni et al. (2021) indicated that, in line with evidence obtained during the global financial crisis in 2008 and natural disasters in the past, it is expected that the accounting, management and accountability practices may play a sophisticated role in decision-making and policies by governmental and non-governmental organizations'; in public services, businesses and not-for-profit organizations reacting to the crisis; along with the well-being of societies.

The Association of Chartered Certified Accountants (ACCA) (2020a) released a paper in which they addressed the challenges and considerations regarding audit and assurance during the pandemic. As a result of mandatory lockdown requirements enacted by governments around the world to stop the infection from spreading, auditors, among many other individuals, were forced to work from home. Therefore, auditors were obliged to conduct the audits remotely because they could no longer travel to work or to the locations of the audited entities. These occurrences are then supported by evidence derived from their global survey with over 10,000 members and stakeholders responding from over 100 countries regarding the impact of COVID-19 on businesses. They then found that for auditors, the pressure to finish client service work and inability to meet reporting deadlines were among the most significant business implications (ACCA, 2020b). This indicates some of the challenges faced by mainly auditors as a result of the COVID-19 pandemic. The challenges faced by companies in different industries are also considerable and will be discussed in the following sections of the literature review.

Albitar et al. (2020) conducted a study regarding the effect of COVID-19 on auditing quality during the initial year of the pandemic. The authors argue that they anticipated to see several implications to the quality of the audit process, which included reductions in audit fees, challenges in the conclusion of going-concern assessments, problems regarding the reliability and sufficiency of audit evidence gathered, potential employee loss from sickness or quarantine, and decreases in the income of audit employees. However, as ACCA (2020) mentioned, the optimistic part to all these implications is the more rapid investment in the digitalization of the audit profession, that had initially been moving toward turning more digital, because the essence of the audit process necessitates support and interaction with the clients.

2.2. Critical Audit Matters

Critical audit matters (CAMs) are defined as matters appearing from the audit that are communicated or required to be communicated to the audit committee that relate to accounts or disclosures that are material to the financial statements, and include particularly challenging, subjective, or complex auditor judgment. This was introduced on June 1, 2017, by the Public Company Accounting Oversight Board (PCAOB) as Accounting Standard (AS) 3101 with the goal to improve the importance and usefulness of the auditor's report by delivering supplementary and significant information to investors (Elshafie, 2023). The issuance of this standard came in response to orthodox audit reports receiving criticism regarding the lack of information on complicated and onerous issues faced during the audit. Auditors have entrance to a large quantity of private information concerning their clients' financial statements and are therefore in a distinctive arrangement to source investors and other stakeholders with supplementary beneficial information (Li & Luo, 2023). Moreover, several studies indicate that CAM disclosures in audit reports are viewed as more credible than management's disclosures of similar matters since auditors are independent and execute certain audit procedures in tackling CAM issues (Glendening et al., 2019; Pinello et al., 2020). Several studies have been conducted in different countries regarding key audit matters, which are similar to critical audit matters in the United States. For example, Hegazy et al. (2022) examined whether auditor characteristics and COVID-19 affect key audit matters (KAMs) in Egypt and found that heightened uncertainty, management estimates and subjective judgment by auditors and the management throughout the pandemic increased the number of KAMs contrasted to pre-COVID levels.

Past research has indicated that conservative auditors have a higher probability to report CAMs in their audit reports. Particularly, that a cautious auditor with a lower threshold for labeling something "material," "subjective," or "complex" has a higher tendency to state these matters in the audit report (Elshafie, 2023). Auditor conservatism is defined as accountants' tendency to demand a higher verification level to realize good news as gains than to realize bad news as losses. In other words, timelier acknowledgement in earnings of bad news than good news concerning future cash flows (Basu, 1997). One of the cases in which auditors became more conservative was after the major failures of prestigious companies in the early 21st century. These substantial failures gave rise to surged proceedings against auditors, increased insurance fees, media inspection, and expanded regulatory revision of the auditing profession. These occurrences resulted in auditors declaring more going-concern opinions to bankrupt companies, which has been portrayed as heightened auditor conservatism (Fargher & Jiang, 2008; Geiger et al., 2005; Feldmann & Read, 2010). Past research has also found increased auditor conservatism resulting from the enactment of new regulations or standards. One such instance was the passage of the Sarbanes-Oxley Act (SOX) in July 2002, which was the result of the several major corporate scandals around that time (e.g., Enron & WorldCom) (Feldmann & Read, 2010). Using the issuance of going concern (GC) opinions as a proxy for accounting conservatism, researchers found an increase in the percentage of firms receiving a GC opinion in the years following the passage of SOX (Geiger et al., 2005).

Another significant example of the increase in auditor conservatism was the Global Financial Crisis (GFC), which marked the start of a recession that officially began in December 2007 and lasted for about 18 months until it ended in June 2009 (National Bureau of Economic Research, 2010). Beams & Yan (2015) examined the impact of the GFC on auditor conservatism and, similar to previously mentioned research, made use of GC opinions as proxy for auditor conservatism. They found that the GFC and the recession that started in December 2007 led to an increase in financially distressed firms, subsequently resulting in higher numbers of GC opinions issued by auditors of both Big 4 and non-Big 4 accounting firms. This indicates that auditors became more conservative during the GFC, but the authors also found that this increase in auditor conservatism reverted to its pre-crisis stage in 2010. Taken together, it can be stated that there is enough evidence indicating that auditors become more conservative as a result of certain changes in the accounting environment, whether due to a crisis or heightened regulatory action against the auditing profession (Fargher & Jiang, 2008; Feldmann & Read, 2010). Considering increased CAM disclosure is also used as proxy for increased auditor conservatism, it can also be expected that the COVID-19 pandemic should increase the number of CAMs disclosed, which forms a basis for the first hypothesis in this research:

H1: The COVID-19 pandemic generally increases the number of CAMs disclosed across all industries in the United States.

2.3. Effects in specific industries

Measures taken by governments all around the world resulted in a reduced labor force covering all economic sectors and caused numerous jobs to be lost. These measures include social distancing, self-isolation, travel restrictions, schools closing, businesses closing, and decreases in the demands for commodities and manufactured products. Many of these measures were implemented in countries that form the world's biggest economies, which initiated concerns of an imminent economic crisis and recession (Nicola et al., 2020). This next section highlights some of the industries where some impact of COVID-19 is expected and attempts to find the relationship of these industries relative to the other industries.

2.3.1. Healthcare

The COVID-19 pandemic negatively impacted the financial condition of US healthcare facilities due to heightened costs and lost revenue from the annulment of outpatient office appointments, elective procedures, and elective surgeries. Hospitals needed to create more room, hire more personnel, pay overtime for personnel and acquire more personal protective equipment (PPE) for the increase in hospitalized patients with COVID-19. The healthcare sector was not prepared and with no effective treatment to combat the virus and a vaccine was expected to be ready in 2021, they suffered substantial losses. Apart from the increase in patients infected by COVID-19, the COVID-19 pandemic had also initiated a psychosocial effect among society. According to a survey conducted by the Centers for Disease Control (CDC) roughly 41% of participants suffered at least one adverse psychological health disorder, which mainly included substance abuse, anxiety, depression, suicidal ideation, trauma and stress-related disorders. About 25% of participants that stated suicidal tendencies

were between the ages of 18 and 24 (Kaye et al., 2021). Based on these occurrences, the expectation for the healthcare industry is that there will be an increase in financially distressed firms as a result of COVID-19. Based on prior literature, this would mean more auditor conservatism. The developments in this industry provide a unique setting for this research and therefore the following hypothesis is formulated:

H2a: The COVID-19 pandemic will increase the number of CAMs disclosed in the healthcare industry more compared to other industries.

2.3.2. Retail

One of the sectors most impacted by the COVID-19 outbreak is retail. Due to the measures taken in order to oppose the pandemic, retail customers have occasionally been prohibited from visiting physical stores, from shopping with their partners or children, and leaving the house aside from certain errands, and were obliged to put on face masks. Retail businesses, which meet the returning demands of customers and frequently impose on a physical location for service supply, have undoubtedly been impacted by this. This has forced retail companies to adapt to the pandemic by focusing on service improvements aimed to enhance customer safety, with online shopping becoming one of the key factors in this regard (Pilawa et al., 2022). Research indicates that the COVID-19 pandemic presents numerous chances for improving online shopping, but that a lack of professionalism may hinder traditional local merchants from holding onto a portion of the growing online market. If, as is projected, the share of online shopping in total retail expenditure stays high after the pandemic, then this could very well mean the downfall of local physical stores (Beckers et al., 2021). This would mean auditors becoming more conservative as the retail companies they audit face backlash due to the COVID-19 pandemic. Based on the occurrence of these developments the following hypothesis is formulated:

H2b: The COVID-19 pandemic will increase the number of CAMs disclosed in the retail industry more compared to other industries.

2.3.3. Hospitality

The hospitality industry encountered worldwide distortions due to the COVID-19 pandemic. Hotels' hourly workers faced devastating hardships, such as Marriott International having to place tens of thousands of circa 174,000 of their workers on leave (USA Today, 2020). Furthermore, with hotel revenue per available room in the United States undergoing a decline of 11.6% in the first week of March 2020, other hotels in the United States were requesting roughly $150bn in direct aid for workers as a result of an extraordinary reduction in demand, together with an approximated $1.5bn loss since mid-February (Nicola et al., 2020). Previous research regarding the impact of crises on the hospitality industry, such as the 9/11 terrorist attacks and the outbreak of Severe Acute Respiratory Syndrome in 2003 (SARS), have indicated substantial negative effects on the hospitality industry through declines in hotel revenues and profits (Chen, 2011). Research has also indicated that policy makers at large have underestimated the economic impact of infectious diseases, which resulted in unpreparedness against outbreaks of infectious diseases (Sands et al., 2016). Furthermore, research also indicates the observed risks faced by tourism-dependent businesses result from

seasonality in demand, longer lockdown times, and more ambiguous reopening dates, which may point to a longer-term susceptibility for these businesses (Ntounis et al., 2022). The impact of COVID-19 on the hospitality industry can be expected to have increased the number of financially distressed firms in this industry, which ultimately leads to higher levels of auditor conservatism (Beams & Yan, 2015). Based on the expected impact of COVID-19 on the businesses in the hospitality industry, the following hypothesis is formulated:

H2c: The COVID-19 pandemic will increase the number of CAMs disclosed in the hospitality industry more compared to other industries.

3. Data

The data used for this research is collected through the Wharton Research Data Services (WRDS) databases Audit Analytics and Compustat. The critical audit matters are retained from filed reports of large accelerated filers for the fiscal years 2019 and 2020, because the CAM disclosure requirement only applies to annual audits for fiscal years ending on or after June 30, 2019, for large accelerated filers, and for fiscal year ending on or after December 15, 2020, for all other companies (AS 3101). Large accelerated filers are defined as public companies that satisfy the following demands at the end of their fiscal years: 1) the company needs to contain a public float (or aggregated worldwide market value of common equity held by non-affiliates) of at least $700 million commencing the final business day of its most recently finished second fiscal quarter; 2) the company has been conditional on the reporting requirements of Section 13(a) or 15(d) of the Securities Exchange Act for at least 12 calendar months; 3) the company had previously filed at least one annual report under Section 13(a) or 15(d) of the Securities Exchange Act; and 4) the company is not eligible for the status of a smaller reporting company because it does not meet the requirement for this (as stated in Rule 12b-2 of the Exchange Act) (SEC, 2020).

The hypotheses will be tested using a negative binomial regression model with *N_CAM* as the dependent variable, which will be calculated by counting the total number of CAMs reported in the given period. The independent variables include a dummy variable *COVID*, which takes the value 1 for the period after the COVID-19 pandemic started, which according to the Center for Disease Control and Prevention (CDC) is March 11, 2020, and zero for the period before March 11, 2020 (CDC, 2023). Furthermore, dummy variables *HEALTH*, *RETAIL* and *HOSPITALITY* represent the healthcare industry, retail industry and hospitality industry respectively. The dummy variable *HEALTH* equals 1 for companies with SIC codes between 8011 and 8099, and zero otherwise; *RETAIL* equals 1 for companies with SIC codes between 5200 and 5999, and zero otherwise; and *HOSPITALITY* equals 1 for companies with SIC codes between 7011 and 7041, and zero otherwise. This classification of dummy variables to indicate distinct industries follows the approach taken by Kile & Phillips (2009). The control variables which are used include *LOG_FEE*, which is the natural logarithm of total audit fees, a dummy variable *LOSS*, which equals 1 if the company made a loss in the given year and zero otherwise, and a dummy variable *BIG4*, which equals 1 if the company is audited by a Big-4 auditor and zero otherwise. Furthermore, the control variables also include a dummy variable *GC*, which equals 1 if a company received a going concern opinion in the given year and zero otherwise, variables *ROA* and *ROE*, which indicate a company's return on assets ratio and return on equity ratio, respectively, and a variable *QR*, which indicates a company's quick ratio. Lastly, *DE_RATIO*, which indicates the company's debt-to-equity ratio is also included as control variable, *LOG_REV*, which indicates the natural logarithm of a company's revenues, and *LOG_IA* which indicates the natural logarithm of a company's intangible assets. The control variables *LOG_FEE, ROA, LOG_IA, LOG_REV, ROE, DE_RATIO, QR* and *LOSS* are used control for instances of firm complexity and profitability, whereas *BIG4* and *GC* are used to control for outside monitoring (Chychyla et al., 2019). Refer to Appendix B for a summary of the variable definitions.

Keeping only the observations from large accelerated filers for the years 2019 and 2020, 1,777 observations remain and are used for further analysis, which includes first examining the cumulative effect of the COVID-19 pandemic on CAMs, such as stated in the first hypothesis. And afterwards subsequently analyzing the effects for the given industry as stated in *H2*.

4. Results

Given the dependent variable *N_CAM* being a count variable of which the effect of the COVID-19 pandemic is measured on, the ideal regression model to be used in this case is the Negative Binomial (NB) regression. The NB regression model is a more generalized version of the Poisson regression model, because it accounts for overdispersion in the data (Greene, 2008). In the following section the descriptive statistics and correlation matrix are examined after which the results of the NB regression model are discussed.

4.1. Descriptive Statistics and correlation matrix

Table A1 indicates the number of observations, the mean, standard deviation, minimum and maximum of the variables used for the analysis. The continuous variables are winsorized at the 1st and 99th percentiles in order to minimize the potential effect of outliers. Table A1 indicates that the average number of CAMs disclosed by a large accelerated filer is 5.78, which is more than the average of 1.7 as implied by Li & Luo (2023) and the average of 1.69 as implied by Burke et al., (2023). Furthermore, 20% of the companies in the sample reported a loss and 90% hire one of Big-4 accounting firms as their auditors, which is slightly less than the 92% that Li & Luo (2023) found.

Table A2 indicates the correlation coefficients, which measure the relationship between two variables within a range from -1 to 1, with 0 indicating there is no relationship. Variables have a perfectly negative correlation or perfectly positive correlation if the correlation coefficients equal -1 or 1, respectively, and the relationship between the variables is stronger as the coefficient moves toward -1 or 1 (Schober et al., 2018). The correlation coefficient of *COVID* with *N_CAM* is equal to 0.268, which implies a positive correlation between the number of CAMs and the COVID-19 pandemic. This indicates that the COVID-19 pandemic is related to the increased number of CAMs reported, which is in line with prior literature stating that COVID-19 increased the number of key audit matters disclosed (Hegazy et al., 2022). Furthermore, this correlation is statistically significant at the 5% level, which indicates that there is conclusive evidence that the variable has an effect. These results give introductory support to *H1*, which tests the effect of COVID-19 on CAMs for all industries.

A negative correlation is found between the healthcare industry and the number of CAMs reported, which has a correlation coefficient of -0.020. This implies that companies in the healthcare industry are associated with a decrease in the number of CAMs disclosed. Furthermore, the retail industry has a negative correlation with the number of CAMs and its correlation coefficient is equal to -0.024. This implies that companies in the retail industry are also associated with disclosing a lower number of CAMs. Lastly, a negative correlation also exists between the hospitality industry and the number of CAMs, with its correlation coefficient being equal to -0.010. Implying that companies in the hospitality industry are associated with disclosing a lower number of CAMs. However, the magnitudes of the correlation coefficients between the three industries and the number of CAMs disclosed indicate that they are very close to zero, which is the point at which there is no relationship between the variables. The correlations of the healthcare, retail and hospitality industries with the number of CAMs disclosed are statistically insignificant.

4.2. Regression models

Table 1 column (1) presents the results of the tests of *H1*, which is the effect of the COVID-19 pandemic on the number of critical audit matters disclosed for all industries. The variable *COVID* is the independent variable of interest in the NB regression. The coefficient associated with this variable has a value of 0.544, which is statistically significant at the 5% level. Because the results are from a NB regression, the coefficients are measured in logarithmic values. Thus, the results indicate the COVID-19 pandemic results in an increase in the number of CAMs (*N_CAM*) disclosed by the log value of 0.544, holding all other variables constant. This increase in the number of CAMs reported implies that auditors become more conservative during COVID-19 and is in line with findings in prior literature, which indicate increased auditor conservatism during crisis periods (Fargher & Jiang, 2008; Feldmann & Read, 2010). Based on this result, there is enough evidence to support *H1*, which states that the COVID-19 pandemic will generally increase the number of CAMs disclosed across all industries in the United States.

The control variable *LOG_REV*, which indicates the natural logarithm of total revenues, has a coefficient of 0.053 and is statistically significant at the 5% level, which implies a positive relationship with the dependent variable. The coefficient indicates that when the natural logarithm of revenue increases with 1 unit, the number of CAMs disclosed increases with the log value of 0.053, holding all other variables constant. Furthermore, the control variable LOG_FEE, which indicates the natural logarithm of a company's total audit fees, has a coefficient of 0.063 and is also significant at the 5% level. When the natural logarithm of audit fees increases with 1 unit, the number of CAMs disclosed increases with the log value of 0.063.

The control variable *QR*, which implies a company's quick ratio, has a coefficient of -0.043. This indicates that when the *QR* increases with 1 unit, the number of CAMs disclosed decreases with the log value of 0.043, holding all other variables constant. Lastly, the control variable *ROA* indicates the ratio of return on assets and has a coefficient that is equal to -0.910. Thus, implying that when the *ROA* increases with 1 unit, the number of CAMs disclosed decrease with the log value of 0.910, holding all other variables constant. *QR* and *ROA* are also significant at the 5% level. The control variables *GC*, *BIG4, DE_RATIO, LOG_IA, ROE* and *LOSS* are not statistically significant and will therefore not be discussed.

4.2.1. Healthcare industry

Column (2a) shows the results from *H2a*, which is the effect of the COVID-19 pandemic on the number of CAMs disclosed in the healthcare industry. The coefficient of interest in this regression is the one associated with the interaction term of COVID-19 and *HEALTH*, which indicates the number of CAMs reported in the COVID-19 period by companies in the healthcare industry relative to the other industries in the sample. This coefficient has a value of -0.106, which implies that when companies in the healthcare industry are affected by COVID-19, the number of CAMs disclosed decreases with the log value of 0.106. However, this effect is statistically insignificant and based on these results, *H2a* is rejected.

Table 1. Univariate tests for the impact of COVID-19 on CAM disclosure

	(1)	(2a)	(2b)	(2c)
Dependent variable =	Number of Critical Audit Matters (N_CAM)			
COVID	0.544*			
	(0.048)			
COVID * HEALTH		-0.106		
		(0.238)		
COVID * RETAIL			0.357*	
			(0.089)	
COVID * HOSPITALITY				-0.375
				(0.367)
GC	-0.133	-0.135	-0.130	-0.135
	(0.157)	(0.157)	(0.157)	(0.157)
BIG4	0.025	0.028	0.026	0.027
	(0.042)	(0.043)	(0.042)	(0.042)
LOG_REV	0.053*	0.053*	0.057*	0.053*
	(0.011)	(0.011)	(0.011)	(0.011)
DE_RATIO	0.005	0.005	0.005	0.005
	(0.005)	(0.005)	(0.005)	(0.005)
LOG_IA	0.004	0.005	0.004	0.005
	(0.006)	(0.006)	(0.006)	(0.006)
QR	-0.043*	-0.044*	-0.045*	-0.044*
	(0.018)	(0.018)	(0.018)	(0.018)
ROA	-0.910*	-0.910*	-0.901*	-0.892*
	(0.292)	(0.292)	(0.291)	(0.292)
ROE	0.007	0.006	0.006	0.008
	(0.018)	(0.018)	(0.018)	(0.018)
LOG_FEE	0.063*	0.063*	0.059*	0.063*
	(0.017)	(0.016)	(0.016)	(0.016)
LOSS	0.076	0.076	0.080	0.077
	(0.042)	(0.042)	(0.042)	(0.042)
Constant	0.310	0.312	0.321	0.306
	(0.112)	(0.112)	(0.111)	(0.112)
Year Fixed-Effect	Yes	Yes	Yes	Yes
Observations	1,777	1,777	1,777	1,777
Pseudo R squared	0.0518	0.0520	0.0526	0.0520

Table 1 columns 1, 2a, 2b and 2c present the results from the Negative Binomial regression of hypotheses 1, 2a, 2b and 2c respectively. The dependent variable N_CAM is the number of critical audit matters disclosed for each company. The coefficient COVID and its interaction with the healthcare, retail and hospitality industries captures the effect of the COVID-19 pandemic on the companies in the related industries. GC, BIG4 and LOSS are dummy variables. LOG_REV, DE_RATIO, LOG_IA, QR, ROA, ROE and LOG_FEE are control variables. Continuous variables are winsorized at the 1st and 99th percentiles. Detailed variable definitions are provided in Appendix A. Furthermore, standard errors are provided in parentheses. * indicates statistical significance at the 5% level.

4.2.2. Retail industry

Column (2b) shows the results from *H2b*, which is the effect of the COVID-19 pandemic on the number of CAMs disclosed in the retail industry relative to the other industries. The interaction term of *COVID* and *RETAIL* indicates the companies in the retail industry in the COVID-19 pandemic. The coefficient is equal to 0.357, which indicates that when companies in the retail industry are affected by COVID-19, the number of CAMs disclosed increases with the log value of 0.357, as compared to other industries. This coefficient has a statistically significant relationship with the dependent variable *N_CAM*. Based on these results, there is enough evidence to support *H2b*, which states that the COVID-19 pandemic increases the number of CAMs disclosed in the retail industry more as compared to other industries.

4.2.3. Hospitality industry

Column (2c) shows the results from *H2c*, which is the effect of the COVID-19 pandemic on the number of CAMs disclosed in the hospitality industry relative to other industries. The coefficient of interest is the interaction term of *COVID* and *HOSPITALITY*, which indicate the companies in the hospitality industry in the COVID-19 pandemic. The coefficient has a value of -0.375, thus implying that when companies in the hospitality industry are affected by COVID-19, the number of CAMs disclosed decreases with the log value of 0.375. However, this coefficient is not statistically significant and thus cannot be regarded as to having a relationship with the dependent variable *N_CAM*. Based on these results, *H2c* is rejected.

4.3. Limitations

The results of this thesis follow a relevant research method. However, there are several limitations regarding these results, which will be discussed in this section.

First and foremost, this thesis focuses on large accelerated filers in North America due to the CAM disclosure requirement only being applicable to large accelerated filers with annual audits ending on or after June 30, 2019. The legislation only applied to all other companies with annual audits ending on or after December 15, 2020. This limits the research because the sample only includes CAMs reported by large accelerated filers between 2019 and 2020. Furthermore, the results are not generalizable to other companies except the large accelerated filers, which contain a public float of at least $700 million among several other requirements, in North America.

Secondly, because the data is only available for companies in North America, the results are not generalizable to other countries. This also includes the comparison of results between countries.

4.4. Implications

Researching the impact of COVID-19 has several implications that hold significance for various stakeholders. By looking at the disclosure of CAMs, which is a relatively new concept, it can be assessed whether auditors become more conservative as a result of the COVID-19 pandemic. Furthermore, by comparing the effects of different industries, investors

are able to make informed investment decisions. Finally, the insights retrieved from this research provide a better understanding of how industries respond to certain extreme events, such as a pandemic in this case.

4.5. Further research

Further research in this area includes expanding the dataset to include all other companies. This will result in the conclusion being generalizable to all companies in the country. Arguably, it could also be taken a step further by conducting the research in other countries as well, which would improve the generalizability of the conclusions even more and lead to comparisons between different countries. However, the latter depends on data availability.

Secondly, the analysis could also be expanded by including more years after the pandemic in the dataset. This would result in long-term impact assessments to analyze how the effects of the pandemic on CAM disclosure evolve over time. Consequently, this would provide a better understanding of the long-term implications of crisis-driven changes in disclosure patterns.

Ultimately, further research also includes assessing how CAM disclosures evolve as industries transition from crisis response to post-pandemic recovery. Investigating whether the nature and number of CAMs change as industries revert to normal and stable economic conditions.

5. Conclusion

Examining how the COVID-19 pandemic has affected CAM disclosure in various industries, such as the healthcare, retail and hospitality industry in the United Stated divulges understandings into the developing environment of financial reporting, audit practice, and industry-specific challenges.

The COVID-19 pandemic led to severe economic and social effects, which have been regarded more extreme than the 2008 Global financial crisis or the Ebola pandemic. Many businesses were forced to close doors, which led to disruptions in supply and demand in many industries, and some businesses were not able to recover from this.

Several industries such as healthcare, retail, and hospitality have witnessed considerable impacts as a result of measures taken by the government, such as social distancing and travel restrictions. Investigating the CAM disclosure of companies in these industries provides insights into auditor conservatism during the COVID-19 pandemic, and consequently, how the pandemic has affected companies in different industries.

This thesis investigates the effect of COVID-19 on the disclosure of critical audit matters across all industries, and specifically in the healthcare, retail, and hospitality industry by assessing the number if CAMs disclosed between 2019 and 2020. Therefore, the following research question was formulated:

How has the Covid-19 pandemic affected the disclosure of critical audit matters in different industries, such as healthcare, retail, and hospitality in the United States?

From this research question the following hypotheses were formulated:

H1: The COVID-19 pandemic generally increases the number of CAMs disclosed across all industries in the United States.

H2a: The COVID-19 pandemic will increase the number of CAMs disclosed in the healthcare industry more compared to other industries.

H2b: The COVID-19 pandemic will increase the number of CAMs disclosed in the retail industry more compared to other industries.

H2c: The COVID-19 pandemic will increase the number of CAMs disclosed in the hospitality industry more compared to other industries.

To test the hypotheses, a negative binomial regression is used. The results of these regressions are shown in Table 1. The results from the first binomial regression in *H1* indicate an increase in CAMs disclosed after the pandemic started. The coefficient associated with this increase is statistically significant, which indicates that there is indeed an effect on the dependent variable, which is also in line with prior literature. *H1* is therefore accepted. As for the industry-specific hypotheses in *H2*, only the retail industry shows a result which is statistically significant and therefore ultimately leading to accepting only *H2b*.

In conclusion, this research finds that the COVID-19 pandemic generally increases the number of critical audit matters disclosed across all industries in the United States and that this effect is stronger in the retail industry relative to other industries. Thus, auditors become more conservative as a result of the COVID-19 pandemic.

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Appendices and tables

Appendix A. Summary statistics and correlation matrix

Table 1. Descriptive Statistics

Variable	N	Mean	SD	Min	Max
N_CAM	1,777	5.778	3.094	1	36
COVID	1,777	0.899	0.300	0	1
HEALTH	1,777	0.033	0.179	0	1
RETAIL	1,777	0.030	0.173	0	1
HOSPITALITY	1,777	0.021	0.146	0	1
GC	1,777	0.003	0.062	0	1
BIG4	1,777	0.900	0.299	0	1
LOG_REV	1,777	7.770	1.818	0	13.149
DE_RATIO	1,777	2.590	2.634	0.276	8.837
LOG_IA	1,777	5.654	2.772	0	8.984
QR	1,777	0.783	0.749	0.110	2.520
ROA	1,777	0.041	0.061	-0.065	0.145
ROE	1,777	0.096	0.617	-3.091	3.102
LOG_FEE	1,777	7.933	1.142	0	11.265
LOSS	1,777	0.202	0.401	0	1

Table 2. Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.N_CAM	1.000														
2.COVID	0.268*	1.000													
3.RETAIL	-0.024	0.038	1.000												
4.HEALTH	-0.020	-0.011	-0.033	1.000											
5.HOSPIT.	-0.010	0.024	-0.026	-0.027	1.000										
6.GC	-0.033	-0.008	-0.011	-0.011	-0.009	1.000									
7.BIG4	0.153*	0.364*	0.037	0.019	0.024	-0.039	1.000								
8.LOG_REV	0.290*	0.180*	0.115*	0.011	0.022	-0.147*	0.236*	1.000							
9.DE_RATIO	0.111*	-0.004	-0.012	-0.032	0.012	-0.004	-0.133*	0.115*	1.000						
10.LOG_IA	0.210*	0.049*	0.023	0.095*	0.039	-0.065*	0.089*	0.568*	0.209*	1.000					
11.QR	-0.156*	-0.066*	-0.053*	-0.014	-0.042	0.037	-0.001	-0.291*	-0.356*	-0.297*	1.000				
12.ROA	-0.045	0.121*	0.048*	0.012	0.051*	-0.082*	0.116*	0.354*	-0.212*	0.096*	0.048*	1.000			
13.ROE	0.014	0.033*	-0.001	-0.017	0.060*	0.022	0.038	0.172*	0.022	0.084*	-0.057*	0.316*	1.000		
14.LOG_FEE	0.292*	0.099*	-0.020	0.018	0.022	-0.073*	0.219*	0.609*	0.129*	0.517*	-0.180*	0.059*	0.075*	1.000	
15.LOSS	0.001	-0.135*	-0.017	-0.015	-0.046	0.102*	-0.057*	-0.35*	-0.060*	-0.208*	0.155*	-0.698*	-0.280*	-0.093*	1.0

* indicates statistical significance at the 5% level.

Appendix B. Variable definitions

Variables	Description
N_CAM (DV)	Number of critical audit matters measured in terms of observations per firm-year.
COVID (IV)	Dummy variable taking on the value 1 if the company's fiscal year end date is later than March 11, 2020 (start of the global pandemic), and zero otherwise.
RETAIL (IV)	Dummy variable that equals 1 for companies in the retail sector (SIC 5200-5990), and zero otherwise.
HEALTH (IV)	Dummy variable that equals 1 for companies in the healthcare sector (SIC 8011-8099), and zero otherwise.
HOSPITALITY (IV)	Dummy variable that equals 1 for companies in the hospitality sector (SIC 7011-7041), and zero otherwise.
LOSS	A dummy variable that equals 1 if the company made a loss in the given fiscal year and zero otherwise.
BIG4	Dummy variable that equals 1 if the company is audited by a Big-4 auditor, and zero otherwise.
GC	Dummy variable that equals 1 if the company received a going-concern opinion in the given year, and zero otherwise.
DE_RATIO	Indicates the leverage of a company, which is calculated by dividing total debt with total equity.
LOG_FEE	The natural logarithm of audit fees.
ROA	Return-on-assets ratio, which is calculated by dividing net income with average total assets.
ROE	Return on equity, which is calculated by dividing net income with average shareholder's equity.
LOG_REV	The natural logarithm of total revenue.
LOG_IA	The natural logarithm of intangible assets.
QR	Quick ratio, which is calculated by dividing current assets with current liabilities.