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Auditing during a pandemic: The impact of Covid-19 on audit effort, audit quality and auditor disclosure quality

Masteroppgave

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Preface

This master thesis represents our final assignment as students of the master's program in Master of Accounting and Auditing at the Norwegian University of Science and Technology (NTNU). This thesis amounts to 30 credits.

The main objective of this master thesis is analyzing how the Covid-19 pandemic has affected audit effort, audit quality and auditor disclosure quality supplied by auditors of listed firms in Norway. We have used data in the period from 2018 to 2021 and applied three different study models with a total of eleven different proxies to examine the effect of the pandemic. This study has given us a deeper understanding around the theory of factors driving auditors' effort and supply of audit quality and disclosure quality, how regulators use standards to affect this supply, and finally, how today's standards sustain a pandemic.

We would like to thank our supervisors Anders Berg Olsen and Seyed Mahmoud Hosseinniakani for helpful guidance and constructive feedback, and our family and friends for support throughout the process of writing this thesis.

The content of this thesis is solely at the authors' expense and responsibility.

Trondheim, May 2022

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Abstract

This paper examines the impact of the Covid-19 pandemic on audit effort, audit quality and auditor disclosure quality. The outbreak of the pandemic has led to uncertainties regarding the financial situation of firms and increased risks. In theory, auditors respond to increased risks by providing higher audit quality. We investigated this effect by using a quantitative approach with data on listed firms in Norway for the period 2018-2021.

Our results show no evidence of change in audit effort due to the pandemic. For audit quality, we find a significant decrease in the issuance of going concern opinions post Covid-19, but that this is likely due to the governmental grants and delayed due dates of taxes given to firms in financial distress. We find no significant changes in other proxies of audit quality post Covid-19, measured by abnormal accruals and small earnings increase.

We further use textual analyses to examine auditor disclosure quality by measuring the readability and evaluative content of disclosed key audit matters (KAMs) in audit opinions. Our empirical investigation reveals that there is a significant decrease in the number of disclosed KAMs, and a significant increase in the average length of KAM post Covid-19, implying an improved disclosure quality after the pandemic. However, no significant change was found in other proxies for readability, and no change regarding measurements of evaluative content.

Our results suggest that auditors in Norway were able to preserve their level of audit quality without changing audit effort due to the Covid-19 pandemic. In addition, some evidence suggests that auditors provided higher disclosure quality in the aftermath of the Covid-19 pandemic.

Sammendrag

Denne oppgaven undersøker Covid-19 pandemiens effekt på revisors innsats, revisjonskvalitet og informasjonskvalitet av revisjonsberetningen. Utbruddet av pandemien har ført til usikkerhet vedørende den finansielle situasjonen til selskap og økt risiko. I teorien responderer revisor på økt risiko ved å øke revisjonskvaliteten. Vi undersøker denne effekten ved å bruke en kvantitativ tilnærming med data fra børsnoterte foretak i Norge i tidsperioden 2018-2021.

Våre resultater gir ingen bevis for at det foreligger endring i revisor innsats knyttet til pandemien. For revisjonskvalitet finner vi en signifikant nedgang i utsendelse av revisjonsberetning med fortsatt drift presisering, men at dette i hovedsak skyldes tilskuddsordninger og utsettelse av skatt og avgift for selskap i vanskelighet på grunn av pandemien. Vi finner ikke signifikante endringer i andre målinger av revisjonskvalitet på grunn av Covid-19, målt ved abnormal accruals og small earnings increase.

Videre bruker vi tekstanalyse for å undersøke informasjonskvaliteten ved å måle lesbarhet og evaluere innholdet i avsnittet «Sentrale forhold ved revisjonen» i revisjonsberetningene for samme periode. Den empiriske undersøkelsen viser at det er en signifikant nedgang i antall sentrale forhold og en signifikant økning i gjennomsnittlig lengde på sentrale forhold i revisjonsberetningen etter Covid-19 pandemien. Dette impliserer at informasjonskvaliteten har økt på grunn av pandemien. På den andre siden er det ikke funnet signifikante endringer i andre målinger av lesbarhet, og ingen endring i måling av innhold.

Resultatene våre viser at revisorer i Norge klarte å opprettholde revisjonskvaliteten uten å endre innsatsen under Covid-19 pandemien. I tillegg finner vi noen bevis som tyder på at informasjonskvaliteten i revisjonsberetningen har økt.

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1. Introduction

The Covid-19 virus was first detected in China in December of 2019. It was later declared a pandemic by WHO on 11 March 2020 (World Health Organization). The following day, the Norwegian government presented strict measures and restrictions that were in effect from the same day (NOU 2021: 6, 2021). The outbreak of the pandemic represented an alarming health, economic and social crisis which could lead to various financial distress for firms (Albitar et al., 2021). The restrictions affected firms across industries in different ways with limitations in daily operations. Some firms experienced reduced demands or the possibility to supply their products and services, while others even had to close their businesses for some time. This impacts the financial situations of firms and increases risks (Albitar et al., 2021). In addition, auditors experienced challenges performing audits with work-from-home restrictions, not able to meet the audit team or client (Gong et al., 2022). This motivates us to investigate how the Covid-19 pandemic impacted audit effort, auditor´s ability to supply high quality audits and provide high quality disclosures to stakeholders.

Preliminary studies show a decrease in audit quality due to the Covid-19 pandemic. The decrease is mostly characterized by engagements audited by non-Big 4 auditors, where Big 4 auditors were able to preserve the same audit quality throughout the pandemic (Gong et al., 2022). Kend and Nguyen (2022) found in their study of Key Audit Matter (KAM) disclosures in the years 2019-2020 that only 3% of KAM disclosures were designed to address the audit risks arising from the pandemic, and that there was no change in the sentiment when comparing 2020 with 2019.

Despite being a country with low litigation risk (Hope & Langli, 2010), prior research implies that Norway retains the same audit quality as other countries (Eilifsen, 1998). We therefore expect that factors affecting auditors supply of audit quality also applies in a Norwegian setting, such as reputation loss, litigation risk, and regulatory concerns, connected to independence and competence (DeFond & Zhang, 2014). Where regulators implement new reporting regimes to increase auditors' accountability by adjusting the audit opinion, research shows that auditors in most cases respond by increasing audit quality, measured by lower abnormal accruals among other proxies (Carcello & Li, 2013; Gold et al., 2020; Reid et al., 2019; Zeng et al., 2021). However, there are mixed results of auditors' response to higher accountability due to change in the audit

opinion, where e.g. Gutierrez et al. (2018) and Bedard et al. (2019) found no change in audit quality due to increased risks. Moreover, when the audit risks increased due to the Global Financial Crisis (GFC) of 2008-2009, Geiger et al. (2014) and Xu et al. (2013) found an increase in audit quality by issuance of going concern opinions, while Chen et al. (2018) find no change in the likelihood of issuance of going concern opinions during the GFC. This provides evidence of auditors responding to increased risk of reputation loss, litigation risk and regulatory concerns, by increasing audit quality to an extent.

As a result of several bankruptcies during the GFC without any warnings from the auditor, investors required a more informative audit report (Doogar et al., 2015). As a response, IAASB implemented ISA 701, requiring auditors to disclose KAMs in the audit opinion. Studies examining the adoption of ISA 701 find that the communicative value in audit reports increased after the implementation of KAM, and that the quality has continued to increase the three following years (Seebeck & Kaya, 2022). Smith (2023) found that audit reports are more readable and have a greater specificity measured by more negative and uncertain tone after the adoption of ISA 701, which indicates higher communicative value and less boilerplate audit reports. Moreover, Zeng et al. (2021) find that disclosure characteristics as specificity, similarity, readability and length, and the number of KAMs disclosed signal auditors concern about client's earnings quality, audit effort and the propensity to issue a qualified opinion. Thus, the KAM section have reduced the information and expectation gap regarding the audit (Smith, 2023).

As there only exists limited number of studies attributed to the pandemic, this provides a unique setting in which we can examine how a pandemic, with restrictions and other measures, affects the audit. The Norwegian setting is interesting, because there are no previous studies providing evidence on audit quality and disclosure quality in Norway. Additionally, a number of measures were implemented by the government designed to avoid unnecessary bankruptcies and dismissals during the Covid-19 pandemic (Statministerens kontor, 2020).

By using a sample consisting of Norwegian listed firms in the years 2018-2021, we examine how the pandemic has affected audit effort, audit quality and auditor disclosure quality. For measuring audit effort, we will be using audit fee and audit delay as proxies. As proxies for audit quality, we

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will be using abnormal accruals, small earnings increase and the likelihood of receiving a going concern opinion. Disclosure quality of KAM is measured by three readability proxies; number of disclosed risks, length, and FOG score, and three proxies for evaluative content; frequencies of negative, positive, and uncertain words in the KAM sections.

Our results show no significant change in the proxies of audit effort due to the Covid-19 pandemic. For audit quality, no significant change in abnormal accruals or small earnings increase were found, but there was a significant decrease in the issuance of going concern opinions, which are associated with lower audit quality. However, the decrease in issuance of going concern opinions are likely due to financially distressed firms in Norway during the pandemic receiving governmental grants and delayed due dates for taxes. These results suggests that auditors in Norway were able to maintain the same level of audit quality without changing their effort during the pandemic. On the other hand, auditors may have increased their effort but without this being transferred to the firms in the form of increased audit fee or delayed earnings announcements.

For disclosure quality of KAM sections, the findings in our readability measures were a significant decrease in number of KAM disclosed, a significant increase in the length of KAM risks and no significant change in the FOG Score. While decrease in the number of KAM risks disclosed are likely due to confounding events during the pre-Covid period (e.g., implementation of IFRS 16), the increase in length of KAM risks disclosed provides evidence for increased disclosure quality. However, there were no significant changes in the evaluative content of KAM sections, measured by the tone.

Our study contributes to the literature in several ways. First, we contribute by providing evidence on how the Covid-19 pandemic has affected auditing. While a limited number of studies have focused on which impact the pandemic had on audit quality, we are examining to what extent the pandemic has affected the audit quality. In addition, we also investigate the effect on audit effort and auditor disclosure quality in audit reports. Second, we provide evidence on how disclosure quality in the KAM section has continued to develop beyond the years of the implementation. Finally, while most studies on the field have their settings in the US, UK, and Australia, we

contribute to the literature by researching audit quality and disclosure quality in a Norwegian setting.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 presents the hypotheses. Section 4 explains the variables and research method. Section 5 shows our results. Section 6 discusses the results. Section 7 concludes our study.

2. Background and prior research
2.1 Institutional setting

Most studies regarding auditing have their setting in the U.S., U.K., or Australia. Limited research has been done in Norway regarding audit quality and disclosure quality. Norway implemented the International standards on Auditing and Related Service (ISA) issued by the IFAC in 1998, and was the first of the Nordic countries to choose this adoption (Eilifsen, 1998). This implementation was only included in national auditing standards, and the full adoption of ISA came first in place in 2010 (Sormunen et al., 2013). However, Eilifsen (1998) finds that arrangements and the statutory auditor´s responsibilities in Norway bear resemblances to those found in other countries, and that Norwegian auditors' responsibilities for stewardship verifications has not been found to significantly differ from common international practice before adoption.

Some differences still exist. Norway is defined as a country with low litigation and reputation risk (Hope & Langli, 2010), and this may be a factor reducing audit quality as litigation and reputation risks are some of the factors driving the supply of audit quality (DeFond & Zhang, 2014). On the other hand, Norway has a strong investor protection that can reduce earnings management (Eilifsen & Knivsfla, 2013), and thereby increase audit quality.

Prior studies have examined the effect of lower litigation risk environment in Norway on auditor independence, and the likelihood of a firm receiving a going concern opinion before bankruptcy (Hope & Langli, 2010; Sormunen et al., 2013). Hope and Langli (2010) find that auditors receiving high fees or fees in excess of normal or expected fees of their services to not decrease the likelihood of issuance of a going concern opinion or modified audit opinion. Also, the proportion of Norwegian firms receiving a going concern opinion before bankruptcy are at the same level or

higher than in U.S. studies. In a Nordic setting, Sormunen et al. (2013) finds that Norwegian and Danish firms are more likely to receive a going concern opinion before bankruptcy compared with Swedish and Finnish firms, and that the source of difference may be the level of formal requirement for becoming an auditor, the demand for continuing education and the risk of disciplinary sanctions, which increases the quality in Norway and Denmark. Based on the previous literature, we assume that Norway retains the same audit quality as other countries, despite lower risks regarding litigation and reputation loss.

Norway implemented ISA 701 with the extended audit report 15 December 2016 (IAASB, 2015). According to ISA 701 key audit matters are those matters that required significant auditor attention in performing the audit, e.g., areas with higher risk of material misstatements, significant risk, estimation uncertainty, significant events or transactions etc. KAM are disclosed in the audit opinion and the description of each KAM shall include a) why the matter was considered to be one of the most significances in the audit and therefore determined to be a KAM, and b) how the matter was addressed in the audit. While there has been no study on KAM in a Norwegian setting, Norway adopted the new standard at the same time as most other early EU adopters in 2016 (Hosseinniakani et al., 2023). As prior literature provides evidence that Norway retains the same level of audit quality compared to other research settings in U.S., U.K., etc., we find no reasons for disclosure quality to differ from the level provided in other research.

2.2 Audit Quality

Audit quality is the magnitude of assurance provided in an audit, which are unobservable and an important input in the clients reporting quality (DeFond & Zhang, 2014). DeAngelo (1981, p. 187) define audit quality as "the market-assessed joint probability that a given auditor will both detect a breach in the clients accounting system and report the breach". DeFond and Zhang (2014, p. 281) further define higher audit quality as "greater assurance that the financial statement faithfully reflects the firm's underlying economics, conditioned in its financial reporting system and innate characteristics". Furthermore, DeFond and Zhang (2014, p. 280) presents a theoretical framework of audit quality which express that audit quality is a function of client´s demand and auditor´s supply, which both are affected by regulatory intervention. Focusing on auditor´s supply of audit quality, their theory is that this supply is driven by incentives such as loss of reputation, litigation

risk and regulatory concerns which are connected to auditors' independence, and auditors' competence such as expertise.

Regulators use standards and requirements to control audit quality in the market (DeFond & Zhang, 2014). New implementations increase auditors' risks regarding reputation loss, litigation, and regulatory concerns, which in turn, regulators receive a higher audit quality in the market. Several studies have looked at recent changes of auditor reporting requirements, and their effect on audit quality by increasing the accountability for the auditor after the implementation (Bedard et al., 2019; Carcello & Li, 2013; Gold et al., 2020; Gutierrez et al., 2018; Reid et al., 2019; Zeng et al., 2021). Whereas Carcello and Li (2013), Reid et al. (2019), Gold et al. (2020) and Zeng et al. (2021) found that the new reporting requirements improved audit quality measured by lower abnormal accruals among other proxies, Gutierrez et al. (2018) and Bedard et al. (2019) found no change in audit quality after the implementation. In the majority, research show that new requirements generally improve audit quality.

The last known crisis was the Global Financial Crisis (GFC) during 2008-2009, creating an environment with higher business risk (Kend & Nguyen, 2022). There are several studies of audit quality regarding the GFC, where going concern opinions have been used as proxy among others. Ettredge et al. (2017) find that auditors obtaining fee pressure from clients are less likely to issue a first time going concern opinion in 2008, but Chen et al. (2018) find no significant difference in the likelihood of a going concern opinion between client firms that received a fee cut during the GFC and control firms, and thereby no changes in audit quality. On the other hand, Geiger et al. (2014) and Xu et al. (2013) find an increase in auditors reporting going concern during and after the GFC, and thereby a higher audit quality. Prior studies give no clear evidence of the impact of financial crisis on audit quality. Mainly, there is no reduction in auditors´ independence following the increased pressure from clients, and the auditors provide higher quality following increased risks in the audit environment.

Taken together, prior literature provide evidence that audit quality generally increases when the risk of litigation, reputation loss and regulatory concerns increases. Thus, in line with DeFond and Zhang (2014) framework of audit quality.

2.3 Auditor disclosure quality

Before implementation of ISA 701, audit opinions were highly standardized with a pass/fail model, providing limited information for users of the financial statement (Gutierrez et al., 2018). This created an information gap with a difference in the information between public available information and what information that would be useful for stakeholders. It also created an expectation gap with difference between what stakeholders expected auditors' responsibilities to be and what they actually are (Smith, 2023).

During the GFC, several firms collapsed without any warnings from their auditors, where Doogar et al. (2015) found that this was likely a result of restrictions in the audit opinion where auditors did not have the opportunity to express their concern. As a consequence, investors requested more information in the audit opinion (Doogar et al., 2015). To follow up the demand from stakeholders, IAASB issued ISA 701 of Key Audit Matters (IAASB, 2015), to create informative value for the users of the financial statements, and to reduce the information and expectation gap (EC, 2011; IAASB, 2013). IAASB's post implementation review of ISA 701 reveals that there is broad support across stakeholder groups, investors find the audit opinion more transparent regarding the audit. They also disclosed that communication between the auditor, management and those charged with governance has improved (IAASB, 2021).

The audit opinion is the auditor's only direct communication with users of the financial statement, and an output-based measure for audit quality (DeFond & Zhang, 2014). For disclosed information to be informative and useful, and thereby improving quality, KAM-section should not include boilerplate language, but rather non-standardized and firm-specific information (Seebeck & Kaya, 2022; Smith, 2023; Zeng et al., 2021). Chen et al. (2019) present audit quality disclosure as a product of the quality of both the underlying financial report and audit opinion, where auditors can contribute to higher information value by increasing the quality of the audit opinion if the quality of the underlying financial report is lower.

Several studies have examined the adoption of the extended auditor's report and which consequences that follows the implementation. Gutierrez et al. (2018) found the disclosure of KAM did not improve financial reporting quality, nor that investors found the information

disclosed useful. Lennox et al. (2022) supplement this study by providing evidence for investors not finding the information useful because investors already knew this information before it was disclosed by auditors. On the contrary, Reid et al. (2019), Gold et al. (2020), Zeng et al. (2021) and Smith (2023) provide evidence that the financial reporting quality increased after the implementation of ISA 701. For the communicative value, Zeng et al. (2021) found that disclosure characteristics as specificity, similarity, readability and length, and the number of KAMs signal the auditor's concern about the client's earnings quality. It also provides a signal of audit effort and the propensity to issue a qualified opinion. Moreover, Smith (2023) find that the readability of the auditor opinion improves after the ISA 701 implementation and that KAM sections capture more client-specific audit risk with increases in negative and uncertain tone, providing evidence that the extended audit report does not use "boilerplate" language. Thus, the KAM section of the audit report has an informative value.

In addition to the implementation year of KAM, Seebeck and Kaya (2022) used textual analyses to examine the communicative value of KAM reporting three years after the implementation, where they find an improvement in the communication value of the KAM sections, especially for Big N auditor firms. Gutierrez et al. (2018) also researched years after the implementation and find a decrease in the number of KAM reported after the implementation year, and where there is a link between numbers of risk disclosed and audit fee. Similarly, Kend and Nguyen (2022) find that auditors report fewer but longer KAM and that there is an increase in disclosure of procedures in the years after the implementation. This implies that the communicative values continue to increase some years after the implementation.

While there are mixed results regarding the communicative value of KAM reporting, most studies show that the informative value of financial reporting has increased after implementation of ISA 701, and thereby increased the disclosure quality. As implementation of new standards increases auditors' accountability (DeFond & Zhang, 2014), mentioned studies of ISA 701 provide evidence that auditors respond to increased risks by increasing the informative value of the audit opinion. They also show that disclosure quality has continued increasing through the first years after implementation. Thus, there is an implementation phase with adjusting of the quality of disclosed KAMs.

2.4 Effect of Covid-19 restrictions and measures

The Norwegian government responded to the Covid-19 outbreak by implementing strict national restrictions and measures. These restrictions included, amongst others, closing of all educational institutions in Norway and a recommendation to work from home (NOU 2021: 6, 2021). Measures such as lowering the interest rate and delayed due dates for taxes were implemented along with governmental grants provided for firms suffering from a greater loss due to the pandemic (Lov om midl. tilskudd ved omsetningsfall etter august 2020, 2020; Statministerens kontor, 2020). This arrangement was made to give some relief to the firms in financial distress due to the pandemic. In retrospect, this enabled approximately half of the firms receiving the grant to gain profit in 2020 compared to 2019 (Fraser et al., 2021).

Work-from-home restrictions during the pandemic made auditors lose the possibility to have physical meetings and interactions with clients and other team members and forced auditors to adopt a remote way of auditing and having to change their original audit plan (Albitar et al., 2021). Audit quality is found to be lower when changing to a remote work model, although this effect could be mitigated by adjusting the audit procedures, such as relying more on data analysis and digital evidence in auditing (Jin et al., 2022). However, Gong et al. (2022) find that the decrease in audit quality mainly is attributable to firms with high inventory rates and high R&D expenses, in addition to being audited by a non-Big 4 auditor. On the other hand, Li et al. (2023) show that auditors adapted adequately to remote or hybrid auditing, where remote auditing does not affect audit quality or the auditor´s job satisfaction, but do affect audit efficiency. The study also holds that when working in remote auditing, audit quality and efficiency is higher when the organization provides sufficient support to auditors.

For the Covid-19 impact on disclosure quality, Kend and Nguyen (2022) used audit reports to explore KAM disclosures in 2019 and 2020 by using textual analyses. They found that 17% of KAMs in 2020 referred to covid-19, but only 3% of the procedures done in the same year were designed to address the audit risks that were a consequence of the pandemic. In the same study they also found differences in the sentiment or tone of words used by different auditors in 2020, but no differences were found when comparing 2020 with 2019.

In summary, studies show that audit quality decreases after Covid-19 and the use of remote auditing, but this effect can be mitigated by serving the auditors with sufficient support from the organization.

3. Hypothesis development
3.1 Covid-19 impact on audit effort

The Covid-19 pandemic has raised the level of uncertainty about the economy, future earnings and many other inputs that affect the financial reporting, and auditors may be obstructed to obtain sufficient appropriate evidence for the audit (Arnolds, 2020). Greater uncertainty tends to lead to increased business risk for clients and thereby increased litigation risk for auditors. Following DeFond and Zhang (2014), litigation risk can be reduced through increased effort and/or fee.

Prior studies show that increased litigation risk leads to increased audit fee, but the increase could be either effort, risk premium, or both (Simunic & Stein, 1996). Bell et al. (2008) find increase in labor hours of partners and managers when business risk increases, and thereby an increase in audit effort.

Another way of handling increased risk concerning audit effort is audit lag (Xu et al., 2013). In their study of the GFC, evidence was found of increased audit fee responding to the increased business and litigation risk, but no evidence of reporting lags. Nor Reid et al. (2019) or Bedard et al. (2019) found a delay of audit opinion following increased accountability for auditors after implementation of new reporting regimes for auditors in the U.K. and France. Nonetheless, with the pandemic came restrictions which demanded auditors to work from home offices and were forced to adopt to a remote way of working. Because of this, auditors lost essential contact with both clients and team members, and accordingly might have needed more time to adjust to this new situation which could create a lag in the reporting. Moreover, if the risks and challenges from the pandemic increase auditors´ perceptions of litigation risk and motivate them to perform additional tests and procedures, both audit fee and audit delay may increase accordingly. This leads us to our first hypothesis:

H1: Audit effort will increase due to the Covid-19 pandemic

3.2 Covid-19 impact on audit quality

IAASB has created a staff audit practice alert regarding going concern audit consideration for the impact of Covid-19, which express that Covid-19 is likely to have an implication for several markets and industries and may result in events and conditions that may cause significant doubt on the ability for a firm to continue as a going concern, and the auditors need to apply a greater professional skepticism and judgement (IAASB, 2020a). DeFond and Zhang (2014) express going concern opinions as an output-based measure for audit quality, and prior studies in Norwegian settings show that there is no compromise of auditor independence regarding going concern opinions, despite lower litigation- and reputation risk (Hope & Langli, 2010). Based on this, we believe that the Covid-19 pandemic would lead to an increase in issuance of going concern opinions. However, since several Norwegian firms gained profit in 2020 compared to 2019 due to the postponed due dates for taxes and governmental grants for firms in financial distress (Fraser et al., 2021), there may be an impact of the issuance of going concern opinions in Norway.

Prior studies show financially distressed firms engage more in income-decreasing earnings management, and more income increasing earnings management prior to a violation of debt covenants (Deangelo et al., 1994; Habib et al., 2013). Since the pre-audited financial statement is an important input in the audit process, this can also affect the audit quality by increasing both the risk concerned reputation loss and litigation due to misstatements and errors (DeFond & Zhang, 2014). Prior studies shows that auditors will increase their audit effort as a response to the increased risks (Bell et al., 2008). We therefore believe that the increase in audit effort will impact audit quality positively due to the pandemic. While the new remote work environment created by the pandemic have been found to decrease audit quality by some studies (Gong et al., 2022; Jin et al., 2022), Li et al. (2023) find that working remotely leads to high audit efficiency, and can enhance audit quality and efficiency when the audit firm provides sufficient support to auditors.
In theory, these circumstances with higher risk of reputation loss, litigation, and other regulatory concerns due to the pandemic, will make auditors respond by increasing effort and supply higher audit quality. We therefore hypothesize as follow:

H2: Audit quality will increase due to the Covid-19 pandemic

3.3 Covid-19 impact on disclosure quality

Users of financial statements requested more information from auditors after the GFC (Doogar et al., 2015). With the implementation of ISA 701, we believe this will encourage auditors to provide more informative disclosures about situations arising from the Covid-19 pandemic. Prior research has defined longer reports with more specific text to be more informative, unlike less readable and standardized KAMs that are referred to as "boilerplate" (Seebeck & Kaya, 2022; Smith, 2023; Zeng et al., 2021). Moreover, Kend and Nguyen (2022) found in their study of KAM sections in Australia in the four years after the implementation that auditors reported fewer but longer KAM sections with more descriptions of procedures, implying higher information value of the reported KAM. These studies of post-implementation years imply greater discloser quality of reported KAMs in the years after implementation. Since the implementation period interferes with the Covid-19 period, the implementation effect can also influence KAMs during the Covid-19 period.

IAASB published a staff audit practice alert on auditor reporting due to Covid-19 which highlights the changing circumstances and difficulties arising due to the Covid-19 pandemic that can affect determining the key audit matters reported in the auditor's report (IAASB, 2020b). Given the transparency of the KAM section in the audit report that increases auditors' responsibility, and increased business risk for firms and litigation risk for auditors following the pandemic, we believe this would lead to auditors improving the disclosed information by increasing readability and specificity of KAM sections, providing more useful information to the user of the financial statements. This leads us to our final hypothesis:

H3: Disclosure quality of KAM will increase post Covid-19.

4. Variable selection, research setting and method
4.1 Relationship between Covid-19 and audit effort

Our empirical model to capture relation between Covid-19 and audit effort is as follows:

[1] $AE = \beta_0 + \beta_1 COVID + CONTROLS + IndustryFE + \varepsilon$

Following Reid et al. (2019) and Bedard et al. (2019), we have adopted two proxies for audit effort; Audit fee (*LNAFEE_TOT)* and audit delay (*DELAY_LN*), which are represented by the dependent variable AE in the model. *LNAFEE_TOT* is the natural logarithm of audit fee (Bedard et al., 2019; Carcello & Li, 2013; Reid et al., 2019), and *DELAY_LN* the natural logarithm of number of calendar days between the firm´s fiscal end and date in the auditor opinion (Bedard et al., 2019).

Our variable of interest, COVID, is a dummy variable coded 0 if the firm year is 2018 or 2019, and 1 if the firm year is 2020 or 2021. For the regression, we expect *COVID* to be positively associated with *LNAFEE_TOT* and *DELAY_LN* since we hypothesize there will be put down more audit effort due to the pandemic. Hence, an increase in audit fees and audit delay.

Following Simunic and Stein (1996), Carcello and Li (2013) and Reid et al. (2019) we control for firm total assets (*SIZE*), profitability (*ROA* and *LOSS*), market-to-book ratio (*MB*), leverage (*LEVERAGE*), cash flow from operations (*CFO*), sales volatility (*VOLATILITY*), the use of a Big 4 auditor (*BIG4*), inventory and receivables intensity (*INVENTORY* and *RECEIVABLES*), and auditor busy season. While prior studies have included audit fee (*LNAFEE_TOT*) as a control variable, we excluded this from our DELAY-regression since there were high multicollinearity. We also control for industry fixed effects (IndustryFE) which are created as dummy variable of the two-digit industry codes (Carcello & Li, 2013; Reid et al., 2019). See Appendix A for the full description of variables.

4.2 Relationship between Covid-19 and audit quality

DeFond and Zhang (2014) split proxies for audit quality into output-based measures such as auditor communication and financial reporting quality, and input-based measures such as audit fees and auditor characteristics. Prior research uses different measures for audit quality, but it is recommended to combine several input- and output based measures to capture the phenomena of audit quality (DeFond & Zhang, 2014). We have adopted three commonly used proxies for audit quality; absolute abnormal accruals (*ABS_ACC*), small earnings increase analysis (*INCREASE*) and going concern opinions (*GOING_CONCERN*) (Carcello & Li, 2013). Our empirical model to capture the relation between Covid-19 and audit quality is expressed as:

[2] $AQ = \beta_0 + \beta_1 COVID + CONTROLS + IndustryFE + \varepsilon$

The dependent variable AQ is our three proxies for audit quality; *ABS_ACC*, *INCREASE* and *GOING_CONCERN*. *ABS_ACC* is a continuous variable calculated with the modified Jones-model (Carcello & Li, 2013; Dechow et al., 1995; Reid et al., 2019). *INCREASE* is a dummy variable coded 1 if the difference between a firm´s income before extraordinary items in years *t* and *t*-1 are in the interval [0.00, 0.02], and 0 otherwise. *GOING_CONCERN* is a dummy variable coded 1 if the firm receives a going concern modification in their audit opinion, and 0 otherwise. As we hypothesize an increase in audit quality due to Covid-19, we expect *COVID* to be negatively associated with *ABC_ACC* and *INCREASE*, but positively associated with *GOING_CONCERN*. This implies that we expect lower values of total abnormal accruals and small earnings increase, and higher issuance of going concern opinions which are proxies for higher audit quality.

Our variable of interest, *COVID*, is the same as in equation 1. Following Carcello and Li (2013), we control for firm size (*SIZE*), profitability (*ROA* and *LOSS*), leverage (*LEVERAGE*), market-to-book ratio (MB), last year´s total current accruals (*LCACCR*), cash flow from operations (*CFO*), sales volatility (*VOLATILITY*), whether the firm is in a litigious industry (*LITIGATE*) based on Francis et al. (1994), and whether the auditor is a Big 4 auditor (*BIG4*). In addition, we control for industry fixed effects as in equation 1.

4.3 Relationship between Covid-19 and disclosure quality
According to ISA 701, the purpose of key audit matters is to increase the informative value of the audit opinion to give the stakeholders information to better understand the areas with highest matter of auditing the financial statement. We use readability in our model to capture how well a message is communicated to the intended users of KAMs, measured by numbers of KAMs in the auditor opinion (*KAM_number*), numbers of words in KAMs (*ln_KAM_length*) and the Gunning FOG Score of KAMs (*KAM_fog_score* (FOG Score)) (Seebeck & Kaya, 2022; Smith, 2023; Zeng et al., 2021). The FOG score evaluates total words of sentences and the percentage of complex words, where complex words are defined as word with three syllables or more. The score represents how many years of formal education you need to understand the text (Smith, 2023). Hence, higher FOG score implicates more difficult text, and thereby lower readability.

As notified by Hosseinniakani et al. (2023), longer KAM can also indicate auditor using "boilerplate" language. As readability alone does not fully capture what the message contains, we consider this by measuring the tone of KAM, where negative and uncertain tone implies more client-specific disclosure (Smith, 2023).

We argued that the Covid-19 will change the tone of KAMs and thereby affect the evaluative content. Following prior studies, we use the bag-of-word model with the Loughran & McDonalds dictionary of financial words (Loughran & McDonald, 2011; Seebeck & Kaya, 2022; Smith, 2023), and measure for frequency of negative words (*neg_freq*), frequency of positive words (*pos_freq*), and frequency of uncertain words (*unc_freq*) in disclosed KAMs.

Our empirical model to capture relation between Covid-19 and disclosure quality are based on Seebeck and Kaya (2022), and represented by:

[3] $DQ = \beta_0 + \beta_1 COVID + CONTROLS + IndustryFE + \varepsilon$

Where the dependent variable DQ represents the three proxies of readability and the three proxies of evaluative content. Our variable of interest, *COVID*, is the same as in equation 1 and 2. As we hypothesize an increase in disclosure quality, we expect an increase in the length of the KAM, and a decrease in FOG Score, meaning the communication improves. Number of KAMs should only increase if previously insignificant parts of the financial statement become material because of the pandemic, creating new significant matters. For the tone, we expect an increase in negative and uncertain words, and a decrease in positive words, meaning the text will be more firm-specific. We therefore expect *COVID* to be positively associated with *ln_KAM_length, neg_freq and unc_freq,* and negatively associated with *KAM_fog_score* and *pos_freq*.

Following Gutierrez et al. (2018) and Seebeck and Kaya (2022), we control for firm size (*SIZE*), profitability (*ROA* and *LOSS*), market-to-book ratio (*MB*), leverage (*LEVERAGE*), cash flow from operations (*CFO*), audit period in busy season (*BUSY*), and whether the auditor is a Big4 auditor (*BIG4*). In addition, we control for industry fixed effects as in equation 1 and 2.

4.4 Sample

Our study uses the listed firms in Norway, both on Oslo Børs and Euronext Growth, which contains 326 firms in total as of December 2022. The research period is 2018 to 2021 where 2018-2019 is defined as the pre-Covid-19 period, and 2020-2021 as the post-Covid-19 period.

For the data collection, we have used Compustat to extract financial numbers of annual reports. Audit Analytics was used to extract information of audit fees, audit opinion, and reporting dates. In addition, we have manually hand-collected all KAM sections from audit opinions by downloading the annual report for all listed firms in Norway in the research period. For the textual and regression analyses, we have used Python as a program.

We begin with the 913 firm year observations available in Compustat and delete 121 observations with SIC-code 6000-6799 (Carcello & Li, 2013; Gutierrez et al., 2018; Zeng et al., 2021), giving us a sample of 792 firm years. For the abnormal accruals analysis, we deleted 17 observations without necessary data to calculate variables, giving us a final sample of 775 firm years. For the other models in our study, the sample of 792 firm years are reduced for observations without necessary data to calculate given variables of the models. The final sample therefore consists of 775 firm years in the small earnings increase analysis, 775 firm years in the going concern analysis, 616 firm years in the audit fee analysis, 608 firm years in the audit delay analysis, and finally, 517 firm years for the disclosure analyses with KAM. See appendix B for further details.

5. Results

5.1 Descriptive statistics

Table 1 provides descriptive statistics for our data observations. All continuous control variables are winsorized at the 1st and 99th percentile level, except *SIZE* which is the natural logarithm of total assets. The statistics show that 59% of our sample is in the post-COVID period, which is because the sample contains the Euronext Growth exchange with younger companies listed mostly at the end of the sample period. The table also shows that about 72% of the firm year observations are audited by a Big 4 auditor, and about 7% of the sample have received a going concern opinion. On average, auditors report 1,63 KAMs per firm, and the average length of each KAM is 196,48 words.

Table 1				Descriptive statics				
	n	mean	std	0,25	Median	0,75	min	max
LNAFEE_TOT	616	12.75	1.34	11.69	12.78	13.62	8.91	16.46
DELAY_LN	608	4.51	0.25	4.37	4.50	4.73	3.69	5.23
ABS_ACC	775	-0.04	0.51	-0.14	-0.03	0.04	-2.44	2.57
INCREASE	775	0.05	0.23	0.00	0.00	0.00	0.00	1.00
GOING_CONCERN	775	0.07	0.26	0.00	0.00	0.00	0.00	1.00
KAM_number	517	1.63	0.74	1.00	1.00	2.00	1.00	4.00
neg_freq	517	0.02	0.02	0.01	0.03	0.04	0.00	0.14
pos_freq	517	0.00	0.00	0.00	0.00	0.01	0.00	0.04
unc_freq	517	0.02	0.01	0.02	0.03	0.04	0.00	0.12
KAM_fog_score	517	21.61	3.84	19.30	20.63	22.41	15.26	38.87
KAM_lenght	517	196.48	69.58	145.00	187.00	236.00	63.00	481.00
ln_KAM_length	517	5.21	0.34	4.98	5.23	5.46	4.14	6.18
COVID	775	0.59	0.49	0.00	1.00	1.00	0.00	1.00
SIZE	775	7.68	2.05	6.14	7.71	9.18	2.34	14.08
ROA	775	-0.07	0.26	-0.11	-0.01	0.04	-1.49	0.41
LEVERAGE	775	0.21	0.22	0.02	0.14	0.34	0.00	1.12
LOSS	775	0.51	0.50	0.00	1.00	1.00	0.00	1.00
LCACCR	775	-0.04	0.16	-0.06	-0.02	0.01	-0.93	0.39
CFO	775	0.00	0.23	-0.03	0.04	0.10	-1.29	0.53
MB	775	3.46	4.84	0.85	1.86	4.44	-7.04	26.59
VOLATILITY	775	0.17	0.32	0.03	0.08	0.17	0.00	2.18
BIG4	775	0.72	0.44	0.00	1.00	1.00	0.00	1.00
LITIGATE	775	0.27	0.44	0.00	0.00	1.00	0.00	1.00
RECEIVABLES	775	0.11	0.11	0.03	0.07	0.17	0.00	0.53
INVENTORY	775	0.05	0.09	0.00	0.01	0.08	0.00	0.41
FOREGIN	775	0.79	0.40	1.00	1.00	1.00	0.00	1.00
BUSY	775	0.42	0.49	0.00	0.00	1.00	0.00	1.00

Table 1 provides descriptive statistics of the firm-year observations. All variables are defined in Appendix A.

5.2 Univariate results
5.2.1 Audit effort
Table 2 presents the univariate results on the audit effort measures in the pre-Covid-19 period (*Pre_COVID*) and the post-Covid-19 period (*Post_COVID*). These results show that there is no statistically significant change in logged audit fee (*LNAFEE_TOT*) and logged audit delay

(*DELAY_LN*). The only significant differences between the pre-period and post-period are an increase in market-to-book ratio (*MB*) and the value of receivables (*RECEIVABLES*). Because the univariate test does not control for other factors that impact audit fees or audit delay, we use regression analysis in the next section for a more complete analysis of the audit effort results.

Table 2		Univariate Statistics (mean values)				
	Audit fee analysis LNAFEE_TOT			Audit delay analysis DELAY_LN		
	Pre_Covid n = 282	Post_Covid n = 334	t-stat.	Pre_Covid n = 278	Post_Covid n = 330	t-stat.
LNAFEE_TOT	12.780	12.730	0.45			
DELAY_LN	0,000	0,000	0,000	4.513	4.507	0.33
SIZE	7.945	8.055	-0.66	7.958	8.079	-0.72
ROA	-0.078	-0.053	-1.14	-0.080	-0.054	-1.17
LEVERAGE	0.211	0.234	-1.33	0.212	0.235	-1.28
LOSS	0.464	0.458	0.15	0.467	0.457	0.24
MB	2.682	3.720	-2.78***	2.635	3.636	-2.71***
CFO	0.004	0.018	-0.71	0.002	0.017	-0.95
VOLATILITY	0.204	0.169	1.26	0.205	0.170	1.26
LITIGATE	0.255	0.266	-0.31			
BIG4	0.897	0.889	0.31	0.906	0.896	0.39
RECEIVABLES	0.138	0.117	2.09**	0.137	0.117	2.04**
INVENTORY	0.061	0.054	0.98	0.060	0.054	0.90
FOREIGN	0.854	0.865	-0.37			
BUSY	0.500	0.550	-1.26	0.496	0.548	-1.28

Table 2 present the differences in means between the pre-period and post-period of COVID. ***, ** and * indicates statistical significance at 1%, 5% and 10% levels, respectively. All variables are defined in Appendix A.

5.2.2 Audit quality

Table 3 presents the univariate results for the audit quality measures in the pre-COVID period compared to the post-COVID period. The results show that there is no statistically significant change in abnormal accruals (*ABS_ACC*) or small earnings increase (*INCREASE*) between the periods. For the control variables, there is significantly less use of Big 4 auditors (*BIG4*), and a significantly higher market-to-book ratio (*MB*) among firms in both the ABS_ACC- and INCREASE analysis.

Table 3				Univariate Statistics (mean values)					
	Abnormal Accruals ABS_ACC			Small Earnings Increase INCREASE			Going Concern Analysis GOING_CONCERN		
	Pre_Covid n = 312	Post_Covid n = 463	t-stat.	Pre_Covid n = 312	Post_Covid n = 463	t-stat.	Pre_Covid n = 312	Post_Covid n = 463	t-stat.
ABS_ACC	-0.055	-0.040	-0.40						
INCREASE				0.070	0.051	1.07			
GOING_CONCERN							0.102	0.058	2.28**
SIZE	7.811	7.594	1.44	7.811	7.594	1.44	7.811	7.594	1.44
ROA	-0.092	-0.062	-1.51	-0.092	-0.062	-1.51	-0.092	-0.062	-1.51
LEVERAGE	0.214	0.210	0.25	0.214	0.210	0.25	0.214	0.210	0.25
LOSS	0.503	0.526	-0.64	0.503	0.526	-0.64	0.503	0.526	-0.64
MB	2.797	3.910	-3.15***	2.797	3.910	-3.15***	2.797	3.910	-3.15***
LCACCR	-0.043	-0.041	-0.13	-0.043	-0.041	-0.13			
CFO	-0.001	0.002	-0.23	-0.001	0.002	-0.23	-0.001	0.002	-0.23
VOLATILITY	0.190	0.157	1.39	0.190	0.157	1.39	0.190	0.157	1.39
LITIGATE	0.256	0.285	-0.877	0.256	0.285	-0.87	0.256	0.285	-0.87
BIG4	0.817	0.654	5.02***	0.817	0.654	5.02***	0.817	0.654	5.02***
RECEIVABLES							0.132	0.107	2.92***
INVENTORY							0.058	0.055	0.43
FOREIGN							0.823	0.777	1.56
BUSY							0.455	0.403	1.41

Table 3 present the differences in means between the pre-period and post-period of COVID. ***, ** and * indicates statistical significance at 1%, 5% and 10% levels, respectively. All variables are defined in Appendix A.

For the last measurement of audit quality, the likelihood that a firm receives a going concern opinion (*GOING_CONCERN*), there is a significant decrease from the pre-period to the post-period. This provides evidence inconsistent with H2 that audit quality will increase due to the Covid-19 pandemic. In this analysis, firms with higher market-to-book ratio, are less likely to use a Big 4 auditor and have a smaller amount of receivables.

5.2.3 Disclosure quality

Table 4 presents the means of linguistic measures in the pre and post period of Covid-19. The results show only a significant change in numbers of KAMs (*KAM_number*) with a decrease from the pre-Covid to post-Covid period. This result is inconsistent with H3 that disclosure quality will increase due to the Covid-19 pandemic, as lower numbers of KAMs provide less information. These firms have a higher average value of *ROA* and *LEVERAGE*, and a higher market-to-book ratio (*MB*) from the pre-Covid period to post-Covid period.

Table 4	Univariate Statistics (mean values)		
	Pre_Covid n = 238	Post_Covid n = 279	t-stat.
KAM_number	1.726	1.555	2.61***
KAM_fog_score	21.654	21.583	0.21
KAM_length	193.668	198.888	-0.85
ln_KAM_length	5.197	5.238	-1.35
neg_freq	0.029	0.029	-0.16
pos_freq	0.004	0.004	-0.22
unc_freq	0.027	0.027	0.01
SIZE	8.174	8.280	-0.60
ROA	-0.050	-0.017	-1.73*
LEVERAGE	0.202	0.235	-1.96*
LOSS	0.441	0.412	0.66
MB	2.747	3.701	-2.37**
CFO	0.042	0.057	-1.01
BUSY	0.483	0.541	-1.31
BIG4	0.873	0.874	-0.02
Table 4 present the differences in means between the pre-period and post-period of COVID. ***, ** and * indicates statistical significance at 1%, 5% and 10% levels, respectively. All variables are defined in Appendix A.			

5.3 Regression results

All models are tested for multicollinearity (see Appendix C). In addition, we have also made a correlation matrix for each model (see Appendix D). Some variables show tendency to multicollinearity, especially *SIZE*. We have tried different combinations and excluding of variables without any change in the results, and therefore kept the original models used in prior studies.

5.3.1 Audit effort

Table 5 presents the results for the analyses of audit fee (*LNAFEE_TOT*) and audit delay (*DELAY_LN*). The coefficient on the COVID interaction, our variable of interest, is insignificant for both analyses, which provides no evidence that the Covid-19 pandemic resulted in a significant change in audit effort. On the other hand, we see that there is a decrease in audit fee and increase in audit delay post Covid-19, even though it´s insignificant.

Table 5	Regression results - audit effort			
	Audit fee **DV = LNAFEE_TOT**		**Audit delay** **DV = DELAY_LN**	
	Coeff.	t-stat.	Coeff.	t-stat.
Intercept	7.568	38.559***	4.762	115.238***
COVID	-0.038	-0.653	0.015	1.253
SIZE	0.574	28.778***	-0.012	-2.850***
ROA	-0.546	-2.550**	0.004	0.087
LEVERAGE	0.184	1.224	0.059	1.818*
LOSS	0.032	0.438	0.023	1.486
MB	0.012	1.703*	0.001	0.473
CFO	-0.453	-1.960**	-0.009	-0.197
VOLATILITY	0.252	2.783***	0.050	2.648***
LITIGATE	-0.415	-3.306***		
BIG4	0.146	1.411	-0.024	-1.068
RECEIVABLES	2.312	8.253***	0.057	0.960
INVENTORY	1.863	4.053***	0.160	1.658*
FOREIGN	0.029	0.332		
BUSY	-0.108	-1.656	-0.378	-26.765***
n	616		608	
Industry FE	Included		Included	
F-value	71.13		51.67	
Adj.R^2	0.724		0.637	
Table 5 present the regression results of the audit effort analyses. ***, ** and * indicates statistical significance at 1%, 5% and 10% levels, respectively. COVID is the variable of interest and the interaction term. All variables are defined in Appendix A.				

Control variables show that bigger firms with higher volatility in sales, and higher amount of receivables and inventories pay significantly higher fees. On the other hand, firms with higher return on assets and cash flow from operations pay significant less in audit fees. For the number of days between firm's balance date and date of audit opinion (*DELAY_LN*), bigger firms audited during busy season have significant smaller delays, compared to firms with higher leverage, volatility, and inventory intensity, which have a significant increased auditor delay.

5.3.2 Audit quality
Table 6 represents regression results of abnormal accruals (*ABS_ACC*), small earnings increase (*INCREASE*) and the likelihood of receiving a going concern opinion (*GOING_CONCERN*), which are our measures of audit quality. The coefficient of our variable of interest, *COVID*, indicates that the Covid-19 pandemic is positively associated with the absolute value of abnormal accruals, and negatively associated with small earnings increase. However, the associations are not significant and both models have a relatively low explanation power. Firms reporting increases in return on assets have a significantly higher amount of abnormal accruals, compared to firms with higher last year accruals and higher cash flow from operations which have significantly smaller abnormal accruals. For the small earnings increase analysis, bigger firms have a significantly higher likelihood of reporting a small earnings increase.

For the likelihood of receiving a going concern opinion, the variable of interest *COVID*, is significant (COVID, Coef. = -0,574, P-value = 0,080), but negatively associated with receiving going concern opinion. This meaning there is a reduced likelihood of receiving a going concern opinion post pandemic, which is inconsistent with H2 that audit quality will increase due to the Covid-19 pandemic. On the other hand, the control variables show that the decrease in going concern opinions applies to firms with an increase in the value of ROA and receivables, and firms with their audit opinion date during busy season. For firms audited by a Big 4 auditor, experiencing loss, and having a higher market-to-book ratio, the likelihood of receiving a going concern opinion increase.

Table 6	Regression results - audit quality					
	Abnormal accruals **DV = ABS_ACC**		**Small Earnings Increase** **DV = INCREASE**		**Going Concern Analysis** **DV = GOING_CONCERN**	
	Coeff.	**t-stat.**	**Coeff.**	**Chi-Square**	**Coeff.**	**Chi-Square**
Intercept	-0.168	-1.542	-5.099	-4.971***	-5.314	-3.814***
COVID	0.014	0.366	-0.276	-0.847	-0.574	-1.750*
SIZE	0.008	0.686	0.286	2.793***	0.006	0.054
ROA	0.547	4.23***	1.606	0.891	-2.524	-3.392***
LEVERAGE	0.076	0.824	-1.301	-1.336	-0.272	-0.420
LOSS	0.071	1.560	-0.315	-0.738	3.675	3.560***
MB	-0.005	-1.224	-0.032	-0.674	0.092	2.801***
LCACCR	-0.244	-2.100**	2.311	1.361		
CFO	-0.757	-5.32***	-1.423	-0.788	1.685	1.637
VOLATILITY	0.080	1.378	-0.458	-0.766	0.474	0.802
LITIGATE	-0.079	-1.023	-0.827	-0.937	-0.232	-0.274
BIG4	0.020	0.431	0.769	1.448	1.187	2.429**
RECEIVABLES					-5.606	-2.320**
INVENTORY					-1.248	-0.356
FOREIGN					-0.374	-0.804
BUSY					-1.261	-2.930***
n	775		775		775	
Industry FE	Included		Included		Included	
F-value	2.624					
Likelihood Ratio			-150.72		-131.14	
Adj.R^2	0.038					
Pseudo R^2			0,060		0.181	

Table 6 present the regression results of the audit quality analyses. ***, ** and * indicates statistical significance at 1%, 5% and 10% levels, respectively. COVID is the variable of interest and the interaction term. All variables are defined in Appendix A.

5.3.3 Disclosure quality

Table 7 provide the regression results for disclosure quality, measured by readability; number of KAM (*KAM_number*), average length of KAM (*ln_KAM_lenght*) and FOG Score of KAM sections (*KAM_fog_score*), and evaluative content; frequency of negative words (*neg_freq*), positive words (*pos_freq*) and uncertain words (*unc_freq*).

For readability measures, the coefficient on the COVID interactions is negatively associated with KAM number and the FOG score, and positively associated with the length of KAM. This implies that after the Covid-19 pandemic, there are fewer but longer KAMs, and the KAM sections are easier to read. However, only numbers of KAMs (COVID, Coef. = -0,178, P-value = 0,004) and length of KAM (COVID, Coef. = 0,052, P-value = 0,059) have a significant association with the COVID-variable. This is mainly consistent with H3 that disclosure quality will improve post Covid-19, but the decrease in number of disclosed risks is rather not consistent with the expected increase in risks following the pandemic and decreases readability by providing less information.

For the regression models testing evaluative content, there is no significant change in the tone of KAM sections due to the pandemic, but we see a slight tendency of increase in negative wording, suggesting more specific content.

For the control variables, the results shows that an increase in SIZE is associated with both an increase in number of disclosed KAMs and numbers of words in KAMs which improves readability, and an increase in FOG score and frequency of positive wording which decreases readability and evaluative content. Higher values of LEVERAGE are associated with decrease in FOG score, suggesting improved readability. An increase in CFO is associated with an increase in length of KAMs, and an increase in market-to-book ratio decreases the negative tone in KAMs and increases the FOG score. Higher values of ROA decrease the frequency of uncertain words in KAM sections. In addition, firms that are audited by a Big 4 auditor are associated with an increase in length of KAMs and a less negative tone of wording, indication more use of "boilerplate" language.

Table 7													Regression results - disclosure quality						

	Numbers of KAM		Lenght of KAMs		FOG Score of KAM		Frequency of negative words in KAM		Frequency of positive words in KAM		Frequency of uncertain words in KAM	
	DV = KAM_number		DV = ln_KAM_lenght		DV = KAM_fog_score		DV = neg_freq		DV = pos_freq		DV = unc_freq	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Intercept	0.809	4.200***	4.775	55.234***	19.243	18.768***	0.026	4.850***	0.000	0.064	0.0179	4.096***
COVID	-0.178	-2.896***	0.052	1.889*	-0.034	-0.106	0.001	0.517	0.000	-0.131	0.000	0.096
SIZE	0.117	5.641***	0.032	3.526***	0.352	3.179***	0.001	1.630	0.000	1.726*	0.001	1.096
ROA	-0.146	-0.664	-0.067	-0.681	-1.656	-1.410	-0.009	-1.439	0.001	0.438	-0.009	-1.848*
LEVERAGE	0.026	0.142	0.040	0.485	-2.231	-2.234**	0.003	0.636	0.001	0.338	-0.000	-0.065
LOSS	0.109	1.401	0.019	0.550	0.449	1.085	0.001	0.664	0.000	-0.106	0.003	1.652
MB	-0.003	-0.483	-0.003	-1.023	0.112	2.673***	-0.001	-2.996***	0.000	0.979	-0.000	-0.617
CFO	0.067	0.255	0.228	1.917*	-0.085	-0.060	0.005	0.784	-0.002	-0.784	0.003	0.413
BUSY	0.043	0.629	-0.068	-2.216**	0.534	1.452	-0.001	-0.231	0.001	0.704	0.002	1.145
BIG4	-0.107	-1.080	0.213	4.764***	-0.582	-1.099	-0.008	-2.835***	0.001	0.800	0.002	0.998
n	517		517		517		517		517		517	
Industry FE	Included		Included		Included		Included		Included		Included	
F-value	6.037		9.045		3.847		4.536		1.961		3.000	
Adj.R^2	0.149		0.219		0.090		0.110		0.032		0.065	

Table 7 present the regression results of the disclosure quality analyses. ***, ** and * indicates statistical significance at 1%, 5% and 10% levels, respectively. COVID is the variable of interest and the interaction term. All variables are defined in Appendix A.

6. Discussion

Starting with audit effort, there is an association of a decrease in audit fee and an increase in audit delay following Covid-19. However, neither of the associations are statistically significant, which does not provide evidence to hypothesis 1, that audit effort will increase due to the Covid-19 pandemic. On the contrary, the results are consistent with Reid et al. (2019) and Bedard et al. (2019) which found no evidence of increased audit cost due to the implementation of ISA 701 or French JOAs, where they expected higher accountability for the auditors. Besides this, when comparing audit effort in conjunction with the new reporting regime, auditors may have had the burden of additional costs related to the Covid-19 pandemic, but did not pass along these costs to the client in form of audit fees or audit delay (Reid et al., 2019).

For the measures of audit quality, we find no significant change in absolute abnormal accruals or small earnings increase, but the likelihood of receiving a going concern opinion have decreased significantly. This implies that the audit quality has decreased due to the pandemic (DeFond & Zhang, 2014). Together with the insignificant reduction of audit fee, similarities can be drawn to Ettredge et al. (2017) that found fee pressure from clients reduced issuance of going concern opinions under the GFC. However, we do not have enough empirical evidence to draw this conclusion. On the other hand, control variables show that the decrease applies for firms with higher return on assets (ROA), while firms experiencing loss are significantly associated with increases in going concern opinions, which is reasonable. Moreover, measures provided by the government with lowering interest rates could help firms gaining loans, while governmental grants and delayed due dates for taxes can stimulate the liquidity (Fraser et al., 2021). These measures can result in a generally decrease in going concern opinions, as firms improves liquidity and capital. Our results are however inconsistent with the theory that risks of litigation, reputation loss and regulatory concerns influence auditor´s supply of audit quality. In contrast, prior research has given some mixed results of auditor´s response to increase in these risks, where Chen et al. (2018), Gutierrez et al. (2018) and Bedard et al. (2019) find no change in audit quality due to higher accountability of auditors. In all, we fail to provide enough evidence of a change in audit quality due to the Covid-19 pandemic, and we therefore reject H2 where audit quality will increase due to the Covid-19 pandemic.

Another way to interpret these results is that the auditors managed to preserve the same level of audit quality throughout the Covid-19 pandemic. Where preliminary research finds a decrease in audit quality after implementation of work-from-home restrictions, we provide evidence that auditors maintained the same level of audit quality throughout the pandemic. This supports the working paper of Li et al. (2023) where results show that auditors adapted to the remote auditing adequately, and remote auditing does not affect the audit quality.

For the disclosure quality of KAM sections, the results show significant change for two of our three measures of readability, and no significant change for our three measures of content. Regarding readability, there is a significant increase in the length of disclosed KAM risks, consistent with higher communicative value (Seebeck & Kaya, 2022; Zeng et al., 2021), but a significant decrease in the number of KAM risks disclosed. By investigating our dataset, we observe that there may be confounding events that can impact our results regarding number of disclosed risks, e.g., implementation of IFRS 16 (9 KAM risks disclosed in pre-COVID period vs. 1 in post-COVID period). This could explain some of the reduction of disclosed KAM risks post Covid-19. At the same time, the results may also be affected by the implementation period, where Gutierrez et al. (2018) find a decrease in the number of KAM disclosed from the implementation year to the year after. Moreover, Kend and Nguyen (2022) observe a decrease in the number of disclosed KAMs and an increase in the length of KAMs in the period 2017-2020, suggesting auditors focus on a narrower set of risks where they provide more information and procedures. We find no significant change in the third readability measure (FOG Score), but based on the increased length of KAMs, there exists an increase in the readability of KAM sections post Covid-19.

For the measures of content in KAM-sections, we find no significant change in our three measures of tone. We therefore may not conclude that there is an increase in the evaluative content due to the pandemic (Seebeck & Kaya, 2022; Smith, 2023). This result is similar to Kend and Nguyen (2022) which found no change in the tone of KAM when comparing 2020 to 2019. While this may be true, there are associations of increased frequencies of negative and uncertain words post Covid-19, which implies that KAM sections capture more specific risks (Smith, 2023). In conclusion, auditors have increased the quality of disclosed KAMs to a degree by increasing the readability after the pandemic, while sustaining the level of evaluative content.

7. Conclusion

The aim of the present study is to examine the Covid-19 pandemic's impact on auditor effort, audit quality and auditor disclosure quality, by using data on listed firms in Norway for the period 2018-2021, which include two years before the pandemic and two years after the outbreak of the pandemic. Overall, we find no evidence of any change in audit effort due to the pandemic. However, there may be an increased effort without the cost being transferred to clients in the form of audit fee or delay. For audit quality, we find a significant decrease in the issuance of going concern opinions post Covid-19, but that this is likely due to the governmental grants and delayed due dates for tax given to the financially distressed firms. We find no significant changes in other proxies of audit quality post Covid-19, measured by abnormal accruals and small earnings increase. Next, we use textual analyses to examine the audit disclosure quality by measuring the readability and communicative value of disclosed KAMs in audit opinions. For readability measures, we find an increase in the length of KAM risks disclosed post the pandemic, which provides evidence for higher readability of KAM sections and thereby improved disclosure quality after the pandemic. There are no significant changes in the measures of evaluative content due to the pandemic. In conclusion, we provide some evidence for improved auditor disclosure quality post Covid-19.

Our results suggest that auditors in Norway were capable to preserve the level of audit quality without significantly changing audit effort due to the Covid-19 pandemic. In addition, we find some evidence suggesting that auditors provided higher disclosure quality by improving readability of disclosed information post Covid-19.

Our study is subject to some limitations. First, the situation in Norway was affected by financially distressed firms under the Covid-19 pandemic that were receiving government grants and delayed due dates for tax. The same arrangements might not have existed in other countries, and our findings may therefore not be transferable to other countries. Second, due to the amount of governmental grants and tax reliefs given to Norwegian firms in financial distress, more firms gained profit in 2020 compared to 2021, which also made a decrease in going concern opinion in the post Covid-19 period. There may be a displacement of the economic impact of the pandemic to the period after our study. Future research will be needed to assess the long-term effects of the

Covid-19 impacts in Norway. Finally, our study does not address the aspect of investor reactions to information disclosed in the study period. Even if we find some evidence of improved disclosure quality post Covid-19, we do not know if the investors find the disclosed information useful. Following up investors´ requests of more information from auditors after the GFC, future research could investigate investors' reactions of disclosed information provided by auditors during the Covid-19 pandemic.

Notwithstanding these limitations, our results provide initial evidence that the Covid-19 pandemic did not have significant impact on audit quality, nor audit effort. In addition, some evidence suggesting improved disclosure quality. This is also an important finding for standard setters, as it provides evidence regarding the robustness of implemented standards, which provide enough guidance to handle auditing through a pandemic.

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Appendix
Appendix A: Variable descriptions

Dependent and test variables

Variable	Description	Source
Audit quality:		
ABS_ACC	Modified Jones	Compustat
INCREASE	Assumes a value of 1 if the difference between a firm´s income before extraordinary items in year t and (t-1) scaled by the market value at the end of year t-1 falls in the interval [0.00, 0.02], and 0 otherwise	Compustat
RET	12-month cumulative raw returns at year t ending three months after the fiscal year-end.	Compustat
GOING_ CONCERN	1 if the auditor issued a going concern modification for year t, 0 otherwise.	Audit analytics
Audit effort:		
LNAFEE_TOT	Natural logarithm of total audit fees in year t.	Audit analytics
DELAY_LN	The natural logarithm of number of days between the fiscal year-end and the audit report date	Audit analytics
Disclosure quality:		
KAM_number	Number of key audit matters disclosed in the audit opinion	Audit opinion
ln_KAM_lenght	The natural logarithm of total number of words per disclosed key audit matter	Audit opinion
KAM_fog_score	The Gunning-Fog Index, calculated as: FOG = (words per sentence + percent of complex words) * 0.4	Audit opinion
neg_freq	Number of negative words based on Loughran & McDonald (2011) dictionary / total words in KAM	Audit opinion
pos_freq	Number of positive words based on Loughran & McDonald (2011) dictionary / total words in KAM	Audit opinion
unc_freq	Number of uncertain words based on Loughran & McDonald (2011) dictionary / total words in KAM	Audit opinion
Variable of interest:		
COVID	Indicator variable equal 1 if the fiscal year is the first or second year of the Covid-19 pandemic (2020 and 2021), 0 otherwise (2018 and 2019)	Compustat

Control variables

Variable	Description	Source
SIZE	Natural logarithm of total assets at the end of year t	Compustat
ROA	Earnings before extraordinary items in year t divided by total assets at the end of year t.	Compustat
LEVERAGE	Total debt at the end of year t divided by total assets at the end of year t.	Compustat
LOSS	1 if net income in year t is less than 0, 0 otherwise	Compustat
MB	Market value at the end of year t divided by book value at the end of year t.	Compustat
LCACCR	Prior year´s total current accruals (net income before extraordinary items + depreciation and amortization – operating cash flows) divided by lagged total assets.	Compustat
CFO	Cash flow from operations divided by total assets at the end of year t.	Compustat
VOLATILITY	Standard deviation of annual sales over the prior four (5) years, divided by total assets	Compustat
LITIGATE	1 if the firm´s main operations are in a high-litigation industry (biotechnology, computers, electronics, and retail industries [based on Francis et al. 1994]), and 0 otherwise	Audit analytics
BIG4	1 if the firm is audited by a Big 4 firm in year t, and 0 otherwise	Audit analytics
RECEIVABLE	Total accounts receivables at the end of year t divided by total assets at the end of year t.	Compustat
INVENTORY	Total inventories at the end of year t divided by total assets at the end of year t.	Compustat
FOREIGN	1 if the firm has foreign transactions in year t, and 0 otherwise	Compustat
BUSY	1 if the firm´s audit opinion in year t is between December and March	Audit analytics
Industry FE	Industry dummies – two-digit industry group with at least 8 firms in the current year.	Audit analytics

Appendix B: Sample

Sample construction	Firm-years
Firmyears with financial information aviable at Compustat	913
Firmyears in SIC-code 6000-6799	-121
Compliance firm-years	792

Abnormal accruals analysis:

Sum firm years before correction	792
Missing data necessary to calculate ABS_ACC	-17
Final sample	775

Small earnings increase analysis:

Sum firm years before correction	792
Missing data necessary to calculate INCREASE	-17
Final sample	775

Goning concern analysis

Sum firm years before correction	792
Missing data necessary to calculate GOING_CONCERN	-17
Final sample	775

Audit fee analysis

Sum firm years before correction	792
Missing data necessary to calculate LNAFEE	-176
Final sample	616

Audit delay analysis

Sum firm years before correction	792
Missing data necessary to calculate DELAY_LN	-184
Final sample	608

KAM analyses:

Sum firm years before correction	792
Firm years without KAM-reporting or Norwegian KAM section	-275
Final sample	517

Appendix C: VIF-indexes (multicollinearity)

Panel A: Abnormal accrual analysis		Panel B: Small increase analysis		Panel C: Going concern analysis	
Variable	**VIF**	**Variable**	**VIF**	**Variable**	**VIF**
COVID	2.483	COVID	2.483	COVID	2.493
SIZE	8.666	SIZE	8.666	SIZE	13.056
ROA	3.754	ROA	3.754	ROA	3.752
LEVERAGE	2.274	LEVERAGE	2.274	LEVERAGE	2.336
LOSS	2.645	LOSS	2.645	LOSS	2.893
MB	1.680	MB	1.680	MB	1.720
LCACCR	1.131	LCACCR	1.131	CFO	3.133
CFO	3.114	CFO	3.114	VOLATILITY	1.379
VOLATILITY	1.317	VOLATILITY	1.317	LITIGATE	1.770
LITIGATE	1.685	LITIGATE	1.685	BIG4	4.992
BIG4	4.505	BIG4	4.505	RECEIVABLES	2.250
				INVENTORY	1.530
				FOREIGN	5.470
				BUSY	2.308

Panel D: Audit fee analysis		Panel E: Audit delay analysis		Panel F: Disclosure analyses	
Variable	**VIF**	**Variable**	**VIF**	**Variable**	**VIF**
COVID	2.219	COVID	2.203	COVID	2.184
SIZE	18.470	SIZE	15.413	SIZE	11.674
ROA	4.131	ROA	4.105	ROA	2.433
LEVERAGE	2.572	LEVERAGE	2.533	LEVERAGE	2.756
LOSS	2.745	LOSS	2.570	LOSS	2.435
MB	1.814	MB	1.590	MB	1.465
CFO	3.481	CFO	3.425	CFO	2.171
VOLATILITY	1.397	VOLATILITY	1.383	BUSY	2.504
LITIGATE	1.973	BIG4	9.389	BIG4	7.319
BIG4	9.429	RECEIVABLES	2.206		
RECEIVABLES	2.342	INVENTORY	1.605		
INVENTORY	1.663	BUSY	2.603		
FOREIGN	7.317				
BUSY	2.637				

Appendix D: Correlation matrix

Panel A	Correlation matrix for abnormal accruals analysis											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) ABS_ACC	1.000											
(2) COVID	0.014	1.000										
(3) SIZE	0.002	-0.052	1.000									
(4) ROA	-0.029	0.054	0.376	1.000								
(5) LEVERAGE	0.031	-0.009	0.331	0.034	1.000							
(6) LOSS	0.057	0.023	-0.350	-0.531	-0.027	1.000						
(7) MB	-0.062	0.112	-0.296	-0.058	-0.217	-0.004	1.000					
(8) LCACCR	-0.098	0.004	0.115	0.200	-0.072	-0.136	-0.009	1.000				
(9) CFO	-0.130	0.008	0.415	0.812	0.101	-0.423	-0.070	0.182	1.000			
(10) VOLATILITY	0.032	-0.050	0.062	0.091	-0.071	-0.133	-0.023	-0.045	0.126	1.000		
(11) LITIGATE	-0.034	0.031	-0.382	-0.271	-0.238	0.111	0.327	-0.057	-0.286	-0.065	1.000	
(12) BIG4	0.010	-0.177	0.403	0.131	0.149	-0.228	-0.147	0.054	0.153	0.090	0.075	1.000

Panel B	Correlation matrix for small earnings increase analysis											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) INCREASE	1.000											
(2) COVID	-0.038	1.000										
(3) SIZE	0.115	-0.052	1.000									
(4) ROA	0.074	0.054	0.376	1.000								
(5) LEVERAGE	-0.021	-0.009	0.331	0.034	1.000							
(6) LOSS	-0.096	0.023	-0.350	-0.531	-0.027	1.000						
(7) MB	-0.026	0.112	-0.296	-0.058	-0.217	-0.004	1.000					
(8) LCACCR	0.055	0.004	0.115	0.200	-0.072	-0.136	-0.009	1.000				
(9) CFO	0.056	0.008	0.415	0.812	0.101	-0.423	-0.070	0.182	1.000			
(10) VOLATILITY	-0.009	-0.050	0.062	0.091	-0.071	-0.133	-0.023	-0.045	0.126	1.000		
(11) LITIGATE	0.029	0.031	-0.382	-0.271	-0.238	0.111	0.327	-0.057	-0.286	-0.065	1.000	
(12) BIG4	0.095	-0.177	0.403	0.131	0.149	-0.228	-0.147	0.054	0.153	0.090	0.075	1.000

Panel C	Correlation matrix for going concern analysis														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) GOING_CONCERN	1.000														
(2) COVID	-0.081	1.000													
(3) SIZE	-0.072	-0.052	1.000												
(4) ROA	-0.261	0.054	0.376	1.000											
(5) LEVERAGE	0.099	-0.009	0.331	0.034	1.000										
(6) LOSS	0.267	0.023	-0.350	-0.531	-0.027	1.000									
(7) MB	-0.006	0.112	-0.296	-0.058	-0.217	-0.004	1.000								
(8) CFO	-0.141	0.008	0.415	0.812	0.101	-0.423	-0.070	1.000							
(9) VOLATILITY	0.008	-0.050	0.062	0.091	-0.071	-0.133	-0.023	0.126	1.000						
(10) LITIGATE	-0.034	0.031	-0.382	-0.271	-0.238	0.111	0.327	-0.286	-0.065	1.000					
(11) BIG4	0.059	-0.177	0.403	0.131	0.149	-0.228	-0.147	0.153	0.090	-0.075	1.000				
(12) RECEIVABLES	-0.101	-0.104	-0.076	0.092	-0.204	-0.201	0.132	0.102	0.200	0.164	0.108	1.000			
(13) INVENTORY	-0.105	-0.015	0.067	0.096	-0.100	-0.256	0.047	0.054	0.113	0.030	-0.057	0.068	1.000		
(14) FOREIGN	0.000	-0.056	0.260	0.073	0.094	-0.046	-0.111	0.120	0.079	-0.142	0.276	0.059	0.007	1.000	
(15) BUSY	-0.138	-0.050	0.449	0.199	0.037	-0.272	0.047	0.218	0.050	-0.099	0.349	0.120	0.078	0.149	1.000

Panel D	Correlation matrix for audit fee analysis														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) LNAFEE_TOT	1.000														
(2) COVID	-0.018	1.000													
(3) SIZE	0.799	0.026	1.000												
(4) ROA	0.218	0.046	0.365	1.000											
(5) LEVERAGE	0.224	0.053	0.308	0.029	1.000										
(6) LOSS	-0.238	-0.006	-0.303	-0.532	0.053	1.000									
(7) MB	-0.184	0.111	-0.288	-0.065	-0.193	-0.053	1.000								
(8) CFO	0.273	0.028	0.408	0.831	0.084	-0.398	-0.079	1.000							
(9) VOLATILITY	0.145	-0.050	0.050	0.063	-0.091	-0.092	-0.012	0.094	1.000						
(10) LITIGATE	-0.326	0.012	-0.414	-0.306	-0.273	0.124	0.388	-0.329	-0.071	1.000					
(11) BIG4	0.213	-0.012	0.259	0.109	0.109	-0.132	-0.110	0.118	0.043	-0.068	1.000				
(12) RECEIVABLES	0.125	-0.084	-0.118	0.113	-0.257	-0.176	0.173	0.114	0.187	0.165	-0.010	1.000			
(13) INVENTORY	0.109	-0.039	0.067	0.083	-0.128	-0.261	0.093	0.056	0.091	0.098	-0.143	0.068	1.000		
(14) FOREIGN	0.176	0.0153	0.180	0.039	0.055	0.071	-0.090	0.073	0.052	-0.186	0.057	0.012	-0.014	1.000	
(15) BUSY	0.290	0.050	0.383	0.201	-0.017	-0.246	-0.006	0.216	0.014	-0.103	0.040	0.067	0.091	0.012	1.000

Panel E	Correlation matrix for audit delay analysis												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) DELAY_LN	1.000												
(2) COVID	-0.013	1.000											
(3) SIZE	-0.368	0.029	1.000										
(4) ROA	-0.182	0.047	0.374	1.000									
(5) LEVERAGE	0.048	0.052	0.309	0.032	1.000								
(6) LOSS	0.234	-0.010	-0.304	-0.531	0.051	1.000							
(7) MB	0.022	0.109	-0.272	-0.075	-0.187	-0.052	1.000						
(8) CFO	-0.189	0.029	0.419	0.830	0.086	-0.397	-0.092	1.000					
(9) VOLATILITY	0.032	-0.051	0.048	0.065	-0.092	-0.093	-0.008	0.096	1.000				
(10) BIG4	-0.095	-0.015	0.236	0.129	0.101	-0.135	-0.069	0.139	0.039	1.000			
(11) RECEIVABLES	-0.013	-0.082	-0.114	0.112	-0.252	-0.177	0.167	0.112	0.188	0.004	1.000		
(12) INVENTORY	-0.051	-0.036	0.081	0.073	-0.121	-0.254	0.070	0.048	0.095	-0.121	0.060	1.000	
(13) BUSY	-0.787	0.051	0.387	0.196	-0.014	-0.240	-0.008	0.213	0.014	0.049	0.065	0.081	1.000

Panel F	Correlation matrix for disclosure quality analyses														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) KAM_number	1.000														
(2) ln_KAM _length	-0.115	1.000													
(3) KAM_fog_ score	0.046	0.171	1.000												
(4) neg_freq	-0.015	0.106	0.060	1.000											
(5) pos_freq	0.039	-0.018	0.092	-0.029	1.000										
(6) unc_freq	0.047	0.020	0.144	0.354	-0.004	1.000									
(7) COVID	-0.114	0.059	-0.009	0.007	0.009	-0.000	1.000								
(8) SIZE	0.277	0.317	0.127	0.079	0.041	0.012	0.026	1.000							
(9) ROA	0.017	0.107	-0.095	-0.069	0.015	-0.115	0.076	0.287	1.000						
(10) LEVERAGE	0.040	0.217	-0.014	0.098	-0.007	-0.006	0.086	0.343	0.115	1.000					
(11) LOSS	0.007	-0.050	0.065	0.114	-0.043	0.130	-0.029	-0.249	-0.556	0.035	1.000				
(12) MB	-0.108	-0.215	0.014	-0.198	0.089	-0.028	0.104	-0.284	-0.002	-0.111	-0.077	1.000			
(13) CFO	0.045	0.172	-0.016	0.006	-0.006	-0.057	0.044	0.315	0.690	0.133	-0.391	0.031	1.000		
(14) BUSY	0.120	0.021	0.123	-0.011	0.076	0.061	0.057	0.385	0.181	0.028	-0.220	0.004	0.217	1.000	
(15) BIG4	0.009	0.229	-0.005	-0.062	0.054	0.058	0.000	0.199	0.114	0.050	-0.122	-0.044	0.122	0.145	1.000