Masteroppgave

NTNU
Norges teknisk-naturvitenskapelige universitet
Fakultet for økonomi
NTNU Handelshøyskolen

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Earnings management og generøse kompensasjonsordninger: bevis fra norske selskaper under Covid-19

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Trondheim, 25.05.2023

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Abstract

This thesis examines earnings management among Norwegian firms in response to the generous compensation scheme offered by the Norwegian government following the Covid-19 pandemic. We employ established models that use discretionary accruals as their proxy of earnings management. By studying a sample consisting of mainly unlisted firms, we obtained 723 firm-year observations during the period 2017-2021. We find that firms who received grants through the Norwegian government engaged in higher levels of accrual earnings management in the pandemic years (2020-2021) compared to the preceding period (2017-2019). We attribute this to the general compensation scheme serving as an incentive for managers to try to maximize government grants by managing earnings. Further inquiry shows that the firms in the industries that received the most grants (hotel and food service) show higher levels of accrual earnings management when compared to all other firms in the pandemic period. Lastly, we find no significant difference in levels of earnings management between firms depending on whether the grant application had been approved by either an auditor or a state authorized accountant.

Sammendrag

Denne avhandlingen undersøker nivået av resultatstyring (earnings management) blant norske bedrifter som respons på den generøse kompensasjonsordningen for næringslivet under Covid-19. Den generelle kompensasjonsordningen ble tilbudt til norske bedrifter som en del av regjeringens økonomiske tiltakspakke for å støtte næringslivet under pandemien. Vi benytter etablerte modeller som bruker skjønnsmessige periodiseringer som mål på resultatstyring. Ved å studere et utvalg bestående av hovedsaklig unoterte selskaper, får vi 723 årlige observasjoner i perioden 2017-2021. Våre resultater viser at selskaper som mottok tilskudd fra den norske regjeringen viste høyere nivå av resultatstyring ved hjelp av periodiseringer i pandemi-årene (2020-2021) sammenlignet med perioden før pandemien (2017-2019). Vi begrunner dette med at den generelle kompensasjonsordningen fungerte som et insentiv for ledelsen i norske bedrifter for å styre resultat med mål om å maksimere tilskudd fra regjeringen. Videre undersøkelse viser at selskaper i bransjene som mottok flest tilskudd (hotell- og serveringsvirksomhet) viste høyere nivåer av negativ resultatstyring ved hjelp av periodiseringer sammenlignet med alle andre selskaper i pandemiperioden. Avslutningvis finner vi ingen signifikant forskjell i nivåene av resultatstyring mellom selskaper avhengig av om tilskuddssøknaden ble behandlet av en statsautorisert revisor eller regnskapsfører.

Contents

List of Tables

1 Introduction

Earnings management has been studied in accounting and finance for decades. The term broadly refers to how management and other influencers of the financial statements can use accounting techniques in order to manipulate firms' earnings. Management may want to manipulate earnings for a host of reasons. This can be done in order to meet analyst forecast expectations, trigger bonuses that are tied to certain financial targets, or simply maintain a company's reputation (Degeorge et al., 1999). In some cases management may also wish to reduce earnings in order to pay less taxes. In times of crisis it can be argued there are strong incentives for management to manipulate earnings - as firms under pressure will have more riding on the reported figures. Crises such as economic recessions, natural disasters or pandemics can force firms to contend with reduced demand for their products or services as well as disruptions to their supply chains. In situations like this management may be tempted to manage earnings to make the outlook of the firm more favourable.

A global pandemic that lasted for more than two years was definitely an economic crisis. Covid-19 brought many initiatives aiming to limit the spread of the virus. Policies such as lockdowns in society, travel restrictions and social distancing resulted in substantial economic downturns as many industries suffered due to lack of demand. As a measure to counteract to the economic consequences of the pandemic, the Norwegian government introduced a subsidy scheme aimed at firms that were significantly affected. The support scheme dubbed *The General Compensation Scheme* (in Norwegian: den generelle kompensasjonsordningen) involved specific eligibility criteria that firms had to meet in order to receive funding. As such, some companies may have engaged in earnings management practices to artificially manipulate their financial performance and qualify for the government support. Hence, we wish to supplement past research on earnings management in Norway, by studying this while including the element of government subsidies. Furthermore, the pandemic is still a very recent event and as such studies on financial reporting quality in the pandemic period are only just emerging.

Despite the economic downturns around the world, certain sectors actually experienced growth during the pandemic. For instance, the E-commerce market grew largely, as social restrictions meant more people had to go online to purchase items they wanted (Dinesh and MuniRaju, 2021). Also, Telecommunications companies saw a large increase in demand for their services both in private and professional markets. For example, in March 2020, Microsoft reported that their online communications software Microsoft teams had reached 32 million daily active users (Nellis, n.d.). One year later, according to Vailshery (n.d.), they had reached 145 million daily active users. Nevertheless, the detrimental effects of Covid-19 from a public health standpoint and the drastic safety measures that followed, meant that to most businesses the pandemic was a big blow. Even sectors of the economy that did not directly suffer from reduced demand due to Covid-19 experienced increases in costs as new safety measures were required in the workplace.

Some sectors of the economy that were particularly vulnerable to the measures put in place suffered considerably because of the pandemic. As travel was restricted and face-to-face interactions were limited, the tourism and hospitality sectors were heavily impacted (Thams et al., 2020). Many restaurants and bars were forced to shut down temporarily and send their employees on leave. This was also the case for other businesses. In fact, from March to April 2020, the unemployment rate in Norway saw the largest growth over one month that has ever taken place in the country (Høgseth et al., 2020). Furthermore, the Norwegian Kroner drastically fell at the start of the pandemic. The fall of the NOK could be attributed to the fall of the price of Brent Crude Oil in early 2020, as well as investors opting for more secure currencies such as euros (EUR) and US dollars (USD) in times of crisis. Both these effects highlight the economic blow the pandemic brought to Norway.

According to the estimations of statistical research at Statistics Norway (Statistisk Sentralbyrå, SSB), the coronavirus-pandemic led to loss of GDP in mainland Norway of 145 billion Norwegian kroner in 2020, with an estimated total loss of 330 billion kroner for the entire period between 2020 and 2023. In 2022, GDP per capita increased by more than 20% following the economic recovery after the Covid-19 pandemic (Brasch et al., 2022). Despite this, in 2020 bankruptcies and forced liquidations in Norway fell by 12.8% compared to 2019. One would assume this largely is due to the subsidies granted by the Norwegian government, as one would expect less demand to lead to more bankruptcies than usual, cp.

Because of these circumstances in the Norwegian economy following Covid-19 and measures taken to protect society, we detect several motivations as to why management could engage in more earnings management

during this period. As Kjærland et al. (2021) found, past research could suggest that firms struggling due to Covid would engage in more earnings management in times where their economic goals would not be met no matter what. As such firms could take a *big bath* strategy. This is achieved by lowering earnings in the current year, so that the benchmark for comparison with future earnings will be lower. It is also plausible that upwards earnings management could also take place in the case of firms facing the possibility of bankruptcy or insolvency. As many firms lost their revenue streams while having to continue to pay fixed costs, already struggling firms will have been under a lot of pressure to avoid bankruptcy. In these situations management may have wanted to paint the future outlook of the firm more desirable in order to attract future investors and ensure continued operation.

While these reasons describe motivations to engage in more earnings management in times of crisis, past research has also found that financial reporting quality can increase when there has been a shock to the economy. Arthur et al. (2015) found in a European study that earnings quality during the financial crisis of 2008 improved compared to the preceding period. This is attributed to management wanting to increase investor confidence and reduce the negative impact of economic recession. However, the situation in Norway during Covid-19 is not perfectly comparable to the 2008 financial crisis as it includes the factor of firms receiving government grants if they met certain thresholds for loss of revenues compared to the pre-pandemic period. Because of this it could be argued that the Norwegian government initiatives gave management further incentives to be more aggressive in their accounting practices during Covid-19 - as engaging in downward earnings management could be of direct benefit to firms.

The compensation scheme issued grants from the 1st of September 2020 to the 28th of February 2022. The size of subsidies given to firms was based on amount of lost revenues and fixed, unavoidable costs as well as lost inventory during the aforementioned period. As of February 2023, over 8 billion Norwegian kroner had been awarded to Norwegian businesses through the general compensation scheme alone (Brønnøysundregistrene, 2023). The majority of this was issued in relation to firms' fixed, unavoidable costs – whereas approximately 80 million kroner have been awarded based on lost inventory. More than 14 000 companies have been awarded support, distributed across 37 000 individual grants. The firms that have received the most grants from the general compensation scheme are naturally in sectors of the economy that were heavily affected by Covid-measures. Companies dealing with Hotels, Travel- and hospitality services were as mentioned very much affected by the measures put in place. We notice that many of the same industry codes are prevalent when looking at the firms who received the most compensation.

The threshold for being able to apply for compensation was a 30% drop in revenue compared to the same time of year in 2019. The compensation scheme was made to be a swift and accessible tool to help firms. As such there is a large degree of trust placed on the firms that apply. Applications could be approved either by the external auditor or a state-authorized accountant. Given this information, we believe that there is potential for firms to abuse the compensation scheme by engaging in downward earnings management in order to meet its criteria.

In light of the general compensation scheme and former findings of earnings management in times of crisis, we want to investigate whether earnings management in Norwegian firms has changed in the pandemic period. Whilst there have been studies in the past examining earnings management in times of crisis, the recency of Covid-19 means there have not been completed many studies on this time period. Our contributions can highlight the effect that compensation schemes in times of economic crisis have on earnings management, and how companies can adjust their accounts to meet threshold values presented by the compensation schemes.

We investigate earnings management levels through the use of established models to determine discretionary accruals. By examining 723 financial statements for firms that received grants during the periods 2017-2019 (425) and 2020-2021 (298), we found that firms who received grants from the general compensation scheme had higher levels of discretionary accruals compared to the pre-pandemic period. Through further research we arrive at the conclusion that firms reduced earnings in order to meet criteria thresholds for the general compensation scheme.

This helps contribute to the existing literature in a few ways. As mentioned, past research has given conflicting conclusions as to whether levels of earnings management rise or fall in times of crisis (Arthur et al., 2015; Cimini, 2015; Filip and Raffournier, 2014; Iatridis and Dimitras, 2013; Kjærland et al., 2021) - and in spite of some of the preliminary research from the pandemic being released (Liu and Sun, 2022; Yan et al., 2022; Zhao et al., 2019), the scope of these studies differ from ours. For instance, they mainly involve

listed companies.

The results of this study will therefore contribute to the existing literature, in isolating the effect of generous government grants on opportunistic earnings management. This will be of interest for shareholders, accountants, auditors, policymakers and other stakeholders. Our findings show that users of the financial statements have to be skeptical when firms are offered generous grants in times of crisis.

In the remainder of this thesis, the structure is organized as follows: Chapter 2 provides a literature review, synthesizing past research; Chapter 3 presents the hypothesis development; Chapter 4 details the research design and methodology; Chapter 5 reports the empirical findings; and Chapter 6 concludes with a summary of the findings, an examination of limitations, and suggestions for future research.

2 Literature review

In this thesis, we examine the occurrence of earnings management among Norwegian companies during Covid-19. A commonly cited definition of earnings management comes from Healy and Wahlen (1999, p. 368):

earnings management occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.

There is compelling evidence that executives in firms do engage in such behaviours. Empirical studies generally describe two common ways in which earnings management is performed, namely adjusting accruals and real activities manipulation (Roychowdhury, 2006). Adjusting accruals of course entails manipulating the accruals of the firm and this has no direct cash flow consequences. This can be done by altering the timing of revenue and expense recognition in the financial statements. For example, a company may accelerate the recognition of revenue to the current period, even though it has not been earned yet, as a means of meeting earnings expectations. Real activities manipulation on the other hand, involves changing the underlying business operations to achieve the desired financial results. This affects the cash flow of the firm and in some cases also accruals. An example of real activites manipulation would be offering discounts to customers toward the end of the financial year as a way of increasing revenues.

Past research has shown that both adjusting accruals and real activities manipulation have been exploited in manipulating earnings, as found by Graham et al. (2005). In addition, accrual-based and real activities manipulation are found to be substitutes in managing earnings, where managers trade off the two earnings management methods based on their relative costs (Zang, 2012). For the scope of our study and data collection, we will focus on the former.

2.1 Motivations for engaging in earnings management

There are many suggested motivations for why managers would engage in earnings management behaviours. Management that are compensated based on firm performance may wish to boost firm earnings for personal gains (Degeorge et al., 1999). Furthermore, firms under pressure may want to provide investors with a greater outlook in order to stimulate further investment and avoid insolvency. One way of achieving stable earnings is income smoothing, where companies aim to avoid volatility in their earnings by delaying the recognition of revenue from one period to another. This technique can also be used to lower the bar for future comparison. Healy and Wahlen (1999) state that if earnings target earnings will not be met no matter what accounting principles are used, managers may be incentivized to further reduce current earnings by deferring revenues. In relation to the Covid-19 pandemic, the preliminary research on whether levels of earnings management increased in response to the pandemic are just being released. However, there have been many studies on this topic completed in relation to past economic crises, such as the 2008 financial Crisis. These events share similarities with the Covid-19 pandemic in that they heavily impacted the macroeconomic environment in countries across the world.

According to *agency theory*, managers will often take care of their own self-interests before looking after

the interests of stakeholders (Jensen and Meckling, 1976). A typical example of this would be when management prioritize short-term results for their own benefit rather than making decisions that benefit the long-term outlook of a firm. The reason the Norwegian government introduced the general compensation scheme was so that struggling Norwegian firms would receive grants which would help them survive and keep the Norwegian economy afloat. As such, it was in the best interest of the Norwegian government that eligible firms applied for and received the financial compensation they were entitled to. However, for the management of each individual firm it would be better to maximize compensation, as all other things being equal, more cash would be of benefit for the firm. Therefore there is a conflict of interest, as the Norwegian government want firms to receive sufficient compensation, while the management in firms see the opportunity to receive more than this. As such, we see there being incentives for the firm management to abuse to compensation scheme by engaging in earnings management behaviour.

In the past, Norway has been found to generally have low levels of earnings management – attributing this to its robust investor protection (Leuz et al., 2003). As mentioned, Kjærland et al. (2021) on the other hand find that Norwegian oil companies on the Oslo Stock Exchanged showed significant increases in earnings management during the third and fourth quarters of 2014 in response to the oil price-shock that year. This revelation of earnings management in Norway is noteworthy, especially considering the context of it being studied during a time of distress in the economy.

2.2 Earnings Management in times of crisis

It seems logical to assume that levels of earnings management can rise in times of crisis. In cases where firms are struggling, management may wish to boost or smooth their earnings in order to secure the survival of the firm. Despite this, Cimini (2015) found that the occurrence of earnings management in non-financial entities listed in European countries dropped after the 2008 financial crisis. This was deemed due to common incentives to attract potential investors during a crisis through high quality financial reporting. This is consistent with the findings of Arthur et al. (2015), who by comparing the earnings quality of sample firms in 14 European countries between 2005-2007 and 2008-2010 find that the sample firms presented higher-quality financial results during the financial crisis than prior to it.

Iatridis and Dimitras (2013) on the other hand find that the financial crisis had a significant negative effect on accounting quality for firms audited by a big4 auditor. They say that the crisis led to an increase in earnings management, and more so in the countries most effected by the crisis. However, Filip and Raffournier (2014) echo the findings of Arthur et al. (2015), in finding that earnings management significantly decreased during the crisis years. The difference in past findings can at large be attributed to the different research designs. While some studies merge several countries into the same sample, others take more of a country-by-country approach. It is also worth mentioning that the 2008 financial crisis arised partly due to poor financial reporting, demonstrating why the demand for high quality financial reporting was high in the aftermath.

While we do find past empirical research relevant for our thesis, it should be mentioned that Covid-19 was an unprecedented event, to wich no economic crises in the past decades can directly compare to. Because of this we deemed it important to look at more recent research that encompasses the magnitude of the pandemic. Research on the impact of Covid-19 on financial reporting has been only been possible for a limited amount of time. However we are now seeing more of the preliminary research released, given that we now have access to audited financial statements from both financial years 2020 and 2021.

In a chinese study, Yan et al. (2022) look into earnings management in response to Covid-19 by looking at both accruals-based earnings management and real earnings management in Chinese A-listed firms in the years 2018-2020. They find that enterprises in industries and regions where Covid-19 affected suspension of work engage in higher levels of accrual-based earnings management. This is credited to firms wanting to manage losses, and is in line with the findings of Aljughaiman et al. (2023). These findings are echoed by Liu and Sun (2022), who find that levels of earnings management in America rise in response to the pandemic. However Liu and Sun (2022) find income-decreasing accruals, crediting this to firms wanting to inflate earnings in the years after the pandemic and taking a *big bath* approach in doing so. Filipović et al. (2022) on the other hand find that Covid-19 positively affected the relationship between income-increasing accruals and dividend payments in Croatian firms. Companies that do not make dividend payments are presumed to not manage earnings as investor tolerance increased due to the tough circumstances of the pandemic.

In the UK, it was found that financial reporting quality deteriorated during the pandemic, due to the prevalence of real activities manipulation. This is suggested to be because firms want to avoid further negative reaction of investors or to survive during the crisis (Hsu and Yang, 2022). Further findings suggest that higher levels of corporate governance help mitigate the negative impact of Covid-19 on financial reporting quality. Investor protection is also found to have an inverse relationship with earnings management (Ali et al. (2022)). In a Malaysian study it was found that firms less affected by the pandemic are more likely to use the accrual earnings management approach to meet earnings targets, while more affected firms tend to engage in real earnings management (Zamri et al., 2022). Managers under extreme pressure may opt for the real earnings management strategy to avoid going bankrupt, without considering long term effects (Campa and Camacho-Miñano, 2015). Evidence from american firms also shows this trend, despite reporting abnormal levels of PPE losses in comparison to other quarters (Flores et al., 2023). Another study containing observations from 46 countries finds a positive association between the severity of Covid-19 and real earnings management in firms from 2021Q1 to 2020Q4 (Lee et al., 2023).

To summarize, these recent studies seem to demonstrate that firms in a myriad of countries have managed earnings in one way or another in response to Covid-19. Specific studies on downward earnings management in the presence of government grant incentives are scarce, however Zhao et al. (2019) found that firms in China who receive subsidies engage in more aggressive earnings management practices. This was found to be especially true for policy subsidies with the goal of helping weak firms. However this study exclusively looks into Chinese public utility firms that maintain infrastructure or deliver other essential public services.

In conclusion, while past research has shown conflicting results – it has been shown that firms on a large scale are willing to engage in earnings management in response to Covid-19. However there is a large gap in the literature when it comes to how firms respond to government grants. Therefore our thesis that looks at whether firms manage earnings when faced with the prospect of a generous compensation scheme during a crisis, is highly distinguishable from past empirical research.

3 Hypothesis development

As the existing literature gives conflicting sentiments as to whether earnings management levels increase or decrease during times of crisis in Norway, a mix of an intuitive and analytic approach is needed.

As previously mentioned, past research has found there to be low levels of accruals-based earnings management in Norway compared to other countries (Leuz et al., 2003). This finding was attributed to a high level of investor protection as well as the quality of national accounting rules and principles. Further studies have found that countries seen as having higher levels of ethical standards and social trust are associated with lower levels of accruals-based earnings management (Chen et al., 2021; Viana Jr et al., 2021). This, in addition to the fact that auditors tend to be more stringent during times of crisis due to probability of firm bankruptcies increasing (Xu et al., 2013), should restrict management's capabilities to perform accrual-based earnings management in Norway.

Despite these past findings, the unique circumstances of a global pandemic mean that the context of our study requires new perspective. The Norwegian governments' initiatives to shut down society in response to the pandemic led to significant losses for many firms. Considering this and the existing pandemic literature, we predict that firms have managed their earnings more in the pandemic period than in the prior period. A recent European study found that firms responded to Covid by managing earnings in order to display acceptable levels of losses and consequently alleviate the effect of the pandemic in the eyes of investors and other stakeholders (Lassoued and Khanchel, 2021). The results from this study ratify the existing literature's suggestion that european managers are willing to manage earnings in their desired direction in response to the pandemic.

Moreover, the possibility of receiving government grants based on the reported figures means that there are further incentives to manage earnings. This was also shown to be the case in countries issuing grants following the 2008 financial crisis – as recipient firms experienced greater increases in downward accrual management (Zhao et al., 2019).

Based on previous findings in the earnings management literature and the fact that many Norwegian firms struggled in response to the pandemic as well as the introduction of the general compensation scheme, we

present the following hypothesis:

Hypothesis 1: Companies that were awarded grants from the Norwegian Business Compensation Scheme during the Covid-19 outbreak engaged in more earnings management during the pandemic than in the years prior to the pandemic

The Covid-19 pandemic adversely affected certain sectors of the economy, which prompted the introduction of the general compensation scheme. However, this provided an opportunity for these firms to manipulate financial information to increase their grants. Zhao et al. (2019) discovered that firms tend to engage in earnings management related to government subsidies, particularly when the subsidies aim to support weak firms.

Table 1: Industry sections sorted by amount of Covid-grants

Industry Section		Grants received (in million NOK)
I	Accomodation and food service activities	2 968
H	Transportation and storage	1 493
R	Arts, entertainment and recreation	684
G	Wholesale and retail trade	632
N	Administrative and support service activities	460
L	Real estate activities	453
M	Professional, scientific, and technical activities	400
C	Manufacturing	351
F	Construction	204
B	Mining and quarrying	190

Notes: Top ten industry sections (Standard Industry Classification 2007) that received the most grant awards from the Norwegian Business Compensation Scheme during Covid. Source: Brønnøysundregistrene, via www.kompensasjonsordningen.no. Total amount distributed through the Norwegian Business Compensation Scheme was 8 095 MNOK.

The hotel industry, which falls under the "Accommodation and food service activities" bracket, is part of the industry that received the highest levels of grants in Norway. The hotel sector has been found to have several motivations to engage in earnings management practices, such as selective capitalization or expensing of assets to increase tax deductions (Turner and Guilding, 2011). Furthermore, previous studies have found that hotel managers have the ability to manipulate earnings figures, and are not indifferent to earnings outcomes (Esteban and Devesa, 2011). According to Seetah (2017), earnings management practices were found to be prevalent in the hospitality sector during the European debt crisis.

These findings demonstrate the ability of the hospitality sector to manage earnings in times of crisis. Moreover, Charitou et al. (2007) reported that managers of highly distressed firms tend to engage in downwards earnings management, and that the pressure to follow conservative earnings behavior during a distressed period is intensified by an increase in qualified audit reports. The study also indicated that distressed firms with lower institutional ownership have a greater tendency to engage in earnings management. Gore et al. (2007) also discovered that firms in industries with more volatile earnings are more likely to manipulate their earnings.

Based on these findings and previous discussions, we present the following as our second hypothesis:

Hypothesis 2: Firms in the industries that received the most grant awards from the Norwegian Business Compensation Scheme show the highest levels of industrywide earnings management

In order to receive grants from the general compensation scheme, the contents of the applications had to be approved by either an external auditor or a certified public accountant. The prospect of grant applications being processed by accountants as well as auditors has been the subject of some criticism from the Norwegian Auditors Association (NAA) (in Norwegian: Revisorforeningen) in the past.

In response to electricity support regulations that were proposed in Norway toward the end of 2022, the NAA specifically criticized the fact that the contents of applications could be validated by firms' own accountants.

In their response to the proposed electricity support regulations they made the following comment: "we remind you that auditors and accountants have fundamentally different tasks and responsibilities in relation businesses and society in general. Auditors carry out the confirmations of matters, while accountants carry out the client´s financial reporting duties and look after their interests" (Revisorforeningen, 2022).

The criticism could be based in a host of reasons. Because auditors generally face stricter requirements for independence, this should go a long way to ensure they do not have any personal incentives or relations with applying firms that would cloud their judgement in the assurance process. While accountants in Norway are also under strict rules for ethical accounting practice, the nature of their work means that total independence is hard to achieve. However, this is not only a matter of independence, but also the fact that auditors are more experienced in assurance work than accountants. Taylor et al. (2023) found that high quality audits reduced levels of earnings management during Covid.

Furthermore, in order to become authorized as an auditor in Norway, there are stringent requirements to competence in form of education and experience. Accountants are not required the same qualifications when it comes to assurance engagements. Thus we expect auditors to be more proficient in assurance engagements such as reviewing grant applications. Consequently, we expect that the firms that had their applications approved by certified public accountants will have had more possibilities to manage earnings, resulting in higher levels of earnings management.

Hypothesis 3: Companies whose grant applications were approved by an auditor engaged in less earnings management compared to companies whose grant applications were approved by a state authorized accountant

4 Research design

4.1 Event period

To conduct our study, the event period needs to be identified. The beginning of the crisis period is set to the year 2020, as the World Health Organization (WHO) on the 30th of January 2020 declared the Covid-19 outbreak to be a Public Health Emergency of International Concern (World Health Organization, 2020). From this moment the Norwegian government closely monitored the outbreak and took continuous action to contain the virus (Regjeringen, n.d.). One could argue that the end of the crisis in regard to the Norwegian context would be the 12th of February 2022, when the Norwegian Government removed all invasive regulations in response to Covid. Since mid-November 2022, the Norwegian government has neither issued any statements nor made any adjustments to its approach to the coronavirus. Regardless, given the lack of financial data for the fiscal year 2022 (as of writing this thesis), and the context of this study regarding companies that received grant awards from the Norwegian Business Compensation Scheme, discussing the pandemic after the fiscal year of 2021 would not be appropriate. In this study, the year 2020 marks the beginning of the crisis, while 2021 marks the end year of the crisis.

The preceding period selected for this study is the interval 2017-2019. Data from the pandemic's preceding years allows for comparison of panel data between pre- and intra-pandemic. We chose the preceding period based on several factors, including the limitations of time and resources during the study's development. We ended with a sample size that we deemed appropriate, especially when considering the significant amount of manual labor required to collect data from the firms.

4.2 Data and sample selection

Data on companies that have received grants from the Norwegian Business Compensation Scheme is available publicly and for free on the Brønnøysund Register Centre (BRC) website (Brønnøysundregistrene, n.d.), and is available for download in both JSON and CSV formats. We gained access to a data set on financial reporting from Norwegian companies from Wahlstrøm (2022), which contains all unconsolidated annual financial statements of Norwegian private and public limited liability companies as well as other company types that report to the Norwegian authorities. This dataset contains financial data for the accounting years 2006 – 2020. Remaining data for 2021 is therefore hand-collected, as we would argue only having data for

half of the crisis years would hurt the validity of our study. Data on cash flow from operational activities is also hand-collected for all companies during the event period. Grant awards data is filtered to provide a sample for modeling, which is then used to gather financial statement data from the Wahlstrøm data set by organization number.

The initial sample size possible for our study is 14 055. This is the number of companies that received grants from the Norwegian Business Compensation Scheme. Since data needed to be hand-collected for all observations in the sample, having a sample size equal to all relevant companies would be unrealistic given the timephrame and effort that would be required to gather all data. A compromise was made, in which the sample is filtered to only include companies that have received more than 3 million NOK in grant awards from the Norwegian Business Compensation Scheme during the pandemic. We also remove any companies meeting the criteria for "small companies", cf. The Norwegian Accounting Act. This left us with an initial sample size of 225.

We considered filtering the companies based on relative measures, as filtering based on absolute values might not be the most accurate solution. However, doing this would also pose several issues. The BRC data does not contain information on companies' assets, and would require us to manually download the data. This would involve an unreasonable amount of time and effort that could be put to better use for the purpose of this thesis. In addition, we would argue that filtering based on grants relative to revenue could create a skewed dataset, as the ratio of fixed unavoidable cost to revenue largely differs between industries.

Our sample consists mostly of private limited liability companies, whereas only a handful are public companies listed on the Oslo Stock Exchange. Through the sampling process, we found that very few public companies actually received grant awards from the Norwegian Business Compensation Scheme. While public companies often provide quarterly financial reports, unlisted companies generally only report once a year. Because of this, the sample consists of firm-year observations, rather than quarterly observations, which is a sampling method also used in more prominent earnings management literature (Burgstahler and Dichev, 1997; Dechow et al., 1995; Jones, 1991; Kothari et al., 2005).

The companies in our sample would in theory provide 1 125 firm-year observations. However, as some of the companies were not yet established during the earlier years of the event period, 22 firm-year observations are non-existent, providing an initial number of firm-year observations of 1 103. Upon further review, we found that 375 observations had to be removed due to filtering error on the BRC data, as the requirements for what accounts for a small company differs between the Norwegian Accounting Act and the Norwegian Covid-regulation concerning the Norwegian Business Compensation Scheme. Furthermore, since the accrual-based earnings management models employed in this thesis require financial data from year t-1, recently established companies during the event period had to be removed, and 3 observations are lost because of this. 2 more firm-year observations are also lost due to firm-specific events that make for unrealistically skewed outliers on certain variables. The final sample size after removing all unfit observations is 723 firm-years. Several studies of similar nature utilize a sample of similar size (Filipović et al., 2022; Hsu and Yang, 2022; Zamri et al., 2022).

Table 2: Sample selection of companies in thesis

Companies who received grants during the pandemic	14 055
Initial number of companies selected for sample	225
Initial firm-year observations for 2017 - 2021	1 103
Observations lost due to small companies, cf. Norwegian Accounting Act § 1-6	-375
Observations lost due to being recently established companies	-3
Observations lost due to firm-specific events	-2
Final sample - number of firm-year observations	723

4.3 Measurements of earnings management

Several means through which earnings management can be achieved are mentioned by Jones (1991), such as the use of accruals, changes in accounting methods, and changes in capital structure. This thesis focuses on accruals as the source of earnings management, where total accruals equal net income after tax subtracted

by operating cash flow. Total accruals can then be split into two groups: discretionary and non-discretionary accruals. Discretionary accruals are a common proxy of earnings management in the literature, through the accrual models error terms/residuals. Residuals from accrual models represent management discretion or estimation errors, both of which reduce decision usefulness, and is the more accepted methodology in accounting to capture discretion (Dechow et al., 2010). Discretionary accruals can occur due to both intentional earnings management and unintentional misjudgement of accrual accounting. The standard deviation of the models' residuals is our measure of earnings management. Francis et al. (2005) points out that larger standard deviations of residuals indicate poorer accruals quality, while large, consistent residuals do not necessarily translate to poor accruals quality.

In our thesis we utilize three models widely accepted in the literature to detect earnings management during the pandemic years of 2020-21. This is done to increase the validity of the results. Dechow et al. (1995) test and evaluate five different accrual-based models with the purpose of detecting earnings management. Our thesis will utilize the Jones (1991) model and the modified Jones model, which are both examined in this paper. In addition, Kothari et al. (2005) discuss the benefit of adding performance-based measures to the modified Jones model to increase the specification and power of tests. The modified Jones model is perceived to be a more powerful model compared to the Jones model (Dechow et al., 1995), especially in settings where revenue is manipulated (Dechow et al., 2010). With regard to performance-based measures, these are said to increase the specification and power of the accrual-based earnings management models under most circumstances (Kothari et al., 2005). Accrual-based models generally tend to be of relatively low power for detecting earnings management, hence using a mix of widely accepted models is a frequently taken approach to mitigate the issues that might arise from low power models in earnings management literature.

The original Jones model from 1991 focuses on accruals as the source of earnings management. The aim of the first study using the model was to test whether companies that would benefit from import relief attempted to decrease earnings during import relief investigations by the United States International Trade Commission (ITC). Jones argues that explicit use of accounting numbers in import relief regulations creates an environment where managers were, to a larger degree, incentivized to manage earnings to obtain import relief and possibly increase the amount of relief granted. The ITC looked at earnings before taxes, which included the effects of all accrual accounts. Managers were seen as more likely to use several accounts to reduce reported earnings. The model and methodology of Jones (1991) is an extension of previous earnings management studies such as Healy (1985), DeAngelo (1986), and M. McNichols and Wilson (1988), where time-series models are used to estimate non-discretionary accruals.

An underlying assumption in Jones' model and the study's hypothesis is that the incentive to decrease reported earnings must be greater that the incentives managers might have to increase their reported earnings. Otherwise, downward earnings management could not occur.

Jones (1991) model is presented as follows:

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 (\Delta REV_{it}) + \beta_3 PPE_{it} + \epsilon_{it} \tag{1}$$

Where TA_{it} is total accruals scaled by lagged assets. Lagged assets is the total value of assets in year t-1. Total accruals is the result of subtracting operating cash flow from net income after taxes in year t. Δ REV is the change in revenue from year t-1 to t, scaled by lagged total assets in year t. PPE_{it} is property, plant, and equipment, scaled by lagged total assets in year t. ϵ is the residual for a given year t.

Two of the study's limitations as presented by Jones are relevant to this thesis when considering the context of both studies. One limitation brought to light is the fact that many affected companies had financial performances that were already in an adverse state to such a degree, it would not seem necessary to use accounting choices to manage earnings (Jones, 1991). The other limitation proposed, is that the power of the tests may not be sufficient to detect managers' income-decreasing accounting choices.

Dechow et al. (1995) support the limitation of low power of tests, also when testing for different accrual-based models for detecting earnings management. Their study compares the specification and power of the commonly used models to measure discretionary accruals, and modifies Jones' model by adding the changes in receivables from year t-1 to t. This proposed modification to the Jones model is made to counteract one of the limitations of the original Jones model, regarding the assumption that all revenues are nondiscretionary.

The change in revenue is subtracted the change in receivables, and assumes that all changes in credit sales result from earnings management, with the rationale that managing earnings through credit sales is easier compared to cash sales (Dechow et al., 1995).

The modified Jones model is presented as follows:

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 (\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \epsilon_{it} \tag{2}$$

Delta REC is the change in receivables from year t-1 to year t, scaled by lagged total assets in year t. Dechow et al. (1995) found that the modified version of the Jones model gave the most powerful tests of earnings management of the models tested. A performance-based measure for discretionary accruals is added onto the modified Jones model in Kothari et al. (2005), using ROA (return on assets) as a measure of performance. One of the reasons ROA is used as a performance-based measure is because Dechow et al. (1995) suggest the use of ROA to control for the effect of performance on measured discretionary accruals.

The Kothari et al. (2005) model is presented as follows:

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 (\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \epsilon_{it} \tag{3}$$

Where ROA is added to control for firm performance, and equals net income after tax year t, scaled by lagged total assets in year t. Kothari et al. (2005) suggest that extending the modified Jones model of Dechow et al. (1995) produces a more viable alternative to the existing discretionary accrual models used in the research on earnings management.

Similar to Kothari et al. (2005), Larcker and Richardson (2004) also expand on the Jones model, adding book-to-market ratio and operating cash flow as additional independent variables. Previous research shows that misspecification of discretionary accruals is more likely for firms with extreme levels of performance (Dechow et al., 1995). Operating cash flows is included as a measure of operating performance, in contrast to the Kothari model, which follows the recommendation of Dechow, Sloan, and Sweeney, using ROA as an independent variable to control for firm performance. However, subsequent literature states that while the use of ROA mitigates misspecification in samples with extreme ROA, it exaggerates misspecification in samples with extreme firm size (Dechow et al., 2012).

In the further testing of hypotheses 2 and 3, we expand on the Kothari model, adding operating cash flow (OCF_{it}) as an independent variable, inspired by the expansions made by Larcker and Richardson (2004). Their inclusion of the independent variable market-book ratio is not included in our thesis, as our sample consists of primarily private companies. The new equation is presented as follows:

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 (\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \epsilon_{it} \tag{4}$$

Equation (4) is used in the bootstrapping procedure used to measure our proxy for earnings management for hypotheses 2 and 3, similar to how equations (1)-(3) are used to measure the proxies of earnings management in hypothesis 1.

To test for the direction of earnings management, we use a similar method as Han and Wang (1998) and Patten and Trompeter (2003). Indicator variables are added as expansions to equation (4) to test the variables of interest. For instance, in Patten and Trompeter (2003) they use the year 1984 as an indicator variable, where the value 1 is designated observations in the year 1984 and 0 otherwise. For all the hypotheses in this thesis, a variety of indicator variables are required. In hypothesis 1, the indicator variables $GRANTS2020$ and $GRANTS2021$ are used to test for income-decreasing earnings management among companies that where recipients of Covid grants in the years 2020 and 2021, respectively.

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 (\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \beta_6 GRANTS2020 + \beta_7 GRANTS2021 + \epsilon_{it} \tag{5}$$

As in the example of Patten and Trompeter (2003) $GRANTS2020$ and $GRANTS2021$ equal 1 if a company received compensation from the Norwegian Business Compensation Scheme during the Covid years 2020 and 2021, and 0 otherwise.

Indicator variables employed to test the direction of earnings management in hypothesis 2 are industry-based. Industries are classed in sections as defined by the Standard Industrial Classification 2007 (SIC 2007). The six sections that received the most grants are included in an expanded model of (4) as indicator variables:

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + SECTION_G + SECTION_H + SECTION_I + SECTION_L + SECTION_N + SECTION_R + \epsilon_{it} \quad (6)$$

Once again the value 1 is given to a represent a company being part of a certain industry section, and will be 0 for the other indicator variables. All indicator variables equal 0 if a company does not operate in any of the sections included as indicator variables. Variable $SECTION_I$ equals 1 for companies in the accommodation and food service section, which is the section that received the most grants during the pandemic.

For hypothesis 3, the expanded model (4) includes the indicator variable $AUDITOR$, and equals 1 if an auditor did the assurance on a company's grant application, and 0 if the assurance was done by a state authorized accountant. The model is presented as follows:

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \beta_6 AUDITOR + \epsilon_{it} \quad (7)$$

This thesis' proxy for earnings management is the standard deviation of discretionary accruals. The discretionary accruals equal the residual terms of the models employed (ϵ). Although this proxy for accrual-based earnings management is widely used, other measures of discretionary accruals have also been tested. For instance, Kothari et al. (2005) examine the properties of total accruals of a company subtracted by the industry median total accruals, as well as total accruals subtracted by a matched firm's total accruals, and discretionary accruals minus the industry median discretionary accruals using the Jones model - as possible alternative measures for discretionary accrual measures.

All numeric variables used in the models are winsorized at the 1% tails to control for extreme outliers without removing observations from the sample. Winsorizing techniques have been used in several earnings management studies (Dechow et al., 2012; Francis et al., 2005; Kothari et al., 2005).

4.4 Similar studies and employed models

Nevertheless, the original Jones model from 1991, with its expansions, represents one of the most frequently used and widely accepted frameworks in the earnings management literature among the contributors to the subject (Dechow et al., 2010). This is further proven given the methods employed in studies with similar hypotheses to our thesis. For instance, Yan et al. (2022) examine the impact of the pandemic on earnings management. They use the modified Jones model to estimate discretionary accruals, based on Dechow et al. (1995). In addition, a frequently used model measuring real earnings management is employed, following the method of Roychowdhury (2006). The original Jones (1991) model is also used to test for alternative measures of accrual-based earnings management.

All models used in this thesis are written using the programming language R in the programming suite RStudio. According to Muenchen (2022), R has the second most articles among data science softwares, where SPSS is the most dominant data science software in scholarly articles. R offers a powerful tool for statistical computing and graphics and is free of charge and highly extensible (The R Foundation, n.d.).

Multicollinearity in regression analysis can be detected by using Variance Inflation Factor (VIF) measures. A common rule of thumb is that values exceeding 5 represent a greater likelihood of multicollinearity among the variables used in the models, however, a research paper by Johnston et al. (2018) suggest that a higher

Table 3: Similar studies and employed earnings management models

Paper	Models applied to test for earnings management
Lassoued and Khanchel (2021)	Modified Jones, Kothari, & M. F. McNichols (2002)
Filipović et al. (2022)	Modified Jones
Hsu and Yang (2022)	Real earnings management models
Liu and Sun (2022)	Kothari
Zamri et al. (2022)	Modified Jones
Flores et al. (2023)	Kothari
Lee et al. (2023)	Modified Jones & Kothari

degree of care is needed when considering thresholds for the VIF. VIFs of 2,5 or higher are also seen as indicative of considerable multicollinearity in their paper. O'Brien (2007) argues in a similar vein that rules of thumb regarding threshold values of the VIF can create more serious problems than they are solving, and finds that threshold values for VIF need to take context into the equation. In addition, multicollinearity is suggested to be more present and more of a concern in smaller data sets (de Jong et al., 2015), and is relevant in our thesis since the data set is of a smaller size. A correlation matrix and VIF index for the variables are found in the appendix, and we find that all VIF measures are below the threshold value of 2,5 as suggested by Johnston et al. (2018). This indicates that multicollinearity did not pose an issue in the models. Additionally, the correlation matrix shows no signs of multicollinearity issues in the models employed.

5 Empirical results

5.1 Summary statistics

Descriptive statistics of firm characteristics in our sample is presented in table 4. Panel A and B presents the pre-Covid and Covid periods respectively, while panel C presents t-tests for the difference in means between the two periods. Mean revenue during Covid was 399 million NOK (MNOK), a decrease from a mean revenue of 565 MNOK during the pre-Covid period. Adjusting for received Covid grants, mean revenue during Covid was 387 MNOK, only 12 MNOK less than non-adjusted mean revenue during the Covid period. Regarding total assets among companies in the sample, there was a negligible difference in means between the periods, with means of 653 MNOK pre-Covid, and 651 MNOK during the Covid period. Firms in the sample experienced a decrease in mean net income from 16 MNOK to -19 MNOK, as well as a reduction in mean return on assets (ROA) from 4.1% to -8.5% during the pre-Covid and Covid period, respectively. Furthermore, the mean operating cash flow among firms in the sample declined from 43 MNOK to 3 MNOK.

The t-tests in panel C reveal that firm characteristics were negatively affected by the pandemic, with the difference in net income, operating cash flow, and return on assets being significant at the 1% level. Surprisingly, the t-test shows no significance at the 1%, 5%, or even at 10% level in the mean difference of firm revenues, even after adjusting the revenues for received Covid grants. However, the t-test measures a higher value for revenues that are adjusted for received Covid grants than non-adjusted revenues, which indicates a higher significance and a larger mean difference in revenues adjusted for received grants. To summarize, the descriptive statistics of firm characteristics confirms that recipient firms of grant awards suffered heavily during the pandemic, with especially adverse effects on firms' profitability and cash flow.

Descriptive statistics of the model variables are presented in table 5, with Panel A and B presenting the pre-Covid and Covid periods, respectively. Upon reviewing the table, it is apparent that several model variables exhibit similar minimum and maximum values, such as ΔREV_{it}, $\Delta Rev_{it} - \Delta REC_{it}$, OCF_{it}, and $1/A_{it-1}$. This similarity can be attributed to the winsorizing method employed to treat outliers within the data set, as previously disclosed. It should be noted that other variables utilized in the thesis models are at a binary level, serving as dummy variables, and are therefore not presented in the descriptive statistics of model variables.

Table 4: Descriptive statistics of firm characteristics for the sample firms

Variable	Mean	Median	Std.Dev	Min	Max
Panel A: Pre-Covid period (N = 425)					
Revenue	565.9	176.1	1 561.4	0.1	18 899.1
Revenue (- Covid grants)	565.9	176.1	1 561.4	0.1	18 899.1
Total assets	653.6	128.8	1 571.3	1.5	9 644.30
Net income	16.9	4.9	137.3	-1 283	1 246.2
Operating cash flow	43.8	9.5	139.7	-646.9	1 189.4
ROA	0.041	0.04	0.199	-1.27	0.875
Panel B: Covid period (N = 298					
Revenue	399.8	123.1	1 374.8	0.04	17 561.1
Revenue (- Covid grants)	387.9	120.6	1 373.8	-168.9	17 555.1
Total assets	651.6	128.3	1 635.8	6.7	11 351
Net income	- 19.6	- 2.8	118.5	-1 509	478.2
Operating cash flow	3.9	1.3	140.5	-1 141.4	787.5
ROA	-0.085	-0.026	0.241	-1.84	0.452
Panel C: t-test for difference in means between pre-Covid and Covid period					
Variable	Mean pre-Covid	Mean Covid	Difference	t-test	
Revenue	565.9	399.8	-166.1	-1.5114	
Revenue (- Covid grants)	564.9	387.9	-178	-1.62	
Total assets	653.6	651.6	-2.0	-0.016831	
Net income	16.9	-19.6	-36.6	-3.8255***	
Operating cash flow	43.8	3.9	-39.9	-3.7658***	
ROA	0.041	-0.085	-0.126	-7.4197***	

Notes: Full sample consists of companies that received grant awards from the Norwegian Business Compensation Scheme during Covid. The number of firm-observations is 723. All variables except ROA are in MNOK. Panel A contains a summary of pre-Covid data during the period of 2017-2019. Panel B contains a summary of Covid data during period of 2020-2021. A t-test for the mean value differences between the two periods is performed and the results are presented in panel C. ***, **, * indicate significance at 1%, 5%, and 10%, respectively.

Table 5: Descriptive statistics of model variables

Variable	Min	1st Qu	Median	Mean	3.rd Qu	Max
Panel A: Pre-Covid period (N = 425)						
ROA_{it}	-0.8581	-0.0024	0.0404	0.0407	0.1080	0.5254
ΔREV_{it}	-1.6392	-0.0083	0.0687	0.1449	0.2482	1.7769
$\Delta REV_{it} - \Delta REV_{it}$	-1.7706	-0.0731	0.0481	0.0912	0.2545	1.6177
TA_{it}	-0.8379	-0.1234	-0.0360	-0.0498	0.0321	0.5016
OCF_{it}	-204.934	0.772	9.529	40.184	31.020	494.676
PPE_{it}	0.0000	0.0465	0.1786	0.2764	0.4025	1.2236
$1/A_{it-1}$	1.212e-10	3.020e-09	8.580e-09	1.492e-08	1.990e-08	9.356e-08
Panel B: Covid period (N = 298)						
ROA_{it}	-0.85810	-0.14088	-0.02644	-0.07863	0.02241	0.45234
ΔREV_{it}	-2.36163	-0.62609	-0.10145	-0.31061	0.05133	1.77691
$\Delta REV_{it} - \Delta REC_{it}$	-2.44832	-0.57621	-0.12840	-0.32696	0.05912	1.61767
TA_{it}	-0.83792	-0.17104	-0.04176	-0.06612	0.05021	0.50159
OCF_{it}	-204.934	-12.617	1.377	10.931	19.087	494.676
PPE_{it}	0.00000	0.03109	0.17710	0.25788	0.41774	1.22362
$1/A_{it-1}$	1.212e-10	2.980e-09	7.890e-09	1.349e-08	1.787e-08	9.356e-08

Notes: Panel A consists of values of the variables used in the models of pre-Covid observations. Panel B consists of values of the variables used in the models of Covid observations. Both panels present the minimum value, 1st quadrant value, median observation, mean of observations, 3rd quadrant value, and maximum value of all variables. Variables are winsorized at the 1% tails. OCF_{it} is presented in MNOK.

5.2 Results hypothesis 1

The first hypothesis was tested using models (1)-(3) on the pandemic and pre-pandemic period respectively. A bootstrapping procedure was conducted to test for model significance of earnings management, where we performed the bootstrap with 10 000 repetitions, randomly selecting 100 samples for each boot. Every model at both pandemic and pre-pandemic level was bootstrapped. Every boot returns the standard deviation of the residuals, and is saved as a unique variable. Subsequently, a t-test was conducted to examine the mean difference between the pandemic and pre-pandemic periods.

As presented in table 6, all three models return output that display higher standard deviations of the residuals during the pandemic. This strongly suggests an increase in earnings management practices among companies that received grants from the Norwegian Business Compensation Scheme during the Covid-19 outbreak. The increase in earnings management during the pandemic is significant at the 1% level. These results are interpreted as robust, as they demonstrate a consistent pattern of earnings management across all models employed in our analysis.

Table 6: Measures of earnings management for the pre-Covid and Covid period.

Period	N	Jones	Modified Jones	Kothari
Pre-Covid	425	0.1833	0.1834	0.1757
Covid	298	0.2222	0.2186	0.2031
Difference		-0.0389***	-0.0352***	-0.0274***
t-value		-134.97	-121.62	-101.64

Notes: Values are the standard deviation of the residuals from the Jones (1991): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it}) + \beta_3 PPE_{it} + \epsilon_{it}$ (1), Modified Jones (Dechow et al., 1995): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \epsilon_{it}$ (2), and Kothari et al. (2005): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \epsilon_{it}$ (3) models. Measures were calculated using a bootstrapping procedure of 10 000 iterations of each model through a random sample size of 100 per boot. Afterwards, an independent t-test with unequal variances was performed to examine the difference between the two periods. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

As stated in Kothari et al. (2005), models that control for performance have higher explanatory power. The Kothari model (3) controls for firm performance, and shows higher explanatory power and lower standard deviation of the residuals than models (1) and (2), which is in alignment with previous research.

We find evidence supporting the existence of strong incentives for firms to engage in earnings management practices to decrease earnings during the pandemic. As prevous evidence shows, firms are, in theory, more inclined to manage earnings to meet threshhold values (Degeorge et al., 1999; Hu et al., 2012; Lai and Tam, 2017). Therefore, firms were incentivized to reduce earnings to meet the threshold of the required revenue drop to become eligible for Covid grants. In regards to agency theory, we argue that managers' actions, as agents, during the pandemic were misaligned with the government's (principal) interests. One could argue that managers behaved out of their own self-interest over the short-term, rather than in the interest of stakeholders, as discussed in Jensen and Meckling (1976). The misaligned actions of the agents might have caused excessive public spending on Covid grants, which deprives the public of resources that could have yielded a higher social return if spent elsewhere.

The first hypothesis is supported, as we observe a higher degree of earnings management among companies that received grant awards from the Norwegian Business Compensation Scheme during the pandemic. These findings align with the findings of Lassoued and Khanchel (2021), Liu and Sun (2022), Yan et al. (2022), Aljughaiman et al. (2023), and Lee et al. (2023) in the pandemic literature, as well as the conclusions of Habib et al. (2013), Iatridis and Dimitras (2013), and Persakis and Iatridis (2015) in the financial crisis literature. Additionally, the results are consistent with the findings of Zhao et al. (2019) regarding more aggressive earnings management practices among recipients of government subsidiaries following the 2008 financial crisis. However, our findings conflict somewhat with previous studies on earnings management in the Norwegian context (Leuz et al., 2003; Filip and Raffournier, 2014). It is important to note that the focus of this study does not involve commenting on the strength and extent of the increase in earnings management, as studies that employ similar models to those employed in this thesis do not provide a common metric of,

Table 7: Testing for abnormal income-decreasing total accruals

	Dependent variable: TA_{it}	
Variables	Coefficient estimates	t-stat
Constant	−0.010	−0.744
PPE_{it}	−0.031	−1.255
$\Delta REV_{it} - \Delta REC_{it}$	-0.077^{***}	−5.480
$1/A_{it-1}$	$-813{,}548^{**}$	−1.979
ROA_{it}	0.399^{***}	10.397
OCF_{it}	-0.000^{***}	−8.799
GRANTS2020	−0.008	−0.379
GRANTS2021	-0.050^{***}	−2.761
Model statistics		
Observations	723	
R^2	0.212	
Adjusted R^2	0.204	
Residual Std. Error	0.184 (df = 715)	
F Statistic	27.507^{***} (df = 7; 715)	

Notes: Table presents the results from the fixed effects regression based on equation (5): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \beta_6 GRANTS2020 + \beta_7 GRANTS2021 + \epsilon_{it}$. $***$, $**$, and $*$ indicate significance at 1%, 5%, and 10% respectively.

or discussion on the degree of change in earnings management.

To test the direction companies manage earnings in the findings from hypothesis 1, the regression model based on equation (5) was employed. The results are presented in table (7). While the variable $GRANTS2020$ did not yield significant results, the variable $GRANTS2021$ exhibited significance at the 1% level, with both variables displaying negative coefficients. These findings suggest a significant use of income-decreasing earnings management in the Covid-year 2021 amongst recipient companies of Covid grants.

5.3 Results hypothesis 2

To test hypothesis 2, the sample is divided into four subsets that filters the sample by period and whether the firms industry section is I or not. Industry section I represents the 'Accomodation and food service activities' industries - the industries that received the most grants. Equation (4) was applied to each subset of the sample. Table A.5 presents the regression results of industry section I firms and other firms during the pandemic, demonstrating that both models exhibit similar and high explanatory power. Interestingly, the standard error of residuals appears to be higher in the model for section I firms, suggesting a potentially greater degree of earnings management within this industry section during the pandemic. To investigate this further, a bootstrapping procedure similar to the one used in hypothesis 1 was employed. However, a minor but essential change to the bootstrapping procedure was made by reducing the number of random samples selected per boot to 50, rather than staying at 100. This is done due to the lower sample sizes of the subsets. Maintaining the boot sample size unchanged would only diminish the effectiveness of the bootstrap procedure in this case. The number of iterations remained fixed at 10 000. The results from the bootstrapping procedure are presented in table 8. A t-test was conducted to test the difference in means between section I firms and other firms, similar to the t-test used in hypothesis 1.

The difference in mean of standard deviations of the model residuals between section I firms and other firms are significant at the 1% both before and during Covid. However, these findings alone do not provide sufficient evidence to argue for a higher degree of earnings management among the 'accommodation and food service activities' firms during the pandemic. By comparing the groups and performing a t-test on the pre-Covid and Covid periods separately, the comparison becomes more fitting to answer hypothesis 2. Section I firms and other firms both have significant mean differences of earnings management measures

at the 1% level. However, the results from the t-test of section I firms are greater than the t-value of other firms, as shown in panel C of table 8. These findings support hypothesis 2 of more earnings management amongst 'accommodation and food service activities' firms during the pandemic, and is in alignment with the findings of Esteban and Devesa (2011) and Seetah (2017). Our results also somewhat agree with the findings in Turner and Guilding (2011).

Table 8: Industry section model bootstrap results

Panel A: Covid period

Covid	N	Bootstrap results
Section I	104	0.198572
Other sections	194	0.157541
Difference		0.041031***
t-test		129.18

Panel B: Pre-Covid period

Pre-Covid	N	Bootstrap results
Section I	155	0.1571935
Other sections	270	0.1517014
Difference		0.0054921***
t-test		14.092

Panel C: t-test

	Pre-Covid	Covid	Difference	t-test
Section I	0.1571935	0.198572	0.0413785***	137.45
Other sections	0.1517014	0.157541	0.0058396***	14.502

Notes: Values are the standard deviation of the residuals from equation (4): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \epsilon_{it}$. Measures were calculated using a bootstrapping procedure of 10 000 iterations of each model through a random sample size of 50 per boot. Afterwards, an independent t-test with unequal variances was performed to examine the difference in means between the subsets during the Covid and pre-Covid periods (Panels A and B). An independent t-test with unequal variances was also perfomed on each subset separately to test the difference in means between the pre-Covid and Covid periods (Panel C). ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

To further test hypothesis 2, we examined the direction firms of different sections managed earnings during the pandemic using a regression model based on equation (6). The results are presented in table 9, revealing that section I is significant at the 1% level with a negative coefficient, which suggests the use of income-decreasing earnings management amongst 'accommodation and food service activities' firms during the pandemic. This echoes the findings of Seetah (2017), where companies in the hospitality industry might use income-decreasing accruals during crisis periods. Outside of crisis periods, Turner and Guilding (2011) discovered that hotel owners have very strong incentives to reduce gross operating profits to lower the operator's incentive management fee and gain greater taxation deductions. In the context of the pandemic, it is plausible that these incentives were further intensified, providing an explanation for the amplified use of income-decreasing earnings management strategies observed in section I, alongside the incentives provided by the compensation scheme.

In conclusion, hypothesis 2 is supported, as our findings indicate more earnings management among companies operating within the section that received the most grant awards during the pandemic, namely section I.

Table 9: Industry section model regression summary

Dependent variable: TA_{it}		
Variables	Coefficients	t-value
Constant	-0.003	-0.144
PPE_{it}	-0.006	-0.211
$\Delta REV_{it} - \Delta REC_{it}$	-0.081***	-6.408
$1/A_{it-1}$	-285 457	-0.639
ROA_{it}	0.418***	11.089
OCF_{it}	-0.000***	-9.028
Section I (hospitality)	-0.063***	-2.860
Section L (real estate)	0.046	1.216
Section G (wholesale and retail)	-0.009	-0.356
Section H (transportation)	-0.030	-1.176
Section R (culture)	-0.063**	-2.258
Section N (administrative)	-0.027	-0.940
Model statistics		
Observations	723	
R^2	0.221	
Adjusted R^2	0.209	
Residual Std. Error	0.183 (df = 711)	
F Statistic	18.375*** (df = 11; 711)	

Notes: Table presents the regression results obtained for equation (6): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + SECTION_L + SECTION_G + SECTION_H + SECTION_R + SECTION_N + \epsilon_{it}$. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

5.4 Results hypothesis 3

Finally, hypothesis 3 was tested using the same bootstrap procedure used in hypotheses 1 and 2, and the changes in the bootstrapping procedure used to test hypothesis 2 were also applied in this test. The results of the bootstrapping procedure can be found in table 10, which displays our measures of earnings management amongst firms whose grant application content was confirmed by either an auditor or a state authorized accountant. The results of the t-test indicate no significant difference between the means of our proxy for earnings management, and imply that the degree of earnings management amongst grant award recipients was not affected by the acceptor of the grant application's content.

Our results disagree somewhat with the criticism raised by the Norwegian Auditors Association (NAA) regarding the use of state authorized accountants as validators of grant applications. Although not explicitly stated, it can be reasonably assumed that their criticism stems from concerns about potential compromises in the assurance process quality. As discussed in chapter (3), auditors are perceived to possess greater proficiency in assurance engagements compared to accountants. Despite this, the results from hypothesis 3 indicate that there was no discernible difference in the quality of the assurance process between auditors and state authorized accountants, if earnings management among the recipient firms is the proxy for the application process quality.

To summarize, hypothesis 3 is not supported by the results, as they indicate no discernible difference in earnings management between firms with auditor- and state authorized accountant-approved application contents. However, it is important to note that this context is fairly unique. To the best of our knowledge, few, if any, studies exist on this matter due to the distinctive nature of the Norwegian compensation scheme during the pandemic. Consequently, this presents a possible vacant area for future research.

Table 10: Auditor model bootstrap results

Group	N	Bootstrap results
Auditor	228	0.1789
Accountant	70	0.1786
Difference		-0.0003
T-test		-1.2767

Notes: Values are the standard deviation of the residuals of the regression from equation (4): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \epsilon_{it}$. Measures were calculated using a bootstrapping procedure of 10 000 iterations of each model through a random sample size of 50 per boot. An independent t-test with unequal variances was performed to further examine the difference in means of our proxy for earnings management between the firms whose grant applications were assured by an auditor or a state authorized accountant. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

6 Conclusion

The aim of this study was to investigate the effect the Covid-19 pandemic had on firms' accounting choices, in a scenario where government grants were offered under generous terms. We found that firms who received grants via the Norwegian Business Compensation Scheme engaged in more accrual-based earnings management during the Covid-years of 2021-2020, in comparison to the pandemics preceding three years (2017-2019). Furthermore, we found that firms booked large income-decreasing accruals during the pandemic's second year (2021).

In addition, we also found that companies operating within section I of the Standard Industrial Classification 2007 (i.e. 'Accommodation and food service activities'), showed higher levels of accrual earnings management in comparison to the other industries during the pandemic. These were the firms that received the most compensation from the general compensation scheme. In regard to hotels, there appears to be clear incentives for managing earnings, especially when considering the fact that these firms were forced to be closed for longer periods of time, and that when they were allowed to open, they were forced to follow strict guidelines. Looking into real earnings management could be an interesting approach in regard to hotels during the pandemic.

Finally, we found no significant difference in earnings management between firms whose grant applications had its contents assured by an auditor or a state authorized accountant. Norwegian Covid-regulations concerning the Norwegian Business Compensation Scheme assert that both auditors and accountants can confirm the contents of the firms' grant applications.

Jones (1991) employed an accrual-based approach to earnings management measurements of firms during import relief investigations by the United States Trade Commission, and whether firms decrease earnings if they would benefit from import relief. We argue that the context of our study fits well within Jones framework's original vision; To look at firms who inhabit strong incentives to adjust accounting numbers to increase the likelihood of receiving government relief and/or increase the size of said government relief.

The findings in this thesis support other studies that report increases in earnings management during the pandemic (Liu and Sun, 2022; Yan et al., 2022. On the other hand, they contradict studies that find less earnings management during crises (Cimini, 2015; Filip and Raffournier, 2014). Studies claiming less earnings management during times of crisis point out that managers have less incentive to manipulate earnings during a crisis because of the higher tolerance for poor performance. In the case of the pandemic in Norway however, there were clear incentives for firms to manipulate earnings downwards, which makes this context unique in the crisis literature. From an agency perspective, these incentives might have further skewed the activities of the firms (agent) away from the governments intent (principal), which could affect the firms' stakeholders negatively. Furthermore, earnings management is said to decrease during crises due to increased auditor scrutiny. While the topic of auditors was discussed in this thesis, we only examined auditors' influence on the assurance of firms' application for grants, and not specifically the audit of the financial statements.

Our thesis contributes to the literature on earnings management during the pandemic. While earnings management literature regarding the pandemic generally looks at listed companies in a nation and/or also by industry, our sample nearly exclusively consists of unlisted companies who received government grants. Although other pandemic studies also find an increase in earnings management, they tend to find evidence suggesting that firms manage earnings upward, often in order to alleviate the effect of the pandemic from the point of view of investors and other stakeholders (Lassoued and Khanchel, 2021). We argue that when there are requirements for reduction in revenues in order to qualify for Covid grants - there are greater incentives to manage earnings downwards than upwards.

Our findings contain valuable implications for, inter alia, national governing bodies, firm governance, and other stakeholders. The findings in this thesis indicate that firms are inclined to exploit generous compensation schemes in times of crisis. For national governing bodies, we provide valuable evidence that can be of aid during the establishment of newer compensation schemes in the future. We also provide evidence for governing bodies regarding the inclusion of accountants in government application processes as validators of application information. There is also value for other types of stakeholders in our results, since they pertain to public spending that could be more efficiently spent elsewhere.

Our thesis naturally has its limitations. Firstly, we rely on proxy measures of earnings management, many of which have been criticized in the literature. It is worth mentioning the fact that there appears to be no relation between discretionary accruals as measures of earnings management and subsequent cases of confirmed manipulation (Jackson, 2018). It is also possible that our findings are subject to more natural explanations, such as firms having adverse financial performances to such a degree that managing earnings would not be necessary in order to receive grants (Jones, 1991). Furthermore, the negative effect of the low sample size and possible model limitations highlight potential shortcomings of our thesis. We attempt to alleviate these shortcomings by running every proxy of earnings management through a bootstrap procedure. In addition, we employed an array of models that are widely used in accrual-based earnings management literature. Finally, only Norwegian private firms were included in the sample of this thesis. As a result, the external validity of our results is unknown.

Future research may explore the comparability of our findings with those of recipient firms under similar compensation schemes in other countries during the Covid period or other crisis periods. A common metric of 'generosity' could be assigned to the compensation schemes to compare the degree of exploitation across compensation schemes while considering compensation characteristics. Additionally, in the following years, it could also be interesting to examine the pandemic context in the years proceeding it (i.e., 2023-2025), and observe firms' accounting approach following a crisis. This enables further discussion on whether companies were exercising a big bath strategy in the post-pandemic period.

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Appendix

A Appendix tables

Table A.1: Variable definitions

TA_{it}	Total accruals for company i in year t. Computed as net income after tax – net operating cash flow, where the sum is then deflated by lagged assets in year t
PPE_{it}	Value of property, plant, and equipment for company i in year t. Deflated by lagged total assets in year t
ΔREV_{it}	Change in revenue from year t-1 to year t for company i. Deflated by lagged total assets in year t
ΔREC_{it}	Change in reveivables from year t-1 to year t for company i. Deflated by lagged total assets in year t
A_{it-1}	Lagged total assets year t for company i
ROA_{it}	Net income after tax deflated by lagged total assets in year t for company i.
OCF_{it}	Operating cash flow in year t for company i.
GRANTS2021	Dummy variable. 1 if company received government grants during the Covid-year 2021, 0 otherwise
GRANTS2020	Dummy variable. 1 if company received government grants during the Covid-year 2020, 0 otherwise
Section I	Dummy variable. Equals 1 if company's primary operating activity is in accomodation and food service activites (Section I of Standard Industrial Classification 2007)
Section L	Dummy variable. Equals 1 if company's primary operating activity is in real estate activities (Section L of Standard Industrial Classification 2007)
Section G	Dummy variable. Equals 1 if company's primary operating activity is in wholesale and retail trade (Section G of Standard Industrial Classification 2007)
Section H	Dummy variable. Equals 1 if company's primary operating activity is in transportation and storage (Section H of Standard Industrial Classification 2007)
Section R	Dummy variable. Equals 1 if company's primary operating activity is in arts, entertainment, and recreation (Section R of Standard Industrial Classification 2007)
Section N	Dummy variable. Equals 1 if company's primary operating activity is in administrative and support service activities (Section N of Standard Industrial Classification 2007)
AUDITOR	Dummy variable. Equals 1 if the contents of the grant application was assured by auditor, 0 if approved by a state authorized accountant

Notes: Non-categorical variables are winsorized at the 1%-tails

Table A.2: Jones model, developed by Jones (1991)

	Dependent variable: TA_{it}			
	Covid		Pre-Covid	
Variables	Coefficients	t-value	Coefficients	t-value
Constant	-0.045^{*}	-1.952	-0.051^{***}	-3.221
PPE_{it}	-0.077	-1.556	-0.046	-1.421
ΔREV_{it}	-0.036^{*}	-1.891	0.035	1.453
$1/A_{it-1}$	$-918{,}444.600$	-1.116	593,869.000	1.144
Model statistics				
Observations	298		425	
R^2	0.024		0.016	
Adjusted R^2	0.014		0.009	
Residual Std. Error	0.227 (df = 294)		0.188 (df = 421)	
F Statistic	2.367^{*} (df = 3; 294)		2.337^{*} (df = 3; 421)	

Notes: Table presents the summary of the regression results obtained by the Jones (1991) model (1): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it}) + \beta_3 PPE_{it} + \epsilon_{it}$. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Table A.3: Modified Jones model, developed by Dechow et al. (1995)

	Dependent variable: TA_{it}			
	Covid		Pre-Covid	
Variables	Coefficients	t-value	Coefficients	t-value
Constant	-0.051^{**}	t = -2.283	-0.044^{***}	t = -2.790
PPE_{it}	-0.077	t = -1.556	-0.052	t = -1.614
ΔREV_{it}-ΔREC_{it}	-0.066^{***}	t = -3.591	0.026	t = -1.163
$1/A_{it-1}$	$-1{,}231{,}735$	t = -1.508	740,655	t = 1.439
Model statistics				
Observations	298		425	
R^2	0.053		0.015	
Adjusted R^2	0.044		0.008	
Residual Std. Error	0.224 (df = 294)		0.188 (df = 421)	
F Statistic	5.510^{***} (df = 3; 294)		2.082 (df = 3; 421)	

Notes: Table presents the summary of the regression results obtained by the Dechow et al. (1995) modified Jones model (2): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \epsilon_{it}$. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Table A.4: Kothari model, developed by Kothari et al. (2005)

	Dependent variable: TA_{it}			
	Covid		Pre-Covid	
Variables	Coefficients	t-value	Coefficients	t-value
Constant	-0.04^{*}	t = −1.908	-0.050^{***}	t = −3.279
PPE_{it}	−0.074	t = −1.623	−0.042	t = −1.324
ΔREV_{it}-ΔREC_{it}	-0.113^{***}	t = −6.026	-0.057^{***}	t = −2.518
$1/A_{it-1}$	−872,515	t = −1.134	380,613	t = 0.758
ROA_{it}	0.405^{***}	t = 6.364	0.278^{***}	t = 5.512
Model statistics				
Observations	298		425	
R^2	0.168		0.081	
Adjusted R^2	0.157		0.072	
Residual Std. Error	0.210 (df = 293)		0.182 (df = 420)	
F Statistic	14.814^{***} (df = 4; 293)		9.267^{***} (df = 4; 420)	

Notes: Table presents the summary of the regression results obtained by the Kothari et al. (2005) model (3): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \epsilon_{it}$. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Table A.5: Industry section I and other sections regression results

	Dependent variable: TA_{it}			
Variables	Section I Coefficients	t-stat	Other sections Coefficients	t-stat
Constant	−0.071	−1.413	−0.012	−0.565
PPE_{it}	0.034	0.377	-0.103^{**}	−2.150
$\Delta REV_{it} - \Delta REC_{it}$	-0.119^{***}	−3.921	-0.080^{***}	−3.851
$1/A_{it-1}$	−1,231,436.000	−1.106	1,778,794.000	1.256
OCF_{it}	-0.000^{***}	−4.930	-0.000^{***}	−5.371
ROA_{it}	0.436^{***}	3.957	0.599^{***}	8.140
Summary statistics				
Observations	104		194	
R^2	0.310		0.335	
Adjusted R^2	0.275		0.317	
Residual Std. Error	0.219 (df = 98)		0.174 (df = 188)	
F Statistic	8.823^{***} (df = 5; 98)		18.919^{***} (df = 5; 188)	

Notes: Table presents a summary of the regression results obtained by equation (4): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \epsilon_{it}$. Data is split into two subsets, with the first subset consisting of observations of companies classified by section I in the Standard Industrial Classification 2007 (SIC 2007), while the second subset consists of the remaining observations in the sample. $***$, $**$, and $*$ indicate significance at 1%, 5%, and 10% respectively.

Table A.6: Auditor model regression summary

	Dependent variable: TA_{it}	
Variables	Coefficients	t-value
Constant	0.003	0.111
PPE_{it}	-0.055	-1.291
$\Delta REV_{it} - \Delta REC_{it}$	-0.100***	-5.680
$1/A_{it-1}$	-1 300 701*	-1.792
ROA_{it}	0.469***	7.774
OCF_{it}	-0.000***	-6.643
AUDITOR	-0.031	-1.129
Model summary		
Observations	298	
R^2	0.282	
Adjusted R^2	0.267	
Residual Std. Error	0.196 (df = 291)	
F Statistic	19.068***$(df = 6; 291)$	

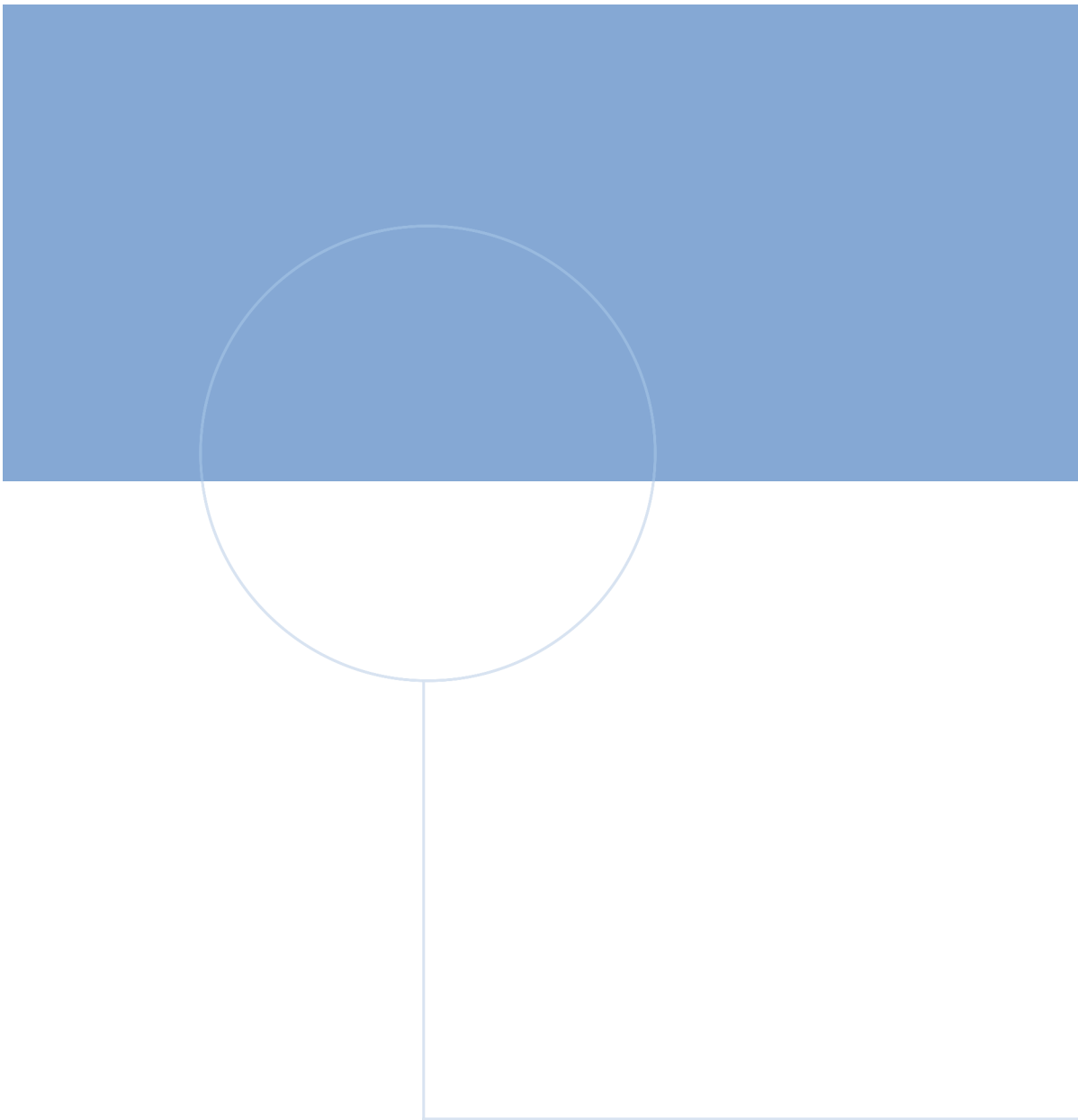
Notes: Table presents the summary of the regression results obtained by equation (7): $TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \beta_5 OCF_{it} + \beta_6 AUDITOR + \epsilon_{it}$. Variable $AUDITOR$ equals 1 if the content of the grant application was assured by an auditor, 0 if assured by a state authorized accountant. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Table A.7: Correlation Matrix

	AUDITOR	ROA_{it}	OCF_{it}	TA_{it}	REV.REC	PPE	$1/A_{[it]}$	GRANTS2020	GRANTS2021	SECTION L	SECTION N	SECTION R	SECTION G	SECTION H	SECTION I
AUDITOR	1														
ROA_{it}	-0.255	1													
OCF_{it}	-0.103	0.243	1												
TA_{it}	-0.066	0.243	-0.242	1											
$REV_{it} - \Delta REC_{it}$	-0.291	0.404	0.167	-0.112	1										
PPE_{it}	0.006	-0.034	0.123	-0.086	0.005	1									
$1/A_{it-1}$	-0.085	0.044	-0.206	0.027	-0.03	-0.14	1								
GRANTS2020	0.527	-0.206	-0.152	0.083	-0.477	-0.012	-0.037	1							
GRANTS2021	0.568	-0.138	-0.009	-0.158	0.063	0.006	-0.004	-0.228	1						
SECTION L	-0.002	0.004	0.085	0.047	0.028	-0.026	-0.053	0.014	-0.01	1					
SECTION N	0.03	-0.037	-0.052	0.009	0.015	-0.103	-0.092	0.026	-0.009	-0.062	1				
SECTION R	0.04	0.011	0.063	-0.066	0.018	0.126	-0.065	0.012	0.014	-0.065	-0.097	1			
SECTION G	-0.043	-0.005	-0.045	0.066	-0.035	-0.207	-0.07	-0.075	0.012	-0.076	-0.113	-0.119	1		
SECTION H	0.005	0	0.043	-0.002	-0.023	0.072	-0.101	0.026	-0.008	-0.076	-0.112	-0.118	-0.138	1	
SECTION I	0.014	-0.021	-0.103	-0.075	-0.048	0.131	0.382	0.011	0.002	-0.153	-0.227	-0.239	-0.278	-0.276	1

Table A.8: Variance inflation factors

	Grants model (5)	Section model (6)	Auditor model (7)
PPE_{it}	1.03	1.15	1.03
$\Delta REVit - \Delta REC_{it}$	1.49	1.21	1.24
$1/A_{it-1}$	1.07	1.28	1.07
OCF_{it}	1.15	1.15	1.09
ROA_{it}	1.30	1.26	1.25
GRANTS2020	1.39		
GRANTS2021	1.09		
SECTION G		1.49	
SECTION H		1.48	
SECTION I		2.20	
SECTION L		1.17	
SECTION N		1.35	
SECTION R		1.40	
AUDITOR			1.04
Mean VIF	**1.22**	**1.38**	**1.12**



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