Master's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Economics and Management
NTNU Business School

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Analysing Earnings Management in Response to COVID-19: A Study of Compensation Schemes in Norway

Analyse av Earnings Management som respons på COVID-19: En studie av kompensasjonsordninger i Norge

Master's thesis in Economics and Business Administration
Supervisor: Levi Gårseth-Nesbakk
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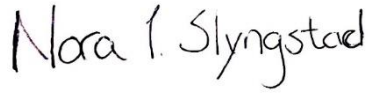
Preface

This master's thesis was completed in the final semester of the master's program in Economics and Business Administration, specialising in the main profile "Management Accounting" at the Norwegian University of Science and Technology (NTNU). The process has been exciting, educational, and challenging. In writing this thesis, we have gained valuable insights into the well-explored topic of earnings management, but the pandemic has introduced a new context.

We would like to express our gratitude to our supervisor, Levi Gårseth-Nesbakk, for sharing his knowledge and insightful guidance throughout the semester. We would also like to thank fellow students and staff at the NTNU Business School for their curiosity and openness. We take full responsibility for the content of this thesis.

Trondheim, 23.05.2024



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Abstract

This thesis examines the impact of government compensation schemes on earnings management practices among Norwegian companies during the COVID-19 pandemic. These schemes, implemented as part of the government's measures to alleviate the economic effects of the pandemic and subsequent infection control measures, focused on discretionary income accruals. The study analyses 1,010 large and medium-sized companies from 2017 to 2022. Additionally, we included a comparison group to investigate the potential causal relationship between the extent of earnings management and the effect of the compensation scheme.

We developed a main hypothesis, supplemented with two additional investigations, resulting in the following findings: (1) COVID-19 and its associated compensation scheme provided incentives for manipulating revenue recognition through discretionary accruals in the first year of the pandemic. This thesis uncovers potential manipulations in financial statements and explores two possible methods for such manipulation through ratio analysis. (1.1) Although the ratio analysis did not reveal any illogical relationships indicating premature revenue recognition, (1.2) some incentives suggest companies may have deferred revenues to later periods. These findings contribute to a deeper understanding of the economic dynamics within Norwegian businesses under pandemic conditions.

Keyword: Compensation scheme, COVID-19, Earnings management, Norway

Sammendrag

Denne studien undersøker hvordan statlige kompensasjonsordninger har påvirket praksisen med resultatstyring (earnings management) blant norske bedrifter under COVID-19 pandemien. Kompensasjonsordningen for næringslivet ble implementert som en del av regjeringens tiltak for å lindre de økonomiske virkningene av pandemien og de påfølgende smitteverntiltakene, med fokus på skjønnsmessige periodiseringer på inntektssiden. Studien analyserer et utvalg på 1010 store og mellomstore selskaper i perioden 2017–2022. I tillegg inkluderer studien vår en sammenligningsgruppe for å undersøke den potensielle årsakssammenhengen mellom omfanget av resultatstyring og effekten av kompensasjonsordningen.

Vi utviklet en hovedhypotese, supplert med to tilleggsundersøkelser som resulterte i følgende: (1) COVID-19 og dens tilhørende kompensasjonsordning ga insentiver for manipulering av inntektsføring gjennom skjønnsmessige periodiseringer det første året av pandemien. Studien avdekker potensielle manipulasjoner i regnskapstallene og utforsker to mulige måter for slik manipulasjon gjennom forholdstallsanalyse (1.1) Selv om forholdsanalysen ikke avslørte noen ulogiske sammenhenger som indikerer prematur inntektsføring, (1.2) er det insentiver til at inntektene kan ha blitt forskjøvet til senere perioder. Disse funnene bidrar til en dypere forståelse av de økonomiske dynamikkene i norsk næringsliv under pandemiske forhold.

Stikkord: COVID-19, Earnings management, Kompensasjonsordning, Norge

Contents

List of Tables

Appendix

1. Introduction

Accounting manipulation, manifesting in various forms such as big bath, income smoothing, accounting fraud, and earnings management, represents a critical concern across the financial landscape (Robinson et al., 2020; White et al., 1994). This thesis focuses on manipulating financial accounting figures, delving into the practice where managers and other key personnel adjust revenues and expenses to influence stakeholder perceptions, often misleading investors and other users of financial information. (Healy & Wahlen, 1999; Roychowdhury, 2006). Such manipulations are detectable through various indicators, including changes in deferred taxes, auditor replacements, and fluctuations in the market-to-book value ratio (Dechow et al., 2011).

The implications of earnings management intensify during economic downturns, a period marked by mixed findings in the literature. While specific studies suggest a tendency to manipulate financial records to navigate through financial crises (Chia et al., 2007; Rusmin et al., 2013), others suggest a decline in such activities as companies prioritise operational viability over financial appearances (Filip & Raffournier, 2014; Kousenidis et al., 2013). During these periods, the distinction between genuine financial distress and deliberate manipulation becomes particularly blurred (Butler et al., 2004; Seetah, 2017).

The onset of the COVID-19 pandemic early in 2020 triggered a global crisis affecting all society industries, prompting a swift governmental response in Norway to support businesses and preserve economic stability. Among the key measures was implementing a compensation scheme to stabilise the economy and prevent widespread bankruptcies among firms experiencing revenue declines (Prop. 67 S (2019–2020), p. 10). Introducing these schemes raises pertinent questions regarding the potential for earnings management, particularly considering previous research suggesting that government grants can influence corporate financial reporting practices (Chandran, 2016).

The pandemic's economic pressures have once again brought focus to the scholarly debate on earnings management during extraordinary circumstances, with recent studies demonstrating divergent trends in its practice during the crisis (Ali et al., 2022; Yan et al., 2022). Nygård & Undall (2022) analysed 225 Norwegian companies that received support through the government's compensation scheme and found that earnings management is more prevalent during the COVID-19 pandemic. Meanwhile, government investigations have identified a limited number of cases where repayment of compensation was deemed necessary (Hopland & Fraser, 2020).

Our research builds on these findings and examines whether companies that received grants during the COVID-19 pandemic in Norway may have been more actively involved in earnings management to exploit crisis-based support measures. This approach differs from Nygård and Undall's (2022) study by including a broader sample. We investigated how companies in the comparison group that did not receive compensation could manipulate financial figures. It is important to note that this study also excludes approximately 37,000 of 38,179 businesses classified as small enterprises, thus focusing on a segment that represents only a fraction of a considerably larger population.

Given the substantial role that public support schemes play in mitigating the economic consequences of the pandemic, it is crucial to explore the potential for accounting manipulations in this context. The literature reveals a substantial gap in studies examining the relationship between public support schemes and earnings management during crises. To address this gap, we pose the following research question: Are there irregular patterns in the reported accounting figures for firms receiving government grants during extraordinary circumstances? Our study aims to fill this gap by analysing if publicly funded compensation schemes can enable the misuse of financial reporting and contribute to a deeper understanding of their impact on corporate financial behaviour.

We use the modified Jones model and ratio analysis to examine earnings management levels in 1,010 companies that received grants during the pandemic. Our findings show that these companies exhibited increased earnings management in the first year of the crisis. Additionally, there are indications that revenues could have been deferred to later periods to qualify for support. This deferral compromises the reliability and value of financial reports during compensation schemes and crises. We address a knowledge gap and enrich the literature by documenting the relationship between government grants and earnings management. Our findings are relevant for future studies and of interest to shareholders, accountants, auditors, and other stakeholders.

This thesis is organised as follows: Section 2 presents a literature review discussing factors affecting earnings management during extraordinary conditions, focusing on government grants. *Section 3* presents our hypothesis, while *Section 4* describes the methodology. Further, *Section 5* presents data and statistical analyses. The discussion and concluding thoughts follow in the subsequent sections.

2. Literature Review

2.1 Earnings Management

In financial reporting, managers can choose from various accounting practices to accurately depict financial results (Riahi-Belkaoui, 2004). However, managers can exploit this flexibility for earnings management, deliberately manipulating accounting choices to achieve specific performance targets. The academic literature offers multiple definitions of earnings management. Healy and Wahlen (1999) describe it as the strategic exercise of managerial discretion in financial reporting and transaction structuring. Mulford and Comiskey (2002) perceive it as deliberate measures to achieve specific objectives. Ronen and Yaari (2008) define earnings management as deliberate actions that influence reported revenues and their interpretation. This study will amalgamate these three definitions to illuminate the purpose of the study, as each definition offers a unique perspective contributing to a comprehensive understanding of the phenomenon of earnings management.

Earnings management manifests in two primary forms, accrual-based and real earnings management (Gunny, 2010). Accrual-based earnings management involves the manipulation of accounting principles and methods to adjust the timing of revenue and expense recognition, potentially leading to distortions in reported results that do not accurately represent the company's actual financial condition (Constantatos et al., 2016; Peasnell et al., 2000a). Conversely, real earnings management entails managerial actions that influence reported results through changes in the company's operational, investment, or financing activities (Zang, 2012).

Companies seeking to manipulate their financial statements often prefer accrual-based methods, which are generally less detectable than actual activities (Osma, 2008). Consequently, this study will explore accrual-based earnings management and examine its implications and prevalence across various governance contexts.

2.2 Earnings Management during Economic Crises

Earnings management during economic crises is complex, with divergent research suggesting varied motivations for manipulating financial reports. On the one hand, the literature suggests an increase in earnings management during economic crises. For instance, a study by Chia et al. (2007) revealed that service-based companies in Singapore were more inclined to employ income-decreasing earnings management strategies during the Asian financial crisis of 1997. Additionally, Rusmin et al. (2013) found that companies with low current-year earnings may

take drastic measures to reduce income to build future financial reserves. Several studies support this finding. (Abarbanell & Lehavy, 2003; Kirschenheiter & Melumad, 2002; Walsh et al., 1991). Similarly, Kjærland et al. (2021) linked the 2014 oil price shock to increased earnings management among oil companies listed on the Oslo Stock Exchange, driven by uncertain macroeconomic conditions. Furthermore, Habib et al. (2013) observed that managers in financially distressed companies tend to engage in more income-decreasing earnings management during financial crises. These studies suggest that times of crisis can directly impact earnings management.

Conversely, other studies point to decreased earnings management during economic crises. For instance, Kousenidis et al. (2013) found that such periods are typically associated with less earnings management, likely due to increased supervision and improved quality of financial reporting (Francis et al., 2013). During the global financial crisis, Arthur et al. (2015) observed that managers enhanced the quality of financial reporting to restore investor confidence and mitigate the crisis's adverse effects. This improvement in financial reporting quality aligns with the findings of Filip and Raffournier (2014), who reported a decrease in earnings management practices among European companies during the crisis. Furthermore, Kanagaretnam et al. (2014) argued that robust legal and political frameworks can limit the extent of earnings management under economic pressure. At the same time, Butler et al. (2004) and Seetah (2017) argued that negative abnormal accruals during crises may reflect genuine economic difficulties rather than deliberate manipulations. These studies suggest that economic crises can result in a more accurate and cautious approach to financial reporting, supported by stricter supervision and enhanced regulatory frameworks.

Furthermore, governments can implement public subsidies, such as compensation schemes, during economic crises to preserve businesses and ensure economic stability. Chandran (2016) highlights how public subsidies affect earnings management in companies, particularly in vulnerable sectors. These subsidies can facilitate adaptation to economic changes and meet ethical requirements. However, they can incentivise short-term actions that distort the actual financial condition of companies. Chandran (2016) also argues that effective external monitoring is crucial in countering earnings management associated with government grants. This monitoring is critical as companies often react swiftly to immediate economic pressures and incentives associated with such measures. The heightened level of monitoring during crises contributes to an increased likelihood of earnings management in the initial year of a global

crisis, which subsequently declines over time (Paolone & Pozzoli, 2017). Therefore, it is crucial to implement strict external monitoring from the onset of the crisis to counter potential earnings management.

Information asymmetry can arise when the government implements compensation schemes, allowing managers to reduce income to increase support strategically. This asymmetry undermines trust between companies and authorities while creating opportunities for accounting manipulation. This dynamic creates an environment where government schemes can be abused, especially by managers with opportunistic intentions who exploit hidden information for personal gain (Douma & Schreuder, 2017). The deliberate manipulation of income in financial reports for personal profit undermines the scheme's intention (Aljughaiman, 2023; Azizah, 2017; Lassoued & Khanchel, 2021). Despite the original goals of supporting struggling businesses, stakeholders may exploit such schemes to their advantage.

2.3 Earnings Management during COVID-19

Although research on the COVID-19 pandemic has focused on a relatively short period, it has already highlighted various global economic challenges businesses face. The pandemic has led to economic crises, reduced activity, and forced several countries into recession (Tulvinschi, 2021), affecting financial reporting numbers and earnings management.

Existing research literature indicates, on the one hand, that earnings management has increased during the pandemic, especially in the most severely affected industries and regions (Hsu & Yang, 2022; Lee et al., 2024; Yan et al., 2022). Lassoued and Khanchel (2021) recorded a notable increase in earnings management among companies in 15 European countries, focusing on increasing revenues in 2020 to reduce reported losses and restore stakeholder trust. Similarly, Yan et al. (2022) noted analogous patterns among financial institutions in China. This finding is consistent with observations by Xiao and Xi (2021), who noted an increase in accrual-based earnings management in the most severely affected Chinese regions. Furthermore, Liu and Sun (2022) reported that US companies had strengthened their revenue reduction strategies. Notably, Da Silva Flores et al. (2023) discovered potential misrepresentation in financial reports when assessing companies in Brazil and the US amid economic turbulence.

On the other hand, Ali et al. (2022) observed that companies in G12 countries showed lower levels of earnings management. Their findings suggest that stringent regulations protecting

investors contribute to reduced earnings management, thereby improving the quality of financial results amid the pandemic. Further studies indicate that stricter regulations can mitigate the adverse effects of COVID-19 by encouraging companies to improve their corporate governance, thereby ensuring higher-quality financial reporting (Hsu & Yang, 2022). These insights underscore the profound impact of the COVID-19 pandemic on earnings management in global businesses and highlight the critical need to understand how economic crises affect companies' accounting data.

3. Hypotheses

Earnings management in the context of economic crises is a well-explored area yet remains contentious within scholarly debates. Research diverges markedly; some suggest that companies may intensify earnings management to counter perceived economic downturns (Chia et al., 2007; Hsu & Yang, 2022; Rusmin et al., 2013), while others argue that such practices diminish due to increased regulatory scrutiny (Arthur et al., 2015; Francis et al., 2013; Kanagaretnam et al., 2014; Kousenidis et al., 2013). This divergence in viewpoints reflects the complex nature of earnings management during times of crisis and underscores the need for further research to understand and address these conflicting findings.

The COVID-19 pandemic introduced unique challenges that could have impacted earnings management in new ways in the Norwegian context, making it an ideal context for this study. The sudden, extensive lockdowns led to severe economic disruptions, potentially driving companies to use accrual-based earnings management strategies. Furthermore, introducing extensive government compensation schemes in response to the pandemic-induced economic downturn may have amplified incentives for companies to manipulate revenues to qualify for these support programs. The presence of these schemes can create information asymmetry, leading firms to engage in earnings management to meet the criteria for receiving government grants (Douma & Schreuder, 2017). This convergence highlights the need to investigate changes in earnings management practices among Norwegian firms under these circumstances.

Research by Nygård and Undall (2022) highlights an increase in discretionary accrual manipulations during the pandemic in Norway linked to governmental compensation schemes. Similarly, Leuz et al. (2003) find that such practices are generally less prevalent in Norway compared to other contexts, which is consistent with the fact that only a small fraction (323 out of 38,179) of companies needed to return funds from the compensation scheme

(Brønnøysundregistrene, n.d.; Hopland & Fraser, 2020; Skatteetaten, n.d.). This apparent contradiction between the observations of Nygård and Undall (2023) and public reports underscores the need for further investigation. Determining whether the economic pressures induced by the pandemic have led to increased earnings management is crucial.

Moreover, Nygård and Undall (2023) analysed only 225 companies out of 38,179, indicating that many firms remain unexamined. By expanding the scope of the study to include a larger sample of companies, this analysis will enhance our understanding of how crises impact corporate financial reporting numbers behaviour in Norway and contribute to broader discussions on earnings management during economic upheavals. This approach leads us to the following research question:

H1: *Implementing COVID-19 compensation schemes is associated with increased tendencies to manipulate accounting figures.*

Previous research on earnings management during economic crises has primarily focused on a broad spectrum of indicators and models. Studies have considered variables such as government quality (Iturriaga & Alvarado, 2016), the role of auditors (Chia et al., 2007; Nygård & Undall, 2023), and dynamics within publicly traded companies (Kjærland et al., 2021). Furthermore, Dechow et al. (2011) noted that research has included deferred taxes, market value to book value ratio, and growth rates between financial and non-financial measures such as patent numbers, workforce size, and product portfolios.

Despite this extensive research base, studies examining compensation schemes during economic crises are limited. Notably, the Norwegian compensation scheme requires businesses to demonstrate at least a 30 percent reduction in revenue compared to the same period in the previous year (Prop. 67 S (2019–2020), p. 10). This requirement may encourage firms to manipulate the timing of revenue recognition—either accelerating or deferring income—to meet the criteria. Such regulatory frameworks, designed to provide temporary relief, could foster short-term financial strategies that obscure the actual economic condition of enterprises (Chandran, 2016). This dynamic underscores a critical area for rigorous scrutiny within financial reporting numbers.

To further investigate the potential for accrual-based earnings management under the COVID-19 compensation scheme, we propose two supplementary analyses to H1 based on Schilit and

Perler's (2010) framework of seven financial shenanigans, which categorise techniques to increase income in the current period and transfer income to future period. This leads us to the following supplementary analysis:

H1.1: Companies tend to recognise revenue to exaggerate subsequent revenue declines recognised prematurely.

H1.2: Companies tend to defer revenue recognition in the current accounting period to influence their eligibility for financial support during the pandemic.

By thoroughly exploring these categories, our analysis will provide valuable insights into how firms adjust and modify their financial accounting figures during economic uncertainty. This exploration is crucial for understanding the underlying mechanisms and motivations behind such manipulation, potentially diverging from the more general indicators previously explored.

4. Methodology

This research focuses on revenue recognition within financial statements, a crucial area for understanding a company's operational health. Revenue recognition is a critical indicator in financial reporting and provides insights into a company's activities (Rezaee, 2005). Previous studies, such as Kinserdal (2016), have shown that earnings management frequently occurs in this domain due to the flexibility in applying various revenue recognition principles, which can substantially alter reporting outcomes (Robinson et al., 2020). This variability in revenue recognition practices forms the foundation of our investigation into potential earnings management strategies employed by firms.

4.1 Event Period

To conduct a comprehensive event study, we identified both the event and the preceding periods. The crisis began in Norway in the winter of 2020 when health officials recorded the first cases of coronavirus infection. The government implemented extensive measures, including societal lockdowns and economic support schemes, to bolster Norwegian businesses' liquidity (Helse- og omsorgsdepartementet, 2023). February 2022 marked the end of the crisis as the government lifted all legally mandated measures against COVID-19, and the government's compensation scheme was terminated (Høylie, 2022). Due to limitations in the availability of financial data for 2023, we confined the dataset for the period after the COVID-

19 pandemic to 2022. Furthermore, we defined 2022 as post-COVID because the absence of measures characterised much of the year.

Additionally, the activity level had returned to the pre-crisis trend by March 2022 (Næringlivets hovedorganisasjon [NHO], 2022, p.15). We began the analysis with company data from 2017, justified by the persistent oil crisis until the fourth quarter of 2016. Including data from before 2017 could potentially lead to misinterpretations due to the profound impact of the oil crisis on companies' financial performance (Kjærland et al., 2021).

4.2 Data and Sample

Due to its extensive structure, the analysis included Norwegian companies utilising the national compensation scheme for businesses. Skatteetaten was responsible from March 2020 to August 2020 and the Brønnøysundregistrene from September 2020 to February 2022. We sourced organisational numbers from both entities to identify support recipients, ensuring the accuracy and reliability of the data in our study of the scheme's impact on companies' economic behaviour.

Table 1: Sample selection

Population (Brønnøysundregistrene, n.d., Skatteetaten, n.d.)	38 179
Excluding small companies (Norwegian Accounting Act §1-6, 1999)	-37 128
Excluding companies established after 2017	-41
Final company selection	1 010
Final sample - observation for 2017-2022	6060

Our original sample comprised 38,179 companies (Brønnøysundregistrene, n.d.; Skatteetaten, n.d.). However, this study selectively focuses on large and medium-sized enterprises, excluding small businesses as stipulated by the Accounting Act §1-6. This exclusion was necessary due to the frequent absence of comprehensive accounting data in small businesses, which may also neglect to include several required elements in their annual reports (cf. the Accounting Act §3-3a from 1999). Additionally, 41 companies were excluded due to a lack of data for 2017, as the modified Jones model employed in the hypothesis requires financial data from the preceding year (t-1). As a result, our final sample consists of 1010 companies and 6060 firm-year observations for 2017-2022. A larger sample size would be preferable, as this study examines only a small segment of a considerably larger population. Nevertheless, similar sample sizes are standard in comparable studies (Filip & Raffournier, 2014; Liu & Sun, 2022; Yan et al., 2022).

Although quarterly data would increase the likelihood of detecting earnings management during the crisis by capturing fluctuations in revenue (Kosberg & Misje, 2018), we were required to use annual data. This requirement arises because our sample includes only one public company listed on the Oslo Stock Exchange, making obtaining quarterly reports for the remaining firms impossible. However, previous literature on earnings management also relies on annual data, and firm-year observations are therefore considered sufficient (Ali et al., 2022; Dechow et al., 1995; Jones, 1991; Kothari et al., 2005).

We collected annual company data for the period 2017 to 2022. By employing panel data, our objective is to understand firms' performance over this period comprehensively. This approach enables a comparison of financial performance before, during, and after the pandemic, offering insights into the impact of the compensation scheme on the business industry. We sourced these company data from ENIN, which provides an overview of Norwegian corporate data (Enin, n.d.).We obtained the remaining necessary data through BDO and their access to Bisnode. We also collected data on grants received during the pandemic and deducted these amounts from the reported revenue to determine the actual income used as the basis for companies' compensation applications (Brønnøysundregistrene, n.d.; Skatteetaten, n.d.). Our analysis uses STATA (version 18) to estimate the parameters of the Modified Jones model (Dechow et al., 1995). Additionally, we used it to calculate t-values for the descriptive statistics and the Modified Jones model. We employed Microsoft Excel to analyse ratio figures.

We included a comparison group to explore further the potential causal link between the level of earnings management and the influence of the compensation scheme. This approach allows us to investigate whether the alterations in accounting numbers predominantly emerge from the compensation schemes or broader market conditions during the crisis. The comparison group consisted of 958 large and medium-sized enterprises (final sample - observation for 2017-2022: 5748), selected based on their similarity in size and industry to the compensation group. Including this group enhances the precision and credibility of our research analysis.

4.3 Measuring Earnings Management

To calculate discretionary accruals (DAP), non-discretionary accruals (NDAP) are subtracted from total accruals (TA). These total accruals are standardised using lagged total assets (Dechow et al., 1995):

$$DAP_{it} = TA_{it} - NDAP_{it} \quad (1)$$

In our analysis, we distinguish between income-increasing and income-decreasing accruals. This choice assumes managers can manipulate financial reports to achieve specific income targets (Mulford & Comiskey, 2002). By considering positive and negative values, we can identify whether companies tend to artificially boost income or intentionally reduce it to achieve specific financial outcomes (Cohen et al., 2008).

To identify discretionary accruals, we explored various models and selected the most appropriate one for our analysis of earnings management during a crisis. Through comprehensive literature searches across multiple databases (Google Scholar, Oria, Scopus), we identified several vital models commonly used in such analyses, including the Jones model (Dechow & Sloan,1991), the modified Jones model (Dechow et al., 1995), and Kothari et al. (2005), which incorporates Return on Assets (ROA).

For hypothesis 1, our analysis is based on the modified Jones model (Dechow et al., 1995), even though most studies use the Jones model (Dechow & Sloan, 1991). This model was selected as it more effectively accounts for potential discretionary adjustments, particularly those related to credit sales, which may indicate earnings management. The modified model includes adjustments for changes in accounts receivable, thereby enhancing precision and reducing the risk of type-II errors. This approach provides deeper insights into how reported revenues can be influenced, particularly during economic turbulence (Dechow et al., 1995).

However, due to criticism regarding the risk of type-I errors, several researchers prefer to use the model proposed by Kothari et al. (2005). This model includes adjustments for the company's financial performance, enhancing the analyses' validity and accuracy. Critics have pointed out the limitations of Kothari's model in capturing the full complexity of earnings management (Chansarn, 2016; Jang & Kim, 2017). Therefore, we have chosen the modified Jones model to ensure the reliability of our research on discretionary accruals during periods of economic uncertainty. Trends in manipulation will lead to more accurate estimates of earnings management in cases where such management occurs. The description of the modified Jones model is as follows (Dechow et al., 1995):

$$NDA_t = \alpha_1\left(\frac{1}{A_{t-1}}\right) + \alpha_2(\Delta REV_t - \Delta REC_t) + \alpha_3(PPE_t) + \varepsilon_{it} \quad (2)$$

Where:

NDA_t = total accruals for the company in year t.

A_{t-1} = total assets of the company at the beginning of year t.

ΔREV_t = change in the company's revenues from year t-1 to year t.

ΔREC_t = change in the company's accounts receivable from year t-1 to year t.

PPE_t = gross value of the company's property, plant, and equipment in year t

ε_{it} = error term.

α_1 til α_3 = model-specific parameters.

To explore our supplementary analyses H1.1 and H1.2, we based our theoretical framework on the study conducted by Schilit and Perler (2010), which identified seven of the most common tricks of earnings management that misrepresent a company's revenues. These researchers categorised them into two main groups: The first, which forms the basis of H1.1, involves inflating revenues in the current period. The second involves inflating revenues in future periods, forming the basis of H1.2. When examining these shifts, it is crucial to consider the flexible revenue recognition and valuation rules specified in sections 4-1(2) and 5-2 of accounting regulations. According to these rules, companies must recognise revenues when earned and value accounts receivable at either the lower cost or fair market value. This framework permits some discretion, potentially causing differences between reported revenues and actual cash flows, possibly leading to premature or delayed revenue recognition. However, few studies examine whether companies shift revenues to earlier or later periods. This represents a limitation for our study, as it restricts the availability of comprehensive information to understand this phenomenon fully.

We have used ratio analysis to investigate whether companies have shifted revenues to earlier or later periods. This analytical approach, where we analyse financial ratios, gives us a deeper insight into the company's historical financial performance and position. Assessing the company's ability to handle economic challenges, especially during periods characterized by economic uncertainty, is crucial. However, ratio analysis has its limitations. Companies can employ different accounting principles and practices, making comparisons difficult and potentially misleading (Robinson et al., 2020). Additionally, extreme values or abnormal transactions can distort ratios and not reflect the company's everyday operations. This issue is

especially problematic during periods of economic uncertainty when there could be greater variations in financial data.

Furthermore, we have chosen to segment the data by industry to obtain more accurate estimates, as industry segmentation plays a crucial role in explaining variations in earnings management activity. Companies within the same industry face comparable levels of operational risk, share similar asset bases, and follow the same rules and regulations (Chevalier, 1995; Wasiuzzaman, 2015). Table 2 presents a distribution of observations for the various industries.

Table 2: Industry selection

Industry selection		Observations
A - E	Industry	1482
F & L	Real estate	720
G & H	Retail, transportation, and storage	2508
I	Accommodation and hospitality industry	414
J - S	Service-oriented enterprise	1182

Note: The industry codes are grounded in the EU standard NACE. They are the cornerstone for categorising entities based on their primary activities within Statistical research at the Statistics Norway Register of Establishments and Enterprises (Statistisk sentralbyrå [SSB], 2009).

To investigate H1.1, the ratio between revenue and accounts receivable is calculated (Heskestad, 2015, 2016; Penman, 2013). A potential indicator of premature revenue recognition is a reduced turnover ratio, where the increase in accounts receivable significantly exceeds the growth in sales. Furthermore, we evaluate the alignment between cash flows from operations and the company's operating income. Discrepancies between these factors can indicate manipulated revenues (Heskestad, 2015). This approach combines regulatory considerations with practical financial analysis, providing a comprehensive overview of a company's financial health and reporting integrity.

For H1.2, we analyse the growth rate in key indicators such as revenue, accounts receivable, cost of goods sold, gross profit, and gross margin to identify potential red flags for manipulation. Marked deviations in the growth rate or sudden changes in the figures may indicate possible manipulation. Revenue analysis is central to our study due to its frequent manipulation in financial statements (Dechow et al., 2011; Robinson et al., 2020; Stubben, 2010). By examining the correlation between accounts receivable and revenue over time, we can identify discrepancies that could indicate accounting manipulation. Moreover, we consider the manipulation potential of the cost of goods sold, as prior studies indicate that companies

can misclassify it to meet or exceed industry-average gross margins (Bansal et al., 2022). Substantial deterioration in a company's gross margin may also encourage economic manipulation (Beneish, 1999). Furthermore, we will assess gross profit based on previous research suggesting that variations in this element can impact earnings management (Andriato & Amin, 2023).

5. Results

5.1 Descriptive Statistics

The descriptive analysis in Table 3 highlights significant variances in income levels across three periods: pre-COVID-19, during COVID-19, and post-COVID-19. From 2017 to 2019, we recorded an average income level of 258.8591 in the pre-COVID period. This level dropped to 240.2228 during the COVID period, from 2020 to 2021, reflecting the economic challenges caused by the pandemic, including lockdowns and reduced consumer activity (SSB, 2021). In the post-COVID period, defined as 2022, we observed a substantial recovery, with the average income rising to 335.8171. This upswing indicates a robust economic rebound following the lifting of pandemic restrictions. Although there was a decline in income levels, the data revealed an increase in total assets and property, plant, and equipment from the pre-COVID to the COVID period, countering the general downturn in other economic indicators. Additionally, cash flow from operations increased, doubling from 12.2822 during the COVID period to 24.1875 post-COVID. The effects of the compensation scheme can be attributed to the improvement in liquidity.

The results from the t-test in panel D indicate that revenue significantly differs at a 1 percent significance level between the COVID and post-COVID periods, suggesting that companies faced greater challenges during the COVID period than afterward. Furthermore, we observe that receivables, total assets, net income, cash flow from operations, and cost of goods are significantly different at a 5 percent significance level. These findings suggest that companies experienced significant disparities between the COVID and post-COVID periods.

Table 3: Descriptive statistics

Variable	Mean	Std.Dev	Median	Min	Max
Panel A: Pre-COVID (N=3030)					
Revenue	258.8591	671.8409	1225.0273	0	18899.19
Accounts Receivables	270.7713	902.22	117.167	-7.0969	30287.93
Property, plant and equipment	43.3255	191.2031	60.4323	0	3446
Total assets	157.3413	460.1121	590.6403	0	8178.041
Net income	5.8454	47.7096	31.5707	-1283	607.826
Cash flow from operations	14.3612	69.5963	63.7577	-791.792	1092.471
Cost of Goods	129.1154	337.2154	61.4375685	-0.5945	10538.07
Panel B: COVID (N=2020)					
Revenue	240.2228	602.0103	1233.524	-1.2998	17561.1
Accounts Receivables	244.5323	753.1441	121.759	-10.1756	26435.08
Property, plant and equipment	45.1639	182.6252	69.7455	0	3116
Total assets	164.9082	416.1786	648.9165	0	6987.931
Net income	2.8689	53.5322	32.818	-1509	478.292
Cash flow from operations	12.2822	12.2822	66.736	-1300.216	1002.599
Cost of Goods	122.8287	320.6066	62.035	-12.853	9529.578
Panel C: Post-COVID (N=1010)					
Revenue	335.8171	1205.334	1613.11	0	35420.99
Accounts Receivables	278.6549	839.7702	173.124	-4.4186	44154.32
Property, plant and equipment	46.3618	179.1885	88.746	0	2497.867
Total assets	179.8434	464.8956	802.399	0	16838.87
Net income	5.3086	54.0767	54.556	-2284	1919.673
Cash flow from operations	16.2507	69.9748	98.738	-2228	4405.638
Cost of Goods	171.4777	735.6666	82.7761	-1.4122	22220.09
Panel D: t-test for difference in between periods					
	Pre-COVID vs. COVID		COVID vs. Post-COVID		
	Difference	t-value	Difference	t-value	
Revenue	18.6363	-1.0062	-95.5943	2.9117***	
Accounts Receivables	26.239	-1.0801	-34.1226	2.5477**	
Property, plant and equipment	-1.8384	0.3407	-1.1979	0.5157	
Total assets	-7.5669	0.5946	-14.9352	2.2350**	
Net income	2.9765	-2.0675**	-2.4397	2.4927**	
Cash flow from operations	2.079	-1.0259	-3.9685	2.4881**	
Cost of Goods	6.2867	-0.6619	-48.649	2.5304**	

Note: The sample consists of companies that received grants from "The Norwegian Business Compensation Scheme" during COVID-19. All figures above are in Norwegian million amounts (M), with 6060 observations. The revenue factor is without COVID grants. The data is divided into three periods: Panel A represents the "pre-COVID" period (2017-2019), Panel B covers the COVID-19 period (2020-2021), and Panel C categorizes 2022 as the "post-COVID" period. We deployed t-tests to compare mean values between the pre-COVID and COVID periods and between COVID and post-COVID periods, with findings presented in Panel D. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

To address potential issues with multicollinearity, we employ various methodologies, including correlation matrices and variance inflation factors (VIF). Appendix A Tables A.2 and A.3 present the correlation matrix and VIF values for the variables. A VIF value of 1.0 indicates the absence of multicollinearity, while higher values suggest increasing levels of multicollinearity. Typically, a VIF exceeding 5.0 raises concerns, and a value surpassing 10.0 indicates severe multicollinearity (Studenmund, 2017). In our analysis, all VIF values are approximately 1.0, confirming the absence of multicollinearity. The correlation matrix supports this observation, as none of the correlations between variables exceed 0.8, indicating the absence of strong correlations among the variables (Studenmund, 2017).

5.2 Results H.1

Table 4 illustrates trends in accounting manipulation before and after implementing government compensation schemes during the COVID-19 pandemic. In 2018, the compensation group (0.0655) and the comparison group (0.2714) exhibited significant upward revenue adjustments. These adjustments are substantiated by high t-values of 5.56 and 21.85, respectively, indicating statistically significant differences at the 1 percent level. The substantial revenue adjustments before the pandemic for both the compensation and comparison groups suggest that companies can be less cautious with accounting practices outside crisis periods. This observation also supports previous findings that there is less monitoring outside of crisis periods, providing opportunities for manipulation (Francis et al., 2013).

From 2018 to 2019, both groups show clear trends of downward adjustment, with the compensation group reducing significantly by -0.0306 and the comparison group by -0.0826. Statistical significance supports these reductions at the 5 percent level for the compensation group and the 1 percent level for the comparison group. This higher incidence of manipulation in the comparison group suggests that factors such as market trends or regulatory changes may have influenced the participants before the onset of the crisis.

Table 4: Modified Jones

Year	2018	2019	2020	2021	2022
Mean					
Compensation group	0.0655	-0.0306	-0.0596	-0.0068	0.0101
Comparison group	0.2714	-0.0826	-0.0232	-0.0154	-0.0007
T - value					
Compensation group	5.56***	-2.6**	-5.13***	-0.58	0.85
Comparison group	21.85***	-6.65***	-1.87	-1.24	0.06

Note: The models allow us to observe the degree of manipulation via mean values, where 0 indicates no signs of manipulation. The further the number is from 0, the greater the likelihood that discretionary accruals have been manipulated. Furthermore, we examined whether the values significantly differed from 0. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

At the start of 2020, the COVID-19 pandemic precipitated a global crisis, profoundly impacting all industries and prompting the introduction of governmental support schemes for businesses (Folkehelseinstituttet [FHI], 2020; NOU 2022:5). Data analysis from this period shows a doubling in the downward adjustment values to -0.0596 for the compensation group, with a t-value of -5.13, indicating potential underreporting. This finding is supported by a significance level of 1 per cent for the compensation group. Conversely, the comparison group exhibited an average value of -0.0232 with a t-value of -1.87, which does not reach statistical significance. These findings highlight that the pandemic and related compensation schemes significantly influenced the financial reporting numbers in the compensation group. These observations align with theories suggesting that public subsidies can impact financial reporting, suggesting the possibility of opportunistic behaviour where managers manipulate earnings to maximise benefits from such schemes (Aljughaiman, 2023; Azizah, 2017; Lassoued & Khancel, 2021).

For 2021 and 2022, we detected no changes in earnings management, aligning with existing literature that suggests the highest likelihood of earnings management occurs during the initial year of a global crisis (Paolone & Pozzoli, 2017). The observed stability during these years may indicate an adjustment to the economic conditions following the initial implementation of compensation schemes. Such trends were noted in both the compensation and comparison groups, potentially reflecting adapting to new regulatory guidelines and establishing a more stable economic base under the prevailing conditions. Moreover, companies could attribute this stability to the effects of heightened external monitoring, corroborating research that

underscores the critical role of effective external oversight in curbing earnings management (Chandran, 2016).

These findings corroborate the hypothesis that earnings management may manifest after introducing extraordinary economic measures, albeit the effects appear transient as companies adapt to new economic norms. In support of this observation, Nygård and Undall (2022) reported increased earnings management activities among companies during the COVID-19 pandemic in Norway.

5.3 Results H1.1

To further investigate the findings from H1, this inquiry examines the potential for accrual-based earnings management through premature revenue recognition, which could contravene the fundamental principles of the Accounting Act (1998, §4-1). This analysis is particularly pertinent in the context of the COVID-19 compensation scheme initiated by authorities in March 2020. Notably, companies had to submit their annual accounts for 2019 by July 31, 2020 (Altinn, 2024), a submission deadline a few months after the introduction of the compensation scheme.

Table 5 4: Ratio analysis – Premature revenue recognition

Accounts receivable turnover ratio	2018	2019	2020	2021	2022
Compensation group (N = 6060)	9,70	9,93	8,16	10,17	10,67
Comparison group (N = 4787)	10,44	10,66	10,76	10,69	10,14

Percentage change	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Compensation group (N = 6060)					
EBIT	13 %	34 %	-71 %	114 %	109 %
CFO	7 %	12 %	-30 %	18 %	86 %
Comparison group (N = 4787)					
EBIT	-11 %	44 %	8 %	40 %	-17 %
CFO	-42 %	73 %	20 %	-23 %	2 %

Note: This ratio analysis presents the accounts receivable turnover ratio for both the compensation and comparison groups. Furthermore, these figures are linked to the change in CFO and EBIT to identify potential inconsistencies.

Among the firms that received compensation, the total turnover ratio declined from 2019 (9.93) to 2020 (8.16), followed by a decrease in operating income (-71 percent) and cash flow from operations (-30 percent), hereafter referred to as EBIT and CFO.

The reduction in the accounts receivable turnover ratio may suggest premature revenue recognition, implying that sales were recorded before the actual realisation of cash flows, as posited by Heskestad (2015). However, the concurrent decreases in both EBIT and CFO complicate the inference of premature revenue recognition based solely on these metrics. These observed declines could also reflect genuine economic challenges rather than deliberately manipulating financial figures. Conversely, in the comparison group, a modest increase in turnover was observed alongside growth in CFO (8 percent) and EBIT (20 percent). This differential response can indicate variations in the impact of the pandemic and the adaptive capacities between firms that did not receive compensation and those that did. This observation is consistent with Hypothesis 1, which suggests that the pandemic exerted a more pronounced impact on the financial accounting figures of the compensation group compared to the comparison group in 2020.

We segmented the dataset by industry for a more precise analysis, providing detailed industry-specific data in Appendix A Table A.4. When examining industry-specific data for potential revenue shifting to earlier periods, indications of premature revenue recognition were found exclusively in the real estate industry from 2018 to 2019. These trends preceded the pandemic and are not associated with the compensation scheme.

Furthermore, the analysis highlights deviations between the compensation and comparison groups, with volatile results observed in the accommodation and hospitality industry from 2019 to 2020. There was a minor increase in the turnover rate of receivables, contrasted with a steep decline in both EBIT and CFO, which plummeted by -181.1 percent and -55 percent, respectively, from 2019 to 2020. This downturn is attributable to the general economic decline experienced in Norway during 2020, exacerbated by the extensive lockdowns in the fall of 2020 and the winter/spring of 2021 (Helliesen et al., 2021). Nonetheless, there was a noticeable improvement in the turnover rate in 2021 (18.37) and 2022 (19.13), suggesting a gradual industry recovery following the economic adversities of 2020.

There is limited evidence of substantial accounting manipulation in the form of premature revenue recognition among medium and large enterprises. The absence of sustainable discrepancies in the financial ratios between the compensation and comparison groups substantiates this conclusion. The analysis of Hypothesis 1 and the findings from H1.1 reveal no discernible trends of upward manipulation in 2019 or 2020, suggesting that companies did not prematurely recognise revenues to exaggerate subsequent sales declines artificially.

5.4 Results H1.2

Supplementary Analysis H1.2 posits that companies may have deferred revenue to later periods to meet the prerequisite of a minimum 30 percent decline in turnover required for compensation eligibility.

Table 6 5: Ratio Analysis - Deferred revenue recognition

	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022
Total					
Compensation group					
Accounts Receivables	6 %	8 %	-25 %	23 %	28 %
Revenue	15 %	10 %	-25 %	19 %	32 %
Cost of Goods sold	10 %	11 %	-20 %	13 %	32 %
Gross Profit	20 %	9 %	-31 %	27 %	33 %
Gross Margin	4 %	0 %	1 %	2 %	0 %
Comparison group					
Accounts Receivables	3 %	7 %	-1 %	25 %	15 %
Revenue	9 %	8 %	3 %	11 %	13 %
Cost of Goods sold	-2 %	6 %	5 %	13 %	14 %
Gross Profit	28 %	10 %	3 %	7 %	14 %
Gross Margin	-1 %	0 %	-1 %	-1 %	-1 %

Note: To rigorously examine potential deferred revenue, we analysed the percentage changes in key metrics from t-1 to t, including revenue, accounts receivable, cost of goods sold, and gross profit for both the compensation group and the comparison group.

From 2019 to 2020, the compensation group experienced a notable decline (31 percent) in gross profit, contrasting sharply with the modest 3 percent increase observed in the comparison group. This trend reversed in the subsequent years of 2021 and 2022, where there was an improvement in the gross profit for the compensation group. Changes in the cost of goods sold and revenue supported this, revealing a decrease in 2020, followed by an increase in 2021. A substantial drop and subsequent rise in revenue suggest potential deferred revenue and manipulation (Beneish, 1999). The cost of goods sold bolsters this inference, decreasing by 20 percent in 2020 and increasing by 13 percent in 2021, suggesting that goods unsold in 2020 were likely sold the following year. The comparatively slight reduction in the cost of goods compared to revenue implies that companies struggled to adjust costs effectively in response to a decline in demand driven by the pandemic.

In contrast, the comparison group exhibited fewer signs of deferred revenue, displaying steady and synchronised increases in revenue and cost of goods sold from 2020 to 2022. These consistent patterns across all industries indicated conventional operations without apparent

accounting manipulation, highlighting a difference in financial management compared to the compensation group.

Further analysis of gross margins from 2020 to 2022 shows fluctuations in the compensation group compared to the comparison group. Despite a 31 percent decrease in gross profit from 2019 to 2020, the compensation group saw a slight increase in gross margin (1 percent), indicating efficiency improvements under economic pressure. From 2021 to 2022, the gross margin remained relatively stable, with a moderate increase of 2 percent, even as gross profit rose substantially by 27 percent. This pattern indicates a recovery in sales volume combined with effective cost control, collectively contributing to a healthier financial position.

In contrast, the comparison group, where gross margins remained more stable throughout the period, indicated more consistent and predictable operations without clear signs of aggressive accouniting manipulation. These observations suggest a pronounced inclination within the compensation group to manipulate revenues and costs, particularly in response to the economic challenges precipitated by the pandemic in 2020. This approach likely represents a strategic effort to align with the eligibility criteria of the compensation scheme.

Appendix A Table A.5 provides an industry-specific breakdown of the data. During the crisis, we observed an unusual discrepancy between accounts receivable and revenue growth in both the compensation and comparison groups. In the accommodation and hospitality industry of the compensation group, accounts receivable dropped by 52 percent and sales revenue by 38 percent from 2019 to 2020. From 2020 to 2021, however, accounts receivable surged by 68 percent, while revenue only increased by 22 percent. This discrepancy contrasts with the comparison group, where accounts receivable decreased by 15 percent, despite a 12 percent rise in revenue. Pandemic-related challenges, such as restricted operations and reduced economic activity, primarily caused the decline from 2019 to 2020. The disproportionate increase in accounts receivable relative to revenue from 2020 to 2021 might indicate a potential deferral of revenue recognition to improve financial reporting, possibly to meet compensation scheme requirements. Additionally, the growth in accounts receivable (39 percent) and revenue (56 percent) in 2022 indicates economic recovery and normalisation post-pandemic. The higher revenue increase suggests that previously delayed transactions are now fully realised.

The decline in revenues during 2020, followed by subsequent increases in the subsequent years among the compensation group, suggests that companies during the pandemic may have felt pressured to decrease revenue to meet the requirement of at least a 30 percent decline. This trend is consistent with the findings of panel D in the descriptive statistics, revealing a significant revenue gap between the COVID-19 and post-COVID periods at the 1 precent significance level. These findings imply a deliberate shift in revenue recognition from 2020 to 2021 or from 2021 to 2020 to meet the requirement. Such behaviour resonates with prior research, demonstrating that firms experiencing unusually low revenue employ tactics to underreport revenues (Rusmin et al., 2013). This strategic manoeuvre can constitute part of a broader scheme aimed at bolstering financial reserves for the future (Abarbanell & Lehavy, 2003; Kirschenheiter & Melumad, 2002; Walsh et al., 1991).

Moreover, notable revenue increases, which do not proportionally match the ratios, indicate possible revenue manipulation through delayed revenue recognition. Companies could have strategically designed these manipulations to meet the eligibility criteria for compensation and improve financial results in subsequent years. The removal of health restrictions in February 2022 may have contributed to further increases in revenue that year. Drawing from the findings in H1, which indicate revenue manipulation in 2020, the results in H1.2 suggest the possibility that companies manipulated their accounts by shifting revenues from 2020 to 2021.

6. Summary and Conclusion

The primary research question of this study was: Are there irregular patterns in the reported accounting figures for firms receiving government grants during extraordinary circumstances? We investigated this question using a dataset of medium and large enterprises that benefited from support during the pandemic, covering the period from 2017 to 2022. The research primarily focuses on identifying potential earnings management of discretionary earnings triggered by the government's compensation scheme. Furthermore, the study investigated how companies potentially exploited the compensation scheme by manipulating financial figures. H1.1 examines the propensity for premature revenue recognition, while H1.2 evaluates potential manipulations through deferred revenue recognition. These investigations are framed within the financial shenanigans delineated by Schilit and Perler (2010).

Analysis of Hypothesis 1 revealed statistically significant results at the 1 percent level for both the compensation and comparison groups in 2018. In 2019, the results remained significant at

the 5 percent level for the compensation group and the 1 percent level for the comparison group. The findings indicate an increasing trend of revenue manipulation prior to crisis periods, possibly due to reduced oversight outside of crises, with managers exploiting this to their advantage to enhance results (Francis et al., 2013).

During the first year of the COVID-19 pandemic, the average value of the modified Jones model showed a statistically significant difference at the 1 percent level. This finding indicates that the government's compensation scheme had a measurable effect on companies accounting numbers during the COVID-19 pandemic, corroborating the hypothesis that compensation schemes may foster such manipulation during crises. This finding supports prior research suggesting increased earnings management during periods of crisis (Hsu & Yang, 2022; Lee et al., 2024; Liu & Sun, 2022; Yan et al., 2022). Additionally, the findings affirm theoretical propositions, such as those advanced by Chandran (2016), which argue that public subsidies can profoundly affect corporate earnings management strategies, emphasising the role of external financial aid in shaping business practices amid economic uncertainty. Conversely, the comparison group for 2020 did not mirror this pattern, as we observed no significant differences, underscoring the distinct impact of compensation schemes on financial reporting metrics during times of crisis.

However, the 2021 data reveal no significant differences at any level for the compensation or comparison groups, suggesting that the compensation scheme had no impact on earnings management in the second year of the crisis. Practical measures implemented by Norway in 2020 to limit the spread of the virus and mitigate the economic consequences may explain the lack of impact. These observations align with Palone and Pozzoli's (2017) theory that earnings management is most prevalent in the initial year of a global crisis, followed by a normalisation as firms adapt to new economic conditions.

Given the trends of downward manipulative adjustments in 2020, supported by a significance level of 1 percent for the compensation group, it is evident that businesses shifted their revenues to an earlier or later period to meet the requirements of the compensation scheme. Nonetheless, the investigation conducted in H1.1, which focused on premature revenue recognition, did not reveal any inclinations towards such practices within the compensation or comparison groups. However, an industry-specific examination suggested the potential for revenue manipulation through early revenue recognition within the real estate industry, a notion reinforced by the outcomes in H1, which highlighted a significant increase in manipulation in 2018. Conversely,

there is minimal evidence of such manipulation among medium and large enterprises across other industries during the COVID-19 pandemic.

Regarding the analysis of H1.2, which investigated the possibility that deferred income recognition affects eligibility for financial assistance during the pandemic, our findings indicate a decline in key financial indicators for the compensation group from 2019 to 2020, followed by a subsequent recovery until 2022. Conversely, the comparison group did not exhibit a similar decline. These contrasting trends may reflect the actual economic challenges faced by the compensation group during the pandemic. Companies in this group were likely more vulnerable and needed to seek corporate compensation. Income loss likely caused the observed decline in accounting figures in the compensation group, unlike the comparison group, which demonstrated greater financial resilience. These observations align with the findings of Butler et al. (2004) and Seetah (2017), which demonstrated that negative abnormal periodisation during crises can reflect genuine economic difficulties rather than deliberate manipulations.

The analysis revealed fluctuations in financial indicators for both groups, with notably illogical correlations in the Accommodation and Hospitality industries. Initially, there was a disproportionate increase in accounts receivable relative to sales revenues from 2020 to 2021, which could signal financial discrepancies (Robinson et al., 2020). In the compensation group, sales revenues decreased notably from 2020 to 2021, then increased in 2021 without correlating with changes in the cost of goods sold. This pattern was not evident in the comparison group, which exhibited a more consistent and synchronised growth in sales revenues and cost of goods sold. These discrepancies, particularly the illogical gaps in key financial indicators in the compensation group, suggest possible revenue shifts to later periods, warranting increased scrutiny under these conditions. Furthermore, these findings may be attributed to the compensation scheme, as the comparison group demonstrated greater consistency in their results. The collective interpretation of H1 and H1.2 bolsters this assertion, suggesting the likelihood of deferred revenue to subsequent periods, consistent with the observations from H1.2.

Considering the findings from this study, it is evident that the economic crisis induced by the pandemic has significantly influenced the accounting figures among medium and large enterprises. Our research has uncovered diverse strategies of accounting manipulation that vary depending on whether the companies received compensation. The hypotheses tested reveal the intricate manner in which businesses react to external economic shocks and government support

initiatives. These findings demonstrate a dynamic interaction between accounting figures and economic conditions, where firms not only adjust to evolving circumstances but may also exploit these situations to their benefit. By documenting potential manipulations in financial reporting under compensation schemes, the study provides a basis for improving the design and monitoring of such support programs in the future.

Our study has its limitations. Firstly, our analysis only includes medium and large businesses that received support from the compensation scheme. This study excludes approximately 37,000 of the 38,179 businesses classified as small enterprises, focusing on a segment representing only a tiny fraction of the notable larger total population. Furthermore, existing research primarily focuses on economic crises without thoroughly exploring the relationship between support schemes and crises, making it challenging to determine their precise impacts on business behaviour. The existing research on financial shenanigans, which form the basis for H1.1 and H1.2**,** is limited. This need for more relevant literature restricts our capacity to effectively integrate our methodological approach with previous studies, potentially impacting the validity of our findings. Additionally, the study's short timeframe does not capture the long-term effects, and the potential impact of external factors needs to be included in the analysis, further limiting the scope of our conclusions.

Future research could investigate whether our findings are consistent with outcomes observed in government compensation schemes in other countries, especially concerning their impact on financial reporting practices. This research is particularly intriguing, given prior research showing significant variations in earnings management across different countries (Aguilera & Jackson, 2003; Bao & Lewellyn, 2017). Such studies would enhance our understanding of how these support mechanisms function during economic crises and could guide program design and oversight enhancements. Notably, both the compensation and the comparison groups exhibited upward accounting manipulation in 2018, underscoring the importance of studying earnings management beyond crisis periods in the Norwegian context. Furthermore, examining the underlying mechanisms of earnings management would offer a deeper understanding of companies' strategies to exploit these schemes. This knowledge could assist policymakers in formulating regulations that effectively deter financial misconduct while ensuring essential economic support for businesses during crises.

Bibliography

Abarbanell, J., & Lehavy, R. (2003). Can Stock Recommendations Predict Earnings Management and Analysts' Earnings Forecast Errors? *Journal of Accounting Research*, *41*(1), 1–31. https://doi.org/10.1111/1475-679X.00093

Aguilera, R. V., & Jackson, G. (2003). The cross-national diversity of corporate governance: Dimensions and determinants. *The Academy of Management Review*, *28*(3), 447–465. https://doi.org/10.5465/AMR.2003.10196772

Ali, H., Amin, H. M. G., Mostafa, D., & Mohamed, E. K. A. (2022). Earnings management and investor protection during the COVID-19 pandemic: evidence from G-12 countries. *Managerial Auditing Journal*, *37*(7), 775–797. https://doi.org/10.1108/MAJ-07-2021-3232

Aljughaiman, A. A., Nguyen, T. H., Trinh, V. Q., & Du, A. (2023). The COVID-19 outbreak, corporate financial distress, and earnings management. *International Review of Financial Analysis*, p. *88*, 102675–102675. https://doi.org/10.1016/j.irfa.2023.102675

Altinn (09.04.2024). *Årsregnskap.* Altinn. https://info.altinn.no/starte-og-drive/regnskap-og-revisjon/regnskap/arsregnskap/

Andrianto, A., & Amin, A. (2023). The Effect of Gross Profit Margin, Intellectual Capital, and Investment Opportunity Set on Firm Value with Earnings Management as an Intervening Variable. *Journal of Social Research*, *2*(10), 3428–3450. https://doi.org/10.55324/josr.v2i10.1392

Arthur, N., Tang, Q., & Lin, Z. (2015). Corporate accruals quality during the 2008–2010 Global Financial Crisis. *Journal of International Accounting, Auditing & Taxation*, *25*, 1–15. https://doi.org/10.1016/j.intaccaudtax.2015.10.004

Azizah, W. (2018). TREND AND TRADEOFF BETWEEN ACCRUAL EARNINGS MANAGEMENT AND REAL EARNINGS MANAGEMENT IN INDONESIA. *Media Riset Akuntansi, Auditing & Informasi*, *17*(2), 159–172. https://doi.org/10.25105/mraai.v17i2.2079

Bansal, M., Kumar, A., & Kumar, V. (2022). Gross profit manipulation in emerging economies: evidence from India. *Pacific Accounting Review*, *34*(1), 174–196. https://doi.org/10.1108/PAR-06-2020-0083Bao, S. R., & Lewellyn, K. B. (2017). Ownership structure and earnings management in emerging markets—An

institutionalized agency perspective. *International Business Review*, *26*(5), 828–838. https://doi.org/10.1016/j.ibusrev.2017.02.002

Beneish, M. D. (1999). The Detection of Earnings Manipulation. *Financial Analysts Journal*, *55*(5), 24–36. https://doi.org/10.2469/faj.v55.n5.2296

Brønnøysundregistrene (n.d.) *Innsyn i tildeling av tilskudd fra kompensasjonsordningen for næringslivet*. Retrieved January, 19, 2024 from https://data.brreg.no/kompensasjonsordning/innsyn/

Butler, M., Leone, A. J., & Willenborg, M. (2004). An empirical analysis of auditor reporting and its association with abnormal accruals. *Journal of Accounting & Economics*, *37*(2), 139–165. https://doi.org/10.1016/j.jacceco.2003.06.004

Chandran, S. (2016). Review on the double side of earnings management. *Pertanika Journal of Social Science & Humanities.*, *24*(4), 1253–1265.

Chansarn, S. (2016). Earnings management and dividend policy of small and medium enterprises in Thailand. *International Journal of Business and Society.*, *17*(2), 307–328.

Chevalier, J. A. (1995). Capital structure and product-market competition: empirical evidence from the supermarket industry. *The American Economic Review*, *85*(3), 415–435.

Chia, Y.M., Lapsley, I., & Lee, H.-W. (2007). Choice of auditors and earnings management during the Asian financial crisis. *Managerial Auditing Journal*, *22*(2), 177–196. https://doi.org/10.1108/02686900710718672

Cohen, D. A., Dey, A., & Lys, T. Z. (2008). Real and Accrual-Based Earnings Management in the Pre- and Post-Sarbanes-Oxley Periods. *The Accounting Review*, *83*(3), 757–787. https://doi.org/10.2308/accr.2008.83.3.757

Constantatos, A.-F., Dionysiou, D., & Tsalavoutas, I. (2016). A synthesis and analysis of models measuring accrual-based and actual activities earnings management. In *Earnings Management: Global Perspectives, Performance and Future Research* (pp. 57–111).

Da Silva Flores, E., Sampaio, J. O., Beiruth, A. X., & Brugni, T. V. (2023). Earnings management during the COVID-19 crisis: evidence from the Brazilian and American capital markets. *Journal of Accounting in Emerging Economies*, *13*(4), 760–783. https://doi.org/10.1108/JAEE-10-2021-0317

Dechow, P. M., & Sloan, R. G. (1991). Executive incentives and the horizon problem: An empirical investigation. *Journal of Accounting & Economics*, *14*(1), 51–89. https://doi.org/10.1016/0167-7187(91)90058-S

Dechow, P. M., Ge, W., Larson, C. R., & Sloan, R. G. (2011). Predicting Material Accounting Misstatements. *Contemporary Accounting Research*, *28*(1), 17–82. https://doi.org/10.1111/j.1911-3846.2010.01041.x

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting Earnings Management. *The Accounting Review*, *70*(2), 193–225.

Douma, S., & Schreuder, H. (2017). *Economic approaches to organisations* (6th ed., pp. XVIII, 382). Pearson Education.

ENIN (n.d) *About us*. Enin. https://www.enin.ai/us/about-us

Filip, A., & Raffournier, B. (2014). Financial crisis and earnings management: the European evidence. *The International Journal of Accounting Education and Research*, *49*(4), 455–478. https://doi.org/10.1016/j.intacc.2014.10.004

Folkehelseinstituttet. (2020, 2. September). *Ukesrapport – uke 35* https://www.fhi.no/contentassets/8a971e7b0a3c4a06bdbf381ab52e6157/vedlegg/4.-andre--2020/2020-09-02-ukerapport-uke-35-covid-19.pdf

Francis, B., Hasan, I., & Wu, Q. (2013). The benefits of conservative accounting to shareholders: Evidence from the financial crisis. *Accounting Horizons*, *27*(2), 319–346. https://doi.org/10.2308/acch-50431

Gunny, K. A. (2010). The Relation Between Earnings Management Using Real Activities Manipulation and Future Performance: Evidence from Meeting Earnings Benchmarks. *Contemporary Accounting Research*, *27*(3), 855–888. https://doi.org/10.1111/j.1911-3846.2010.01029.x

Habib, A., Uddin Bhuiyan, B., & Islam, A. (2013). Financial distress, earnings management and market pricing of accruals during the global financial crisis. *Managerial Finance*, *39*(2), 155–180. https://doi.org/10.1108/03074351311294007

Healy, P. M., & Wahlen, J. M. (1999). A Review of the Earnings Management Literature and Its Implications for Standard Setting. *Accounting Horizons*, *13*(4), 365–383. https://doi.org/10.2308/acch.1999.13.4.365

Helliesen, M.K., Sletten, P., & Todesen, S. (2021). *Overnattings- og serveringstjenester i nasjonalregnskapet under koronakrisen*. Statistisk Sentralbyrå. https://www.ssb.no/nasjonalregnskap-og-konjunkturer/nasjonalregnskap/artikler/overnattings-og-serveringstjenester-i-nasjonalregnskapet-under-koronakrisen/_/attachment/inline/3ccc5ac4-cf0b-42ea-871b-b774bdd4e939:5afde0f773c60599a75c92e8d65992cd1076b548/NOT2021-26.pdf

Helse- og omsorgsdepartementet (2023). *Tidslinje: myndighetenes håndtering av koronasituasjonen*. Regjeringen. https://www.regjeringen.no/no/tema/helse-og-omsorg/folkehelse/tidslinje-koronaviruset/id2692402/

Heskestad, T. (2015). Resultatkvalitetsanalyse, røde flagg og driftsinntekter. In *Revisjon og regnskap (trykt utg.)* (Vol. 85, Issue 8).

Heskestad, T. (2016). Manipulering av kostnader: røde flagg i regnskapet. In *Revisjon og regnskap (trykt utg.)* (Vol. 86, Issue 4).

Hopland, S. & Fraser, S. A (2020, 11 May). 323 bedrifter må tilbakebetale støtte - disse fem tingene går igjen. *Stavanger Aftenblad*. https://www.aftenbladet.no/okonomi/i/K34Kye/323-bedrifter-har-tilbakebetalt-stoette-disse-fem-tingene-gaar-igjen

Høylie, K. (2022, 28. Januar). *Kompensasjonsordning 4 – regelverk på plass og søknadsportal er åpnet*. Regnskap Norge. https://www.regnskapnorge.no/faget/artikler/forretningsjus/kompensasjonsordning-4--regelverk-pa-plass-og-soknadsportal-apnet/

Hsu, Y.-L., & Yang, Y.-C. (2022). Corporate governance and financial reporting quality during the COVID-19 pandemic. *Finance Research Letters*, *47*, 102778–102778. https://doi.org/10.1016/j.frl.2022.102778

Iturriaga, F. J. L., & Alvarado, N. R. (2016). Earnings management during the recent crisis: The role of government quality. In *Earnings Management: Global Perspectives, Performance and Future Research (pp. 31–56).*Jang, G. B., & Kim, W. J. (2017). Effects of key financial indicators on earnings management in Korea's ready mixed concrete industry. *Journal of Applied Business Research*, *33*(2), 329–342. https://doi.org/10.19030/jabr.v33i2.9905

Kanagaretnam, K., Lim, C. Y., & Lobo, G. J. (2014). Effects of international institutional factors on earnings quality of banks. *Journal of Banking & Finance*, *39*, 87–106. https://doi.org/10.1016/j.jbankfin.2013.11.005

Kinserdal, F. (2016). Nedskrivninger i 2015?. *Magma*, *19*(1), 16–18. https://doi.org/10.23865/magma.v19.957

Kirschenheiter, M., & Melumad, N. D. (2002). Can "Big Bath" and Earnings Smoothing Co-exist as Equilibrium Financial Reporting Strategies? *Journal of Accounting Research*, *40*(3), 761–796. https://doi.org/10.1111/1475-679X.00070

Kjærland, F., Kosberg, F., & Misje, M. (2021). Accrual earnings management in response to an oil price shock. *Journal of Commodity Markets*, *22*, 100138. https://doi.org/10.1016/j.jcomm.2020.100138

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting & Economics*, *39*(1), 163–197. https://doi.org/10.1016/j.jacceco.2004.11.002

Kousenidis, D. V., Ladas, A. C., & Negakis, C. I. (2013). The effects of the European debt crisis on earnings quality. *International Review of Financial Analysis*, *30*, 351–362. https://doi.org/10.1016/j.irfa.2013.03.004

Lassoued, N., & Khanchel, I. (2021). Impact of COVID-19 Pandemic on Earnings Management: An Evidence from Financial Reporting in European Firms. *Global Business Review*, 97215092110534. https://doi.org/10.1177/09721509211053491

Lee, H., Choi, D., & Lee, H. Y. (2024). The impact of COVID-19 on earnings management: an international investigation. *Applied Economics Letters*, *31*(4), 353–361. https://doi.org/10.1080/13504851.2023.2167913

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, *69*(3), 505–527. https://doi.org/10.1016/S0304-405X(03)00121-1

Liu, G., & Sun, J. (2022). The impact of COVID-19 pandemic on earnings management and the value relevance of earnings: US evidence. *Managerial Auditing Journal*, *37*(7), 850–868. https://doi.org/10.1108/MAJ-05-2021-3149

Mulford, C. W., & Comiskey, E. E. (2002). *The financial numbers game : detecting creative accounting practices* (pp. XI, 395). Wiley.

Næringslivets Hovedorganisasjon (2022). *Økonomisk Overblikk 2/2022*. https://www.nhosh.no/contentassets/b1a25843f5cb4b1cb76d294fca3a7526/okonomisk-overblikk-2-22.pdf

NOU 2022: 5. (2022). *Myndighetenes håndtering av koronapandemien – del 2*. Statsministerens kontor. https://www.regjeringen.no/contentassets/d0b61f6e1d1b40d1bb92ff9d9b60793d/no/pdfs/nou202220220005000dddpdfs.pdf

Nygård, K. A., & Undall W, R. (2023). *Earnings management in response to generous government grants: Evidence from Norwegian firms during Covid-19*. NTNU. https://hdl.handle.net/11250/3088047

Osma, B. G. (2008). Board Independence and Real Earnings Management: The Case of R&D Expenditure. *Corporate Governance : an International Review*, *16*(2), 116–131. https://doi.org/10.1111/j.1467-8683.2008.00672.x

Peasnell, K. V., Pope, P. F., & Young, S. (2000). ACCRUAL MANAGEMENT TO MEET EARNINGS TARGETS: UK EVIDENCE PRE- AND POST-CADBURY. *The British Accounting Review*, *32*(4), 415–445. https://doi.org/10.1006/bare.2000.0134

Penman, S. H. (2013). *Financial statement analysis and security valuation* (5th ed., International ed., pp. XXVI, 740). McGraw-Hill.

Pozzoli, M., & Paolone, F. (2017). *Corporate Financial Distress: A Study of the Italian Manufacturing Industry* (1st ed. 2017 edition.). Springer International Publishing AG. https://doi.org/10.1007/978-3-319-67355-4

Prop. 67 S (2019–2020). *Endringer I statsbudsjettet 2020.* Finansdepartementet https://www.regjeringen.no/no/dokumenter/prop.-67-s-20192020/id2695373/

Regnskapsloven (1998). Lov om årsregnskap m.v. (LOV-1998-07-17-56). Lovdata. https://lovdata.no/dokument/NL/lov/2018-06-15-40

Rezaee, Z. (2005). Causes, consequences, and deterence of financial statement fraud. *Critical Perspectives on Accounting*, *16*(3), 277–298. https://doi.org/10.1016/S1045-2354(03)00072-8

Riahi-Belkaoui, A. (2004). *Accounting Theory* (5. ed.). London: Thomson Learning.

Robinson, T. R., Henry, E., & Broihahn, M. A. (2020). *International financial statement analysis workbook* (Fourth edition.). Wiley.

Ronen, J., & Yaari, V. (2008). *Earnings Management : Emerging Insights in Theory, Practice, and Research* (1st ed. 2008., Vol. 3). Springer US : Imprint: Springer.

Roychowdhury, S. (2006). Earnings management through actual activities manipulation. *Journal of Accounting & Economics*, *42*(3), 335–370.

Rusmin, R., Scully, G., & Tower, G. (2013). Income smoothing behavior by Asian transportation firms. *Managerial Auditing Journal*, *28*(1), 23–44. https://doi.org/10.1108/02686901311282489

Schilit, H., & Perler, J. (2010). *Financial shenanigans* (3rd ed., pp. XII, 318). McGraw-Hill.

Seetah, K. (2017). The Effect of Financial and Eurozone Crisis on Accounting Quality of the Hospitality Sector. *Journal of Hospitality Marketing & Management*, *26*(5), 552–563. https://doi.org/10.1080/19368623.2017.1231652

Skatteetaten. (n.d). *Kompensasjonsordning for næringslivet (mars – august 2020).* Retrieved October 31, 2020, from https://www.skatteetaten.no/kompensasjonsordning/om-ordningen/

Statistisk Sentralbyrå (2009). *Classification of Standard Industrial Classification.* https://www.ssb.no/en/klass/klassifikasjoner/6

Statistisk sentralbyrå (2021) Nasjonalregnskap for 2020. https://www.ssb.no/nasjonalregnskap-og-konjunkturer/artikler-og-publikasjoner/_attachment/445742?_ts=1779531bda8

Stubben, S. R. (2010). Discretionary Revenues as a Measure of Earnings Management. *The Accounting Review*, *85*(2), 695–717. https://doi.org/10.2308/accr.2010.85.2.695

Studenmund, A. H. (2017) *Using Econometrics: A Practical Guide*, 7th edn. Harlow: Pearson Education Limited

Tulvinschi, M. (2021). THE EFFECTS OF BIG BATH ACCOUNTING IN THE CONDITIONS OF UNCERTAINTY CAUSED BY THE COVID-19 PANDEMIC. *USV Annals of Economics and Public Administration*, *21*(34), 94–103.

Tulvinschi, M. (2021). THE EFFECTS OF BIG BATH ACCOUNTING IN THE CONDITIONS OF UNCERTAINTY CAUSED BY THE COVID-19 PANDEMIC. *USV Annals of Economics and Public Administration*, *21*(34), 94–103.

Walsh, P., Craig, R., & Clarke, F. (1991). 'Big Bath Accounting' Using Extraordinary Items Adjustments: Australian Empirical Evidence. *Journal of Business Finance & Accounting*, *18*(2), 173–189. https://doi.org/10.1111/j.1468-5957.1991.tb00587.x

Wasiuzzaman, S., Sahafzadeh, I., & Nejad, N. R. (2015). Prospect theory, industry characteristics and earnings management. A study of Malaysian industries. *Review of Accounting & Finance*, *14*(3), 324–347. https://doi.org/10.1108/RAF-07-2014-0075

White, G. I., Sondhi, A. C., & Fried, D. (1994). *The analysis and use of financial statements* (pp. XVII, 1198). Wiley.

Xiao, H. and Xi, J. (2021). "The COVID-19 and earnings management: China's evidence", *Journal of Accounting and Taxation*, Vol. 13, pp. 59-77.

Yan, H., Liu, Z., Wang, H., Zhang, X., & Zheng, X. (2022). How does the COVID-19 affect earnings management: Empirical evidence from China. *Research in International Business and Finance*, *63*, 101772–101772. https://doi.org/10.1016/j.ribaf.2022.101772

Zang, A. Y. (2012). Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management. *The Accounting Review*, *87*(2), 675–703. https://doi.org/10.2308/accr-10196

Appendix

A Appendix Tables

Table A.1: Descriptive Statistics for Comparison group

Variable	Mean	Std.Dev	Median	Min	Max
Panel A: Pre-COVID (N=2874)					
Revenue	502.5754	1696.654	157.093	0	40278
Recivables	48.7441	113.3173	18.6201	0	1861
Property, plant and equipment	106.8021	950.7604	5.6280	0	32257
Total assets	349.2833	1555.888	75.2923	0	37747
Net income	19.13072	261.7777	4.6371	-8602.529	5676
Cash flow from operations	38.8921	382.1474	8.6380	-9183.73	8977
Cost of Goods	300.2306	1009.379	87.6768	-12.4192	27842
Panel B: COVID (N=1916)					
Revenue	593.2448	1956.923	192.3661	0	43745
Recivables	57.3545	144.5098	22.0232	0	2720.735
Property, plant and equipment	127.887	1201.183	6.2996	0	34668
Total assets	410.9607	1737.335	94.818	0	38121
Net income	33.6538	258.9357	7.441	-2353	6286
Cash flow from operations	48.0458	361.3346	12.0116	-6318.539	6575.464
Cost of Goods	348.7314	1026.829	109.9444	-9.0447	12684.87
Panel C: Post-COVID (N=958)					
Revenue	706.4555	2344.968	216.82	0	46707.22
Recivables	73.587	170.4742	27.5951	0	1826
Property, plant and equipment	132.2334	1273.422	7.2871	0	35398
Total assets	447.8323	1775.076	112.96224	0	39225
Net income	28.4029	250.6836	7.7813	-2024.756	6581.924
Cash flow from operations	42.4669	336.2581	11.5223	-4299.104	6867.207
Cost of Goods	420.4456	1371.058	130.4915	-2.6397	20189
Panel D: t-test for difference in between periods					
	Pre-COVID vs COVID		COVID vs Post-COVID		
	Difference	t-value	Difference	t-value	
Revenue	-90.6694	2.3039**	-113.2107	2.6699**	
Recivables	-8.6104	1.7029	-16.2325	1.3662	
Property, plant and equipment	-21.0849	0.6757	-4.3464	0.0896	
Total assets	-61.6774	1.2823	-36.8716	0.5325	

Net income	-14.5231	1.8892*	5.2509	-0.5179
Cash flow from operations	-9.1537	0.8299	5.5789	-0.3992
Cost of Goods	-48.5008	1.6179	-71.7142	1.5718

Note: Table present the descriptive statistic for the comparison group. All figures above are in Norwegian million amounts (M), with 5748 observations. The data is divided into three periods: "pre-COVID" (2017-2019) shown in Panel A, the "COVID-19 period" (2020-2021) shown in Panel B, and the "post-COVID" period (2022) shown in Panel C. We deployed a t-tests to compare mean values between the pre-COVID and COVID periods, and between COVID and post-COVID periods, with findings presented in Panel D. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed).

Table A.2: Correlation Matrix for Modified Jones

	Modified Jones	1/A	Delta REV - Delta REC	PPE
Modified Jones	1			
1/A	0.0007	1		
Delta REV - Delta REC	-0.0178	0.0033	1	
PPE	0.0105	-0.0123	0.1621	1

Note: A correlation between two variables above 0,80 is considered high (Studenmund, 2017)

Table A.*3*: VIF Index for Modified Jones

Variable	VIF	1/VIF
1/A	1.00	0.9964
Delta REV - Delta REC	1.03	0.9698
PPE	1.09	0.9179
Mean VIF	1.05	

Note: A VIF index exceeding 5.0 raises concerns, and a value surpassing 10.0 indicates severe multicollinearity (Studenmund, 2017).

Table A.4: Industry-Specific Figures for H1.1

Accounts receivable turnover ratio	2018	2019	2020	2021	2022
Received compensation (N = 6060)					
Industry	7,10	7,25	5,19	7,63	8,27
Real estate	5,30	5,38	4,81	5,37	5,48
Retail, transportation, and storage	14,84	15,93	14,36	16,10	15,73
Accommodation and hospitality industry	15,06	16,23	13,17	18,37	19,13
Service-oriented enterprise	8,75	8,83	7,37	8,82	10,17
Comparison group (N = 4787)					
Industry	7,96	8,35	8,76	9,06	8,25
Real estate	7,40	7,27	6,72	6,71	6,59
Retail, transportation, and storage	11,51	11,67	11,74	11,34	10,85
Accommodation and hospitality industry	9,92	10,34	8,63	10,25	11,06
Service-oriented enterprise	12,99	13,55	14,39	14,69	13,68

Percentage change	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Industry					
EBIT - compensation	30 %	34 %	-17 %	41 %	20 %
CFO - compensation	36 %	2 %	-12 %	23 %	31 %
EBIT - comparison	0 %	20 %	26 %	25 %	-2 %
CFO - comparison	-10 %	39 %	2 %	17 %	0 %
Real estate					
EBIT - compensation	6 %	45 %	-38 %	17 %	56 %
CFO - compensation	4 %	-1 %	17 %	30 %	-7 %
EBIT - comparison	3 %	54 %	11 %	1 %	26 %
CFO - comparison	11 %	15 %	16 %	0 %	-4 %
Retail, transportation, and storage					
EBIT - compensation	12 %	-6 %	0 %	61 %	7 %
CFO - compensation	24 %	23 %	-21 %	25 %	35 %
EBIT - comparison	7 %	0 %	34 %	21 %	-5 %
CFO - comparison	9 %	14 %	30 %	0 %	-3 %
Accommodation and hospitality industry					
EBIT - compensation	-22 %	30 %	-181 %	-131 %	559 %
CFO - compensation	11 %	41 %	-55 %	116 %	4 %
EBIT - comparison	8 %	51 %	-6 %	1 %	-29 %
CFO - comparison	17 %	25 %	34 %	-79 %	-102 %
Service-oriented enterprise					
EBIT - compensation	19 %	7 %	-61 %	102 %	110 %
CFO - compensation	9 %	6 %	-14 %	31 %	49 %
EBIT - comparison	-13 %	34 %	23 %	12 %	-16 %
CFO - comparison	-13 %	51 %	-5 %	21 %	-19 %

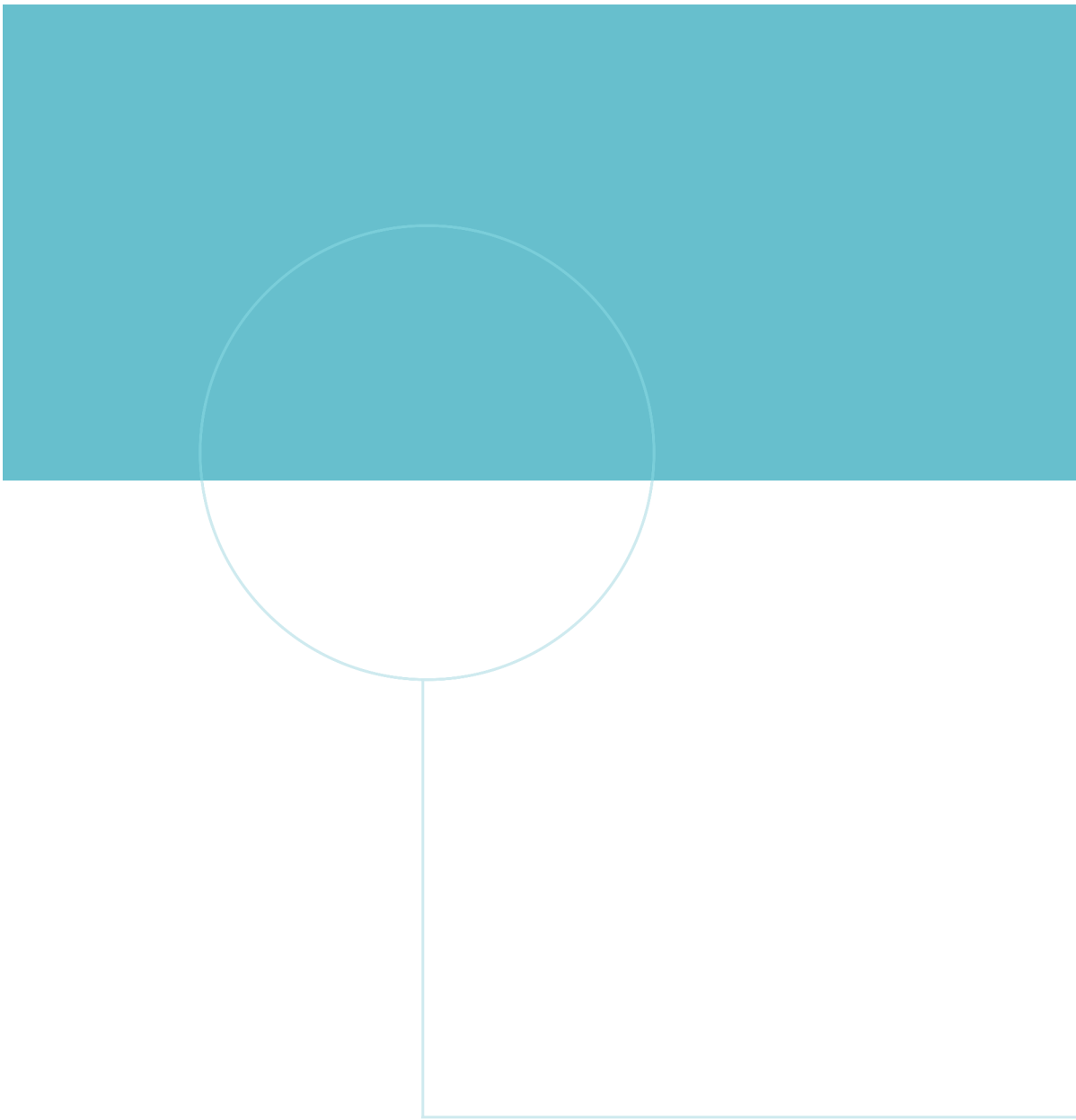
Note: To rigorously examine potential premature revenue within the industry, we analysed the accounts receivable turnover ratio for both the compensation and comparison groups. Furthermore, these figures are linked to the change in CFO and EBIT to identify potential inconsistencies.

Table A.5: Industry-Specific Figures for H1.2

	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022
Total					
Compensation group					
Accounts Receivables	6 %	8 %	-25 %	23 %	28 %
Revenue	15 %	10 %	-25 %	19 %	32 %
Cost of Goods sold	10 %	11 %	-20 %	13 %	32 %
Gross Profit	20 %	9 %	-31 %	27 %	33 %
Gross Margin	4 %	0 %	1 %	2 %	0 %
Comparison group					
Accounts Receivables	3 %	7 %	-1 %	25 %	15 %
Revenue	9 %	8 %	3 %	11 %	13 %
Cost of Goods sold	-2 %	6 %	5 %	13 %	14 %
Gross Profit	28 %	10 %	3 %	7 %	14 %
Gross Margin	-1 %	0 %	-1 %	-1 %	-1 %
Industry					
Compensation group					
Accounts Receivables	9 %	14 %	-25 %	17 %	32 %
Revenue	40 %	14 %	-33 %	37 %	36 %
Cost of Goods sold	17 %	17 %	-20 %	12 %	45 %
Gross Profit	83 %	10 %	-48 %	82 %	26 %
Gross Margin	-3 %	0 %	2 %	0 %	-3 %
Comparison group					
Accounts Receivables	-2 %	7 %	-3 %	21 %	31 %
Revenue	2 %	8 %	6 %	12 %	15 %
Cost of Goods sold	2 %	8 %	8 %	14 %	19 %
Gross Profit	4 %	7 %	4 %	9 %	9 %
Gross Margin	-4 %	1 %	1 %	-2 %	-3 %
Real estate					
Compensation group					
Accounts Receivables	11 %	8 %	-14 %	20 %	17 %
Revenue	22 %	12 %	-14 %	14 %	21 %
Cost of Goods sold	29 %	11 %	-20 %	17 %	24 %
Gross Profit	12 %	13 %	-6 %	10 %	17 %
Gross Margin	-2 %	-2 %	0 %	5 %	-4 %
Comparison group					
Accounts Receivables	21 %	1 %	4 %	17 %	12 %
Revenue	12 %	8 %	-6 %	9 %	14 %
Cost of Goods sold	13 %	8 %	-7 %	8 %	16 %
Gross Profit	10 %	10 %	-1 %	13 %	10 %
Gross Margin	-1 %	0 %	0 %	-6 %	1 %
Retail, transportation, and storage					
Compensation group					
Accounts Receivables	0 %	0 %	-17 %	25 %	23 %
Revenue	5 %	7 %	-17 %	14 %	21 %
Cost of Goods sold	6 %	8 %	-14 %	15 %	16 %
Gross Profit	5 %	6 %	-24 %	12 %	31 %
Gross Margin	0 %	0 %	1 %	2 %	2 %

Comparison group					
Accounts Receivables	1 %	9 %	0 %	33 %	10 %
Revenue	11 %	7 %	5 %	12 %	15 %
Cost of Goods sold	12 %	4 %	6 %	15 %	12 %
Gross Profit	7 %	13 %	2 %	6 %	22 %
Gross Margin	-2 %	0 %	-1 %	0 %	0 %
Accommodation and hospitality industry					
Compensation group					
Accounts Receivables	-10 %	4 %	-52 %	68 %	39 %
Revenue	4 %	6 %	-38 %	22 %	56 %
Cost of Goods sold	2 %	8 %	-33 %	7 %	67 %
Gross Profit	7 %	5 %	-39 %	26 %	54 %
Gross Margin	2 %	2 %	0 %	2 %	-1 %
Comparison group					
Accounts Receivables	-1 %	18 %	4 %	-15 %	10 %
Revenue	14 %	11 %	-8 %	12 %	4 %
Cost of Goods sold	17 %	21 %	-15 %	16 %	3 %
Gross Profit	13 %	10 %	-4 %	11 %	5 %
Gross Margin	1 %	0 %	2 %	1 %	-1 %
Service-oriented enterprise					
Compensation group					
Accounts Receivables	14 %	11 %	-35 %	24 %	36 %
Revenue	10 %	14 %	-28 %	6 %	51 %
Cost of Goods sold	11 %	15 %	-39 %	0 %	87 %
Gross Profit	9 %	13 %	-22 %	9 %	38 %
Gross Margin	26 %	0 %	0 %	2 %	2 %
Comparison group					
Accounts Receivables	2 %	6 %	-7 %	16 %	21 %
Revenue	5 %	8 %	4 %	7 %	9 %
Cost of Goods sold	-54 %	12 %	7 %	7 %	11 %
Gross Profit	97 %	7 %	4 %	5 %	10 %
Gross Margin	-101 %	0 %	-3 %	0 %	-1 %

Note: To rigorously examine potential deferred revenue within the industry, we analysed the percentage changes in key metrics from t-1 to t, including revenue, accounts receivable, cost of goods sold, and gross profit for both the compensation group and the comparison group.



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