

THE IMPACT OF COVID-19 ON EARNINGS MANAGEMENT: EVIDENCE FROM SOUTH AFRICA



ASANDA MPUMPULA

MPMASA001

Research dissertation presented for the approval of the University of Cape Town Senate in fulfilment of part of the requirements for the degree of Master of Commerce (Specialising in Financial Reporting, Analysis and Governance) in approved courses and a minor dissertation. The other part of the requirement for this qualification was the completion of a programme of courses.

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Student number	MPMASA001
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Signature of Student	Signed by candidate
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ABSTRACT

This study aims to determine whether the COVID-19 pandemic impacted the earnings management practices of South African firms and various industries by assessing the quality of total accruals. The study used discretionary accruals as a proxy for the magnitude of earnings management activities, estimated using the Modified Jones Model adapted by Kothari et al. (2005). 2016 to 2019 was deemed the pre-crisis period, while 2020 to 2022 was deemed the crisis period. The discretionary accruals of a sample of 159 Johannesburg Stock Exchange-listed firms were observed to determine the impact of COVID-19 on earnings management. Further, due to how different the impact of COVID-19 and the lockdown protocols were on the various industries, earnings management practices across the industries were observed. The findings suggest that COVID-19 had a significant impact on earnings management. Firms were found to engage in income-decreasing discretionary accruals during the crises. Further, the industry analysis suggests that the impact of COVID-19 on the industries observed was not symmetrical. A statistically significant increase in income-decreasing discretionary accruals was observed in basic metals, consumer discretionary and the technology industry. Consumer staples, health care and the telecommunications industry that were deemed to provide essential services during the pandemic were found to have increased their discretionary accruals and utilised income-decreasing accruals; however, the difference between pre-crisis and crisis-period discretionary accruals is not statistically significant. The study results also found that the energy and industrials industry decreased their discretionary accruals and improved the quality of accruals reported during the pandemic. This study adds to the limited research on earnings management in South Africa, an emerging market with characteristics of a developed country. This study may be useful for standard setters in their mandate to improve reporting standards and thus the quality of financial reports, investors seeking to value companies accurately, and regulators of financial statements concerned with the quality of financial reports in South Africa, such as the JSE and the South African Institute of Chartered Accountants.

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1. INTRODUCTION

1.1 History of earnings management and definition

The earliest documented study to explore earnings management was that of Hepworth (1953), who coined the term ‘income smoothing’. Healy (1985) studied the management of earnings by manipulating accruals. Accruals-based earnings management become topical in the research community due to its pervasiveness in financial reporting. As prescribed by the International Financial Reporting Standards, specifically International Accounting Standard 1, financial statements must be prepared based on the accrual basis of accounting, with the exception of the cash flow statement. From an academic perspective, no formal definition of earnings management exists; however, Davidson et al. (1987) defined it as achieving desired reported earnings by way of deliberate application of certain accounting principles that fall within the generally accepted accounting principles.

Prior research has consistently alluded to the following critical characteristics that effectively define earnings management:

1. it constitutes the intentional manipulation of actual performance and
2. it intends to manipulate users of financial statements. (Healy & Wahlen, 1999; Schipper, 1989).

1.2 Accounting scandals

A short list of the more globally significant accounting scandals in the last two decades includes Enron, WorldCom, and Lehman Brothers (Francis et al., 2013; Toumeh & Yahya, 2019). Tongaat Hulett, Resilient, EOH, Aspen, and Steinhoff (Davies, 2022) are more recent examples of South African firms that have come under fire for the misrepresentation of financial information. The implications of such scandals are far-reaching due to the value relevance of financial reports (Guenther & Young, 2000). Financial reports are still used largely for resource allocation and, thus, the underlying trust between management and stakeholders. Corporate scandals continue to highlight the inherent asymmetry in information between management and stakeholders (Bao & Lewellyn, 2017), and such scandals result in a negative reappraisal of trust placed in firm management. The manipulation of financial information by management has received academic attention as scholars attempt to understand the behavioural nature of firm management. Researchers have attempted to isolate the aiding and constraining conditions under which

earnings are managed (la Porta et al., 2000; Ali et al., 2022), with theories such as the agency theory (Aguilera & Jackson, 2003; Ning et al., 2014), underpinning the behavioural observations of firm management who seek personal gains such as large bonuses (Guidry et al., 1999), and the institutional theory, informing the constraining factors that limit firms from managing earnings through investor protection laws (Leuz et al., 2003).

1.3 Accounting standards

A critical function within the standard-setting arena is deciding the extent of discretion afforded to management when preparing financial statements. Standard setters are constantly attempting to refine existing standards in order to improve the quality of financial reporting. It can be noted that the latest accounting standards aim to bridge the information asymmetry between management and stakeholders by requiring more extensive disclosure and more predictive reporting. IFRS 15: Revenue from Contracts with Customers (“IFRS 15”) and IFRS 9: Financial Instruments (“IFRS 9”) are apt examples of financial reporting standards that have been implemented with the underlying intention of requiring more transparency in the reporting of financial statements (Boujelben & Kobbi-Fakhfakh, 2020). IFRS 15 introduced a more stringent requirement for revenue recognition, requiring entities to recognise revenue if it is highly unlikely that the revenue will be reversed (Boujelben & Kobbi-Fakhfakh, 2020). IFRS 9 introduced the recognition of expected credit losses, which requires entities to recognise credit losses that are expected as opposed to only recognising credit losses as they occur (Gornjak, 2020). The introduction of both these requirements to these standards requires management to report on transactions not just as they are, but management is required to apply the predictive knowledge possessed by the firm to provide a more faithful reflection of the reality of the firm’s performance (International Accounting Standards Board, 2018).

1.4 Earnings management during crisis

Historical research suggests that financial and economic crises often influence the extent of earnings management practices by management (Cimini, 2015; Grimaldi, 2019; Li et al., 2020; Saleh & Ahmed, 2005; Türegün, 2020). While earnings management during crisis has been subject to extensive research, the findings remain inconclusive. Research results suggest that during times of crisis, firms manage earnings to increase performance to give the illusion that earnings remain unaffected or minimally affected by crisis by mitigating the negative impact of crisis on earnings and maintaining a positive outlook on firm performance (Berndt & Offenhammer, 2010; da Silva et al., 2014; Li et al., 2020; Šušak, 2020). Contrary to these findings are research results that suggest

that earnings management activities decrease during crisis due to the fact that regulatory scrutiny and close monitoring activities by auditors are heightened during these periods (Ali et al., 2022; Chia et al., 2007). Further, in support of the latter view, research suggests that firms may not be incentivised to manipulate earnings during a crisis due to investor acceptance of poor performance (Ahmad-Zaluki et al., 2011; Türegün, 2020), the incurred losses may be so significant that they cannot be offset using any earnings management tool.

1.5 A new crisis to observe earnings management

The COVID-19 pandemic has presented the research community with the unique opportunity to investigate earnings management practices during a crisis caused by a pandemic. The asymmetrical impact of the pandemic on industries will offer insights into earnings management practices across industries that operate in the same institutional context but with varied operating restrictions, thus contributing to understanding earnings management, firm performance, and future outlook.

Research has explored earnings management practices during crisis (Lassoued & Khanchel, 2021; Lizińska & Czapiewski, 2023; Xiao & Xi, 2021; Yan et al., 2022); however, research undertaken in the context of South African firms listed on the Johannesburg Stock Exchange (“JSE”) remains limited (Eloff & Steenkamp, 2022; Jordaan et al., 2018; Mnif Sellami & Slimi, 2016; Pududu & de Villiers, 2016), and none has addressed earnings management in South Africa, in light of, the COVID-19 pandemic and the varying impact across different industries. Such a study in the context of South Africa will offer insights into the country's specific characteristics and deepen the literature focused on emerging economies. Further, the results are of interest to the South African investment community, regulatory bodies and auditors. Understanding management behaviour can better inform investment decisions and help auditors identify potential risk areas. Also, it is important to understand management behaviour to ensure that the correct behaviour is incentivised in setting regulations or standards.

1.6 The South African institutional context

South Africa has been characterised by smaller, well-regulated stock exchange (Yalla et al., 2023). Unlike most developing countries, the institutional context is characterised by strong investor protection and world-class accounting and auditing standards. However, much like most emerging markets, legal enforcement is weaker than that of developed markets (Leuz et al., 2003). The complexities of South Africa's institutional environment leave limited scope for generalising

the earnings management practices found in other countries.

1.7 Significance of the study

This study aims to answer the question of how the COVID-19 pandemic impacts the earnings management practices of South African listed firms. The need for the study arises due to:

1. The studies focusing on understanding how crisis impacts earnings management cannot be generalized in the context of South Africa due to the unique institutional context within which South African companies operate; and
2. Of the earnings management studies focusing on South Africa, none have explored how the COVID-19 pandemic impacted earnings management practices.

In observing earnings management before and after the onset of COVID-19, this study will assess whether earnings management was more, or less, prevalent in specific industries due to the government's classification of essential and non-essential industries had the effect of prejudicing some industries to a greater extent than others. Discretionary accruals will be utilised as a proxy for earnings management and in line with the methodology applied in previous studies (Ali et al., 2022; Grimaldi, 2019; Jordaan et al., 2018; Kumar & Vij, 2017; Šušak, 2020; Türegün, 2020). The Modified Jones Model (Dechow et al., 1995), further enhanced by Kothari et al. (2005), will determine the discretionary element of total accruals.

The strength of investor protection within the firm's jurisdiction has been identified as a factor impacting earnings management (la Porta et al., 2000; Ali et al., 2022), and has been noted as a constraining factor on earnings management. This study will focus on firms listed on the JSE that are not dual listed, which will eliminate the institutional factors that constrain or contribute to earnings management, such as the application of King IV principles (Greyvenstein, 2010) and the implementation of International Financial Reporting Standards (IFRS) (Sellami & Slimi, 2016). This study will give insights into the earnings management practices within the South African context.

The quality of financial statements published by firms listed on the JSE is of interest to an extensive list of vested parties, including but not limited to the government, investors, regulators, creditors and standard setters. Schipper (1989) suggested that earnings are managed when management manipulates a firm's actual performance in an attempt to mislead shareholders or influence transactions dependent on reported performance. The attempt to mislead shareholders is of interest

to the JSE. The stock exchange itself engages in proactive monitoring activities on an annual basis to ensure the integrity and consistency of financial information produced by listed firms and to contribute to the production of quality financial reporting. Dechow et al. (2010) defined higher earnings quality as the most faithful representation of a firm's primary earnings process. Lo (2008, p.351) thus concluded that 'highly managed earnings have low quality'.

In answering the research question above, this study will aim to observe the earnings management activities of firms, it must be noted that all earnings management measures are proxies and do not definitively indicate an underlying intention to mislead users of financial statements. Thus, all findings in the earnings management field are suggestive. The model used to determine earnings management activities in this study is the Modified Jones Model of Kothari et al. (2005), which determines the discretionary accruals, a proxy for earnings management activities. The sample consists of 159 JSE-listed non-financial firms from 2016 to 2022. The variables required for the model were sourced from Thomson Reuters Eikon, and ordinary least squares (OLS) regression was estimated with panel data using EViews. The findings suggest that the COVID-19 pandemic impacted the earnings management practices of South African listed firms and that the impact on earnings management practices varied across the eight sectors on the JSE.

The remainder of this dissertation is structured as follows: Section 2 outlines the relevant literature as well as the development of the tested hypotheses. Section 3 details the research methodology as well as the data collection process. Section 4 outlines the results of the testing applied and the accompanying discussion on how the findings linked to expectations from the literature. The last section of this dissertation documents the conclusion as well as outlining suggestions for future research.

2. LITERATURE REVIEW

The literature review will detail the origins of earnings management research and the types of earnings management practices identified over time within the research community, namely accrual-based earnings management ("AEM") and real earnings management ("REM"). Thereafter, an analysis of the incentives and the underlying theories identified by researchers that motivate earnings management will be undertaken, along with the circumstances that impact earnings management, mainly what was seen in past periods of crisis. Following this, further insights on the COVID-19 pandemic and its impact on firms will be detailed. This section will also

explore earnings management research in the context of South Africa, and lastly, the findings of previous research examining the impact of the crisis on earning management will be documented.

2.1 Types of earnings management

Initial earnings management research focused on accrual-based earnings management (Becker et al., 1998; Healy, 1985; Schipper, 1989). Earnings management research has evolved, and two distinct practices have emerged: REM and AEM (Bartov, 1993; Chen et al., 2016; Cohen et al., 2007; Farrell et al., 2014; Zang, 2012).

REM exists when management manipulates the actual activities of the business in a manner that is not in line with the firm's strategy to achieve the desired earnings target and thus manage earnings through actual cash flows (Roychowdhury, 2006). Extant research identifies the reduction of research and development expenditure to meet earnings targets (Barber et al., 1991; Bens et al., 2002). Similarly, Dechow and Sloan (1991) found the same reduction in R&D by CEOs close to the end of their tenure. Real earnings management can also take the form of manipulating production levels to allocate overhead costs over a greater volume, thus decreasing the cost of inventory and offering discounted sales prices to boost sales (Roychowdhury, 2006).

On the other hand, AEM involves the opportunistic use of areas of judgment granted by accounting standards to influence earnings in the direction most beneficial to management. The overarching principle upon which most reporting standards are formulated is the accrual principle, which requires the recognition of transactions in the period in which they occur rather than the period in which the cash flows are realised (International Accounting Standards Board, 2018). Reporting standards offer management the discretion to make judgments on applying methods, disclosures, and estimates, thus enhancing the completeness and relevance of information communicated to the market as management possesses complete knowledge of the firm. This gives management the opportunity to furnish users with value-adding information that more closely reflects the economic reality of the firm. These areas of judgment, however, also present management with the opportunity to manipulate earnings. A subset of earnings management was coined by Niskanen and Keloharju (2000) and Kinnunen and Koskela (2003). Cosmetic earnings management ("CEM") relates to the management of earnings by making specific accrual choices that will result in rounding up performance measures such as earnings per share.

Earnings management in and of itself does not indicate the existence of fraud. As discussed by Jackson (2018), earnings management measures have not, for ex-post fraud cases, identified fraud

that existed in corporate scandals such as Enron. Therefore, earnings management studies are not conducted to conclude on industries/firms suspected of fraudulent behaviour. Earnings management studies conclude on the quality of financial reporting, specifically, the quality of recognised accruals and how external circumstances often affect the quality of financial reports.

Earnings management cannot be directly observed or measured, and ‘evidence of earnings manipulation is suggestive but not conclusive’ (Schipper, 1989, p. 101). The measurement of earnings management is thus a limitation that must be acknowledged, as discussed by Jackson (2018). This study will only observe AEM and not REM practices due to the difficulty in detecting REM (Graham et al., 2004; Zamri et al., 2022). Early earnings management researchers identified total accruals as a tool commonly used to manage earnings (Deangelo, 1986; Healy, 1985), and several models used to estimate discretionary accruals have been developed as a result, most prominently the Jones model of 1991 that sought to split discretionary accruals from non-discretionary accruals to determine the extent of AEM. Discretionary accruals are viewed as the portion of accruals not explained by changes in firm performance and changes in asset base. The model seeks to distinguish between the accruals relating to changes in firm performance and changes in the asset base resulting in changes in depreciation. These explainable accruals are defined as non-discretionary accruals. For example, changes in credit sales will result in changes in trade receivables. There is no room for manipulation or judgment; thus, these accruals are often referred to as high quality. On the other hand, discretionary accruals relate to accruals that cannot be explained by the firm’s performance and are thus viewed as low-quality accruals as they are likely to reflect earnings management.

2.2 Agency theory

The emergence of corporate scandals is a constant reminder of the inherent information asymmetry between a firm's management and its stakeholders. Management owns all information relating to a firm's true economic performance and position, while stakeholders only have access to the information prepared by firm management. Moreover, corporate scandals illuminate the inherent lack of goal congruence captured by the agency theory. Jensen and Meckling (1976, p. 5) defined the "agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf, which involves delegating some decision-making authority to the agent. If both parties to the relationship are utility maximisers, there is good reason to believe that the agent will not always act in the best interests

of the principal". In business terms, a firm's management acts as an agent with the authority to efficiently utilise the firm's resources to create wealth for stakeholders, who are the principals (Ball, 2013).

It must be noted that earnings management is not the incorrect application of a reporting standard but rather the selection of a method or the use of judgment permissible by a reporting standard that is not reflective of the true economic circumstances (Berndt & Offenhammer, 2010). For example, International Financial Reporting Standards require management to determine the probability of future cash outflows resulting from a legal or constructive obligation (International Accounting Standards Board, 1998). Management's judgement on the matter will affect earnings as an expense will be recognised when the obligation is recognised as a liability. This affords management the opportunity to decide when they will decrease earnings. In principle, the decision should not be made with the foresight of how the recognition of the liability will impact earnings; however, the decision should be reflective of the most faithful representation (International Accounting Standards Board, 2018) of the circumstances that prevail regardless of the impact on earnings as this would constitute the intentional manipulation of actual performance.

The second characteristic of earnings management is the intention to manipulate the users of financial statements. In-depth research has been undertaken to understand the incentive management gains or seeks to gain when manipulating earnings, resulting in two distinct hypotheses. Capital market incentives are presumed to be one of the motivators for earnings management (Healy & Wahlen, 1999). Given the pervasiveness of the accrual principle in financial reporting, it is the underlying principle that informs the valuation of firms within capital markets (Wu, 2014); it is therefore concluded that the use of financial information by investors in valuing stocks creates an incentive for firms to manage earnings (Healy & Wahlen, 1999). The Mechanistic Hypothesis assumes that investors can be misled while valuing a firm by the information presented in financial statements and assumes that financial statements are the only source of data utilised in the decision-making process and that any discretionary changes to the financial statements have a direct impact on the valuation of a firm's share price (Ball, 1972; Kaplan & Roll, 1972). The Mechanistic Hypothesis thus assumes that any income-increasing discretionary change to the financial statements will result in a positive abnormal stock return and assumes the inverse to be true (Ball, 1972; Kaplan & Roll, 1972). The underlying assumption inherent in the Mechanistic Hypothesis is that the market is inefficient as investors cannot distinguish between firms that efficiently utilise assets to generate wealth from those performing poorly. Therefore, resources are

not allocated efficiently (Healy & Wahlen, 1999). The Mechanistic Hypothesis relies on the value relevance of earnings, which is in line with Ohlson (1995), who postulates that book value per share and earnings per share are the accounting variables from which stock values are determined and Dechow (1994), who proposes that current earnings better predict future cash flows.

The Efficient Market Hypothesis opposes the Mechanistic Hypothesis as it assumes that the market is efficient and, therefore, no correlation exists between stock prices and the discretionary accounting choices made by management. The assumption is that the stock prices fully reflect all information, and thus, earnings management will bear no fruit in influencing the market (Fama, 1970; Holthausen & Leftwich, 1983). It assumes that investors cannot earn excess returns due to the presence or absence of earnings management (Hines, 1982; Mayer-Sommer, 1979). The research results from the study undertaken by Subramanyam (1996) reveal that the market places value on discretionary accruals, and Sloan (1996) found negative future abnormal stock returns for firms whose earnings seemed to be managed owing to large accruals in earnings. Xie (1998) noted that this is a result of the market distinguishing between normal and abnormal accruals, and the reaction is purely towards abnormal accruals, which are indicative of earnings management.

The Efficient Market hypothesis was contradicted when various studies demonstrated the market's reaction to earnings management, proving that investors do not have access to all information and are, in fact, often misled by earnings management. Dechow et al. (1996) found that firms investigated for earnings management by the SEC had declines in stock prices of 9% after the announcement. Beneish (1997) observed significant negative abnormal returns for firms that were in contravention of GAAP two years following the contravention. One may interpret the market's adverse reaction to manipulating financial statements to indicate that investors cannot identify earnings management due to information asymmetry. In other words, firm management has access to all transactional information pertaining to a firm. However, the results that are subsequently published are summarised and reported according to financial reporting standards. From an external standpoint, the market does not have access to the underlying information that may be used to corroborate the published results. The existence of this informational asymmetry provides firm management with an opportunity to manage earnings for personal gains and, thus, the relevance of the agency theory.

Burgstahler and Eames (2006) further found that earnings are managed to meet 'targets' inadvertently set by analysts when they communicate their predictions for firm performance. The

findings of Burgstahler and Eames (2006) were consistent with Brown (2001), who noted the prominence of financial analysts' forecasts as a performance benchmark. Further evidence of the benefits of meeting analyst expectations was noted by Das et al. (2007), Kasznik and McNichols (2002), and Skinner and Sloan (2002). Similarly, Abarbanell and Lehavy (2003) utilised buy, sell, hold recommendations made by financial analysts to predict earnings management and hypothesised that firms that were recommended as stocks to 'buy' were more likely to manage earnings to meet expectations while 'sell' stock were more likely to show negative unexpected accruals. Kasznik (1999) found evidence of earnings management within firms that were unlikely to meet management earnings forecasts. Another key finding of Burgstahler and Eames (2006) was that management uses earnings management to avoid reporting small decreases in earnings or small losses but rather report small gains. The avoidance of small losses stems from findings indicating that firms with consistent positive earnings are priced at a premium, and a decline in earnings results in substantial premium declines (Barth et al., 1999; DeAngelo et al., 1996). The premium on firms with consistently increasing earnings has resulted in numerous investigations by researchers observing the practice in various industries and countries (Basu et al., 1997; Beatty et al., 2002; Burgstahler & Dichev, 1997; DeGeorge et al., 1999).

As an alternative to the capital market incentives captured by the Mechanistic and Efficient market hypothesis, Watts and Zimmerman (1978) proposed that the incentives that drive earnings management are internal to the firm and relate to some contractual reward. Research has been undertaken to isolate the various internal incentives a firm's management may seek to gain by manipulating earnings; Guidry et al. (1999) undertook a study that showed that managers for large multinational firms deferred income in instances when the earnings target specified in their performance contracts was not likely to be met, to periods when they would be entitled to maximum bonuses. Healy (1985) and Holthausen et al. (1995) found that firms with bonus ceilings were more likely to manage earnings to defer income when the bonus ceiling had been reached, as the additional income would not result in additional income benefit for the firm's management. In addition, Demers and Wang (2010) found that younger managers are less likely to engage in earnings management than older managers who have an incentive to boost their post-retirement labour market value. It must be noted that research has also been undertaken to observe earnings management to understate earnings. The political cost hypothesis postulates that firms may engage in income-decreasing earnings management to reduce their tax burden and similar legal obligations (Watts & Zimmerman 1978). Jones (1991) showed that firms in industries eligible to

apply for import relief were found to defer income in the year of application.

2.3 Institutional theory

Aside from the academic and research community directing time and resources towards understanding earnings management and conclusively isolating the conditions that enable and those that constrain earnings management practices, regulators and standard setters have, over time, demonstrated their interest in constraining earnings management. Seal (2006) developed the institutional theory of agency that provided a focused framework that observed the relationship between the agent's actions and the institutional environment in which they operate. The institutional theory of agency states that the institutional environment within which agents operate, influences their thought process, ultimately informing the decision (Aguilera & Jackson, 2003; Ning et al., 2014). The institutional theory of agency was of explanatory value to earnings management findings that varied when the observed firms operated in different jurisdictions, applied different accounting standards and ownership structures and complied with corporate governance requirements. Leuz et al. (2003) found that from a sample of firms across 31 countries, firms operating in developed economies with strong investor protection, legal enforcement and dispersed ownership engaged in less earnings management and concluded that investor protection is a constraining factor in earnings management.

Regulators have directed their effects towards increasing scrutiny of accounting practices to create robust institutional protection for investors. The passage of the Sarbanes-Oxley Act (SOX) in 2002 was a notable response to corporate failures resulting from the manipulation of accounting information. Given the findings within the research community, it would have been correct to hypothesise that firms reduced earnings management activities after the passage of SOX; however, Cohen et al. (2007) found that while accrual earnings management activities decreased following the passage of SOX, real earnings management practices increased indicating a trade-in earnings management practices. These findings were consistent with those of Graham et al. (2004) who, through a survey, found that management was switching to real earnings management practices due to the difficulty in detecting these practices. Ribstein (2002) argued that the increase in securities regulations and lack of decreased reported fraud cases might indicate that regulations are not the answer. Notwithstanding Cohen et al. (2007) and Graham et al. (2004), compelling evidence exists that supports the notion that institutional conditions influence earnings management (Burgstahler et al., 2006; Cahan et al., 2008; Guenther & Young, 2000; Houque et al.,

2012). Bao and Lewellyn (2017) demonstrated that in emerging markets, controlling ownership is positively correlated to earnings management activities; institutional ownership is negatively correlated to earnings management; minority shareholder protection weakens the correlation between controlling ownership and earnings management; and regulatory quality strengthens the correlation between institutional ownership.

2.4 Earnings management during crisis

In exploring the various elements that impact earnings management activities, researchers have observed earnings management practices in light of a financial or economic crisis. Contradictory findings were documented by Jenkins et al. (2009) and Johnson (1999) regarding the value relevance of earnings during certain phases of a business cycle. Johnson (1999) demonstrated that earnings relevance is greater during economic expansion than during contractions. Jenkins et al. (2009) extended the research findings documented by Johnson (1999) by discriminating between current earnings and future earnings and found that current earnings are relatively more value-relevant during contractionary periods due to conservatism (timely reporting of loss) in reported earnings, while future earnings prove more value-relevant in expansionary periods. The findings of Johnson (1999) and Jenkins et al. (2009), by implication, mean that during recessionary periods, firms report on losses promptly; thus, there is no earnings management to increase earnings. The research community thus took advantage of the opportunity for the contextual study of earnings management in light of various macroeconomic conditions.

Chia et al. (2007) investigated the earnings management practices for financial results released during the Asian financial crisis. They hypothesised that due to increased scrutiny by stakeholders, firms would decrease earnings management practices, and further, the choice of auditor would also contribute to constraining the manipulation of earnings. A sample of 383 service-oriented firms listed in Singapore was used to confirm the hypothesis. The firms were found to engage in income-decreasing earnings management, suggesting a form of ‘big bath accounting’. The reduction in earnings management for firms audited by the Big Six was statically significant. Consistent findings were documented by Ahmad-Zaluki et al. (2011), who found that income-increasing earnings management practices were constrained by the choice of auditor when observing earnings management in the context of IPOs for a sample of 250 Malaysian IPOs over the period 1990 - 2000, which included the East Asian crisis.

Gorgan et al. (2012) found a decline in earnings management during the financial crisis of 2008

after the study observed earnings management in the 30 European firms included in the Global Fortune 2009 (excluding the financial industry). Additionally, Filip and Raffournier (2014) measured the levels of earnings management in 8 266 firms from 16 EU countries between 2006 and 2009. A significant decrease was noted in income smoothing, and the quality of accruals increased. The study accredited the decrease in earnings management to a decrease in incentive for earnings manipulation due to the increased tolerance by investors for losses. Further, the increase in litigation during crises was a factor that dissuaded firm management from manipulating earnings.

Cimini (2015) observed 11,844 firms listed in the 15 countries that belonged to the EU from 2006 to 2012. The hypothesis formulated in this study was informed by the work of Chia et al. (2007), Francis et al. (2013) and Lafond and Watts (2008) that earnings management is likely to decrease over financial crisis due to increased quality of financial reports and audit quality. The findings of Cimini (2015) validated the hypothesis and indicated a decrease in earnings management during the financial crisis of 2008 due to the incentive to attract potential investors by providing high-quality financial reporting. Further, conservatism, as researched by Jenkins et al. (2009) and heightened monitoring activities by auditors, as researched by Chia et al. (2007), was noted as attributing factors that constrained earnings management.

Türegün (2020) researched the behaviour of listed manufacturing firms in Turkey for the periods spanning pre- to post-financial crisis of 2008. Türegün's (2020) study enriched research into earnings management in the context of a recession as it focused on firms listed in an emerging market. The state of investor protection in Borsa Istanbul was consistent with the characteristics of emerging markets in that there is a lack of strong investor protection and minority rights. The hypothesis formulated in the Türegün (2020) study was consistent with the observed behaviour of Indian companies during the financial crisis of 2008 (Kumar & Vij, 2017). Five hundred firms on the S&P CNX were observed from 2007 to 2012, and it was concluded that while there was an increase in earnings management before the crisis, earnings management practices decreased throughout the crisis period. The practices were employed after the crisis (Kumar & Vij, 2017).

The study by Türegün (2020) found that earnings management levels were lower during the crisis and were reflected by the high-quality of accruals. The quality of financial reporting was attributed to the increase in monitoring by government and auditors, the willingness of the market to accept poor performance and lower incentives to manage earnings. Consistent with the study of Indian

firms by Kumar and Vij (2017), earnings management practices were noted to ascend post-crisis (Türegün, 2020).

Adding to the findings of Cook et al. (2003) that suggested that firm management makes use of share repurchases as a means to manage earnings due to the flexibility in deciding when to buy back stock, Li et al. (2020) sought to answer the question as to why share purchases decreased significantly during the crisis of 2008 as a means to manage earnings (real earnings management technique) for publicly listed US firms. Li et al. (2020) isolated firms that were considered suspect firms. These were firms with an actual EPS of 0-1 cent lower than analyst forecast, and thus, the incentive to manipulate earnings was to meet forecasts. The study documented a sharp decline in share repurchases during the crisis, consistent with the finding of Farre-Mensa et al. (2014). It was further documented that firms abandoned share repurchases as an earnings management tool and opted to manipulate discretionary expenses. The unwillingness to abort the management of earnings entirely was attributed to the observations of Jensen et al. (2005), who note that manipulation of earnings is a cascading game; therefore, today's lie requires another lie tomorrow to cover the initial lie, so the game continues. Li et al. (2020) did not consider whether the magnitude of earnings management increased or decreased in absolute terms during the financial crisis but rather a change in technique. This could also result from cash flow constraints, as documented by Farrell et al. (2014), who notes that financially constrained firms opt for alternative earnings management mechanisms.

Grimaldi (2019) investigated the effects of the financial crisis of 2008 on a sample of 89 non-financial listed Italian firms. After observing the following sub-period: pre-crisis 2005 – 2008, crisis period 2009 – 2012 and the post-crisis period 2013-2016, the results showed that earnings management practices decreased during the crisis period and returned post-crisis; however, earnings management was not as prevalent post-crisis as they were pre-crisis. In contrast with the findings that suggest firms decrease earnings management activities during a crisis, Berndt and Offenhammer (2010) studied earnings management within the banking industry in Germany by observing the use of loan loss provisions to increase earnings artificially. The study found an increase in loan loss allowances to decrease earnings. Further studies such as Garsva et al. (2012) found increased income-smoothing practices by 469 banks operating in countries within the European Union. It must be noted that findings identifying increased earnings management during the financial crisis relate to studies that focused on the banking industry. This can be attributed to the incentive to smooth earnings within the banking industry as the financial crisis emanated from

the financial services industry. Thus, firms may have sought to appear stable amid the crisis.

2.5 Earnings management in South Africa

To date, no studies have shed light on earnings management practices in South Africa in light of a specific crisis, like the financial crisis of 2008; however, researchers have contributed to shedding light on the earnings management practices of firms listed on the JSE in general and have explored the impact of regulatory changes on earnings management.

Pududu and de Villiers (2016) added to the body of research by determining earnings management practices to avoid reporting small losses. By observing the cross-sectional distributions of earnings of firms listed on the JSE from 2003 to 2011, the study suggested that the manager did not manage earnings to avoid reporting small losses, contrary to similar studies undertaken in the context of US-listed firms. The study attributed the difference in findings to the fact that the JSE is a significantly smaller stock exchange than that of the stock exchanges in the US and that South African analysts prefer other performance measures, such as headline earnings per share as opposed to earnings.

In line with agency and signalling theory, it has been hypothesised that firm management will likely manipulate earnings to meet dividend thresholds. Li and Chen (2020) analysed firms listed on the JSE from 2011 to 2019 to determine whether South African firms used real earnings management practices to manipulate income towards dividend thresholds. The study suggested that South African firms, in line with agency and signalling theory, managed earnings to meet their income targets, which would trigger the distribution of dividends.

To understand the relationship between corporate social responsibility and earnings management, Jordaan et al. (2018) examined the accrual-based and real earnings management practices and corporate social responsibility performance and disclosure of South African firms. The study collected data for 2008, 2011 and 2013, and the study results suggested a positive relationship between income-increasing accrual-based earnings management and corporate social responsibility performance. In addition, the study suggested that firms with good corporate social responsibility performance were less likely to engage in real earnings management. Further, the study suggested that firms that integrated their corporate social responsibility disclosures into their annual reports were less likely to engage in income-decreasing discretionary accruals.

A study closely related to that of Jordaan et al. (2018) is that of Eloff and Steenkamp (2022). Eloff

and Steenkamp (2022) noted the difference in theoretical objectives of earnings management and integrated reporting. While integrated reporting aims to narrow the information asymmetry between firm management and stakeholders, earnings management takes advantage of the existing information asymmetry to manipulate stakeholders to a desired effect. Eloff and Steenkamp (2022) thus sought to understand the relationship between the quality of integrated reporting and earnings management by observing 238 JSE-listed firms from 2013 to 2017. The study suggested that firms manipulating their earnings upward using income-increasing accruals are less likely to produce a high standard of integrated reports.

The effect of regulatory changes, such as the adoption of International Financial Reporting Standards ('IFRS'), on earnings management was investigated by Sellami and Slimi (2016) in the South African context. Sellami and Slimi (2016) compared the earnings management practices of JSE-listed entities during the pre-adoption phase, 2002 to 2004, and the earnings management practices post the adoption of IFRS, 2010 to 2012. The study suggested that adopting IFRS in South Africa improved accruals quality and, thus, lower earnings management. Consistent with the results of Sellami and Slimi (2016) and Gbadebo (2023) observed the impact of IFRS on discretionary accruals on JSE-listed firms. The study observed the changes in discretionary accruals between the pre-adoption period, 2000 to 2004, and the post-adoption period, 2005 to 2018. Gbadebo (2023) concluded that adopting IFRS was a constraining factor for earnings management.

2.6 COVID-19 Pandemic

The COVID-19 pandemic has presented the research community with the unique opportunity to investigate earnings management practices during a financial crisis caused by a pandemic. While there is considerable research documenting earnings management in the context of economic/financial crisis, limited research exists observing South African firms listed on the JSE. Thus, this study will add to the body of research by pursuing research that has not yet been undertaken.

The World Health Organization (WHO) reported that on the 31st of December 2019, a case of pneumonia was detected in Wuhan City, Hubei Province of China and noted that by the 20th of January 2020, cases were exported to Japan, the Republic of Korea and Thailand (WHO, 2020a). South African Minister of Health, Mkhize (2020), announced that the National Institute for Communicable Diseases confirmed a suspected COVID-19 case on the 5th of March 2020, and days after the announcement of the first case of COVID-19 in South Africa, the WHO (2020b) declared the COVID-19 outbreak a global pandemic. Following the declaration by the WHO,

Ramaphosa (2020) announced the measures to combat the pandemic on the 15th of March 2020 and declared a national state of disaster per the Disaster Management Act. Measures included international travel bans, the closure of some seaports and the introduction of social distancing protocols. The commencement of level 5 restrictions, the most severe in Africa, included closing businesses that were not deemed essential. At the same time, persons were restricted to only purchasing and accessing essential goods and services.

2.7 Earnings management in light of COVID-19

To date, research observing earnings management practices in light of the COVID-19 pandemic includes Šušak (2020), who investigated the effects of financial reporting deadline extensions granted in light of COVID-19 on earnings management practices. A sample of listed Croatian firms was assessed from 2015 to 2019. Financial reporting delays were hypothesised to be positively correlated with earnings management activities. Further, the study hypothesised a positive relationship between income-increasing earnings management and financial reporting delays and a negative relationship between income-decreasing earnings management. Šušak (2020) found increased earnings management activity due to financial reporting delays, consistent with the findings of (Chai & Tung, 2002). A significant relationship was only noted in the case of income-decreasing, which is consistent with the findings of Heninger (2001) that suggest that auditors are less likely to contest income-decreasing accruals.

Ali et al. (2022) examined the relationship between earnings management, the strength of investor protection institutions and the COVID-19 pandemic. A sample of 5,519 firms listed in the G-12 countries for 2015-2020. The study's results suggested that firms engaged in less earnings management practices during the pandemic, while a significant negative relationship was noted between the strength of investor protection institutions and earnings management.

Several studies carried out in China have been documented contrary to the findings of Ali et al. (2022). Yan et al. (2022) researched the impact of COVID-19 on earnings management by observing the impact on China's A-share listed firms. Yan et al. (2022) found that the COVID-19 pandemic intensified accruals-based earnings management practices. Xiao and Xi (2021) also found that accruals-based earnings management increased due to COVID-19 after studying the accruals-based and real activities-based earnings management practices of Chinese listed firms listed on the Shanghai and Shenzhen Stock Exchanges. Aljughaiman et al. (2023) observed an inclination to manage earnings during the crisis after analysing the earnings management activities

of 1,832 listed firms in China. Aljughaiman et al. (2023) found that firms used accrual-based earnings management to real earnings management techniques during the crisis. In addition to the studies above, Liang (2022) analysed firms listed on the Shanghai and Shenzhen stock exchanges from 2018 to 2021 and found an increase in earnings management practices during the pandemic.

Research observing earnings management practices in European firms indicated that firms increased their earnings management activities, as documented by Lassoued and Khanchel (2021). Lassoued and Khanchel (2021) set out to conclude on the impact the COVID-19 pandemic had on 2,031 firms listed in 15 European countries. Lassoued and Khanchel (2021) found a significant difference between the mean values of discretionary accruals during the pandemic when compared to the mean values before the pandemic, suggesting that European firms increase their earnings management activities during the pandemic, resulting in a lower quality of accruals and financial results.

Lizińska and Czapiewski (2023) undertook a study to determine the impact of COVID-19 on real and accrual-based earnings management for Polish firms. The findings of the Lizińska and Czapiewski (2023) study suggest that Polish firms were inclined to adopt big bath accounting by engaging in income-decreasing earnings management, which has the effect of inflating profitability in the future years when the accruals raised are reversed. In the case of real earnings management, Lizińska and Czapiewski (2023) found that Polish firms undertook strategies to increase firm income through real earnings management, which is consistent with the findings of Hsu and Yang (2022) that suggested that the financial reporting quality for UK listed firms decreased during the pandemic due to an increase in real earnings management levels.

In the United States of America, SOX was implemented to inhibit earnings management and to observe whether the COVID-19 pandemic resulted in US firms reverting to earnings management. Jordan et al. (2021) undertook a study to assess the CEM practices of US firms due to the pandemic. Jordan et al. (2021) found no evidence of such earnings management practices being undertaken due to the COVID-19 pandemic.

Garfatta et al. (2023) investigated the impact of COVID-19 on the earnings management practices of firms listed in Tunisia. The study analysed a sample of 41 Tunisian firms from 2016 to 2020 and found that firms engaged in income-decreasing discretionary accruals and used real earnings management to decrease income during the pandemic.

Previous research on the relationship between corporate social responsibility and earning

management, historically, has been carried out during periods where there was no crisis; therefore, to add to the body of research exploring this relationship, Khanchel and Lassoued (2022) investigated this relationship in light of COVID-19. In line with the findings of Jordaan et al. (2018), Khanchel and Lassoued (2022) found that the sample of US firms that were socially responsible and non-socially responsible engaged in income-increasing earnings management.

In the context of Malaysia, Zamri et al. (2022) concluded that firms that were already in financial distress before the pandemic continued to manipulate earnings using real earnings management strategies and further, the results of the study suggest that the higher the financial distress, the less likely firms were to use accruals earnings management. Zamri et al. (2022) concluded that firms in distress were more likely to use real earnings management techniques as they are harder to identify.

To conclude on the impact of COVID-19 on distribution and service industry firms in Korea, Ryu and Chae (2022) investigated the quality of financial information of Korean listed firms from 2018 to 2022. The study suggested that firms engaged in more earnings management during the crisis period than the pre-crisis period, as indicated by a significant increase in discretionary accruals, thus indicating a decline in the quality of financial information due to the pandemic.

After assessing the findings of studies undertaken to conclude on whether the COVID-19 pandemic had an impact on earnings management and in line with the findings of (Lassoued & Khanchel, 2021; Lizińska & Czapiewski, 2023; Xiao & Xi, 2021; Yan et al., 2022) the following hypothesis has been formulated;

Hypothesis 1: Earnings management activities increased due to the COVID-19 pandemic.

2.8 Asymmetrical impact of COVID-19

Governments around the world responded decisively to the threat to human life when the pandemic struck. Restrictions directly impacted firms as production and consumption ceased for many industries, and as a result, economies shrunk unprecedentedly. The growing instability due to COVID-19 resulted in stock market crashes during March 2020, with the NASDAQ down 19,79%, the Dow Jones Industrial Average down 21%, the JSE 23,5%, and the S&P 500 down 19,94% on the 13th of March 2020 Krugel and Viljoen (2020). The result of various industries continuing operations during the pandemic, while other industries were forced to cease operations, was reflected in stock performances. Mazur et al. (2021) investigated the US stock market performance in light of the 2020 March crash and found that natural gas, healthcare, food, and software

industries generated high returns while firms operating in real estate, entertainment, crude petroleum and hospitality declined considerably. Jooste (2020) noted disparities in stock performance on the JSE. The technology industry realised significant gains mainly attributed to Prosus N.V (+35%) and Naspers Limited (+60%), and an industry realising even more significant gains was the mining industry, with the most notable stock performance from Gold Fields Limited (+120%), AngloGold Ashanti (+55%) and Sibanye-Stillwater Limited (+36%) (Jooste, 2020). Significant stock value losses were realised in the travel leisure and the bank industry, most notably the decline of City Lodge, Tsogo and Sun International (-60%), Investec (-45%), Nedbank (-50%) and Capitec (-40%) (Jooste, 2020). The pandemic has augmented the demand for software development, and digital spending has accelerated the demand for stocks in the technology industry. In contrast, the exceptional performance of gold mining stocks can be attributed to the view that gold is a safe haven asset (Baur & McDermott, 2010).

Muthu and Wesson (2023) noted that the COVID-19 pandemic affected the various industries on the Johannesburg stock exchange differently in terms of company performance; we can thus expect that not all industries changed their earnings management strategies as a result of the pandemic and the industries that did change their strategies, it can be hypothesised that the change was not uniform across the various industries. Yan et al. (2022) investigated the shock effect on earnings management due to COVID-19. They found that earnings management intensified for firms facing financial constraints during the pandemic and that earnings management intensified within industries where the impact of the pandemic was more severe due to the lockdown protocols.

To further investigate the impact of COVID-19 on earnings management activities, the following hypothesis has been formulated;

Hypothesis 2: Earnings management practices across the eight industries were inconsistent due to the varying impact the COVID-19 pandemic had on the different industries.

3. RESEARCH METHODOLOGY

The research methodology section will detail the sample selection and data collection process. This section will also document the estimation of discretionary accruals, the interpretation of the results of the equation used to estimate discretionary accruals, and the research design's limitations.

3.1 Sample selection and data collection

This study's sample comprises firms primarily listed on the JSE. Firms with dual listings were excluded from this study as studies have found that the regulatory environment that firms operate in influences the quality of financial reporting and, thus, the extent of earnings management (Ali et al., 2022; Houque et al., 2012). The research period is financial reports published between 2016 to 2022. The research period was divided between the pre-crisis and crisis period, with the crisis period commencing 2020 to 2022. The crisis period is informed by lockdown protocols, which spanned from March 2020 to April 2022, ranging from level 1 to 5.

The sample of firms excluded firms listed on alternate exchanges, Exchange Traded Funds (ETFs), financial services, Real Estate Investment Trusts (REITs) and insurance industry firms, certificates and portfolios and retirement funds. Financial services and REITs were excluded due to the financial reporting peculiarities of the respective industries and the regulations inherent in those industries (Chakroun et al., 2022; Prior et al., 2008). The financial data and the variables required to calculate earnings management were sourced from Thomson Reuters Eikon. The sample consists of 159 firms as at 2016 and 1 113 firm observations. The sample is listed in Table 1.

Table 1: Sample selection

	Number of companies
Firms with a primary listing on the JSE at 2016	333
Firms removed from the sample	(174)
Firms on alternate exchange	14
ETFs	60
Financial firms, REITS and insurance firms	88
Certificates and portfolios	10
Retirement funds	2
Total	159
Notes: This table presents the complete number of companies primarily listed on the JSE and the companies removed from the entire population to arrive at the sample size for the study.	

The JSE utilises the Industry Classification Benchmark (ICB) method to categorise firms. The industry sample distribution is detailed in Table 2 below.

Table 2: Sample Distribution

Code (ICB)	Industry	No. of companies	(%)
55	Basic materials	30	19
40	Consumer discretionary	35	22
45	Consumer staples	21	13
20	Health care	7	4
50	Industrials	40	26
60	Energy	4	3
10	Technology	15	9
15	Telecommunications	7	4
	Total	159	100
Notes: This table shows the sample distribution by industry based on the JSE Industry Classification Benchmark (ICB) instrument classification.			

3.2 Estimation of discretionary accruals

The Jones (1991) model has been modified over the years to allow for discretionary revenue management by (Dechow et al., 1995) by allowing for changes in credit sales has been applied in several studies, including (Ali et al., 2022; Cohen et al., 2007; Kumar & Vij, 2017; Sellami & Slimi, 2016; Türegün, 2020). The Modified Jones Model (Dechow et al., 1995) was further modified by Kothari et al. (2005), who introduced a cross-sectional model that included return on assets, which was introduced to control for abnormal performance. This dissertation will employ the Modified Jones Model that Kothari et al. (2005) improved to estimate discretionary accruals as the model controls for abnormal performance which was observed during the crisis as noted in section 2.4. As mentioned above, the study period is between 2016 and 2022, and to compensate for the lack of time-series depth, panel data models will be utilised. All computations and regression residuals will be calculated on Eviews.

Discretionary accruals will be calculated as follows;

$$TACC_{it} = \beta_1(1/Assets_{it-1}) + \beta_2(\Delta Sales_{it} - \Delta TR_{it})/Assets_{it-1} + \beta_3PPE_{it}/Assets_{it-1} + \beta_4(ROA_{it}) + \varepsilon_t \quad (1)$$

Where:

$TACC_{it}$ – Total accruals, which are calculated as net income minus cash flows from operations of firm i in year t .

$Assets_{it-1}$ – Lagged total assets.

$\Delta Sales_{it}$ – Change in sales in year t from year $t - 1$ divided by lagged total assets.

ΔTR_{it} – Change in trade receivables in year t from year $t - 1$ divided by lagged total assets.

PPE_{it} – Gross property, plant and equipment divided by lagged total assets.

ROA_{it} – Return on assets calculated as net income before minority interest divided.

Equation (1) will be estimated for each ICB industry, and the coefficients β_1 , β_2 , β_3 and β_4 will be calculated by running the OLS regression (Ismael & Kamel, 2020; Türegün, 2020). The residual resulting from equation (1), ε_t , which is the error term, measures discretionary accruals. As mentioned above, earnings management is not explicitly observed, but proxies such as discretionary accruals are utilised as measures of earnings management. The value that is obtained when calculating discretionary accruals using equation (1) will indicate two behavioural observations regarding management's earnings management strategy;

1. The absolute value of discretionary accruals is a proxy for earnings management. Therefore, an increase in the absolute value of discretionary accruals indicates increased earnings management, and a decrease in the absolute value suggests a decrease in earnings management (Kumar & Vij, 2017). In other words, discretionary accruals changing from 0.01 to -0.1 is interpreted as an increase in earnings management due to the absolute value of 0.1 being greater than 0.01. Dechow and Dichev (2002) stated that a high value of discretionary accruals signifies a low quality of accruals, as discretionary accruals represent accruals that management exercises judgment over and are thus susceptible to manipulation. In other words, discretionary accruals of zero would be deemed the highest accrual quality as all the accruals would be non-discretionary.
2. The signage of the value of discretionary accruals signifies whether discretionary accruals were income-increasing or income-decreasing. Therefore, utilising the example above of discretionary accruals changing from 0.01 to -0.1, we can conclude that management changed their strategy from utilising income-increasing accruals to manage earnings to utilising income-decreasing accruals.

This dissertation will utilise equation (1) to determine how the COVID-19 pandemic impacted earnings management activities in South Africa for firms listed on the JSE. The value of discretionary accruals will be observed for the period prior to the COVID-19 pandemic and during the pandemic (pre-crisis and crisis period). A statistically significant difference in pre-crisis and during-crisis discretionary accruals will be used as a proxy to conclude that COVID-19 impacts earnings management activities and thus satisfies hypothesis 1.

As suggested by hypothesis 2, the impact of the crises on discretionary accruals across the eight industries will not be consistent. Firms deemed to be providing essential goods or services will not change their earnings management strategies due to the minimal impact of the pandemic on the industry. In contrast, firms that were affected by lockdown protocols will increase earnings management activities as they will be in crisis. In other words, the value of discretionary accruals for firms negatively impacted by COVID-19 will increase. In contrast, the value of discretionary accruals will remain constant for firms not affected by the pandemic. Hypothesis 2 will be satisfied when varying changes in earnings management practices, as discussed above, are observed. In other words, the strategy adopted due to COVID-19 will be consistent across the industries as a result of the lockdown protocols impacting specific sectors.

3.3 Limitations of the study

Limitations inherent in the study design include excluding the financials industry, which includes financial services and REITs. The study also excluded firms that have dual listings. The changes in accounting standards may also result in changes in the measurement of the variables in the formula this study will use to measure discretionary accruals. Variables such as revenue and accounts receivable may not have been measured consistently due to the introduction of IFRS 15, and property, plant and equipment due to the introduction of IFRS 16: Leases. A singular model to determine earnings management will also present a limitation study as earnings management strongly correlates to the model used (Greyvenstein, 2010). Lastly, as Jackson (2018) pointed out, not all variables contributing to accruals are captured in the equations used to calculate discretionary accruals. Siregar and Utama (2008) also observed the possibility of misclassifying discretionary and non-discretionary accruals. An OLS regression has been applied in line with prior research, as it makes the results more comparable, however there are several flaws in using an OLS regression, however this study did not set out to focus on model design rather application to a new data base over a new crisis event. Further, the limited observations in the health care, energy and telecommunications sectors may have skewed the regression results, this is a limitation of this study.

4. RESULTS AND DISCUSSION

The results and discussion section will detail the results of the Modified Jones Model of Kothari et al. (2005), equation 1, which was estimated for each industry to determine the coefficients and the error terms. Each industry will be discussed in isolation, providing brief commentary on the industry's results of the ordinary least squares regression. These discretionary accruals were determined by the error term of equation 1 and the possible reasons for the observed changes in the discretionary accruals value, which is the proxy for earnings management. Although the study's objective is not to opine on the model itself, brief commentary will be provided on the equation's results for each industry. This study intends to apply the model in a manner consistent with previous studies observing earnings management. In addition to the industry observations, the last segment within the section will detail the pooled results, which will combine all the industry error terms and serve as a representation of the JSE. An interpretation of the pooled results will follow the numerical observations.

The interpretation of the discretionary accruals values is informed by Dechow and Dichev (2002), who stated that a high value of discretionary accruals signifies a low quality of accruals, indicating high earnings management activities and a low absolute value of discretionary accruals indicating a high quality of accruals and thus less earnings management activities. The discussion on the sectors is set out below. The results for the basic metals, health care and technology sector were detailed individually given the material changes in earnings management practices. While the change in consumer discretionary earnings management practices was significant, the results have been grouped with consumer staples in order to contrast the difference the lockdown protocols had on the two sectors and how that impacted earnings management. Energy, industrials and telecommunications sectors were grouped together as the earnings management practices changed in a similar way.

4.1 Industry analysis

4.1.1 Basic Metals industry results analysis

The results of the OLS panel regression for the basic metals industry are depicted in Table 3. The model exhibits minimal existence of autocorrelation with the Durbin-Watson value of 1.2. Further, 86% of the variability in the data can be explained by the model, as observed by the R-squared value of 0.86. The p-values of all variables were positive and statistically significant except for $\Delta\text{Salesit} - \Delta\text{TRit}$.

Table 3: Regression coefficient results for companies classified as basic metals using equation 1

Dependent Variable:		TACC_AT_1 Method: Panel Least Squares		
Variable	Coefficient	Std. Error	t-Stat	Prob.
1/Assetsit-1	832378.40	215582.7	3.861062	0.0002**
Δ Salesit – Δ TRit	-0.073201	0.059596	-1.228297	0.2208
PPEit	-0.098540	0.018657	-5.281663	0.0000**
ROAit	1.052539	0.036679	28.69558	0.0000**
R-squared	0.864661	Mean dependent var		-0.108364
Adjusted R-squared	0.862620	S.D. dependent var		0.797804
Durbin-Watson stat	1.243016			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β_1 , β_2 , β_3 and β_4 . The variables: 1/Assetsit-1; Δ Salesit – Δ TRit; PPEit; and ROAit were used to determine the coefficients β_1 , β_2 , β_3 and β_4 , respectively. The table above represents seven years of data between 2016 and 2022 for 30 firms in the basic metals industry. The dependent variable is total accruals divided by total assets.				
*, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 4: Basic metals mean error term of equation 1 which represents the discretionary accruals

	Sector
Period	Basic Metals Discretionary accruals
Pooled	-0.0070
2016	0.1245
2017	-0.0040
2018	0.0111
2019	-0.0092
2020	-0.0342
2021	-0.0982
2022	-0.0393
Pre-crisis (2016-2019)	0.0306
During Crisis (2020-2022)	-0.0572
Difference between pre-crisis and during crisis	0.0878*** (-2.203)
Notes: The results documented above represent the mean error term calculated by equation 1 after determining the coefficients in Table 3 for the basic metals industry. To conclude on hypothesis 2 stating that the impact of COVID-19 on the various industries was not uniform, an observation of the mean error term which represents discretionary accruals, a proxy for earnings management across the industries from 2016-2022 —further, the mean error term/discretionary accruals for pre-crisis period and during crisis period for each industry is analysed. In doing so, the impact of the pandemic is observed by the movement of the error term/discretionary accruals. A negative error term/discretionary accruals value is interpreted as income-decreasing earnings management; inversely, a positive error term/discretionary accruals value is interpreted as income-decreasing earnings management.	
***p $\leq$ 0.1 and significant	
T statistic is given within brackets.	

Increased earnings management activity can be observed in the increased absolute error term/discretionary accruals from 0.030619 to 0.057222 during the pre-crisis and crisis periods, respectively, in Table 4. During the 21-day national lockdown in South Africa, the mining industry came to a halt as the mining industry was not deemed to be providing an essential service (Ramaphosa, 2020), with a subsequent change allowing the underground-dominated and often labour-intensive mining industry to operate at 50% capacity (Jowitt, 2020). In addition to operating at suboptimal levels, subsequent to the 21-day lockdown period, local and international logistical and supply-chain disruptions due to the pandemic further exacerbated the industry's ability to operate optimally. The crisis period saw significant declines in output within the basic metals industry and reduced export demand (Ajam, 2020). The increased earnings management activity can be observed in the increased absolute error term/discretionary accruals from 0.030619 to 0.057222 during the pre-crisis and crisis periods, respectively.

Further, the results indicate that the industry moved from using income-increasing accruals to manage earnings to income-decreasing accruals, as detailed in Table 4. The difference between pre-crisis and during-crisis accruals of 0.0878 is statistically significant based on the independent samples t-test, with a p-value of 0.0287. Prior research has found that managers manage earnings during crises when the firm is in distress more frequently than healthy firms (Habib et al., 2013). This aligns with the big-bath hypothesis observed by Lizińska and Czapiewski (2023), who found a tendency to use income-decreasing earning management practices during COVID-19. As noted in the literature review section, the basic metals sector realised significant gains in 2020 despite the impact of lockdown protocols. The gains were predominantly due to strong commodity prices during the pandemic as commodities such as gold are viewed as safe-haven assets during crisis (Jooste, 2020). This could inform management's strategy to utilise income-decreasing accruals as the industry had positive margins to absorb the accruals.

4.1.2 Consumer discretionary and consumer staples industry results analysis

The results of the OLS panel regression for consumer discretionary and consumer staples industries are depicted in Tables 5 and 6, respectively. The model exhibits minimal existence of autocorrelation with the Durbin-Watson values of 1.76 and 1.71. In terms of the explanatory power of the variables, the regression is not predictive, as observed by the adjusted R-squared values of

0.07 and 0.03. This is a contrast to the results noted in the basic metals analysis. However, as mentioned, this study intends to apply the model consistently to produce results that are comparable to the existing research findings. The p-values of all variables were positive and statistically significant except for $\Delta\text{Salesit} - \Delta\text{TRit}$ for consumer discretionary and $1/\text{Assetsit-1}$ and $\Delta\text{Salesit} - \Delta\text{TRit}$ for discretionary staples.

Table 5: Regression coefficient results for companies classified as consumer discretionary using equation 1

Dependent Variable: TACC_AT_1 Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Stat	Prob.
1/Assetsit-1	-9223621.	4036324.	-2.285154	0.0234*
Δ Salesit - Δ TRit	0.047508	0.029772	1.595759	0.1121
PPEit	-0.087599	0.010162	-8.620142	0.0000**
ROAit	0.130194	0.055194	2.358865	0.0193*
R-squared	0.082318	Mean dependent var		-0.051323
Adjusted R-squared	0.068483	S.D. dependent var		0.083670
Durbin-Watson stat	1.763786			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β_1 , β_2 , β_3 and β_4 . The variables: 1/Assetsit-1; Δ Salesit – Δ TRit; PPEit; and ROAit were used to determine the coefficients β_1 , β_2 , β_3 and β_4 , respectively. The table above represents seven years of data between 2016 and 2022 for 35 firms in the consumer discretionary industry. The dependent variable is total accruals divided by total assets.				
*, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 6: Regression coefficient results for companies classified as consumer staples using equation 1

Dependent Variable: TACC_AT_1 Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Stat	Prob.
1/Assetsit-1	655905.6	1245589.	0.526583	0.5993
ΔSalesit - ΔTRit	-0.007873	0.026442	-0.297755	0.7663
PPEit	-0.082634	0.010944	-7.550846	0.0000**
ROAit	0.206119	0.065220	3.160387	0.0019*
R-squared	0.052574	Mean dependent var		-0.036080
Adjusted R-squared	0.032698	S.D. dependent var		0.049241
Durbin-Watson stat	1.707024			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β1, β2, β3 and β4. The variables: 1/Assetsit-1; ΔSalesit – ΔTRit; PPEit; and ROAit were used to determine the coefficients β1, β2, β3 and β4, respectively. The table above represents seven years of data between 2016 and 2022 for 35 firms in the consumer discretionary industry. The dependent variable is total accruals divided by total assets.				
*, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 7: Mean error term of equation 1 which represents the discretionary accruals, a proxy for earnings management, for the consumer staples and consumer discretionary industry

Period	Sector	
	Consumer Staples Discretionary accruals	Consumer Discretionary Discretionary accruals
Pooled	-0.0034	-0.0055
2016	0.0175	0.0122
2017	-0.0001	0.0240
2018	-0.0124	-0.0051
2019	-0.0024	0.0029
2020	-0.0229	-0.0642
2021	-0.0153	-0.0046
2022	0.0117	-0.0036
Pre-crisis (2016-2019)	0.0007	0.0085
During Crisis (2020-2022)	-0.0088	-0.0242
Difference between pre-crisis and during crisis	-0.00947 (-1.191)	0.0327*** (3.257)

Notes: The results documented above represent the mean error term calculated by equation 1 after determining the coefficients in Tables 5 and 6 for the consumer staples and consumer discretionary industries, respectively. To conclude on hypothesis 2 stating that the impact of COVID-19 on the various industries was not uniform, an observation of the mean error term which represents discretionary accruals, a proxy for earnings management across the industries from 2016-2022 —further, the mean error term/discretionary accruals for pre-crisis period and during crisis period for each industry is analysed. In doing so, the impact of the pandemic is observed by the movement of the error term/discretionary accruals. A negative error term/discretionary accruals value is interpreted as income-decreasing earnings management; inversely, a positive error term/discretionary accruals value is interpreted as income-increasing earnings management.

***p ≤ 0.1 and significant

T statistics are given within brackets.

Investors have moved to grouping stocks into their cyclical and defensive categories, and the new JSE ICB classification aligns with this approach. The defensive nature of consumer staples means that firms that fall into this category are less volatile even during times of crisis, while consumer discretionary tends to ebb and flow with economic cycles (FTSE Russell, 2019). The earnings management measure for consumer discretionary indicates that earnings management activities increased, as detailed in Table 7. The difference in pre-crisis and crisis periods of 0.0327 is statistically significant. A change in the nature of accruals was also observed as the discretionary accruals measure changed from income-increasing to income-decreasing, as detailed in Table 7. In line with the findings documented for the basic metals industry, consumer discretionary firms were not categorised as essential due to the nature of products offered, and as such, the industry was subject to 21 days of halted operations and, subsequently, limited operating hours. This could

indicate the tendency to use income-decreasing accruals by industries deemed non-essential and thus negatively impacted by lockdown protocols. In contrast, the consumer staples industry was deemed to provide essential goods and services. The industry discretionary accruals increased from 0.007 to -0.0088, as observed in Table 7. While the industry exhibited practices similar to the basic metals and consumer discretionary industry by engaging in income-decreasing accruals during the crisis period, the difference of -0.00947 between the pre-crisis accruals in the consumer staples industry was not statistically significant.

4.1.3 Energy, industrials and telecommunications industry results analysis

The results of the OLS panel regression for the energy, industrials and telecommunications industries are depicted in Tables 8, 9 and 10, respectively. The model exhibits minimal existence of autocorrelation for the energy and industrials industry with a Durbin-Watson value of 1.4 and 1.7, respectively. Severe positive autocorrelation was observed in the results of the telecommunications industry regression, indicating that the results may be unreliable. The problem of autocorrelation has been noted. However, the regression will be utilised for uniformity and consistent application of the model. The correlation coefficient (adjusted R-squared) for the energy, industrials and telecommunications industries were noted at 28%, 62% and 28%, respectively. The p-values of all variables were positive and statistically significant for the industrials industry, while for the energy and telecommunications industry, $1/Assets_{it-1}$ and $\Delta Sales_{it} - \Delta TR_{it}$ were statistically insignificant.

Table 8: Regression coefficient results for companies classified as energy using equation 1

Dependent Variable: TACC_AT_1 Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Stat	Prob
1/Assetsit-1	13835253	7429108.	1.862303	0.0748
ΔSalesit - ΔTRit	0.014226	0.039266	0.362283	0.7203
PPEit	-0.064722	0.020150	-3.211985	0.0037**
ROAit	0.466058	0.121588	3.833080	0.0008**
R-squared	0.356283	Mean dependent var		-0.049496
Adjusted R-squared	0.275819	S.D. dependent var		0.091659
Durbin-Watson stat	1.361395			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β1, β2, β3 and β4. The variables: 1/Assetsit-1; ΔSalesit – ΔTRit; PPEit; and ROAit were used to determine the coefficients β1, β2, β3 and β4, respectively. The table above represents seven years of data between and including the years 2016 and 2022 for four firms in the energy industry. The dependent variable is total accruals divided by total assets. *, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 9: Regression coefficient results for companies classified as industrials using equation 1

Dependent Variable: TACC_AT_1 Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Stat	Prob.
1/Assetsit-1	5680327	1054634.	5.386064	0.0000**
ΔSalesit - ΔTRit	-0.078980	0.018305	-4.314715	0.0000**
PPEit	-0.121579	0.007340	-16.56293	0.0000**
ROAit	0.454196	0.036472	12.45333	0.0000**
R-squared	0.627240	Mean dependent var		-0.039220
Adjusted R-squared	0.623082	S.D. dependent var		0.124851
Durbin-Watson stat	1.679617			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β1, β2, β3 and β4. The variables: 1/Assetsit-1; ΔSalesit – ΔTRit; PPEit; and ROAit were used to determine the coefficients β1, β2, β3 and β4, respectively. The table above represents seven years of data between and including the years 2016 and 2022 for 40 firms in the industrials industry. The dependent variable is total accruals divided by total assets.				
*, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 10: Regression coefficient results for companies classified as telecommunications using equation 1

Dependent Variable: TACC_AT_1				
Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Stat	Prob.
1/Assetsit-1	-3135258	1964514.	-1.595946	0.1175
ΔSalesit - ΔTRit	0.084686	0.091124	0.929348	0.3577
PPEit	-0.116686	0.016208	-7.199264	0.0000**
ROAit	0.509135	0.132195	3.851407	0.0004**
R-squared	0.324019	Mean dependent var		-0.100944
Adjusted R-squared	0.278953	S.D. dependent var		0.113068
Durbin-Watson stat	0.606321			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β ₁ , β ₂ , β ₃ and β ₄ . The variables: 1/Assetsit-1; ΔSalesit – ΔTRit; PPEit; and ROAit were used to determine the coefficients β ₁ , β ₂ , β ₃ and β ₄ , respectively. The table above represents seven years of data between and including the years 2016 and 2022 for seven firms in the telecommunications industry. The dependent variable is total accruals divided by total assets.				
*, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 11: Mean error term of equation 1, which represents the discretionary accruals, a proxy for earnings management, for the energy, industrials and the telecommunications industry

Period	Sector		
	Energy Discretionary accruals	Industrials Discretionary accruals	Telecomms Discretionary accruals
Pooled	-0.0131	0.0019	-0.0282
2016	-0.0215	0.0012	0.0007
2017	-0.0531	-0.0043	-0.0280
2018	-0.0010	0.0110	-0.0609
2019	-0.0018	0.0110	-0.0263
2020	0.0089	-0.0242	-0.0499
2021	-0.0180	-0.0064	-0.0425
2022	-0.0052	0.0251	0.0097
Pre-crisis (2016-2019)	-0.0194	0.0047	-0.0286
During Crisis (2020-2022)	-0.0047	-0.0018	-0.0276
Difference between pre-crisis and during crisis	-0.0146 (0.522)	0.0066 (-0.719)	-0.0010 (0.041)

Notes: The results documented above represent the mean error term calculated by equation 1 after determining the coefficients in tables 8, 9, and 10 for the energy, industrials and telecommunications industries, respectively. To conclude on hypothesis 2 stating that the impact of COVID-19 on the various industries was not uniform, an observation of the mean error term which represents discretionary accruals, a proxy for earnings management across the industries from 2016-2022 —further, the mean error term/discretionary accruals for pre-crisis period and during crisis period for each industry is analysed. In doing so, the impact of the pandemic is observed by the movement of the error term/discretionary accruals. A negative error term/discretionary accruals value is interpreted as income-decreasing earnings management; inversely, a positive error term/discretionary accruals value is interpreted as income-decreasing earnings management.

***p ≤ 0.1 and significant
T statistics are given within brackets.

Decreased earnings management activities can be observed in the energy, industrial, and telecommunications industries. Discretionary accruals decreased during the crisis period as compared to the pre-crisis period. In other words, the quality of accruals during the pandemic improved from the quality of accruals pre-crisis. This can be observed by the decrease of discretionary accruals from -0.0194 to -0.0047, 0.0047 to -0.0018, and -0.0286 to -0.0276, respectively, as detailed in Table 11.

The improved quality of accruals in the energy industry could be informed by the industry's sustained performance during the pandemic, driven by the infrastructural investment in renewable and alternative energy sources in the country (Muthu & Wesson, 2023). In this regard, there was no motive to increase earnings management activities further due to the promotion of investment

in the industry; the increased monitoring of the performance of the industry may have led firm managers to decrease earnings management, as documented by Chia et al. (2007) who observed decreased earnings management activities due to increased scrutiny by stakeholders.

Global studies of the industrial impact of COVID-19 on listed firms noted that advanced technology industries, such as the industrial industry and telecommunications, were not adversely affected by the pandemic (He et al., 2020; Muthu & Wesson, 2023; Shen et al., 2020).

The industrial and telecommunications industry's resilience could be the driver of the decrease in earnings management activities as the industry was not in crisis. This is evidenced by the difference between pre-crisis and crisis-period discretionary accruals not being significant.

4.1.4 Health care industry results analysis

The results of the OLS panel regression for the health care industry are depicted in Table 12. The model exhibits minimal existence of autocorrelation with the Durbin-Watson value of 1.7. Further, 43% of the variability in the data can be explained by the model, as observed by the adjusted R-squared value of 0.40. The p-values of all variables were positive and statistically significant except for $\Delta\text{Salesit} - \Delta\text{TRit}$, which was positive but insignificant.

Table 12: Regression coefficient results for companies classified as health care using equation 1

Equation 1

Dependent Variable: TACC_AT_1 Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Stat	Prob.
1/Assetsit-1	4592461	1543630.	2.975105	0.0047**
$\Delta\text{Salesit} - \Delta\text{TRit}$	-0.099672	0.064455	-1.546383	0.1290
PPEit	-0.085088	0.015918	-5.345311	0.0000**
ROAit	0.448950	0.087614	5.124174	0.0000**
R-squared	0.436594	Mean dependent var		-0.040519
Adjusted R-squared	0.399033	S.D. dependent var		0.079516
Durbin-Watson stat	1.692444			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β_1 , β_2 , β_3 and β_4 . The variables: 1/Assetsit-1; $\Delta\text{Salesit} - \Delta\text{TRit}$; PPEit; and ROAit were used to determine the coefficients β_1 , β_2 , β_3 and β_4 , respectively. The table above represents seven years of data between 2016 and 2022 for seven firms in the health care industry. The dependent variable is total accruals divided by total assets.				
*, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 13: Health care mean error term of equation 1 which represents the discretionary accruals, a proxy for earnings management

	Sector
Period	Health care Discretionary accruals
Pooled	-0.0058
2016	0.0142
2017	0.0243
2018	-0.0264
2019	-0.0148
2020	-0.0133
2021	-0.0114
2022	-0.0133
Pre-crisis (2016-2019)	-0.0007
During Crisis (2020-2022)	-0.0127
Difference between pre-crisis and during crisis	0.0120 (-0.696)
Notes: The results documented above represent the mean error term calculated by equation 1 after determining the coefficients in Table 12 for the health industry. To conclude on hypothesis 2 stating that the impact of COVID-19 on the various industries was not uniform, an observation of the mean error term which represents discretionary accruals, a proxy for earnings management across the industries from 2016-2022 —further, the mean error term/discretionary accruals for pre-crisis period and during crisis period for each industry is analysed. In doing so, the impact of the pandemic is observed by the movement of the error term/discretionary accruals. A negative error term/discretionary accruals value is interpreted as income-decreasing earnings management; inversely, a positive error term/discretionary accruals value is interpreted as income-increasing earnings management. ***p ≤ 0.1 and significant T statistic is given within brackets.	

The earnings management activities in the healthcare industry increased during the crisis period from the pre-crisis period by 0.012. The difference is not statistically significant. When observing the change from 2019 to 2020, there is evidence of decreased earnings management activities, which further decrease in 2021. This is expected as the healthcare industry was deemed to provide essential services and outperformed during COVID-19 in South Africa (Muthu & Wesson, 2023) in line with countries such as India and Indonesia (Machmuddah et al., 2020; Mittal & Sharma, 2021).

4.1.5 Technology industry results analysis

The results of the OLS panel regression for the basic metals industry are depicted in Table 14. The model exhibits minimal existence of autocorrelation with the Durbin-Watson value of 1.2. Further, 86% of the variability in the data can be explained by the model, as observed by the R-squared value of 0.86. The p-values of all variables were positive. However, only PPEit and ROAit were statistically significant.

Table 14: Regression coefficient results for companies classified as technology using equation 1

Dependent Variable: TA	C_AT_1 Method:	Panel Least Squares		
Variable	Coefficient	Std. Error	t-Stat	Prob.
1/Assetsit-1	-1716250	3808594.	-0.450626	0.6532
Δ Salesit - Δ TRit	-0.047799	0.031712	-1.507269	0.1349
PPEit	-0.240661	0.071933	-3.345633	0.0012*
ROAit	0.326945	0.069365	4.713393	0.0000**
R-squared	0.192636	Mean dependent var		-0.030092
Adjusted R-squared	0.168655	S.D. dependent var		0.123254
Durbin-Watson stat	1.450754			
Notes: The following results were obtained on EViews by estimating equation (1) for each ICB industry to determine the coefficients β_1 , β_2 , β_3 and β_4 . The variables: 1/Assetsit-1; Δ Salesit – Δ TRit; PPEit; and ROAit were used to determine the coefficients β_1 , β_2 , β_3 and β_4 , respectively. The table above represents seven years of data between 2016 and 2022 for 15 firms in the technology industry. The dependent variable is total accruals divided by total assets. *, **: represents statistically significant at the 5% and 1% levels, respectively.				

Table 15: Technology mean error term of equation 1 which represents the discretionary accruals, a proxy for earnings management

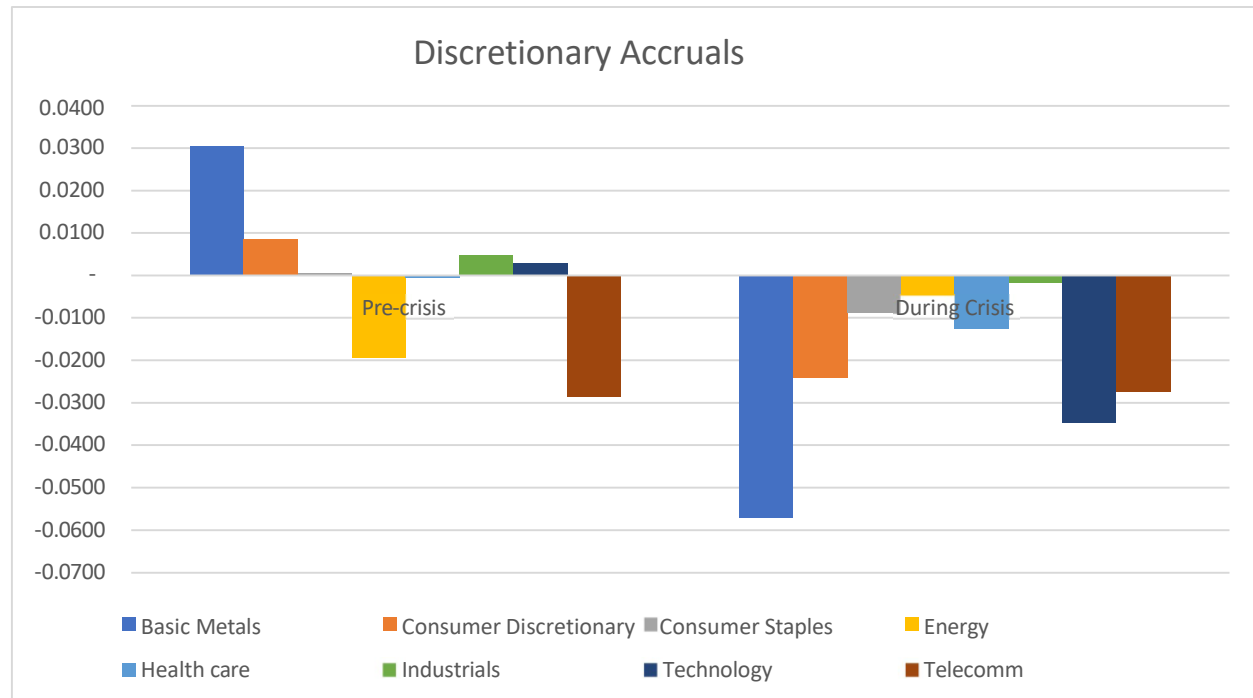
	Sector
Period	Technology Discretionary accruals
Pooled	-0.0132
2016	0.0600
2017	-0.0323
2018	-0.0232
2019	0.0073
2020	-0.0707
2021	-0.0325
2022	-0.0012
Pre-crisis (2016-2019)	0.0029
During Crisis (2020-2022)	-0.0348
Difference between pre-crisis and during crisis	0.0378*** (-1.759)
Notes: Notes: The results documented above represent the mean error term calculated by equation 1 after determining the coefficients in table 14 for the technology industry. To conclude on hypothesis 2 stating that the impact of COVID-19 on the various industries was not uniform, an observation of the mean error term which represents discretionary accruals, a proxy for earnings management across the industries from 2016-2022 —further, the mean error term/discretionary accruals for pre-crisis period and during crisis period for each industry is analysed. In doing so, the impact of the pandemic is observed by the movement of the error term/discretionary accruals. A negative error term/discretionary accruals value is interpreted as income-decreasing earnings management; inversely, a positive error term/discretionary accruals value is interpreted as income-decreasing earnings management. ***p $\leq$ 0.1 and significant T statistic is given within brackets.	

The earnings management activities in the technology industry increased during the crisis period from the pre-crisis period, as observed in the increase in the error term-discretionary accrual of 0.0378 noted in Table 15. The difference is statistically significant. The increase in earnings management activities was not expected due to the documented minimal impact of the pandemic on the sector owing to its high-tech nature (He et al., 2020; Shen et al., 2020). He et al. (2020) noted a positive impact on the technology industry due to COVID-19 in China, findings which were consistent with the findings of Mazur (2021). A possible explanation for the increase in discretionary accruals could be that firms in this industry remained conservative due to the uncertainty of the pandemic. Positive earnings were able to absorb the income-decreasing accruals which would result in even better results in the future when the accruals are released.

4.1.6 Overall industry findings

The results documented above per industry suggest that South African firms engaged in income-increasing accruals pre-crisis across the various industries, with the exception of the energy and telecommunications industries. The basic metals and telecommunications industries displayed the highest earnings management activity, as illustrated in Figure 1. During the crisis, it is illustrated that South African firms changed earning management strategies from income-increasing discretionary accruals to income-decreasing discretionary accruals. In addition, the illustration, Figure 1, reveals not only a change in direction but a change in the magnitude of earnings management. Except for industrials and telecommunications, all industries in South Africa increased the magnitude of earnings management. The industrials and telecommunications industries engaged in less earnings management during the pandemic. During the crisis, basic metals remained the industry engaging in the highest levels of earnings management, while the technology industry displayed the greatest increase in earnings management.

Figure 1: Mean error term of equation 1, which represents the discretionary accruals during the pre-crisis period and during the crisis period



Notes: Figure 1 presents the mean error terms per industry, which represent the mean discretionary accruals per industry pre-crisis and during the crisis period.

4.2 Analysis of the Johannesburg Stock Exchange

This section will provide commentary from an aggregate JSE perspective to add on to the industry-specific observations documented in section 4.1. The JSE mean error terms/discretionary accruals were determined by aggregating the error terms/discretionary accruals calculated in section 4.1 and determining the mean error terms/discretionary accruals for the JSE as a whole. Table 16 details the sample, the specific years, and the two specified periods.

Table 16: JSE mean error term of equation 1 which represents the discretionary accruals, a proxy for earnings management

Period	N	Mean Discretionary Accruals
Pooled	1 113	-0.0056
2016	159	0.0346
2017	159	-0.0011
2018	159	-0.0039
2019	159	0.0002
2020	159	-0.0389
2021	159	-0.0291
2022	159	-0.0008
Pre-crisis (2016-2019)	636	0.0074
During Crisis (2020-2022)	477	-0.0229
Difference between pre-crisis and during crisis		0.0303*** (-3.513)

Notes: The table above details the mean values of the error terms/discretionary accruals, the proxy for earnings management, for a sample of 159 firms per year between 2016 and 2022. In addition, the mean error term/discretionary accruals for the pre-crisis (2016- 2019) and crisis period (2020-2022) have been documented for a sample size of 636 and 477 firms, respectively. The values above were aggregated from the industry error terms calculated in section 4.1. A negative error term/discretionary accruals value is interpreted as income-decreasing earnings management; inversely, a positive error term/discretionary accruals value is interpreted as income-decreasing earnings management.

***p≤ .01 and significant.
T statistic is given within brackets.

An increase in income-decreasing earnings management activities can be noted in the year 2020, as documented in Table 16. Specifically, a decrease in the mean discretionary accruals from 0.0002 in 2019, which is a high quality of accruals, to a discretionary accruals value of -0.0389 in 2020, indicating a deterioration in the quality of accruals. Further, the discretionary accruals value changed from income-increasing to income-decreasing between 2019 and 2020, indicating a change in the earnings management strategy. The quality of accruals is observed in the years 2020 and 2021, with an improved quality of accruals observed in the year 2022, as signified by the decrease in the absolute mean value of the error term/discretionary accruals value. The discretionary accruals in 2022 (-0.0008) seemed to be returning to the discretionary accruals value observed before the crisis in 2019 (-0.0002).

Further, observing the mean error term/discretionary accruals for the pre-crisis period and during the crisis, the independent-samples t-test indicated that the difference of -0.0303 is statistically significant with a p-value of 0.0001. The pre-crisis mean discretionary accruals is 0.0074, indicating high-quality income-increasing accruals. During the COVID-19 pandemic, the mean

discretionary accruals decreased to - 0.0229, signifying a decrease in accruals quality as a result of the increase in the absolute value of discretionary accruals and of interest is the change in direction from income increasing to income-decreasing accruals during the pandemic. These findings are in line with the findings of Liu and Sun (2022), who documented a significant decrease in discretionary accruals coupled with a significant increase in absolute discretionary accruals, suggesting the use of income-decreasing accruals by USA firms as a result of the COVID-19 pandemic. In addition, these results are consistent with the findings of Chia et al. (2007), who observed income-decreasing earnings management during crisis. These findings further support the view that firms may not be incentivised to manipulate earnings during crisis due to investor acceptance of poor performance (Ahmad-Zaluki et al., 2011; Türegün, 2020). This is demonstrated by the fact that even the industries that were performing well during the pandemic also engaged in income-decreasing earnings management, as noted in section 4.1. In other words, there was no benefit to managing earnings upward during the pandemic. In light of the above analysis, H1 is accepted.

5. CONCLUSION

This section will conclude on the study undertaken by providing a concise overview of the research findings with respect to the research questions posed and formulated in the literature review and the contribution thereof. The conclusion will also reiterate the study's limitations and provide future research areas.

This study set out to determine whether the COVID-19 pandemic had an impact on the earnings management practices of South African firms listed on the Johannesburg Stock Exchange.

Specifically addressing the question:

1. How did the COVID-19 pandemic impact the earnings management practices of South African listed firms?
2. How did the COVID-19 pandemic impact the earnings management practices of South African industries?

Based on a sample of 159 JSE-listed firms from 2016 to 2022. The study assessed the impact for different industries. In answering the above questions, the study applied the Modified Jones Model of Kothari et al. (2005) used by Ali et al. (2022), Lassoued and Khanchel (2021) and Türegün

(2020). From previous literature the expectation was that during a crisis earnings management would increase, and specifically by utilizing income-decreasing discretionary accruals (Lizińska & Czapiewski, 2023; Garfatta et al., 2023).

The results from applying the Modified Jones Model, suggested that firms engaged in income-decreasing earnings management during the pandemic. Further, the results of the study suggest that the pandemic had varying impacts on the JSE industries. The basic metals, consumer discretionary, consumer staples, health care and technology industries engaged in income-decreasing earnings management during the pandemic; however, only the difference in discretionary accruals with the basic metals, consumer discretionary and technology industries were statistically significant. Further, the telecommunications, energy and industrials industries also engaged in less earnings management practices, with the difference between pre-crisis and crisis period discretionary accruals for the telecommunications sector being statistically significant.

Literature on the impact of the crisis, specifically the COVID-19 pandemic, on earnings management has contributed to understanding management behaviour under various institutional contexts. This study contributed to the body of research by focusing on South African firms that, while operating in an emerging market, are listed on the JSE, which has been characterised as a world-class stock exchange (Wesson et al., 2018). The study is relevant and useful to the JSE in understanding the underlying behavioural patterns by listed entities and will shed light on how it can strengthen its regulations to constrain any misdirection of investors, as well as its monitoring policies. Likewise, this study is also useful to investors and analysts who make decisions based in published financial statements. This study is also relevant to standard-setters as this study sheds light on the latitude the current standards afford management when preparing financial statements and how it is utilized. In addition, this study is also relevant to auditors as it directs their attention to the accounts likely to be manipulated during times of crisis.

An inherent limitation to earnings management research lies in the fact that earnings management in itself cannot be directly observed or measured; rather, proxies are used to suggest the magnitude of earnings management. This study only explored one earnings management proxy, which may have limited the ability to identify earnings management practices. The study sampling excluded financial services, REITs and dual-listed entities, limiting the scope of observations. Lastly, Jackson (2018) pointed out that not all variables contributing to accruals are captured in the equations used to calculate discretionary accruals. Therefore, the model may misidentify non-

discretionary accruals as discretionary accruals. This study also did not taking into account changes in accounting standards that were applied during the period, and also did not assess the model design.

The limitations noted above present an opportunity for research areas in future. Firstly, the study only considers accrual-based earnings management. An extension to this study would be to explore other earnings management proxies. To understand the full impact of COVID-19 on earnings management, future studies may investigate the impact on real earnings management practices as observed by Lizińska and Czapiewski (2023) for firms listed in Poland and Zamri et al. (2022) for firms listed in Malaysia. Secondly, the study explicitly excluded the financials industry, and gaining an understanding of the earnings management practices within the financial services industry will bridge the gap in South Africa as there is limited understanding of the financial services earnings management strategies. The study mentioned above would be particularly informative as the banking sector is highly regulated, and the regulations may serve as a deterrent for firm managers. The study also did not account for survivorship bias. The regression results also provided insights on the Modified Jones Model of Kothari et al. (2005). It was noted that the variable $\Delta Sales_{it} - \Delta TR_{it}$ was found to be statistically insignificant for most industries. Further, the model provided little explanatory power for industries such as consumer staples and consumer discretionary. The observations made indicate that the model itself has issues. Future research should explore how the model can be adapted to cater to the specific reporting peculiarities of the industries. Future research may also apply the recommendations of Kothari et al. (2005) to include a constant term in the determination of earnings management. Of interest, but not explored in this study, is the high income-increasing discretionary accruals observed in 2016 of 0.2918. It would contribute to the body of research to understand what influenced the use of income-increasing discretionary accruals in a year where no economic crisis was prevalent contrasted to a crisis influencing South African firms to utilise income-decreasing accruals in 2020. This effect seems to be concentrated in the basic metals industry with discretionary accruals of 0.1245. This could have been a result of industry-specific developments in 2016. An additional area of research may be to replicate this study in the context of other emerging markets, specifically African markets and also to replicate this study in the context of the 2008 financial crisis.

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