

The impact of COVID-19 on accrual-based earnings management: Evidence from South Africa



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Dates:

Received: 17 June 2025

Accepted: 03 Feb. 2026

Published: 24 Mar. 2026

How to cite this article:

Mpumpula, A., De Jesus, C. &
 Marais, A., 2026, 'The impact
 of COVID-19 on accrual-
 based earnings management:
 Evidence from South Africa',
*South African Journal of
 Economic and Management
 Sciences* 29(1), a6363.
<https://doi.org/10.4102/sajems.v29i1.6363>

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Background: The coronavirus disease 2019 (COVID-19) pandemic created a period of economic turbulence, affecting firms' performance and providing management with incentives to change their earnings management behaviour. While research has been conducted on the COVID-19 pandemic and other crises in developed markets, evidence from emerging markets, particularly Africa, is limited. Sector-specific research is even more limited.

Aim: This study investigated the COVID-19 pandemic's impact on accruals-based earnings management (AEM) behaviour in South Africa. The study also investigates differences in sector-specific responses.

Setting: This study's population comprised all 333 Johannesburg Stock Exchange (JSE) firms from 2016 to 2022.

Method: This study examined 159 JSE-listed firms across eight sectors from 2016 to 2022 using fixed-effects panel regressions. Absolute and signed discretionary accruals were examined to measure changes in the magnitude and direction of AEM.

Results: Firms engaged in more income-decreasing AEM during the pandemic, consistent with 'big bath' behaviour as explained by agency and prospect theory. COVID-19's impact on earnings management was asymmetric across sectors. Sectors facing more pronounced operational restrictions during the pandemic, such as consumer discretionary and basic materials, experienced shifts in earnings management behaviour, while less affected sectors showed no significant change.

Conclusion: The findings indicate that AEM behaviour changed in South African listed firms, and that this change was not uniform across sectors.

Contribution: Sector-specific testing during a unique natural experiment with asymmetric economic impacts across sectors provides a clearer lens to examine management's behaviour. The findings can be used to enhance investor protection, leading to greater economic stability. Awareness and consideration of these results in decision-making and monitoring can improve the firm's control environment, ensuring better capital allocation.

Keywords: accruals-based earnings management; quality of earnings; JSE; COVID-19 pandemic; South Africa.

Introduction

International Financial Reporting Standards (IFRS) aim to ensure that firms report financial information that is useful for decision-making (International Accounting Standards Board 2025a). To serve this purpose, financial statements must faithfully represent a company's financial position and performance (International Accounting Standards Board 2025b). The agency, prospect and signalling theories suggest, however, that management may have both incentives and opportunities to manipulate the financial statements for personal gain or to maintain investor confidence (Adejumo & Ogburie 2025). Although mechanisms such as external audits, board oversight, and performance-linked incentive structures aim to mitigate such behaviour, manipulation can still occur, particularly given the flexibility afforded by financial reporting standards (Aljughaiman et al. 2023). In less severe cases, manipulation may result in inefficient capital allocation (Pududu & De Villiers 2016). In more extreme cases, however, stakeholders may suffer significant financial and social losses, as demonstrated internationally by Enron, WorldCom and Lehman Brothers (Toumeh & Yahya 2019), and more recently in South Africa by Steinhoff International Holdings, EOH Holdings, Resilient REIT, Aspen Pharmacare Holdings, and Tongaat Hulett (Davies 2022). Steinhoff, for example, lost approximately R295 billion in

value in just 1 week, following concerns about its financial reporting irregularities (Davies 2022). Consequently, financial statement manipulation raises a broad range of ethical and regulatory concerns for corporate governance and markets, impacting stakeholders and economic stability (Adejumo & Ogburie 2025). Investigating and understanding earnings management has important practical implications for legal investor protection mechanisms.

The onset of the coronavirus disease 2019 (COVID-19) pandemic introduced significant economic turbulence and operational challenges for companies (Aljughaiman et al. 2023). Lockdowns, which were implemented to prevent the spread of the virus, increased uncertainty and unemployment, compounding economic turbulence. This was detrimental to demand for firms' products and services (Yan et al. 2022). Consequently, the COVID-19 pandemic posed a threat to a firm's survival (Lassoued & Khanchel 2021), creating incentives for management to engage in earnings management (Yan et al. 2022). Earnings management is when managers exploit the flexibility afforded by financial standards to mislead the users of financial statements (Healy & Wahlen 1999). The asymmetric impact of the lockdowns across sectors offers a unique lens through which to view management's behaviour, and the severity of the circumstances is expected to accentuate management behaviours, providing a natural experiment.

Existing research indicates that economic and financial crises influence companies' earnings management practices (Cimini 2015; Grimaldi 2019; Li, Hsu & Gao 2020; Saleh & Ahmed 2005; Türegün 2020). Internationally, studies investigating the effect of the COVID-19 pandemic on companies' earnings management behaviour have predominantly focused on developed economies (Ali et al. 2022), Asia (Aljughaiman et al. 2023; Liang 2022; Ryu & Chae 2022; Xiao & Xi 2021; Yan et al. 2022), Europe (Filipović, Bartulović & Šušak 2022; Lassoued & Khanchel 2021; Lizińska & Czapiewski 2023) and the United States (US) (Barton, Sheneman & Siriviriyakul 2025; Jordan, Clark & Waldron 2021; Liu & Sun 2022). Africa has received comparatively less attention (Akande 2025), with only a few studies by Garfatta, Hamza and Zorgati (2023), Hussein, Swai and Nathanael (2025), and Swai and Derefa (2024) examining the continent, particularly Kenya and Tunisia. Notably, Swai and Derefa (2024) reported conflicting results between Kenya and Tunisia following the COVID-19 pandemic, suggesting that country-specific responses to the pandemic may have influenced earnings management practices. In light of this gap and inconsistent findings in Africa, this study investigates whether the COVID-19 pandemic impacted South African companies' accruals-based earnings management (AEM) practices, in terms of magnitude and direction. It further explores whether responses differed across sectors because of the pandemic's asymmetric impact. Sector analysis is key as generalising conclusions across a non-homogeneous sample can distort results and may help explain the inconsistent results in

the prior literature. The varying impact of restrictions across sectors offers a natural experiment to explore the heterogeneity of earnings management (Yan et al. 2022).

South Africa provides a unique context for examining the impact of the COVID-19 pandemic on earnings management. Firstly, South Africa imposed one of the strictest lockdowns globally (Steytler & De Visser 2022). Swai and Derefa (2024) showed that the severity of the lockdown restrictions influences the extent of earnings management. Secondly, South Africa's economy exhibits elements of both developed and emerging markets. Unlike most emerging economies, the institutional context is characterised by strong investor protection, world-class accounting and auditing standards, and a well-regulated stock exchange (Yalla, Ateke & Makotore 2024). However, like most emerging markets, legal enforcement and investor protection are weaker than in developed markets (Leuz, Nanda & Wysocki 2003). Ali et al. (2022) identified investor protection strength as a factor constraining earnings management. Ali et al. (2022) further note that prior literature is inconclusive. South Africa's uniquely stringent lockdown and the complexities of its institutional environment provide a contrasting context to other studies, broadening the collective understanding of earnings management. Akande (2025) emphasises the need for country-specific investigations.

This study examined 159 Johannesburg Stock Exchange (JSE) listed non-financial firms from 2016 to 2022 and applied the modified Jones model, as adapted by Kothari, Leone and Wasley (2005), to determine discretionary accruals. While earnings management models are suggestive, the regression results indicate that earnings quality on the JSE decreased with firms engaging in more income-decreasing earnings management during the pandemic. This was in line with prior literature suggesting that firms reduce earnings quality by taking 'big baths' (an accounting technique involving significant negative write-offs) during crises, as investors are more accepting of poor performance (Guo, Luo & Liu 2025). This, in turn, enables companies to inflate future earnings. Further, the study's results suggest that the pandemic had varying impacts across the eight JSE sectors examined.

Aside from the unique South Africa-specific circumstances, which add to the debate through a different lens, to the best of the authors' knowledge, it is the first evidence on sector-specific responses to the COVID-19 pandemic in Africa. Where the majority of studies examine markets holistically, this could distort results, as sector-specific results may influence the sample. Examining a market holistically and at a sector level adds weight to the theoretical conclusions that can be drawn from the testing. For investors, understanding management behaviour during periods of economic turbulence can enhance investment protection and decision-making, particularly as such events become more frequent and severe (Gkeredakis, Lifshitz-Assaf & Barrett 2021). Given the current geopolitical tensions, economic turbulence is becoming more frequent. Understanding earnings

management practices can also assist boards in better management performance evaluation, thereby increasing investor protection. From a governance perspective, these insights help identify potential risk areas, enabling the design of appropriate monitoring mechanisms. Finally, regulators and policymakers can draw on these findings to develop regulatory frameworks that increase investor protection and, in turn, increase economic stability. This is critical as earnings management impacts the efficient allocation of capital and the prevention of significant losses like those experienced at Steinhoff.

For South Africa, ensuring investor protection and good governance could lead to increased investment, which is especially important given the country's economic and social challenges, including low Gross Domestic Product (GPD) growth of 0.1% and high unemployment rate of 32.9% for the first quarter of 2025 (Statistics South Africa 2025a, 2025b).

The remainder of this article sets out the literature review, methodology, results, discussion, and conclusion.

Literature review

International Financial Reporting Standards require that financial statements be prepared on the accrual basis of accounting, except for the cash flow statement. Accruals, in general, contain an element of management judgement. A critical function within the standard-setting arena, therefore, is managing the extent of judgment afforded to management when preparing financial statements. International Financial Reporting Standards seeks to manage judgement through principle-based guidance, such as IFRS Practice Statement 2: Making Material Judgements, as well as the IFRS principle of faithful representation, both of which offer guidance. International Financial Reporting Standards is not rules-based but rather principle-based, meaning it requires some judgement (Lin et al. 2025). Standard setters continually refine existing standards to enhance the quality of financial reporting. International Financial Reporting Standards 15: Revenue from Contracts with Customers and IFRS 9: Financial Instruments are apt examples of financial reporting standards that have been implemented with the underlying intention of requiring greater transparency in financial statement reporting (Boujelben & Kobbi-Fakhfakh 2020). The introduction of these standards requires management to report on transactions not just as they are, but also to apply the firm's predictive knowledge to provide a more faithful reflection of its actual performance (International Accounting Standards Board 2025b). While the standards continually evolve, reliance on managerial judgment remains substantial, enabling earnings management.

Theories behind earnings management

Various theories explain earnings management behaviour during crises, including the agency, prospect and signalling theories. Agency theory highlights the separation of ownership and control within a firm. As a result, management

possesses complete information about a firm's actual economic performance, while shareholders and other outside stakeholders must rely on the information released by management. Jensen and Meckling (1976) argue that if both management (the agent) and the shareholders (the principal) are utility maximisers, then management will exploit the information asymmetries for their personal benefit. During crises, uncertainty and survival pressures increase management incentives to engage in earnings management (Liu & Sun 2022; Swai & Derefa 2024). This may occur either by inflating current-year performance to hide poor results or, when losses are too severe or investors are more tolerant of poor performance, by deliberately inflating current-year losses through a 'big bath', thereby enabling stronger reported performance in future years (Guo et al. 2025; Lassoued & Khanchel 2021; Liu & Sun 2022; Lizińska & Czapiewski 2023). Conversely, Ali et al. (2022) and Chia, Lapsley and Lee (2007) suggest that earnings management may decrease during crises. This can be attributed to increased regulatory scrutiny and closer monitoring by auditors, which constrain managerial opportunism. In addition, pressure on managers to manipulate results may decrease as investors may be more willing to accept poor performance during crises. Finally, the scale of losses incurred may be so severe that they cannot be reasonably concealed through any earnings management technique (Ali et al. 2022; Chia et al. 2007; Türegün 2020).

Prospect theory provides an alternative explanation of management behaviour during crises. This theory suggests that managers react asymmetrically to gains and losses. Managers are risk-averse when facing potential gains, but risk-seeking when facing potential losses (Kahneman & Tversky 1979). During crises such as COVID-19, the heightened threat of loss may incentivise management to engage in riskier accounting practices, including earnings management, to avoid reporting losses and to maintain investor confidence (Adejumo & Ogburie 2025). Alternatively, if management anticipates unavoidable losses, they may engage in income-decreasing earnings management (i.e. taking a 'big bath') to push earnings into future periods, as investors view losses beyond the cost of the crisis as inconsequential (Barton et al. 2025).

Finally, signalling theory focuses on reducing information asymmetries between management and stakeholders. Management has access to private information and must communicate it to external stakeholders who only have access to public information (Connelly et al. 2011). Signalling theory views earnings management as one mechanism through which management communicates their private information about a firm's prospects to stakeholders (Connelly et al. 2011). In times of crises, such as the COVID-19 pandemic, information asymmetry increases, making stakeholders more sensitive to signals. Managers may, therefore, engage in earnings management to signal financial stability and reassure investors, thereby maintaining confidence in the firm (Hussein et al. 2025).

COVID-19's impact on earnings management

Empirical evidence supports the theoretical view that financial and economic crises influence management's earnings management practices (Cimini 2015; Grimaldi 2019; Li et al. 2020; Saleh & Ahmed 2005; Türegün 2020). During such periods, earnings management practices may change in two material ways. Firstly, the magnitude of earnings management may vary, with managers either intensifying or reducing their use of earnings management (Aljughaiman et al. 2023). Secondly, the direction may change, as managers move between income-increasing and income-decreasing earnings management depending on their objectives (Aljughaiman et al. 2023). Despite extensive research, however, findings on earnings management during the COVID-19 pandemic remain inconclusive. In line with the objectives of this study, the review now focuses on the literature on AEM.

COVID-19's impact on the magnitude of earnings management

Considering the empirical literature, Ali et al. (2022) examined 5519 firms listed in the G-12 countries (developed economies including nine countries from Europe, Australia, Canada, Japan and the US) from 2015 to 2020. They found that the magnitude of AEM decreased during the COVID-19 pandemic. This suggests that firms were not incentivised to engage in earnings management.

Other studies in developed economies, however, report contrasting findings. Lassoued and Khanchel (2021) analysed 2031 firms listed in 15 European countries. They found that AEM intensified during the pandemic. Similarly, Liu and Sun (2022) studied 2424 US firms in 2019 and 2020 and also found evidence of increased AEM.

Considering emerging economies, evidence from Asia indicates an increase in AEM practices during COVID-19. Yan et al. (2022) examined 8832 observations of Chinese A-share listed firms from 2018 to 2020 and found an increase in AEM practices. Xiao and Xi (2021) similarly reported an increase in AEM among 2029 firms listed on the Shanghai and Shenzhen Stock Exchanges. Aljughaiman et al. (2023) also observed a greater inclination to manage earnings during COVID-19 after analysing 1832 listed Chinese firms. Likewise, Liang (2022) analysed 15 870 quarterly observations in China from 2018 to 2021 with the same results. Finally, Ryu and Chae (2022) found increased AEM when investigating 869 observations of listed Korean distribution and service firms from 2018 to 2022.

In contrast, studies from emerging African markets showed limited or no change in AEM intensity during COVID-19. Hussein et al. (2025) analysed 250 observations from Kenya and Tanzania from 2017 to 2022 and found no statistically significant effect of COVID-19 on AEM. Similarly, Swai and Derefa (2024) studied 43 firms in the same countries over the same period and found the same results. However, when considered separately, Kenya displayed a reduction

in AEM while Tanzania showed no change. Swai and Derefa (2024) attributed this to Kenya's stricter lockdown measures.

These findings suggest that COVID-19's impact on earnings management differs across countries and contexts. While European, US and Asian firms increased AEM during the pandemic, African firms showed mixed impacts. Consequently, Swai and Derefa (2024) caution against generalising results from more developed to less developed countries. Furthermore, grouping countries can obscure crucial differences, as seen in Ali et al. (2022), Lassoued and Khanchel (2021), and Swai and Derefa (2024). This highlights the need for country-specific analysis that accounts for unique institutional and regulatory environments.

Considering South Africa, earnings management has been investigated in a variety of circumstances, including: earnings management to avoid small losses (Pududu & De Villiers 2016); earnings management pre- and post-adoption of IFRS (Sellami & Slimi 2016); accrual-based and real earnings management impacts on Corporate Social Responsibility performance and disclosures (Jordaan, De Klerk & De Villiers 2018; Marais et al. 2025); earnings management to achieve specified dividend thresholds (Li & Chen 2020); the association between integrated reporting quality and earnings management (Eloff & Steenkamp 2022); the influence of earnings management on abnormal tone in Chief Executive Officer (CEO) statements (Mlawu, Matenda & Sibanda 2023); and the impact of IFRS on accruals (Gbadebo 2023).

Given the scarcity of South African research examining earnings management behaviour during crises, coupled with the divergent findings in the international literature across regions, the first non-directional hypothesis, which addresses the magnitude of AEM in South Africa, is stated as follows:

Hypothesis 1: The COVID-19 pandemic impacted the magnitude of AEM in South Africa.

COVID-19's impact on the direction of earnings management

In addition to influencing the magnitude of earnings management, COVID-19 may also affect its direction, depending on management's specific objectives. Some studies find that, during crises, firms manage earnings upward to create the illusion that performance remains unaffected and maintain a positive outlook (Da Silva et al. 2014; Li et al. 2020), a behaviour consistent with agency, prospect, and signalling theories. Alternatively, as investors are more accepting of poor performance, other studies suggest that companies may be incentivised to take a 'big bath' and engage in income-decreasing earnings management to inflate earnings in future years, which is consistent with the alternative explanations under agency and prospect theory when the losses become too significant to cover up (Guo et al. 2025; Lassoued & Khanchel 2021; Liu & Sun 2022; Lizińska & Czapiewski 2023).

Considering developed economies, Lassoued and Khanchel (2021) found that firms across 15 European countries collectively engaged in more income-increasing AEM. Supporting this, Filipović et al. (2022) analysed 56 Croatian firms from 2015 to 2020 and found that dividend-paying firms were incentivised to engage in income-increasing AEM. In contrast, Lizińska and Czapiewski (2023) found that Polish firms tended towards income-decreasing AEM, enabling them to inflate profitability in subsequent years as the accruals reversed. Consistent with this, Liu and Sun (2022) reported that US firms also engaged in more income-decreasing AEM during the pandemic, providing evidence of 'big bath' behaviour.

Emerging economies also displayed mixed results regarding the direction of AEM during the pandemic. In China, Aljughaiman et al. (2023) reported that firms engaged predominantly in income-increasing AEM. However, Liang (2022) and Yan et al. (2022) found that firms increased AEM in both directions, suggesting that managerial responses varied depending on firm-specific circumstances. In Africa, Garfatta et al. (2023) investigated 41 listed Tunisian firms and found that firms tended to engage in income-decreasing AEM.

Flowing from the mixed findings in the international literature, the second non-directional hypothesis, which addresses the direction of AEM in South Africa, is as follows:

Hypothesis 2: The COVID-19 pandemic impacted the direction of AEM in South Africa.

COVID-19's impact on earnings management in specific sectors

A less explored area is COVID-19's impact on AEM across sectors. Unlike previous crises, COVID-19 impacted sectors asymmetrically because of the government restrictions on trade and activity (Muthu & Wesson 2023). This asymmetrical impact may be causing mixed results, as results are being extrapolated across whole markets. Looking at sectors isolates companies that face the same challenges. This provides an opportunity to gain insights into earnings management practices across companies operating in the same institutional context, thereby contributing to the understanding of AEM practices and providing a potential explanation for the inconsistent findings of prior literature.

In China, Yan et al. (2022) found that companies in more severely affected sectors and regions engaged more actively in AEM. The sectors most affected included transportation, warehousing, postal services, mining, construction, wholesale and retail, and real estate (Yan et al. 2022). In Korea, Ryu and Chae (2022) focused on distribution and service companies and found that these firms engaged in more AEM. Similarly, in Poland, Lizińska and Czapiewski (2023) observed that information technology, consumer discretionary and industrial firms showed the largest shift towards income-decreasing AEM compared to other sectors.

In South Africa, the sector-specific effect of COVID-19 on AEM has not been explored. Instead, the impact of COVID-19 on the performance of different sectors has been studied. Muthu and Wesson (2023) found that the COVID-19 pandemic affected JSE sectors differently in terms of performance, as a result of the idiosyncratic nature of the sectors.

The sector-specific impacts on AEMs would be expected to be asymmetrical. In South Africa, the basic material sector came to a halt during the initial 21-day lockdown period as it was not classified as an essential service. A subsequent change in the lockdown restrictions then allowed mining to operate at 50% capacity (Jowitt 2020). In addition to operating at suboptimal levels, after the initial 21-day hard lockdown period, local and international logistical and supply chain disruptions caused by the pandemic further hampered the sector's ability to operate optimally. The crisis period saw significant declines in output within the basic materials sector and reduced export demand (Ajam 2020). Nevertheless, the basic materials sector realised significant gains in 2020 because of strong commodity prices during the pandemic, as commodities such as gold are viewed as safe-haven assets (Daily Maverick 2020). Similarly, the consumer discretionary sector included sectors which were deemed non-essential and detrimental to curbing the spread of COVID-19, such as travel and leisure, which faced severe restrictions. Consequently, sectors more adversely affected by COVID-19 could be expected to have more incentives to engage in AEM (Chia et al. 2007). Under signalling theory, such firms may engage in income-increasing earnings management to signal future stability and maintain investor confidence or, under agency and prospect theory, to avoid losses and protect themselves (Hussein et al. 2025; Swai & Derefa 2024). Alternatively, if the losses are too large to avoid, agency and prospect theory suggest that management may engage in 'big bath' accounting (Liu & Sun 2022).

Other sectors, by contrast, could be less severely impacted by the pandemic. In South Africa, the consumer staples (which include food producers, personal care, drug stores, and grocery stores) and healthcare sectors were deemed essential services. Healthcare is particularly interesting as, while essential, voluntary medical treatment was avoided, negatively impacting earnings. They thus continued operations, albeit in a different form, during COVID-19 (Muthu & Wesson 2023). For the technology and telecommunications sectors, global studies suggest that advanced sectors were not adversely affected by the pandemic (He et al. 2020; Muthu & Wesson 2023; Shen et al. 2020). These sectors saw increased demand as they helped individuals and companies to stay connected and continue operating during the pandemic (Abed 2022). Finally, Muthu and Wesson (2023) noted that the energy sector maintained its performance during the pandemic, driven by infrastructure investment in renewable and alternative energy sources in the country. Accordingly, sectors less affected by COVID-19 would have fewer incentives to engage in earnings management activities during the pandemic (Chia et al. 2007).

Given the asymmetric nature of COVID-19 lockdown restrictions, the incentives and opportunities to manage earnings differed across sectors. Therefore, not all sectors would have adjusted their earnings management strategies uniformly in response to the pandemic. Further, because economies are often weighted towards dominant sectors, failure to account for sectoral differences can bias overall market results, helping explain the inconsistent findings in the prior literature. To address this, the following hypothesis has been formulated:

Hypothesis 3: The COVID-19 pandemic impacted AEM practices across the eight JSE sectors differently because of the pandemic's asymmetric impact.

Methods

Sampling

This study's population comprised all firms listed on the JSE from 2016 to 2022, totalling 333 firms. Financial data and the variables were retrieved from Thomson Reuters Eikon. Firms with dual listings were excluded, as the regulatory environment in which they operate influences financial reporting quality and, consequently, the extent of earnings management (Ali et al. 2022). Financial services firms and real estate investment trusts were also excluded because of sector-specific financial reporting and regulatory characteristics (Chakroun, Ben Amar & Ben Amar 2022). Exchange Traded Funds (ETFs), certificates, portfolios, and retirement funds were also excluded because they are not operating firms. The final sample consisted of an unbalanced panel of 159 firms representing 1063 firm-year observations. The sample selection process is summarised in Table 1.

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

Observations from 2016 to 2019 were classified as the pre-crisis period, while 2020 to 2022 constituted the crisis period. The crisis period was informed by lockdown protocols (levels 1–5) that spanned from March 2020 until April 2022.

Estimation of discretionary accruals

As earnings management cannot be explicitly observed, discretionary accruals were used as a proxy. Following studies by Kumar and Vij (2017), Sellami and Slimi (2016) and Türegün (2020), the cross-sectional Kothari et al. (2005) model

was used to estimate discretionary accruals. By including return on assets as a performance term, this model controls for abnormal performance observed during the COVID-19 crisis. The model is as Equation 1:

$$TACC_{it} = \alpha_1(1/Assets_{it-1}) + \alpha_2(\Delta Sales_{it} - \Delta TR_{it})/Assets_{it-1} + \alpha_3 PPE_{it}/Assets_{it-1} + \alpha_4(ROA_{it}) + \varepsilon_t \quad [Eqn 1]$$

Where:

- $TACC_{it}$ – Total accruals, which were calculated as net income minus cash flows from operations of firm i in year t , scaled by lagged total assets.
- $Assets_{it-1}$ – Lagged total assets.
- $\Delta Sales_{it}$ – Change in sales in year t from year $t-1$.
- ΔTR_{it} – Change in trade receivables in year t from year $t-1$.
- PPE_{it} – Gross property, plant, and equipment.
- ROA_{it} – Return on assets calculated as net income before minority interest divided by total assets.
- ε_t – error term or the residual.

Equation (1) was estimated for each ICB sector, and the coefficients α_1 , α_2 , α_3 and α_4 were calculated by running panel ordinary least squares (OLS) regression (Türegün 2020). The residual resulting from Equation (1), ε_t , measured discretionary accruals (as a percentage of total assets). Further, cluster-robust standard errors were applied to address potential heteroskedasticity or serial correlation (Hoechle 2007).

Both the absolute and signed values of discretionary accruals were used. The absolute values indicate the magnitude of AEM, with a high absolute value indicating intensified AEM leading to a lower quality of earnings, and vice versa. In contrast, the signed values indicate the direction of AEM (i.e. income-increasing or -decreasing) to achieve specific objectives (Lizińska & Czapiewski 2023).

t -test and fixed effects panel regression

A two-sample t -test was performed to assess whether the change in discretionary accruals pre- and post-crisis is significantly different.

To assess the robustness of the t -test result, the significance of the relationship between AEM and the COVID-19 pandemic was assessed. The following fixed effects panel regression

TABLE 1: Sample selection.

Reconciliation of population to sample	Number of companies
Firms with a primary listing on the JSE in 2016	333
Firms removed from the sample	174
Dual-listed firms	14
ETFs	60
Financial firms, REITs, and insurance firms	88
Certificates and portfolios	10
Retirement funds	2
Total	159

JSE, Johannesburg Stock Exchange; ETFs, exchange traded funds; REITs, real estate investment trusts.

TABLE 2: Sample distribution.

ICB code	Sector	Number 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

ICB, Industry Classification Benchmark.

with panel corrected standard errors (Equation 2) was used to address heteroskedasticity, serial correlation, and cross-sectional correlation (Hoechle 2007):

$$AEM_{it} = \beta_0 + \beta_1 \text{Pandemic}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{LnTA}_{it-1} + \alpha_i + \mu_{it} \quad [\text{Eqn 2}]$$

Where AEM_{it} represents the discretionary accruals for firm i in year t . Pandemic_{it} is a dummy variable indicating whether the observation fell within the pre-crisis (0) or crisis (1) periods. Return on assets, a proxy for profitability, and the natural log of total assets, representing company size, were used as control variables. Finally, α_i is the unobserved individual effect while μ_{it} is the error term.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

Results and discussion

Descriptive statistics

Table 3 presents the mean discretionary accruals in total and by year, as well as the means for the pre-crisis and crisis periods, for the JSE as a whole and by sector. Panel A presents the absolute discretionary accruals, while Panel B presents the signed discretionary accruals.

Considering the overall sample, the magnitude of AEM (measured by absolute discretionary accruals) decreased between 2016 and 2017. This was accompanied by a shift from income-increasing AEM in 2016 to income-decreasing AEM in 2017. From 2017 to 2019, AEM levels remained stable. However, in 2020 (the start of the pandemic), AEM activity increased, as indicated by higher absolute discretionary accruals (mean = 0.0921) and stronger income-decreasing practices (mean = -0.0636), suggesting a deterioration in earnings quality. This trend persisted into 2021 (absolute mean = 0.0810, mean = -0.0543), before earnings quality improved in 2022, as signified by the decrease in both the absolute and signed discretionary accruals (absolute mean = 0.0718, mean = -0.0229). By 2022, AEM levels had returned to pre-crisis levels.

For the overall sample, mean absolute discretionary accruals increased from 0.0669 in the pre-crisis period to 0.0820 during the COVID-19 crisis. The independent-samples t -test confirmed that the increase of 0.0151 was statistically significant ($p < 0.05$). Similarly, mean discretionary accruals decreased from -0.0134 in the pre-crisis period to -0.0476 during the crisis, with the difference of -0.0341 also being statistically significant ($p < 0.01$). These results provide preliminary support for hypotheses 1 and 2. This highlights possible ethical and governance concerns, which may indicate a lack of investor protection during a period of high economic turbulence.

TABLE 3: Mean discretionary accruals and absolute discretionary accruals per Johannesburg Stock Exchange sector.

Period	Sector								
	Overall	Basic materials	Consumer staples	Consumer discretionary	Energy	Industrials	Telecommunications	Health care	Technology
Panel A: Absolute discretionary accruals									
Pooled	0.0732	0.1255	0.0457	0.0586	0.0701	0.0562	0.1106	0.0491	0.0818
2016	0.0798	0.1714	0.0480	0.0494	0.0983	0.0578	0.0910	0.0561	0.0641
2017	0.0614	0.0877	0.0414	0.0439	0.1030	0.0530	0.1050	0.0464	0.0735
2018	0.0674	0.0915	0.0485	0.0483	0.0666	0.0510	0.1501	0.0558	0.1002
2019	0.0596	0.0937	0.0412	0.0480	0.0274	0.0513	0.0846	0.0460	0.0679
2020	0.0921	0.1200	0.0552	0.1082	0.0431	0.0691	0.1294	0.0744	0.1124
2021	0.0810	0.1729	0.0503	0.0548	0.0573	0.0557	0.1103	0.0278	0.0791
2022	0.0718	0.1468	0.0344	0.0559	0.1083	0.0558	0.1013	0.0314	0.0742
Pre-crisis (2016–2019)	0.0669	0.1109	0.0448	0.0473	0.0722	0.0533	0.1083	0.0511	0.0766
During crisis (2020–2022)	0.0820	0.1462	0.0468	0.0731	0.0669	0.0603	0.1137	0.0461	0.0886
Difference between pre-crisis and during crisis	-0.0151	-0.0353	-0.0021	-0.0258	0.0053	-0.0070	-0.0053	0.0050	-0.0119
t statistic	2.0120**	1.0291	0.3596	2.9629***	-0.2491	1.0640	0.2829	-0.4345	0.7288
Panel B: Discretionary accruals									
Pooled	-0.0278	-0.0382	-0.0323	-0.0310	-0.0492	0.0039	-0.1048	-0.0206	-0.0381
2016	0.0177	0.1032	-0.0080	-0.0088	-0.0473	0.0037	-0.0822	0.0002	0.0371
2017	-0.0222	-0.0322	-0.0278	0.0001	-0.1030	-0.0020	-0.1050	0.0105	-0.0536
2018	-0.0279	-0.0235	-0.0423	-0.0289	-0.0666	0.0136	-0.1501	-0.0392	-0.0468
2019	-0.0198	-0.0372	-0.0315	-0.0207	-0.0254	0.0128	-0.0846	-0.0280	-0.0132
2020	-0.0636	-0.0634	-0.0541	-0.0945	-0.0076	-0.0252	-0.1294	-0.0331	-0.1003
2021	-0.0543	-0.1395	-0.0445	-0.0310	-0.0524	-0.0051	-0.1103	-0.0254	-0.0603
2022	-0.0229	-0.0830	-0.0156	-0.0287	-0.0404	0.0307	-0.0688	-0.0314	-0.0245
Pre-crisis (2016–2019)	-0.0134	0.0022	-0.0276	-0.0150	-0.0614	0.0069	-0.1063	-0.0141	-0.0201
During crisis (2020–2022)	-0.0476	-0.0958	-0.0384	-0.0517	-0.0309	-0.0004	-0.1028	-0.0301	-0.0617
Difference between pre-crisis and during crisis	-0.0341	0.0981	0.0108	0.0369	-0.0306	0.0073	-0.0035	0.0160	0.0416
t statistic	3.9930***	2.5887**	1.3995	3.3739***	-0.9971	0.7439	-0.1584	0.9408	1.9531*

Note: The absolute discretionary accruals and discretionary accruals above reflect the percentage of total assets.

*, $p < 0.10$; **, $p < 0.05$; ***, $p < 0.01$.

When examining absolute discretionary accruals by sector, Table 3 panel A indicates that the basic materials and telecommunications sectors had the highest AEM levels. Except for the energy and healthcare sectors, all sectors experienced an increase in absolute discretionary accruals during the pandemic, indicating a decline in earnings quality. Post the onset of the pandemic, basic materials continued to display the highest level of AEM (mean = 0.1462) and showed the largest increase in AEM (change = 0.0353). This was followed by the consumer discretionary sector (change = 0.0258). However, the increase was only statistically significant for the consumer discretionary sector ($p < 0.01$).

Table 3 panel B reveals that, on average, apart from the basic material and industrial sectors, South African firms were engaged in income-decreasing AEM pre-crisis. Post the onset of the pandemic, the basic materials and industrials sectors changed strategies from income-increasing to income-decreasing AEM. The change in discretionary accruals was statistically significant only for the basic materials ($p < 0.05$), consumer discretionary ($p < 0.01$) and technology ($p < 0.10$) sectors. These findings provide preliminary support for hypothesis 3. The sector analysis also shows that a few sectors influenced the overall sample, and the results should not necessarily be extrapolated to the whole market. This outlines that behavioural change in AEM practices is not driven by economic turbulence in isolation, but rather by the interaction between economic turbulence and sector-specific factors that shape the incentives and opportunities faced by management.

Regression results discussion

Table 4 presents the regression results from formula (2), with panel A reporting absolute discretionary accruals as the dependent variable, and panel B reporting signed discretionary accruals. The results indicate that for the full sample ($p < 0.01$), as well as for the consumer discretionary ($p < 0.05$), basic materials ($p < 0.05$), and technology sectors ($p < 0.1$), the pandemic was a significant factor in the determination of discretionary accruals. For absolute discretionary accruals, the overall sample ($p < 0.05$), consumer discretionary ($p < 0.05$) and industrials ($p < 0.05$) sectors, the pandemic was found to be a significant determinant.

Considering the JSE firms collectively, similar to the results in Table 3, the regression results show that during the crisis period, firms engaged in more AEM activities, as reflected in the positive, statistically significant coefficient under absolute discretionary accruals ($\beta_1 = 0.0138$, $p < 0.01$). Panel B (signed discretionary accruals) further indicates that this took the form of more income-decreasing AEM ($\beta_1 = -0.0354$, $p < 0.01$). These findings are consistent with Liu and Sun (2022), who documented an increase in absolute discretionary accruals alongside a significant decrease in discretionary accruals, suggesting that US firms increased their use of income-decreasing AEM during the COVID-19 pandemic. Similarly, Chia et al. (2007) also observed income-decreasing AEM during a crisis.

From an agency and prospect theory perspective, these results suggest that managers used the crisis as an opportunity to engage in self-interested behaviour by using 'big bath' accounting. By deliberately manipulating earnings downwards, capitalising on investors' expectations of poor performance, managers could reduce current period earnings expectations and subsequently inflate future performance once the crisis had passed (Liu & Sun 2022; Lizińska & Czapiewski 2023). Thus, while there was no benefit to upward earnings management during the pandemic, firms chose to manage earnings downward, consistent with the 'big bath' explanation. Consequently, these findings support hypotheses 1 and 2, which state that the COVID-19 pandemic affected both the magnitude and direction of AEM in South Africa.

Considering the sector results, the consumer discretionary ($\beta_1 = 0.0216$, $p < 0.05$) and industrial ($\beta_1 = 0.0084$, $p < 0.05$) sectors showed a significant increase in AEM magnitude (panel A). Concerning direction, the basic materials ($\beta_1 = -0.1420$, $p < 0.05$), consumer discretionary ($\beta_1 = -0.0245$, $p < 0.05$) and technology ($\beta_1 = -0.0394$, $p < 0.10$) sectors shifted towards more income-decreasing AEM (panel B). In contrast, the consumer staples, energy, healthcare, and telecommunications sectors showed no statistically significant change in their earnings management behaviour. Overall, these results are consistent with the descriptive evidence presented in Table 3, reinforcing the observation that COVID-19's impact on AEM was not uniform across sectors. Thus, these results highlight the importance of considering how sector-specific factors influence AEM behaviour, which may explain the inconsistent results in prior literature that have considered the individual sectors collectively.

The sector results show that sector-specific exposure to COVID-19 influenced earnings management behaviour, consistent with agency, prospect and signalling theories. Sectors that were more severely affected by the pandemic (such as basic materials, consumer discretionary and industrials) effectively came to a halt as they were deemed non-essential. These sectors experienced the biggest shifts in AEM behaviour, consistent with the findings of Chia et al. (2007) and Yan et al. (2022). From an agency and prospect theory perspective, managers in more severely affected sectors may have employed a 'big bath' strategy by deliberately reducing earnings so that they could inflate future performance (Liu & Sun 2022). This strategy would have been facilitated by investor acceptance of poor performance during the pandemic.

In contrast, sectors less severely affected by the pandemic (such as consumer staples, healthcare, energy, and telecommunications) displayed no meaningful change in AEM behaviour. From an agency perspective, firms in these sectors would have faced less crisis-related pressure and, hence, weaker management incentives to manipulate earnings. From a prospect theory perspective, managers in these sectors faced limited operational disruptions and a

TABLE 4: Fixed effects regression estimates for COVID-19 pandemic dummy variable.

Variables	Parameter	Overall	Basic materials	Consumer discretionary	Consumer staples	Energy	Health care	Industrials	Technology	Telecommunications
Panel A: Absolute discretionary accruals										
Pandemic	Coeff.	0.0138**	-0.0179	0.0216**	0.0055	0.0239	0.0040	0.0084**	0.0180	0.0185
	SE	0.0066	0.0307	0.0085	0.0040	0.0253	0.0102	0.0042	0.0114	0.0191
Return on assets	Coeff.	0.1160	0.1380	-0.3250***	-0.0396	0.1000	-0.0581	0.0285	0.1900***	0.2470**
	SE	0.0873	0.0900	0.0529	0.0840	0.0841	0.0677	0.0508	0.0544	0.0990
Company size	Coeff.	0.0089**	0.1290**	-0.0353**	-0.0140	-0.0496**	-0.0425**	0.0002	0.0036	-0.0438
	SE	0.0041	0.0567	0.0145	0.0088	0.0203	0.0176	0.0091	0.0039	0.0269
Constant	Coeff.	-0.1960**	-3.0120**	0.8310**	0.3080*	1.1200***	0.9970**	0.0605	-0.0062	1.1130*
	SE	0.0962	1.3410	0.3270	0.1650	0.4180	0.3940	0.2040	0.0918	0.6150
Observations	-	1.063	199.0000	232.0000	144.0000	25.0000	47.0000	264.0000	104	48
Clusters	-	159.0000	30.0000	35	21.0000	4.0000	7.0000	40.0000	15	7
Chi-squared	-	344.22***	30.34***	1257.61***	22.66***	48.41***	326.80***	9.27	19.58**	1121.16***
R-squared	-	0.436	0.461	0.376	0.448	0.364	0.327	0.283	0.346	0.365
Panel B: Signed discretionary accruals										
Pandemic	Coeff.	-0.0354***	-0.1420**	-0.0245**	-0.0041	-0.0428	-0.0036	-0.0045	-0.0394*	-0.0331
	SE	0.0132	0.0555	0.0124	0.0123	0.0312	0.0123	0.0100	0.0220	0.0253
Return on assets	Coeff.	0.0965	0.1430	0.1850***	0.1430	0.0927	0.0096	0.0714	-0.0736	-0.0167
	SE	0.1120	0.1050	0.0614	0.1250	0.1010	0.1250	0.0641	0.0790	0.1190
Company size	Coeff.	0.0133*	0.1550*	-0.0266	-0.0073	0.0951***	-0.0589*	0.0023	0.0096	0.1050**
	SE	0.0076	0.0871	0.0265	0.0174	0.0258	0.0354	0.0134	0.0073	0.0432
Constant	Coeff.	-0.3100*	-3.6650*	0.5780	0.0944	-1.9990***	1.2930	-0.1060	-0.2800*	-2.5240**
	SE	0.1740	2.0620	0.6030	0.3200	0.5340	0.7960	0.3020	0.1600	0.9920
Observations	-	1.063	199.0000	232.0000	144.0000	25.0000	47.0000	264.0000	104	48
Clusters	-	159.0000	30.0000	35.0000	21.0000	4.0000	7.0000	40.0000	15	7
Chi-squared	-	12.94	820.35***	46.32***	29.83***	34.66***	17.78**	4410.81***	54.08***	38.54***
R-squared	-	0.237	0.243	0.349	0.364	0.538	0.163	0.349	0.414	0.339

Note: Panel-corrected standard errors were used to address heteroskedasticity, serial correlation and cross-sectional correlation (Hoechle 2007).

SE, standard error; Coeff., coefficient.

*, $p < 0.1$; **, $p < 0.05$; ***, $p < 0.01$.

lower threat of reduced performance. Consequently, these managers would have been less likely to engage in risky accounting practices, such as AEM (Kahneman & Tversky 1979). Finally, applying signalling theory, these managers would have had limited need to manipulate earnings through AEM to signal stability or reassure investors (Connelly et al. 2011).

Interestingly, however, is the finding that the technology sector engaged in greater income-decreasing earnings management during the pandemic (although this was only at the 10% significance level). This was unexpected given the minimal impact of the pandemic on advanced technology sectors (He et al. 2020; Shen et al. 2020). In fact, He et al. (2020) and Mazur, Dang and Vega (2021) noted that the pandemic had a positive impact on the technology sector's performance in China and the United States, respectively. However, despite arguments that the technology sector should not have been severely affected by the pandemic, these findings are consistent with those of Lizińska and Czapiewski (2023). One possible explanation for this increase in income-decreasing AEM is that firms' behaviour remained conservative as a result of the uncertainty surrounding the pandemic. From an agency perspective, Lizińska and Czapiewski (2023) argued that technology firms engaged in a 'big bath' strategy, using positive earnings to absorb the income-decreasing AEM, thereby allowing better results in future years when the accruals are reversed. Alternatively, from a signalling theory perspective, the firms may have used income-decreasing AEM to signal caution to investors amid the pandemic's uncertainty.

Consequently, hypothesis 3, that earnings management practices varied across the JSE sectors because of the differing impact of the COVID-19 pandemic, was accepted.

Robustness tests

Various additional tests were conducted to assess the robustness of the results. First of all, Kothari et al. (2005) suggest at least 10 observations per sector per year. This criterion was not met for the energy, telecommunications, and healthcare sectors. Consequently, these sectors were consolidated and tested together. As in the initial tests, no statistical difference was found between pre- and post-pandemic discretionary and absolute discretionary accruals for the combined sectors.

Initially, a normal OLS with no adjustments to standard errors was used to determine the coefficients, and significance was found in the same sectors. With firm and market data, there are potential issues relating to endogeneity, serial and autocorrelation and heteroscedasticity. Without wanting to change the established model, a generalised method of moments (GMM) with White two-way cluster-robust standard errors was also used to estimate the coefficients in the Kothari et al. (2005) regression equation. While endogeneity can never be fully addressed, a GMM with

White two-way cluster-robust error adjustments makes the model more robust against potential regression issues. Based on the revised coefficients, the residual errors were determined. The results, using GMM to determine the betas, were consistent with those documented in Table 3.

Conclusion

This article set out to determine whether the COVID-19 pandemic had an impact on the AEM practices (magnitude and direction) of South African firms listed on the JSE. Specifically, it addressed two questions:

- *How did the COVID-19 pandemic impact the AEM practices of South African JSE-listed firms?*
- *Did the COVID-19 pandemic have an asymmetric impact on the AEM practices of firms in different JSE sectors?*

Using a sample of 159 JSE-listed firms from 2016 to 2022, consistent with agency and prospect theory, the results suggested that South African firms took a 'big bath' and engaged in income-decreasing AEM during the pandemic, potentially to inflate future performance. In addition, the COVID-19 pandemic provided a unique natural experiment in which sector-specific economic turbulence was experienced because of varying regulations. The sector-specific results indicated that the pandemic had varying impacts across the different JSE sectors. While all sectors engaged in income-decreasing AEM during the pandemic, only the differences in the basic materials, consumer discretionary and technology sectors were statistically significant, with the basic materials sector displaying a change in behaviour from income-increasing to income-decreasing AEM. Further, only the consumer discretionary and industrial sectors demonstrated a significant increase in the absolute value of discretionary accruals, indicating a deterioration of earnings quality. Considering an agency and prospect theory perspective, the above-mentioned sectors were more severely affected by the lockdown restrictions and would have faced greater pressure to manipulate earnings. Sectors that did not demonstrate significant changes in AEM practices were typically those less affected by trade restrictions during the COVID-19 pandemic. Under agency and prospect theories, management would have faced less pressure to manipulate earnings and under signalling theory, less need to reassure investors. Notably, the sector analysis highlights the risk of evaluating results at a market level, given asymmetric impacts across sectors, which provide clearer insight into management behaviour.

This study contributes to the literature on earnings management by examining how South African listed firms adjust their AEM behaviour during crises. The JSE is particularly relevant as, although it operates in an emerging market, it is regarded as a world-class stock exchange with strong accounting and reporting governance. While the COVID-19 pandemic represents a period of high economic turbulence, understanding how firms respond under extreme

conditions offers key insights into managerial behaviour and the flexibility afforded under accounting standards. The study is consequently relevant to regulators as it highlights behavioural changes that emerge during crises, thereby helping inform developments in corporate governance and monitoring during such periods. For investors, these results improve the understanding of how firms may temporarily distort their performance during crises. This supports calls for more informed disclosures and interpretations of financial statements, as well as sector-specific issues. Auditors may also find the results useful, as behavioural change information during crisis periods is important for risk management and designing appropriate audit procedures. By making regulators, investors, and auditors aware of potential distortions during crises and by encouraging their incorporation into decision-making, the study indirectly contributes to the efficient allocation of capital. This is particularly relevant in South Africa, where appropriate capital allocation is necessary to address low GDP growth and high unemployment. It is also important as crises and economic turbulence are likely to become more frequent. Finally, this study is also relevant to standard-setters as it reveals the latitude the current standards afford management when preparing financial statements and how that discretion is being utilised.

This study is not without limitations. An inherent limitation of earnings management research is that it cannot be directly observed or measured. Rather, proxies are used to estimate its magnitude. Future research could explore whether alternative models yield consistent results or how the models can be adapted to accommodate sector-specific reporting peculiarities. Another limitation is that this study only investigated AEM, without considering how real earnings management could have complemented or substituted the changes in AEM behaviour. Subsequent studies should consider the joint effects of AEM and real earnings management. Finally, some JSE sectors are small with only a few companies represented. As a result of this, and the unequal representation of sectors in the sample, the results for these sectors should be interpreted with caution.

Of interest, but not explored in this study, is the high income-increasing discretionary accruals observed in 2016. 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. An additional area of research may be to replicate this study in the context of other emerging markets, specifically African markets.

Acknowledgements

This article is based on research originally conducted as part of Asanda Mpumpula master's thesis titled 'The impact of COVID-19 on earnings management: Evidence from South Africa', submitted to the Faculty of Commerce, University of Cape Town in 2025. The thesis was supervised by Carlos de

Jesus. The thesis was reworked, revised, and adapted into a journal article for publication. The original thesis is available at: <https://open.uct.ac.za/items/d2e211c4-a962-4dba-84b2-8e5948635ee5>.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

CRedit authorship contribution

Carlos de Jesus: Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Software, Supervision, Writing – original draft, Writing – review & editing. Asanda Mpumpula: Data curation, Software, Writing – original draft. Alastair Marais: Conceptualisation, Formal analysis, Investigation, Writing – review & editing. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication, and take responsibility for the integrity of its findings.

Funding information

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Data availability

The links to the data that support the findings of this study are available from the corresponding author, Carlos de Jesus, upon reasonable request and in compliance with the data providers' policies.

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References

- Abed, S.S., 2022, 'A literature review exploring the role of technology in business survival during the COVID-19 lockdowns' *International Journal of Organizational Analysis* 30(5), 1045–1062. <https://doi.org/10.1108/IJOA-11-2020-2501>
- Adejumo, A.P. & Ogburie, C.P., 2025, 'Financial statement manipulation: Ethical and regulatory perspectives', *GSC Advanced Research and Reviews* 22(3), 252–264. <https://doi.org/10.30574/gscarr.2025.22.3.0087>
- Ajam, T., 2020, 'More eyes on COVID-19: Perspectives from economics. The economic costs of the pandemic – And its response', *South African Journal of Science* 116(8), 1–2. <https://doi.org/10.17159/sajs.2020/8490>
- Akande, J.O., 2025, 'Sentiments, COVID-19, and the motivations for pro-forma earnings management in South Africa', *International Journal of Applied Economics, Finance and Accounting* 21(1), 28–41. <https://doi.org/10.33094/ijaefa.v21i1.2043>
- Ali, H., Amin, H.M.G., Mostafa, D. & Mohamed, E.K.A., 2022, 'Earnings management and investor protection during the COVID-19 pandemic: Evidence from G-12 countries', *Managerial Auditing Journal* 37(7), 775–797. <https://doi.org/10.1108/MAJ-07-2021-3232>
- Aljughaiman, A.A., Nguyen, T.H., Trinh, V.Q. & Du, A., 2023, 'The COVID-19 outbreak, corporate financial distress and earnings management', *International Review of Financial Analysis* 88, 1–13. <https://doi.org/10.1016/j.irfa.2023.102675>

- Barton, F.J., Sheneman, A.G. & Siriviriakul, S., 2025, *The impact of COVID-19 lockdowns on financial reporting behavior*, Social Science Research Network, viewed 20 November 2025, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5183797.
- Boujelben, S. & Kobbi-Fakhfakh, S., 2020, 'Compliance with IFRS 15 mandatory disclosures: An exploratory study in telecom and construction sectors', *Journal of Financial Reporting and Accounting* 18(4), 707–728. <https://doi.org/10.1108/JFRA-10-2019-0137>
- Chakroun, S., Ben Amar, A. & Ben Amar, A., 2022, 'Earnings management, financial performance and the moderating effect of corporate social responsibility: Evidence from France', *Management Research Review* 45(3), 331–362. <https://doi.org/10.1108/MRR-02-2021-0126>
- Chia, Y.M., Lapsley, I. & Lee, H.W., 2007, 'Choice of auditors and earnings management during the Asian financial crisis', *Managerial Auditing Journal* 22(2), 177–196. <https://doi.org/10.1108/02686900710718672>
- Cimini, R., 2015, 'How has the financial crisis affected earnings management? A European study', *Applied Economics* 47(3), 302–317. <https://doi.org/10.1080/00036846.2014.969828>
- Connelly, B.L., Certo, S.T., Ireland, R.D. & Reutzel, C.R., 2011, 'Signaling theory: A review and assessment', *Journal of Management* 37(1), 39–67. <https://doi.org/10.1177/0149206310388419>
- Da Silva, A.F., Weffort, E.F.J., Flores, E.D.S. & Da Silva, G.P., 2014, 'Earnings management and economic crises in the Brazilian capital market', *RAE Revista de Administração de Empresas* 54(3), 268–283. <https://doi.org/10.1590/S0034-759020140303>
- Daily Maverick, 2020, 'Amazing: The JSE is now up for the year 2020', viewed 28 November 2023, from <https://www.dailymaverick.co.za/article/2020-08-12-amazing-the-jse-is-now-up-for-the-year-2020/>.
- Davies, T., 2022, 'Unicorn sightings: The corporate moral apology in South Africa', in M. Judge & D. Smythe (eds.), *Unsettling apologies: Critical writings on apology from South Africa*, pp. 221–245, Bristol University Press, Bristol.
- Eloff, A.M. & Steenkamp, S., 2022, 'Integrated report quality and earnings management – Evidence from South Africa', *South African Journal of Economic and Management Sciences* 25(1), 1–10. <https://doi.org/10.4102/sajems.v25i1.4581>
- Filipović, I., Bartulović, M. & Šušak, T., 2022, 'Earnings management and dividend payments during the COVID-19 pandemic', *Interdisciplinary Description of Complex Systems* 20(5), 590–605. <https://doi.org/10.7906/indcs.20.5.6>
- Garfatta, R., Hamza, M. & Zorgati, I., 2023, 'COVID-19 outbreak and earnings management practice: Case of Tunisia', *Asian Journal of Accounting Research* 8(3), 307–318. <https://doi.org/10.1108/AJAR-04-2022-0129>
- Gbadebo, A.D., 2023, 'Does the international financial reporting standard impact earnings management of the JSE firms?', *Jurnal Dinamika Akuntansi* 15(1), 99–115. <https://doi.org/10.15294/jda.v15i2.44096>
- Gkeredakis, M., Lifshitz-Assaf, H. & Barrett, M., 2021, 'Crisis as opportunity, disruption and exposure: Exploring emergent responses to crisis through digital technology', *Information and Organization* 31(1), 1–12. <https://doi.org/10.1016/j.infoandorg.2021.100344>
- Grimaldi, F., 2019, 'The relationship between financial crisis and earnings management: Some evidence from the Italian context', *Corporate Ownership and Control* 17(1), 325–335. <https://doi.org/10.22495/cocv17i1sart13>
- Guo, M., Luo, D. & Liu, C., 2025, 'Opportunism in crisis: Big baths and COVID-19 disclosure', *International Review of Financial Analysis* 102, 1–15. <https://doi.org/10.1016/j.irfa.2025.104134>
- He, P., Sun, Y., Zhang, Y. & Li, T., 2020, 'COVID-19's impact on stock prices across different sectors – An event study based on the Chinese stock market', *Emerging Markets Finance and Trade* 56(10), 2198–2212. <https://doi.org/10.1080/1540496X.2020.1785865>
- Healy, P.M. & Wahlen, J.M., 1999, 'A review of the earnings management literature and its implications for standard setting', *American Accounting Association Accounting Horizons* 13(4), 365–383. <https://doi.org/10.2308/acch.1999.13.4.365>
- Hoechle, D., 2007, 'Robust standard errors for panel regressions with cross-sectional dependence', *The Stata Journal* 7(3), 281–312. <https://doi.org/10.1177/1536867X0700700301>
- Hussein, M.H., Swai, J.P. & Nathanael, A.C., 2025, 'COVID-19's effects on inward foreign direct investment and earnings management in Southern Africa's development community', *Disclosure: Journal of Accounting and Finance* 5(1), 94–112. <https://doi.org/10.29240/disclosure.v5i1.11773>
- International Accounting Standards Board, 2025a, *Conceptual framework for financial reporting*, International Financial Reporting Standards, viewed 21 August 2025, from <https://www.ifrs.org/issued-standards/list-of-standards/conceptual-framework/>.
- International Accounting Standards Board, 2025b, *IFRS18 presentation and disclosure in financial statements*, International Financial Reporting Standards, viewed 21 August 2025, from <https://www.ifrs.org/issued-standards/list-of-standards/ifrs-18-presentation-and-disclosure-in-financial-statements.html/content/dam/ifrs/publications/html-standards/english/2025/issued/ifrs18/>.
- Jensen, M.C. & Meckling, W.H., 1976, 'Theory of the firm: Managerial behavior, agency costs and ownership structure', *Journal of Financial Economics* 3(4), 305–360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Jordaan, L.A., De Klerk, M. & De Villiers, C.J., 2018, 'Corporate social responsibility and earnings management of South African companies', *South African Journal of Economic and Management Sciences* 21(1), 1–13. <https://doi.org/10.4102/sajems.v21i1.1849>
- Jordan, C.E., Clark, S.J. & Waldron, M.A., 2021, 'Testing for earnings management in the U.S. amid the COVID-19 pandemic', *Journal of Applied Business and Economics* 23(5), 1–10. <https://doi.org/10.33423/jabe.v23i5.4559>
- Jowitz, S.M., 2020, 'COVID-19 and the Global Mining Industry', *SEG Discovery* 122, 33–41. <https://doi.org/10.5382/SEGnews.2020-122.fea-02>
- Kahneman, D. & Tversky, A., 1979, 'Prospect theory: An analysis of decision under risk', *Econometrica* 47(2), 263–291. <https://doi.org/10.2307/1914185>
- Kothari, S.P., Leone, A.J. & Wasley, C.E., 2005, 'Performance matched discretionary accrual measures', *Journal of Accounting and Economics* 39(1), 163–197. <https://doi.org/10.1016/j.jacceco.2004.11.002>
- Kumar, M. & Vij, M., 2017, 'Earnings management and financial crisis: Evidence from India', *Journal of International Business and Economy* 18(2), 84–101. <https://doi.org/10.51240/jibe.2017.2.4>
- Lassoued, N. & Khanchel, I., 2021, 'Impact of COVID-19 pandemic on earnings management: An evidence from financial reporting in European firms', *Global Business Review* 26(5), 097215092110534. <https://doi.org/10.1177/09721509211053491>
- Leuz, C., Nanda, D. & Wysocki, P.D., 2003, 'Earnings management and investor protection: An international comparison', *Journal of Financial Economics* 69(3), 505–527. [https://doi.org/10.1016/S0304-405X\(03\)00121-1](https://doi.org/10.1016/S0304-405X(03)00121-1)
- Li, X.Y. & Chen, P.W., 2020, 'Meeting dividend thresholds through earnings management of listed companies in South Africa', *Advances in Management and Applied Economics* 10(6), 1–5. <https://doi.org/10.47260/amae/1065>
- Li, Z., Hsu, Y.T. & Gao, X., 2020, 'How does real earnings management respond to the 2007–2008 financial crisis?', *Pacific Accounting Review* 32(4), 495–517. <https://doi.org/10.1108/PAR-09-2019-0119>
- Liang, B., 2022, 'The impact of COVID-19 on earnings management of listed companies', *Journal of Simulation* 10(2), 53–60.
- Lin, S., Pownall, G., Sawani, A. & Wang, C., 2025, 'The effect of the FASB-IASB convergence project on the rules-and principles-based nature of US GAAP and IFRS', *Review of Accounting Studies* 30(2), 1500–1542. <https://doi.org/10.1007/s11142-024-09851-7>
- Liu, G. & Sun, J., 2022, 'The impact of COVID-19 pandemic on earnings management and the value relevance of earnings: US evidence', *Managerial Auditing Journal* 37(7), 850–868. <https://doi.org/10.1108/MAJ-05-2021-3149>
- Lizińska, J. & Czapiewski, L., 2023, 'Earnings management amid the COVID-19 financial crisis: The experience of Poland', *Gospodarka Narodowa* 313(1), 93–112. <https://doi.org/10.33119/GN/159032>
- Marais, C., Marais, A., Essa, S. & Doorasamy, M., 2025, 'Environmental, social, and governance and accrual-based earnings management: The South African perspective', *African Journal of Business and Economic Research* 20(2), 239–258.
- Mazur, M., Dang, M. & Vega, M., 2021, 'COVID-19 and the March 2020 stock market crash. Evidence from S&P1500', *Finance Research Letters* 38, 1–8. <https://doi.org/10.1016/j.frl.2020.101690>
- Mlawu, L., Matenda, F.R. & Sibanda, M., 2023, 'Do abnormal accruals influence abnormal tone in the CEO statements of the top 40 JSE-listed companies?', *International Journal of Research in Business & Social Science* 12(8), 247–260. <https://doi.org/10.20525/ijrbs.v12i8.2768>
- Muthu, K. & Wesson, N., 2023, 'The impact of COVID-19 on company performance per industry sector: Evidence from South Africa', *Journal of Economic and Financial Sciences*, 16(1), a801. <https://doi.org/10.4102/jef.v16i1.801>
- Pududu, M.L. & De Villiers, C., 2016, 'Earnings management through loss avoidance: Does South Africa have a good story to tell?', *South African Journal of Economic and Management Sciences* 19(1), 18–34. <https://doi.org/10.4102/sajems.v19i1.1124>
- Ryu, H. & Chae, S.J., 2022, 'The impact of COVID-19 on earnings management in the distribution and service industries', *Journal of Distribution Science* 20(4), 95–100.
- Saleh, N.M. & Ahmed, K., 2005, 'Earnings management of distressed firms during debt renegotiation', *Accounting and Business Research* 35(1), 69–86. <https://doi.org/10.1080/00014788.2005.9729663>
- Sellami, Y. & Slimi, I., 2016, 'The effect of the mandatory adoption of IAS/IFRS on earnings management: Empirical evidence from South Africa', *International Journal of Accounting and Economics Studies* 4(2), 87–95. <https://doi.org/10.14419/ijaes.v4i2.6121>
- Shen, H., Fu, M., Pan, H., Yu, Z. & Chen, Y., 2020, 'The impact of the COVID-19 pandemic on firm performance', *Emerging Markets Finance and Trade* 56(10), 2213–2230. <https://doi.org/10.1080/1540496X.2020.1785863>
- Statistics South Africa, 2025a, *GDP growth subdued in the first quarter*, viewed 24 August 2025, from <https://www.statssa.gov.za/?p=18475>.
- Statistics South Africa, 2025b, *Statistics South Africa on quarterly labour force survey (QLFS) – Q1: 2025*, viewed 24 August 2025, from <https://www.gov.za/news/media-statements/statistics-south-africa-quarterly-labour-force-survey-qlfs-%E2%80%93q1-2025-13-may>.
- Steytler, N. & De Visser, J., 2022, 'South Africa's response to COVID-19: The multilevel government dynamic', in R. Chattopadhyay, F. Knüpling, D. Chebenova, L. Whittington & P. Gonzalez (eds.), *Federalism and the response to COVID-19: A comparative analysis*, pp. 200–207, Routledge, London.
- Swai, J.P. & Derefa, M.J., 2024, 'COVID-19 pandemic and earnings management: Evidence from non-financial firms in Tanzania and Kenya', *NG-Journal of Social Development* 14(1), 121–134. <https://doi.org/10.4314/ngjds.v14i1.9>
- Toume, A.A. & Yahya, S., 2019, 'A review of earnings management techniques: An IFRS perspective', *Global Business and Management Research: An International Journal* 11(3), 1–13.
- Türeğün, N., 2020, 'Does financial crisis impact earnings management? Evidence from Turkey', *Journal of Corporate Accounting and Finance* 31(1), 64–71. <https://doi.org/10.1002/jcaf.22418>
- Xiao, H. & Xi, J., 2021, 'The COVID-19 and earnings management: China's evidence', *Journal of Accounting and Taxation* 13(2), 59–77.
- Yalla, B., Ateke, G.N. & Makotore, P., 2024, 'Statistical characteristics of markets: The case of the Johannesburg Stock Exchange (JSE)', *Journal of Investment, Banking and Finance* 2(1), 1–12. <https://doi.org/10.33140/JIBF.02.01.01>
- Yan, H., Liu, Z., Wang, H., Zhang, X. & Zheng, X., 2022, 'How does the COVID-19 affect earnings management: Empirical evidence from China', *Research in International Business and Finance* 63, 1–13. <https://doi.org/10.1016/j.ribaf.2022.101772>