



Boujelbene, N. & Hadriche, M. (2026). Reflecting Earnings Quality and Earnings Smoothness in Integrated Reporting: Evidence from Companies Listed on the Johannesburg Stock Exchange. *Copernican Journal of Finance & Accounting*, 15(1), 47–65. <http://dx.doi.org/10.12775/CJFA.2026.003>

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REFLECTING EARNINGS QUALITY AND EARNINGS SMOOTHNESS IN INTEGRATED REPORTING: EVIDENCE FROM COMPANIES LISTED ON THE JOHANNESBURG STOCK EXCHANGE

Keywords: integrated reporting quality, earnings quality, earnings smoothness, COVID-19.

J E L Classification: M40, M41, M49.

Abstract: This paper examines the relationship between Integrated Reporting Quality (IRQ) and both earnings quality and earnings smoothness of Johannesburg Stock Exchange (JSE) listed companies during the period 2012–2024. We also investigate the impact of the COVID-19 pandemic and its moderating role in this relationship. Our analysis shows a statistically significant association between IRQ and earnings quality,

Received: 19.01.2026; Accepted: 14.04.2026; Published: 17.09.2026.

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as measured by accrual quality and earnings smoothness. The COVID-19 variable has no significant direct effect on earnings quality but is weakly associated with earnings smoothness. The interaction effect between COVID-19 and integrated reporting quality is generally insignificant, except for a weak positive effect on accrual quality at the 10% level. This paper contributes to the literature by extending the analysis to a longer time horizon, highlighting the role of integrated reporting in crisis period and providing key insights into supporting more informed resource allocation decisions by investors.

■■■ INTRODUCTION

Over the past two decades, the global corporate reporting landscape has undergone a significant transformation, driven by the growing demand for transparency, accountability, and sustainable business practices. As a most recent development of reporting model, integrated reporting (IR) has emerged as a comprehensive framework aimed at enhancing the quality of corporate disclosures by combining financial data with environmental, social, and governance (ESG) information. The goal of IR is to provide a holistic view of an organization's strategy, performance, and value creation over time (Sofian & Dumitru, 2017; Minh, Anh, Thanh & Van, 2025). One of the critical questions that arise in this context is the impact of integrated reporting on the quality of earnings. By fostering greater transparency, accountability, and connectivity of information, IR can enhance earnings quality by reducing information asymmetry, discouraging earnings manipulation, and aligning managerial decisions with long-term stakeholder interests (Shittu, Alagbe & Jimoh, 2023).

Existing research on IR has primarily focused on determinants of IR adoption, including firm size, industry characteristics, ownership structure, and market factors (Barth, Cahan, Chen & Venter, 2017; Leukhardt, Charifzadeh & Diefenbach 2022). However, relatively few studies investigated the association between earnings quality (measured by the magnitude of discretionary accruals) and integrated reporting (Pavlopoulos, Magnis & Iatridis, 2017; Meligy & Alain, 2020, Darminto, Lysandra, Mulyadi & Ahmar, 2024).

This study investigated the relationship between Integrated Reporting Quality (IRQ) and earnings quality of Johannesburg Stock Exchange (JSE) listed companies during the period 2012–2024. The earnings quality considered include Accrual Quality and Earnings Smoothness. Our analysis shows a statistically significant association between IRQ and earnings quality, as measured by accrual quality and earnings smoothness. These findings imply that quality of IR in the South Africa context is probably due to earnings quality.

Our study makes the following contributions to the accounting literature. First, our study focused in a South African setting where IR are mandated. Second, unlike the studies analyzing the economic consequences of the adoption of IR (Bernardi & Stark, 2018; Zúñiga, Pincheira, Walker & Turner, 2020; Rossignoli, Stacchezzini & Lai, 2022), we are interested in a more direct effect, which is the accounting quality information. Finally, most of prior literature that has addressed the effect of IR on earnings quality has been limited to estimating the quality of earnings by two or three attributes in voluntary context, except the study of Eloff and Steenkamp (2022). Eloff and Steenkamp (2022) investigated the association between the IRQ and earnings management (measured by the magnitude of discretionary accruals) in a South African sample of companies. Therefore, most previous studies examine the effect of IR on earnings management measured by the magnitude of discretionary accruals.

The remainder of this paper is structured as follows. In section 2, we describe the literature and hypothesis development. Section 3 discusses the methodology. Results and discussions are presented in section 4, and finally, we conclude the paper in section 5.

RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

Earnings quality (EQ) refers to the degree to which reported earnings accurately reflect a firm's underlying economic performance and can reliably predict future earnings (Francis, Khurana & Pereira, 2005; Dechow, Ge & Schrand, 2010; Khunkaew & Qingxiang, 2019). Several dimensions are commonly used to assess earnings quality (Francis et al., 2005). Accruals refer to the non-cash components of earnings that are based on managerial judgment and estimation. Earnings smoothing is an indicator of earnings management that allows managers to reduce the variability of net income from different reporting periods. High earnings quality reduces the likelihood of manipulation and ensures that financial statements reflect the actual performance of the company. IR represents an evolution in corporate reporting, combining financial and non-financial information into a single, cohesive report that communicates how an organization creates value over time (IIRC, 2013). It aims to improve transparency, provides a holistic view of organizational performance, and better align corporate reporting with stakeholder needs. Greater transparency and more detailed reporting enhance the ability of boards and shareholders to effectively

oversee managerial performance and governance, reducing the risk of managerial opportunism (Jensen & Meckling, 1998; Obeng, Ahmed & Cahan, 2021; Wahl, Charifzadeh & Diefenbach, 2020).

According to Signaling Theory (Spence, 2002), IR not only provides a comprehensive view of a company's financial and non-financial performance but also enhances the clarity and relevance of the information disclosed. Consequently, firms with high IRQ are more likely to produce reliable and sustainable earnings that reflect their true economic performance. This signaling reduces uncertainty, improves investor confidence, and is associated with higher earnings quality due to reduced incentives for earnings management. The literature provides mixed evidence on the relation between IR and earnings quality during periods of economic uncertainty. Flores, Weffort, Silva and Carvalho (2016) find that firms in Brazil and the USA are more likely to engage in earnings management during macroeconomic crises. However, Fonou-Dombeu, Nomlala and Nyide (2023) report mixed results during the COVID-19 period, finding no strong evidence of earnings manipulation or increased accounting conservatism. Herlambang and Faisal (2022) found that the implementation and the quality of IR has a significant negative effect on earnings quality of mining companies in Indonesia Stock Exchange. On the other hand, Zaro, Araujo and Zaro (2024) use a panel data model based on 630 observations of non-financial Brazilian firms (2017–2020), with integrated reporting data collected manually from corporate disclosures. Their findings show that higher-quality integrated reporting is associated with better earnings quality, suggesting greater transparency and reduced short-term reporting pressure. Pavlopoulos, Magnis and Iatridis (2019), as well as Obeng, Ahmed and Miglani (2020), argue that voluntary IR adoption is associated with a reduction in earnings smoothing. Most of prior literature has addressed the effect of IR on earnings quality in voluntary context. An exception is the study by Eloff and Steenkamp (2022), which identified a negative relationship between earnings management, measured through income-increasing accruals and IRQ among JSE-listed firms. Similarly, Zúñiga et al. (2020) reported that high IRQ contributes to improved earnings predictability and lower analyst forecast errors.

According to empirical research results, we assume that IR can be as a proxy to control earnings quality (Francis et al., 2008; Pavlopoulos et al., 2017; Pamungkas, Firmansyah, Qadri, Dinarjito & Arfiansyah, 2021; Darminto et al., 2024). Therefore, investigating the relationship between IRQ and earnings quality in JSE listed firms is crucial for shareholders, policymakers, and

managers, as it has a direct effect on the firms' stock value. Thus, we propose the following hypotheses:

H1: There is a positive relationship between integrated reporting quality and earnings quality.

H2: Higher integrated reporting quality is associated with lower levels of earnings smoothing.

THE RESEARCH METHODOLOGY AND THE COURSE OF THE RESEARCH PROCESS

Data and Sample

The initial sample included 100 listed firms in JSE for the period 2012–2024. Then, we exclude firms in the financial sector and firms with missing data. We obtain the data concerning the remaining variables from Datastream and hand-collection for IR data. Table 1 presents the sample distribution.

Table 1. Sample Selection

	AQ	IS
	Firms-years	Firms-years
EY observations	1300	1300
Less Financial Firms	(403)	(403)
Less Missing data	(585)	(518)
Final Sample	312	379

Source: own study.

Model Specification

We investigate the impact of IRQ on accruals quality (AQ) and earning smoothness by estimating the following models, respectively:

$$\begin{aligned}
 AQ_{it} = & \alpha_0 + \alpha_1 IRQ_{it} + \alpha_2 COVID_{it} + \alpha_3 COVID * IRQ_{it} + \alpha_4 SIZE_{it} + \alpha_5 BIG4_{it} + \alpha_6 ROE_{it} \\
 & + \alpha_7 GROWTH_{it} + \alpha_8 LEV_{it} + \gamma_j \sum_{j=1}^{11} year + n_k \sum_{k=1}^8 Industry + \varepsilon_{it} \quad (1)
 \end{aligned}$$

$$IS_{it} = \alpha_0 + \alpha_1 IRQ_{it} + \alpha_2 COVID_{it} + \alpha_3 COVID * IRQ_{it} + \alpha_4 SIZE_{it} + \alpha_5 BIG4_{it} + \alpha_6 ROA_{it} \\ + \alpha_7 GROWTH_{it} + \alpha_8 LEV_{it} + \gamma_j \sum_{j=1}^{11} year + n_k \sum_{k=1}^8 Industry + \varepsilon_{it} \quad (2)$$

The definitions of the variables in the above-mentioned models are outlined in table 2. All continuous variables are winsorized at the first and 99th percentiles.

Variables' Measurement

Measure of Earnings Quality

Our measure of accruals quality is based on the Dechow and Dichev (2002) model (DD model), as modified by McNichols (2002). Consistent with prior studies, accruals quality are calculated from the standard deviations of residuals computed from the following cross-sectional regression relating total current accruals (TCA) to cash flows (CFO):

$$TCA_{it} = \alpha_1 CFO_{it-1} + \alpha_2 CFO_{it} + \alpha_3 CFO_{it+1} + \alpha_4 \Delta REV_{it} + \alpha_5 PPE_{it} + \varepsilon_{it} \quad (3)$$

Where: Total current accruals (TCA) for firm *i* in year *t* are calculated as the change in current assets (ΔCA) minus the change in current liabilities (ΔCL), minus the change in cash and cash equivalents ($\Delta CASH$), plus the change in short-term debt (STD):

$TCA_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta CASH_{it} + \Delta STD_{it}$; CFO is cash flows from operations in year; NI is net income in year *t*; ACC= Total accruals at the end of year *t* ($ACC = NI - CFO$); PPE is net properties, plant and equipment at the end of year *t*; ΔREV is the change in revenue from prior to current year. All variables are standardized by total assets at the beginning of year *t*.

Measure of Earnings Smoothness

Earnings Smoothness: Consistent with prior studies, we use the ratio of the standard deviation of operating income to the standard deviation of operating cash flows, with both measures are scaled by total assets (Barth, Landsman

& Lang, 2008). Lower values of this ratio indicate more transparent and less manipulated earnings figures.

Table 2. Variable Definitions

Variables	Definition
NI	Net income in fiscal year t.
CFO	Cash flows from operations in fiscal year t.
ACC	The difference between net income and total cash flow at the end of fiscal year t (NI-CFO).
TCA	Total accruals in period t for firm i calculated as the total current accruals during year t standardized by total assets at the end of fiscal year t.
TA	The total assets for company i at year t-1.
AQ	Accruals Quality for company i at year t.
IS	Income smoothness is measured as the ratio of the standard deviation of operating income to the standard deviation of operating cash flows, with both measures are scaled by total assets.
PPE	Net properties, plant and equipment at the end of year t.
ΔREV	The change in revenue in year t from year t-1.
IRQ	It is measured by a score between 1 and 5 (EY, 2020).
SIZE	Natural logarithm of total assets of the company at financial year-end.
LEV	Leverage calculated as the ratio of total debt at the end of fiscal year t to the sum of total debt and the book value of common shareholders' equity during year t.
ROA	Return on Assets calculated as net income for year t divided by total assets at the beginning of the year.
COVID	A dummy variable that equals 1 if an observation falls within the pandemic period 2020–2021 and 0 otherwise.
GROWTH	As measured by the annual percentage change in sales in year t from year t-1.

Source: own elaboration.

Measure of IRQ and COVID

The independent variable IRQ is measured using the annual *EY Excellence in IR Awards* scores (Omran et al., 2020; Barth et al., 2017). EY awards have five categories: Top 10, Excellent, Good, Average, and Progress to be made score 5, 4, 3, 2, 1, respectively.

To examine the effect of the COVID-19 pandemic, a dummy variable (COVID) is introduced, taking the value of 1 for the years 2020–2021 and 0 otherwise.

Control Variables

Based on prior literature, we include Firm size (SIZE), sales growth (GROWTH), profitability (ROA), the level of debt (LEV), and audit quality (BIG4). Finally, we also control year and industry effects.

EMPIRICAL RESULTS

Descriptive Statistics

Table 3 shows the overall descriptive statistics of the combined data for all the firms. Net Income (NI) has a mean of 0.0541, indicating that, on average, firms report a small positive level of net income. The standard deviation of 0.094 reflects a moderate dispersion around the mean, suggesting noticeable variation in profitability across firms. The minimum value (-0.287) indicates that some firms experience substantial losses, while the maximum value (0.519) shows that certain firms achieve relatively high profitability. The mean total accruals (total current accruals) is equal to -6% (-2.6%) and its values range from -46.34% (-50.2%) to 35.4% (31.1%) with a standard deviation of 8% (6.5%).

Table 3. Descriptive Statistics

Variables	Mean	Std. dev	Min	Median	Max
Panel A: Test Variables					
NI	.0541	0.0939	-.287	.0455	.5192
ACC	-.0609	0.0821	-.4634	-.0577	.3543
TCA	-.0265	0.0654	-.5024	-.0218	.3106
IRQ	2.9895	1.2388	1	3	5
Panel B: Control variables					
SIZE	17.1717	1.1402	12.2061	17.1851	20.2895
LEV	.3413	0.2307	0	.3469	1

Table 3. Descriptive...

Variables	Mean	Std. dev	Min	Median	Max
GROWTH	.1983	0.4883	-.9756	.1063	4.7692
ROA	7.2132	9.6315	-30.77	6.56	35.89
Panel C: Dummy variables					
Variables	Percent of dummy = 1				
BIG4	92.42%				
COVID	15.38%				

Note(s): all variables are detailed in table 2.

Source: own elaboration.

For the control variables, we note that the average size is equal to 17.17 with a maximum of 20.289 and a minimum of 12.206, which implies that these firms studied are large. The analysis of other ratios reveals that the average profitability (ROA) is equal to 7.213 and its values range from -30.77 to 35.89 with a standard deviation of 9.6315. The average sales growth is 0.205 with a standard deviation of 0.526. The analysis also reveals the importance of growth opportunities with a mean that amounts to 72.3%.

Following Eloff and Steenkamp (2022), the average of IRQ is 2.98, which means that the average annual quality of integrated reports is between average and good.

Correlation Matrix

Table 4 reports estimates of the Pearson's correlation matrix between all company variables. The correlation between among independent variables are below 0.9 (Hair, 2011), which may indicate no problem of multicollinearity. Table 4 reveals that AQ is negatively associated with IRQ at the 1% level, which indicates that firms with higher IRQ have lower earnings management. Regarding earnings smoothness, there is a statistically insignificant positive association between IS and IRQ. The results indicate a positive but statistically insignificant relationship between the COVID-19 variable and both income smoothing and accrual quality. This suggests that no bivariate relationship between COVID-19 and earnings management proxies.

Regression Results

Table 5 presents the regression of earnings management on IRQ. We show that the coefficient on IRQ is negative and significantly different from zero when earnings management are measured by accruals quality and earnings smoothness, which ultimately assures that firms with higher IRQ engage in less earnings management, indicating a higher earnings quality. Therefore, less earnings smoothness could imply that companies with high IRQ are not manipulating its financial statements to reduce fluctuations, which is a sign of greater transparency and better earnings quality.

These results are consistent with those of Zaro et al. (2024), who studied Brazilian firms. Similar evidence is reported by Eloff and Steenkamp (2022) and Bonareri, Cheboi and Bonuke (2022), where earnings quality is assessed using the magnitude of discretionary accruals. A possible explanation for these results might indicate that companies with high IRQ have become more efficient and producing higher-quality accounting information as a result of the legislative framework's required implementation of IR in South Africa. By providing a comprehensive view of a company's performance including financial and non-financial information, IR can serve as an additional monitoring tool that helps stakeholders mitigate opportunistic management behavior associated with earnings manipulation, while enabling stakeholders to make informed decisions and ensuring a "true and fair" representation of earnings.

The analysis results show that the coefficient corresponding to the covid_19 (COVID) is positive but the relationship seems insignificant, indicating that although earnings quality appears to decline during the pandemic period, this relationship is not statistically reliable. This is similar to the results of Flores et al. (2016), which indicate that Brazilian firms tend to increase earnings management during periods of crisis in order to maintain investor confidence and avoid excessively high interest rates. However, we report a negative and significant coefficient for earnings smoothness during COVID-19 at 10% level, suggesting weak but not strong evidence of reduced income smoothing behavior.

Table 4. Pearson Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) AQ	1.0000								
(2) IS	-0.18*	1.0000							
(3) IRQ	-0.30*	0.0500	1.0000						
(4) COVID	0.0700	0.0000	0.0000	1.0000					
(5) SIZE	-0.34*	0.39*	0.21*	0.0700	1.0000				
(6) LEV	0.0300	-0.11*	-0.0400	0.14*	0.21*	1.0000			
(7) GROWTH	0.0700	-0.0700	0.0200	-0.0100	-0.0100	-0.0700	1.0000		
(8) ROA	-0.10*	-0.24*	0.0400	-0.12*	-0.16*	-0.31*	-0.0200	1.0000	
(9) BIG4	-0.0200	0.08*	0.08*	0.0000	0.18*	0.0100	0.0400	-0.0400	1.0000

Notes: all variables are defined in table 2. * indicates significance at the 5% and 1% level.

Source: own elaboration.

Table 5. Regression of Earnings Quality and Earnings Smoothness on IRQ

	AQ	IS
IRQ	-0.0009***	-0.102*
	(0.0001)	(0.0589)
COVID	0.0001	-0.7064**
	(0.0009)	(0.3255)
SIZE	-0.0021***	0.9509***
	(0.0002)	(0.0825)
LEV	0.0051***	-2.8067***
	(0.0011)	(0.4499)
GROWTH	0.0006*	-0.3544**
	(0.0004)	(0.1638)
ROA	-0.0001**	-0.0171**
	(0)	(0.0084)
BIG4	-0.0002	-1.7762**
	(0.002)	(0.9007)
Industry	yes	yes
Year	yes	yes
Constant	0.8486***	-10.359***
	(0.0041)	(1.6311)
N	312	379
Wald chi2 (28)	264.51***	246.30***

Notes: all variables are defined in table 2. *, **, *** significant at 1, 5, and 10 percent levels, respectively. Standard errors are in parentheses.

Source: own elaboration.

Concerning control variables, we show that firm size (SIZE) and profitability (ROA) have a significant negative effect on AQ, indicating that larger and more profitable firms tend to have lower earnings management. The results are consistent with those of Obeng et al. (2020) and Bonareri et al. (2022). We also report a positive coefficients of leverage (LEV) and growth, implying that

firms with higher debt levels and stronger growth opportunities tend to produce less reliable accrual estimates.

Table 5 also provides the effect of the control variables on income smoothness. GROWTH, LEV, ROA, and BIG4 (SIZE) are negatively (positively) associated with income smoothness, indicating that firms with stronger financial performance, higher leverage, and Big Four auditors tend to engage less in income smoothing practices. However, larger firms tend to engage more in income smoothing practices compared to smaller firms.

Additional Analyses

To ensure the robustness of our primary findings, we examine the robustness of the relationship between integrated reporting quality and earnings quality as well as income smoothness, an additional analysis is conducted by incorporating an interaction term between COVID-19 and integrated reporting quality (COVID $\times$ IRQ).

Table 6 displays results related to moderate relationship between IRQ and COVID_19. The coefficient of integrated reporting quality (IRQ) is negative and highly statistically significant ($\beta = -0.0009$, $p < 0.01$). This indicates that higher integrated reporting quality is associated with lower levels of earnings management.

Table 6. Regression of Earnings Quality and Earnings Smoothness on IRQ and COVID_19

	AQ	IS
IRQ	-.0009*** (.0002)	-.0991* (.0616)
COVID	-.0019 (.0014)	-.9874* (.5592)
COVID*IRQ	.0007* (.0004)	.0702 (.1434)
SIZE	-.0021*** (.0002)	.9223*** (.082)
LEV	.0055***	-2.7884***

Table 6. Regression...

	AQ	IS
	(.001)	(.4197)
GROWTH	.0007**	-.3541**
	(.0004)	(.1609)
ROE	0**	-.0138***
	(0)	(.0039)
BIG4	0	-1.7331*
	(.002)	(.8904)
Industry	yes	yes
Year	yes	yes
Constant	.8486***	-9.8974***
	(.0041)	(1.6311)
N	312	379
Wald chi2 (28)	271.52***	260.56***

Notes: all variables are defined in table 2. *, **, *** significant at 1, 5, and 10 percent levels, respectively. Standard errors are in parentheses.

Source: own elaboration.

The coefficient of the COVID variable is negative but statistically insignificant ($\beta = -0.0019$), suggesting that earnings management appears to decline during the pandemic period, the effect is not statistically reliable. Overall, the results indicate that integrated reporting quality has a strong and robust positive effect on accrual quality. While the COVID-19 pandemic does not have a direct statistically significant effect. However, the interaction term between COVID-19 and integrated reporting quality is positive and statistically significant at the 10% level ($\beta = 0.0007$, $p < 0.10$). This suggests that the COVID-19 pandemic does not significantly moderate the relationship between integrated reporting quality and earnings quality (or income smoothness). This indicates that high-quality reporting systems may become marginally more relevant in maintaining earnings quality during the pandemic period.

■■■ CONCLUSION

This paper examines the relationship between Integrated Reporting Quality (IRQ) and both earnings quality and earnings smoothness of Johannesburg Stock Exchange (JSE) listed companies during the period 2012–2024. We also investigate the impact of the COVID-19 pandemic and its moderating role in this relationship. Our analysis shows a statistically significant association between IRQ and earnings quality, as measured by accrual quality and earnings smoothness. The COVID-19 variable has no significant direct effect on earnings quality but is weakly associated with earnings smoothness. The interaction effect between COVID-19 and integrated reporting quality is generally insignificant, except for a weak positive effect on accrual quality at the 10% level. These findings are consistent with previous studies in voluntary context emerging markets (Eloff & Steenkamp, 2022; Bonareri et al., 2022; Zaro et al., 2024). These results also complement research examining economic consequences of IRQ (Barth et al., 2017; Zúñiga et al., 2020; Boujelben, Hadriche & Makni Fourati, 2024) and other aspects of accounting quality (Loprevite, Rupo & Ricca, 2018; Cooray, Senaratne, Gunarathne, Herath & Samudrage, 2020).

Our findings have important implications for researchers, investors, policymakers, and regulators. Our results offer valuable insights for investors and policymakers, supporting more informed resource allocation decisions by investors, providing stakeholders with more reliable and comprehensive information and guide policymakers in developing frameworks to enhance market efficiency. For researchers and practitioners, our insights aim to enhance the understanding of IR practice and the better use of IR disclosures. Additionally, it provides practical implications for improving the quality and transparency of IR disclosures. Future research could extend this study to examine the effect of integrated reporting adoption for a period before 2010 and after 2024 or may test whether the relation between IR and earnings quality also holds in other countries, in which IR is voluntary. Further research could investigate whether this relationship holds across different industries or geographical contexts. Furthermore, further research can consider other aspects of accounting quality, such as value relevance and comparability.

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