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Market Reaction to the Interaction Between Top Management Tone and Earnings Management: Evidence from South Africa

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Abstract: South Africa has been severely impacted by several high-profile corporate scandals, with significant financial manipulation involving both the content of financial statements and the tone set by top executives. Notably, CEOs such as Markus Jooste from Steinhoff have been accused of misleading investors through both earnings management and the use of an authoritative management tone. This study investigates the market's reaction to the interactive effect of top management tone and earnings management, employing a short-window event study methodology. The tones of two distinct management styles—autocratic and pragmatic—are examined by analysing CEO statements using the DICTION textual analysis software. The sample comprises 944 firm-year observations spanning from 2011 to 2018. The results indicate that the market did not respond to earnings management in isolation. However, a significant negative market reaction was observed when earnings management occurred in conjunction with an autocratic tone. This suggests that South African investors are particularly attuned to multiple signals of potential fraud and will adjust their valuations accordingly. The findings underline the importance of considering not only financial disclosures but also the behavioral cues given by top management in assessing firm performance and risk. Investors, regulators, and analysts must therefore remain vigilant to the combined risks posed by earnings manipulation and the tone of management communications. The study contributes to the limited literature on the stock market's response to the interplay of earnings management and management tone, particularly in the context of South Africa, and is the first to explore the combined effects of these two forms of manipulation.

Keywords: CEO statements; DICTION; Earnings management; Market reaction; Top management tone

JEL Classification: G14; G41; M41

1. Introduction

Share price is a crucial indicator of company performance, reflecting a company's actual value. Rising prices indicate wealth creation, attracting investors to a company, whereas falling prices reveal a decline in investor confidence, threatening the company's survival (Darmawan et al., 2019). To protect the company's value, company leadership may unduly influence stakeholder perceptions by engaging in earnings or tone management in corporate documents (Boudt & Thewissen, 2019). Such manipulative actions by company leaders directly threaten the efficiency and liquidity of global markets, resulting in significant losses to a wide range of stakeholders (Harris et al., 2022). It is, therefore, critical that investors, regulators and those charged with governance can identify and address this pervasive threat.

Earnings management occurs when management uses judgment in preparing the financial statements to deceive the user (Healy & Wahlen, 1999). Manipulating the financial statements is challenging, however, as they must comply with accounting frameworks and be audited. An increased push for voluntary disclosures enables investors to protect themselves from earnings management by providing additional insights (Baber et al., 2006; Price et al., 2012). These voluntary disclosures give context to the financial statements and aid their interpretation (Lo et al., 2017). They also allow management to express their sentiments freely and convey private information (Craig &

Amernic, 2018; Luo & Zhou, 2017). While these disclosures help stakeholders by decreasing information asymmetries, increasing evidence shows that they are used to mislead investors through impression management (Boudt & Thewissen, 2019).

Therefore, management has two avenues to either signal helpful information to investors or manipulate them: the numbers in the annual financial statement and the tone of the voluntary disclosures. On the one hand, management may use both concurrently to manage investor perceptions, ensuring a consistent message and better hiding the manipulation (Boudt & Thewissen, 2019; Paul & Sharma, 2023). Alternatively, as both are tools for managing investor perspectives, they may be used as substitutes, as earnings management would negatively affect accounting quality, while tone management would not (Rahman, 2019). Despite these interrelated effects, a gap exists in understanding how tone management moderates the relationship between earnings management and share price reaction. Understanding this moderating effect is critical to responding to the pervasive and problematic threat of manipulation, especially given that emerging markets have greater information asymmetries than developed markets and how CEOs, such as Markus Jooste in South Africa (Steinhoff), can use tone to create an environment in which they are untouchable and perpetrate fraud (Rose, 2018).

Consequently, this research used an event study to investigate how the CEO's tone in voluntary disclosures moderates the market reaction to earnings management contained in the annual financial statements in South Africa. Two dominant tones were identified, namely autocratic and pragmatic. Autocratic leaders typically display traits associated with the stereotypical strong leader. However, this leadership style is also associated with dark personality traits and represents a fraud risk factor (Harris et al., 2022). Thus, while an autocratic leader is often associated with worse performance (Pizzolitto et al., 2023), there is evidence that, under numerous situations, it can enhance performance (Mwangi et al., 2022; Pizzolitto et al., 2023). Alternatively, Allioui et al. (2021) argue that women are pragmatic and prudent leaders. Given that women leaders are seen as being more ethical, more risk-averse and more conservative, they are associated with lower levels of earnings management (Du et al., 2016; Gull et al., 2018). Both Du et al. (2016) and Gull et al. (2018) also note the positive influences that women leaders bring to firm performance due to their leadership style.

South Africa provides a unique context for the study given the severity of corporate scandals, such as Africa Bank, Dimension Data, EOH, Steinhoff and Tongaat-Hulett. This is despite the country being a leader in corporate governance and its strength in accounting and auditing practices (Janse van Vuuren et al., 2023; Wesson, 2021). In addition, while South Africa is an emerging economy characterized by concentrated ownership structures and weak legal enforcement, which heighten the risk of manipulation (Marais et al., 2023), the country is considered a dual economy as it also has elements of a developed economy, such as a well-established stock exchange and financial institutions (Marais, 2024; Wesson, 2021). Finally, South Africa is Africa's second-largest economy, houses Africa's largest stock exchange, and is widely viewed as a gateway into African markets (World Bank, 2023; International Trade Administration, 2024). Therefore, understanding how investors are manipulated through earnings and tone management in South Africa is essential. However, South African research on these topics is limited, and earnings management and top management tone have only been studied separately. Rabin & Negash (2015) investigated the market reaction to earnings management on the Johannesburg Stock Exchange (JSE). They found that although the market adjusts for discretionary accruals (a tool used in earnings management), it could not distinguish between earnings-managed and non-earnings-managed companies. Alternatively, Totowa & Mokoaleli-Mokoteli (2021) investigated factors influencing impression management in chairperson letters, while Nel et al. (2022) studied the association between optimism and future firm performance.

Overall, this study makes several contributions to the existing research. First, the study combines two distinct yet related areas of research: the market reaction to earnings management (Kwag & Stephens, 2010; Latif & Yang, 2012; Rabin & Negash, 2015) and the market reaction to management tone (Brockman et al., 2017; Rahman, 2019; Tonin & Scherer, 2022). Second, this study uses a broader range of tone measures. Prior studies (such as Brockman et al., 2017; Rahman, 2019; Tonin & Scherer, 2022; Yekini et al., 2016) have predominantly focused on the positive-negative spread (optimism). However, this provides a narrow analysis, and there is a need for more comprehensive studies, as investors may be influenced by a broader range of tones (Patelli & Pedrini, 2015). A third contribution is the study's extension of the work of Totowa & Mokoaleli-Mokoteli (2021) by considering the link between impression management and earnings management and answering the call to investigate the market reaction. Finally, the study explores an African economy in a research field dominated by the United States, Europe and Asia.

The following section reviews the prior literature, the third section describes the methodology employed, the fourth presents the results, and the final section concludes.

2. Literature Review

This section reviews the theoretical framework and prior empirical literature used to develop the hypotheses for this research.

2.1 Theoretical Framework

The theoretical framework for this research rested on the agency and signalling theories. Under agency theory, shareholders employ managers to run a business and increase its value (Darmawan et al., 2019). This separation of ownership and control means managers have greater insights into the company than the shareholders, leading to information asymmetries (Price et al., 2012). Agency theory primarily views voluntary disclosures as a monitoring device to reduce agency conflict (Assidi, 2023; Cotter et al., 2011). Management will provide additional voluntary information to shareholders and debt holders to reduce information asymmetries. Cotter et al. (2011) noted that companies with high debt are incentivised to release additional voluntary disclosures to reduce the cost of debt.

Signalling theory focuses on using voluntary disclosures to reduce information asymmetries about the firm's value (Assidi, 2023; Cotter et al., 2011). Management has access to insider information. If this information represents good news, management is incentivised to share it with external stakeholders. However, if the inside information represents bad news, management is incentivised to withhold it (Cotter et al., 2011). Assidi (2023) argued that high-quality firms have more incentives to increase voluntary disclosures and send signals to the market than low-quality firms.

Consequently, under both theories, management may use financial statements or voluntary disclosures in good faith to signal insider information to the market, reducing information asymmetries (Davis et al., 2012; Healy & Wahlen, 1999). In this case, good news will be responded to positively, increasing the company's value (Darmawan et al., 2019). Alternatively, management may be motivated by selfish goals and manipulate the information sent to the market, making it appear more favourable. If the market identifies that these signals misrepresent reality, any signals would be interpreted as a consequence of the agency problem, leading to an adverse market reaction (Latif & Yang, 2012).

2.2 The Market Reaction to Earnings Management

Earnings management occurs when managers use the judgment allowed in accepted accounting frameworks to mislead stakeholders about a company's performance (Healy & Wahlen, 1999). Simple earnings management practices can mislead the market and, if undetected, exploit the information asymmetry problem, resulting in share mispricing (Rabin & Negash, 2015). This is because the market assumes that the managed earnings reflect the actual performance (Darmawan et al., 2019).

Numerous studies have considered market reaction to earnings management, especially in the United States. Baber et al. (2006) studied the short-term market reaction to earnings management for quarterly earnings announcements. They found that the market could adjust for earnings management when provided with sufficient supplementary information. Kwag & Stephens (2010), however, found that investors tended to under-adjust in highly managed firms. Latif & Yang (2012) found that, contrary to the expectation of the market punishing firms for managing earnings, earnings aggressiveness and smoothing helped to buffer the share price against negative news.

Outside the United States, Rabin & Negash (2015) studied listed non-financial South African companies. They found that investors negatively priced discretionary accruals but could not differentiate between earnings-managed and non-earnings-managed companies. In Indonesia, Darmawan et al. (2019) and Susanto (2017) considered the effect of earnings management on firm value, while Rahmawati & Irnawati (2024) considered earnings management's effect on share returns. Darmawan et al. (2019) found that accruals-based earnings management did not affect firm value, while real-earnings management negatively affected firm value. Susanto (2017) similarly found that real-earnings management was negatively associated with firm value but that accruals-based earnings management positively affected company value. When studying a single company, Rahmawati & Irnawati (2024) found that earnings management did not affect share returns. Finally, Al-Shattarat (2021) found that short-term accruals-based earnings management was not value-relevant in Saudi Arabia. However, if the earnings management continued into the long term, it negatively influenced firm value.

In line with prior South African findings by Rabin & Negash (2015), the first hypothesis was:

H1: The market reacts negatively to higher levels of earnings management.

2.3 The Market Reaction to Top Management Tone

Voluntary disclosures allow top management to express themselves freely as they are not audited or subject to regulatory requirements (Rahman, 2019). Given the absence of regulation, management can use the tone of voluntary disclosures to either enhance or impair a stakeholder's ability to understand a company's financial performance (Rahman, 2019). Voluntary disclosure theory suggests that management will only voluntarily present data that shows the company in a favourable light (Price et al., 2012). In addition, the language used in the voluntary disclosures is likely to affect the investors' ability to appraise the reliability of the company's financial performance (Davis et al., 2012).

Prior research has focused on optimism (commonly measured as the positive-negative spread) to measure the market reaction to the sentiment of the voluntary disclosures. Short window studies using cumulative abnormal returns by Brockman et al. (2017), Davis et al. (2012), Doran et al. (2012), Luo & Zhou (2017), Price et al. (2012), Tonin & Scherer (2022), and Yekini et al. (2016) all showed that a positive tone in either the annual report, qualitative disclosures or conference calls was associated with a positive market reaction. Doran et al. (2012) noted that a positive tone was sufficient to offset negative earnings surprises. Using a longer-term measure of firm value, Alshorman & Shanahan (2021) and Wu et al. (2021) found that CEO optimism was positively correlated with firm value. Given the tones covered by domain-specific wordlists, some research has also been conducted on the relationship between certainty and market response. However, studies by Cookson et al. (2022), Druz et al. (2015) and Pagliarussi et al. (2016) have found conflicting results.

Language characteristics other than optimism and certainty may influence stakeholders (Davis et al., 2012). Thus, Patelli & Pedrini (2015) call for a more comprehensive approach to analysing tone in corporate narratives. It is, therefore, useful to explore the market reaction to different tones expressed in the voluntary disclosures. To answer this call, following Nel et al. (2022) and Patelli & Pedrini (2015), this study uses the DICTION software and its five master variables (activity, certainty, commonality, optimism and realism), which are discussed under the methods.

While the market reaction to optimism and certainty has been explored, the response to the other tones (including composite tones) has not. As such, the following non-directional hypothesis was drawn:

H2: Top management's tone in voluntary disclosures is associated with a market reaction.

2.4 The Moderating Effect of Top Management Tone on the Market Reaction to Earnings Management

While additional disclosures help investors protect themselves from earnings management, the tone of these narratives could mask earnings management from stakeholders (Baber et al., 2006; Lo et al., 2017). Top management's word choices in voluntary disclosures may, therefore, either provide more information to stakeholders or exploit them (Tonin & Scherer, 2022). Top management may use alternative methods to manipulate shareholders, meaning earnings and tone manipulation may be employed as substitutes or complements to deceive stakeholders (Boudt & Thewissen, 2019; Paul & Sharma, 2023).

While the prior literature has not directly studied the moderating effect of top management tone on market reaction to earnings management, two studies have, to an extent, considered their interaction. Boudt & Thewissen (2019) found that earnings and tone management are complementary, as the CEO letter must agree with investors' prior knowledge to enhance reader comprehension. Narratives that do not agree reduce the financial statement's credibility. Similarly, Paul & Sharma (2023) found that top managers use various textual strategies to hide earnings management.

Given that tone may be used as either a substitute for or a complement to earnings management, the third non-directional hypothesis was formulated as follows:

H3: Top management tone in voluntary disclosures impacts market reaction to earnings management.

3. Methodology

This study investigated how earnings management and top management's tone interact to influence the market by looking at the market reactions to earnings management in the financial statements, to top management's tone and to the interactive effect of top management's tone and earnings management.

3.1 Sampling

The initial sample comprised all non-financial companies listed on the JSE from 1 January 2011 until 31 December 2018, resulting in 278 companies representing 1,673 firm-years. Financial companies were excluded due to unique regulations and disclosure requirements (Orazalin & Akhmetzhanov, 2019). The starting date represented the first full year after implementing the King Report on Governance for South Africa 2009, which fundamentally changed how companies are governed, thus creating a breakpoint. The end date of 31 December 2018 was chosen to remove the adverse effects of the COVID-19 pandemic on the South African stock market, which significantly impacted market returns and increased market volatility due to investor uncertainty around the pandemic lockdown extensions (Mokoena & Nomlala, 2022). To minimise survivorship bias, companies that delisted during the period were kept in the sample for as long as data was available.

Of the total, 52 firm-years were removed due to changes in year-end. A further 488 firm-years were excluded, as their annual reports did not include separate CEO reports. This study calculated discretionary accruals using the Kothari et al. (2005) model, which requires at least ten observations for each industry-year combination. For the JSE, the healthcare, oil and gas, and telecommunications sectors, as well as specific years in the technology sector, failed to meet this criterion. Consequently, 134 firm-years were removed. Insufficient share data to perform the

event study resulted in a further 22 firm-years being removed. Finally, 33 companies were removed, as only one firm-year observation remained in the sample. The final sample, therefore, consisted of 944 firm-year observations (173 unique companies). Table 1 summarizes the sampling procedure and provides a breakdown by industry.

Table 1. Sample size determination and industry breakdown

Description	No. of Unique Companies	No. of Firm-Year Observations
Population	278	1673
Change of year-end	(2)	(52)
No separate CEO statement or letter	(52)	(488)
Insufficient industry-year observations to estimate discretionary accruals	(18)	(134)
Insufficient share data to perform event study	(0)	(22)
Companies with only one observation	(33)	(33)
Sample size	173	944
Breakdown per industry[1]		
- Basic materials	55	319
- Consumer goods	20	109
- Consumer services	36	206
- Industrials	55	284
- Technology	10	26

Note: [1] The total number of companies per industry exceeds the number of unique companies in the sample, as three companies changed industry classifications during the study period. These three companies have been included under both classifications for the industry breakdown analysis.

3.2 Econometric Model Specification

The following panel regression model was used to examine the individual and interaction effects of earnings management and tone at the top of the market reaction:

$$CAR_{it} = \beta_0 + \beta_1 EM_{it} + \beta_2 Tone_{it} + \beta_3 EM_{it} * Tone_{it} + Controls_{it} + \varepsilon_{it} \quad (1)$$

where, CAR_{it} represents the cumulative abnormal returns for company *i* measured over a specific window in year *t*, EM_{it} represents the level of earnings management, $Tone_{it}$ represents a vector of top management tone components, EM_{it} * $Tone_{it}$ represents the interaction between EM and Tone, $Controls_{it}$ represents a vector of control variables. All variable measurements are described in the next section. Continuous variables were winsorised at the first and ninety-ninth percentiles to address outliers.

When interpreting the coefficients, β_1 represents the independent effect of earnings management on the cumulative abnormal returns under a neutral tone. A negative, statistically significant value would indicate support for H1. Likewise, β_2 represents the independent effect of top management tone in the absence of earnings management. A statistically significant value would show support for H2. Finally, the interaction coefficient, β_3, indicates how the slopes of earnings management (β_1) and top management tone (β_2) differ in the presence of each other. If β_3 is statistically significant, it would indicate support for H3.

3.3 Variable Measurement

3.3.1 Market response

The market response was measured using a short-window event study methodology to determine a share's cumulative abnormal return, representing the sum of the abnormal returns generated by an event. Abnormal returns were calculated as the difference between actual and expected returns using the conventional market model, which is widely used in event studies (Boudt & Thewissen, 2019; Nyandeni et al., 2024).

The estimation and event windows are key elements in calculating the cumulative abnormal returns. The prior literature has used estimation windows ranging from more than 200 days to less than 100 (Tonin & Scherer, 2022; Yekini et al., 2016). Consequently, following South African studies by Bhana (2007) and Watson & Rossouw (2012), this study used a 160-day estimation window ending 40 days before the annual financial statement release date to exclude the market reaction to trading statements and earnings announcements (Rabin, 2016).

Regarding the event window, following studies by Gavious (2007) and Rabin & Negash (2015), this study used a range of event windows from two days [-1;0] to 42 days [-1;40], allowing the study to determine if investors react to the event, how long they take to respond, and how quickly the effect dissipates.

3.3.2 Earnings management

Earnings management was measured using the absolute value of discretionary accruals, calculated as the residual of the model suggested by Kothari et al. (2005):

$$\frac{NDA_{it}}{A_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{it-1}}\right) + \alpha_2\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \alpha_3\left(\frac{PPE_{it}}{A_{it-1}}\right) + \alpha_4 ROA_{it} + \varepsilon_{it} \quad (2)$$

where, NDA_{it} represents the non-discretionary accruals for company *i* in year *t* scaled by the prior year's total assets (A_{it-1}). ΔREV_{it} and ΔREC_{it} represent the change in revenue and receivables between the periods *t* and *t-1*. PPE_{it} represents the gross property, plant and equipment, while ROA_{it} represents the return on assets.

3.3.3 Top management tone

Top management tone was measured by analysing the CEO statement in the annual financial statements, using the five master variables of the DICTION 7.1 software. Although CEO statements are not spontaneous, they are readily available in South Africa. Furthermore, these statements are critically important when making investment decisions (Boudt & Thewissen, 2019). Further, CEOs are free to express their opinions in these statements as they are not subject to audit (Boudt & Thewissen, 2019). An important consideration is whether CEOs write their statements. Craig & Amernic (2011) argue that even if CEOs do not personally write their statements, they are heavily involved in the statement's development so that it will reflect their views and sentiments.

Prior research primarily uses a spread of positive and negative words (a measure of optimism) to measure sentiment (Boudt & Thewissen, 2019). However, CEO statements may express sentiments other than optimism, which may influence a user's reaction (Marais, 2024). Consequently, this research used the DICTION software developed by Professors Roderick Hart and Craig Carroll, as it captures four thematic tones in addition to optimism, thus providing a more nuanced understanding of the CEO's tone. This software follows a bag-of-words approach based on 31 dictionaries containing over 10,000 words. These words are assigned to 35 categories to develop five thematic tones: activity, certainty, commonality, optimism and realism (Hart & Carroll, 2015). Supporting the use of the DICTION software for textual analysis, Sydserff & Weetman (2002) highlighted that the word classifications use linguistic theory based on the systematic approach to language study, while Cho et al. (2010) noted that DICTION analysis has high objectivity, face validity, and reliability, as the process is automated.

Activity represents movement, change and idea implementation (Hart & Carroll, 2015). It is associated with success and emphasises accomplishments and self-promotion, conveying narcissism and overconfidence (Boudt & Thewissen, 2019; Patelli & Pedrini, 2015). Certainty represents "resoluteness, inflexibility, and completeness and a tendency to speak ex cathedra" (Hart & Carroll, 2015). It is a trait of a transactional and autocratic leader (Alshorman, 2016; Patelli & Pedrini, 2015). Commonality refers to language highlighting group values instead of individual engagement methods (Hart & Carroll, 2015). Commonality represents a CEO's attempt to establish rapport with shareholders by reflecting their values (Alshorman, 2016). Optimism highlights the positive attributes of a person, group, concept or event (Hart & Carroll, 2015). Optimism is associated with less anxiety, achieving higher goals, favourable outcomes, and greater confidence in one's ability, but negatively, it is associated with overconfidence, hubris and risky behaviour (Alshorman & Shanahan, 2021). CEOs may use optimism to emphasise achievements and downplay failures (Patelli & Pedrini, 2015). Finally, realism describes "tangible, immediate, recognisable matters that affect people's everyday lives" (Hart & Carroll, 2015). High realism indicates a pragmatic approach (Alshorman, 2016).

Similar to Price et al. (2012), this research used principal component analysis (PCA) to develop components based on the above five master variables. PCA is beneficial as it incorporates the orthogonal relationships between variables, reduces measurement error and reduces multicollinearity, resulting in the components having a greater impact. In developing the top management tone components, all components with eigenvalues greater than one were retained after a varimax rotation was applied (Larcker et al., 2007). Table 2 presents the PCA results, reporting variable loadings that exceed 0.4.

Table 2. Development of top management tone components

Variable	Tone 1 Autocratic Tone	Tone 2 Pragmatic Tone
Activity	0.4259	
Optimism	-0.5732	
Certainty	0.6342	
Realism		0.6787
Commonality		-0.6027

Note: The top management tone PCA reported a Bartlett test of sphericity of 267.088 ($p<.01$) and a Kaiser-Meyer-Olkin measure of sampling adequacy of 0.524, indicating sufficiency to conduct PCA (Biswas et al., 2022). A rho of 0.5492 was reported.

Based on the PCA results, two components were retained as their eigenvalues exceeded one. The first tone component comprised activity, certainty, and a negative loading for optimism. Activity and certainty represent confidence and authority (Patelli & Pedrini, 2015). The negative loading of optimism is consistent in this regard, as optimism makes an autocratic CEO look naïve (Wunderley et al., 1998). Consequently, the first tone component was labelled an autocratic tone. The underlying variables of this tone demonstrate the characteristics of a stereotypical strong leader, as described by Harris et al. (2022), including confidence (certainty) and the aggressive pursuit of objectives (activity). However, it also masks various dark personality traits that result in it being a fraud risk factor (Harris et al., 2022).

The second tone component comprised realism and a negative loading for commonality, representing diversity. Realism deals with day-to-day issues and is characteristic of a pragmatic leader (Alshorman, 2016). Given South Africa's past, diversity is an everyday issue that features highly in the country's corporate governance codes and legislation. Consequently, the second tone component was labelled a pragmatic tone. While less research exists on the role of a pragmatic tone, Allioui et al. (2021) argued that women typically have a more pragmatic leadership style. This aligns with the diversity theme as women leaders are more democratic and encourage participation (Du et al., 2016). Women are also associated with lower levels of earnings management given that they are viewed as more ethical, risk-averse and conservative (Gull et al., 2018). Thus, a link may be drawn between pragmatic leadership and lower earnings management, although this may be attributable to other characteristics of women and requires further investigation.

3.3.4 Control variables

Prior academic research identified several additional variables that affect the market reaction. Consequently, seven control variables were included: operating cash flows were calculated as operating cash scaled by total assets. Operating cash flows that cover operational expenses indicate good performance. This attracts investors and affects the share price (Muniroh & Yuliati, 2021). Negative earnings were measured as a dummy variable assigned the value of one if the company incurred a loss and zero otherwise (Rahman, 2019), while firm profitability was measured as the return on assets before extraordinary items (Alshorman & Shanahan, 2021). These variables demonstrate management's ability to generate returns to shareholders, theoretically having a positive impact on the share price (Hartika & Iswara, 2024). Leverage was calculated as total debt to total assets (Alshorman & Shanahan, 2021). Higher debt usage is linked to higher risk, reducing investor confidence and leading to decreasing share prices (Bon & Hartoko, 2022). Earnings surprises were calculated as the increase in earnings per share from the prior year, scaled by the opening share price (Tonin & Scherer, 2022). Earnings surprises are widely included in the academic literature as investors prefer smooth earnings rather than surprises (Bansal et al., 2021; Price et al., 2012). Firm size was measured as the natural log of market capitalisation (Rahman, 2019). Research on firm size has shown that size influences market returns, although the direction of this relationship is debated (Bansal et al., 2021). Finally, based on the value effect, which argues that value shares earn higher market returns than growth firms, growth opportunities were measured as the market-to-book ratio (Bansal et al., 2021; Price et al., 2012).

4. Results and Discussion

4.1 Descriptive Results

The descriptive statistics are presented in Table 3. The statistics of only the dependent and primary control variables are discussed for brevity. These statistics show that the market initially reacts only slightly to the release of the financial statements, as measured by cumulative abnormal returns (day zero, mean CAR[-1;0]=0.0017). The cumulative abnormal returns peak around day ten (CAR[-1;10]=0.0144), after which they begin to dissipate. While inconsistent with the efficient market hypothesis, prior studies have shown that it takes time for investors to understand the value relevance of information (Gavious, 2007; Rabin & Negash, 2015).

Regarding the primary independent variables, the earnings management measure reveals that, on average, discretionary accruals represent 5.37% of total assets. This is similar to that found in South Africa over a comparable period by Eloff & Steenkamp (2022). Regarding the individual DICTION tones, the means for activity, optimism and certainty align with prior South African research by Nel et al. (2022) and Totowa & Mokoaleli-Mokoteli (2021). Only Nel et al. (2022) reported means for commonality and realism in South Africa. While the mean for commonality was similar, Nel et al. (2022) reported a lower realism score, which may be driven by the smaller sample size and shorter reporting period. The means of the composite tones (autocratic and pragmatic) are zero, indicating neutrality. The median values, however, are above zero, meaning that more than 50% of CEO letters tend to be autocratic and pragmatic.

The independent variable correlations and variation inflation factors (VIF) are available on request. As all correlation coefficients are below the benchmark of 0.8000 and all VIFs are below ten, multicollinearity is not a concern (Alshorman, 2016).

Table 3. Descriptive statistics

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Dependent Variable					
CAR [-1; 0]	0.0017	0.0008	0.0420	-0.1590	0.1572
CAR [-1; 1]	0.0072	0.0028	0.0531	-0.1469	0.2046
CAR [-1; 3]	0.0128	0.0071	0.0693	-0.1612	0.2961
CAR [-1; 5]	0.0134	0.0074	0.0805	-0.1985	0.3410
CAR [-1; 10]	0.0144	0.0115	0.1028	-0.2828	0.4113
CAR [-1; 15]	0.0121	0.0079	0.1186	-0.3566	0.4841
CAR [-1; 20]	0.0097	0.0058	0.1327	-0.3988	0.5215
CAR [-1; 25]	0.0093	0.0059	0.1445	-0.4897	0.5775
CAR [-1; 30]	0.0080	0.0043	0.1569	-0.4950	0.5754
CAR [-1; 35]	0.0044	0.0056	0.1671	-0.5657	0.5802
CAR [-1; 40]	0.0037	0.0023	0.1748	-0.5524	0.5872
Primary Independent Variables					
Earnings management	0.0537	0.0368	0.0528	0.0000	0.2637
Activity	49.5863	49.7300	1.8330	43.4900	53.8900
Optimism	54.7357	54.5150	3.2946	48.4300	64.8000
Certainty	46.4976	47.3200	4.3304	30.3500	53.5900
Realism	52.2870	52.3300	2.6682	43.1900	58.2600
Commonality	49.3619	49.4600	1.9245	44.1100	56.4000
Autocratic tone	0.0000	0.1362	1.2299	-5.2327	3.3137
Pragmatic tone	0.0000	0.0327	1.1104	-5.2265	3.2320
Control Variables					
Operating cash on assets	0.0784	0.0804	0.0934	-0.3049	0.3023
Negative earnings	0.2002	0.0000	0.4004	0.0000	1.0000
Leverage	0.4780	0.4765	0.1700	0.1273	0.8512
Return on assets	0.0750	0.0773	0.1200	-0.4420	0.4159
Earnings surprises	0.0219	0.0053	0.2913	-0.9563	1.7551
Firm size	15.2440	15.2253	2.2861	10.5911	20.6601
Growth	1.0001	0.6629	0.9913	0.0503	5.4857

Figures 1-3 graphically illustrate how cumulative abnormal returns vary with earnings management and tone. The levels of earnings management and tone are split into quintiles. The cumulative abnormal returns of the top and bottom quintiles are graphed against the overall average cumulative abnormal returns for comparative purposes.

4.1.1. The market reaction to earnings management

Regarding market reaction to earnings management (hypothesis 1), Figure 1 shows an immediate response to releasing the financial statements. Until day three, the graphs move together, indicating similar reactions. After this, companies with the highest levels of earnings management experience lower cumulative abnormal returns. This persists across the 40 days, with cumulative abnormal returns dissipating by day 25. In contrast, companies in the bottom quintile of earnings management move with the average until approximately day 14, after which they outperform the average until day 34. By day 39, the cumulative abnormal returns for the bottom quintile have dissipated. This indicates that the market reacts more favourably to lower earnings management levels and unfavourably to higher levels, suggesting support for hypothesis 1. However, these effects dissipate after 40 days.

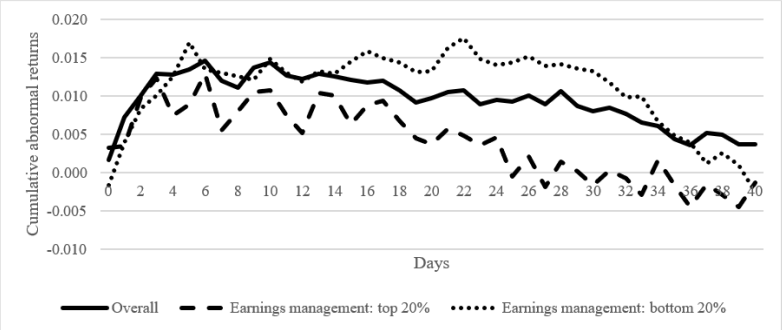

Figure 1. Cumulative abnormal returns split based on absolute earnings management quintiles

4.1.2. The market reaction to top management tone

Regarding the market reaction to an autocratic tone (hypothesis 2), Figure 2 reveals that the top quintile of autocratic tone has larger immediate cumulative abnormal returns than the sample average. In contrast, the bottom quintile experiences a smaller effect. These differences persist over the 40 days. For the top quintile, the autocratic tone effects align with the sample average between days 35 and 40. However, the bottom quintile does not align with the sample average and generates neutral cumulative abnormal returns between days 18 and 28 and negative cumulative abnormal returns from day 28 onwards. This shows that the market has a favourable reaction to a more autocratic tone, providing support for hypothesis 2. However, again, the benefits of an autocratic tone appear to dissipate by day 40.

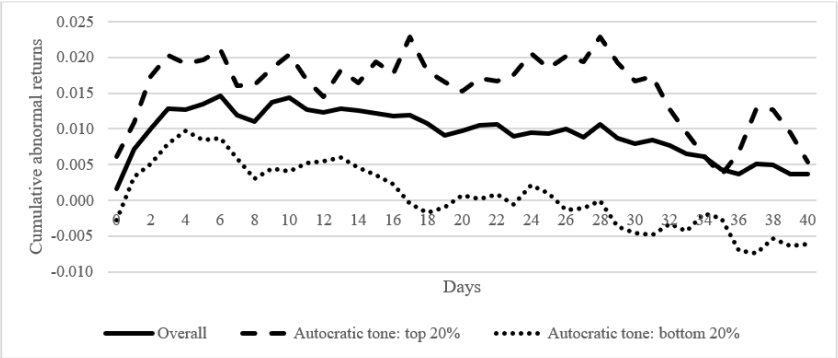

Figure 2. Cumulative abnormal returns split based on autocratic tone quintiles

Figure 3 presents the market reaction to the pragmatic tone (hypothesis 2). Initially, the top pragmatic quintile shows a higher reaction, while the bottom quintile shows a lower response. This difference persists throughout the 40 days. From day 14 onwards, the effects in the lowest quintile have dissipated. However, the cumulative abnormal returns continue over the 40 days for the top quintile. Unlike the bottom earnings management quintile and the top autocratic tone quintile, the cumulative abnormal returns for the top pragmatic tone quintile show no indication of dissipating by day 40. Thus, it appears that the market favours a pragmatic tone over a neutral tone, lending support to hypothesis 2.

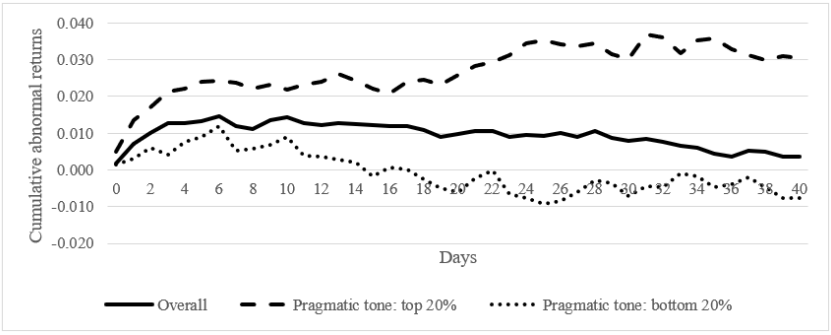

Figure 3. Cumulative abnormal returns split based on pragmatic tone quintiles

Figures 1-3 indicate that the earnings management level and top management tones contain value-relevant information. The statistical significance of this value-relevant information and how the factors interact to influence the market reaction are explored in the next section.

4.2 Regression Results

Regression analysis was used to evaluate the market reaction to earnings management, top management tone, and their interaction. The regression results are presented in Table 4. For all models, the Hausman test favoured fixed effects over random effects ($p<0.01$). However, for the [-1;10], [-1;15] and [-1;20] models, the F-test indicated that a pooled model was preferred over the fixed effects ($p>0.1$). For consistency, all models in Table 4 used fixed effects. The comparative pooled regressions are available upon request. While the major findings do not vary substantially, the pooled results tended to show higher levels of statistical significance. Thus, using fixed effects is more conservative.

Considering the model's overall significance, only after ten days do the models have statistically significant explanatory power ($p<0.01$). In South Africa, this finding is consistent with Rabin (2016). The low adjusted R-squared values across the models are consistent with prior studies such as Price et al. (2012) and Yekini et al. (2016). Nonetheless, there are statistically significant variables in all models.

4.2.1 Market reaction to earnings management

Earnings management has a positive relationship with returns until day three, after which it becomes negative, in line with hypothesis one. This indicates that the market takes time to digest the financial statement content before reacting negatively. However, none of the coefficients are statistically significant ($p>0.1$), meaning that the market does not react to earnings management in the presence of a neutral tone. This aligns with Al-Shattarat (2021), the findings of Rahmawati & Irnawati (2024), and Darmawan et al. (2019) that accruals-based earnings management does not affect firm value in various emerging markets. Likewise, in South Africa, this aligns with the finding of Rabin (2016) that the market could not distinguish between earnings-managed and non-earnings-managed companies. Consequently, hypothesis one, that higher levels of earnings management are associated with a negative market reaction in the short term, is rejected. This finding implies that investors in South African companies either cannot identify earnings management in the short term and, therefore, do not react to it, or they do not perceive it as a risk factor on its own and first require additional warning signs before reacting.

Table 4. Panel regression estimates of the moderating effect of top management tone on the market reaction to earnings management

Variables	**-1** **CAR0**	**-2** **CAR1**	**-3** **CAR3**	**-4** **CAR5**	**-5** **CAR10**	**-6** **CAR15**
Earnings management	0.0458 -0.0351	0.0138 -0.0434	0.0494 -0.0544	-0.0481 -0.0626	-0.0484 -0.0868	-0.082 -0.0943
Autocratic tone	0.0033 -0.002	0.0037 -0.0023	0.0044 -0.0029	0.0058* -0.0032	0.0104** -0.0046	0.0082* -0.0049
Pragmatic tone	0.0007 -0.0022	-0.0014 -0.0025	-0.0018 -0.0036	-0.0044 -0.0044	-0.0029 -0.0055	-0.0008 -0.0058
Earnings management interacted with:						
Autocratic tone	-0.0653** -0.0282	-0.0577* -0.0341	-0.0716 -0.0471	-0.0882* -0.0496	-0.2190*** -0.0688	-0.1802** -0.0768
Pragmatic tone	0.0135 -0.0269	0.0293 -0.0315	0.0637 -0.0458	0.084 -0.0525	0.0345 -0.0779	0.0964 -0.084
Control variables and constant[1]	Included	Included	Included	Included	Included	Included
Observations	944	944	944	944	944	944
Number of companies	173	173	173	173	173	173
F	1.667*	0.74	1.529	1.488	2.607***	2.786***
R-squared	0.2503	0.2287	0.2384	0.2234	0.2158	0.2232
Adjusted R-squared	0.0686	0.0417	0.0538	0.0351	0.0257	0.0349
Variables	**-7** **CAR20**	**-8** **CAR25**	**-9** **CAR30**	**-10** **CAR35**	**-11** **CAR40**	
Earnings management	-0.1082 -0.112	-0.1566 -0.118	-0.1719 -0.1186	-0.1153 -0.1253	-0.05 -0.1353	
Autocratic tone	0.0100* -0.006	0.0116* -0.0067	0.0103 -0.0077	0.0064 -0.008	0.0053 -0.0082	
Pragmatic tone	0.0029 -0.0071	0.0023 -0.0084	-0.002 -0.0091	-0.0007 -0.0089	-0.0061 -0.0098	
Earnings management interacted with:						
Autocratic tone	-0.2116* -0.1187	-0.2213 -0.1394	-0.2229* -0.1285	-0.2465* -0.1368	-0.1986 -0.1357	
Pragmatic tone	0.0705 -0.1065	0.105 -0.1212	0.17 -0.125	0.1593 -0.1306	0.2757** -0.1298	
Control variables and constant[1]	Included	Included	Included	Included	Included	
Observations	944	944	944	944	944	
Number of companies	173	173	173	173	173	
F	2.461***	3.722***	4.195***	5.174***	4.232***	
R-squared	0.2225	0.2475	0.2607	0.2669	0.2573	
Adjusted R-squared	0.034	0.065	0.0814	0.0892	0.0773	

Note: All models presented above use firm fixed effects panel regression. Cluster robust standard errors are presented in parentheses to correct for heteroskedasticity and autocorrelation.

[1] The full results of the control variables and constant are available upon request.

*** p<0.01, ** p<0.05, * p<0.1

4.2.2 Market reaction to top management tone

Initially, in the absence of earnings management, the autocratic tone has no statistically significant association with the market reaction ($p>0.1$). However, there is a positive association from day five ($p<0.1$ for the [-1;5] model increasing to $p<0.05$ for the [-1;10] model and returning to $p<0.1$ for the [-1;15] to [-1;25] models), indicating that investors take time to digest the narrative content and react. This association dissipates by day 25. There is a lack of studies investigating the association between composite tones and share returns. However, the positive association between the autocratic tone and positive performance is consistent with research in Kenya by Mwangi et al. (2022), who found that an autocratic tone positively affected the financial performance (based on accounting measures) of commercial banks. However, it contradicts the findings by Nyamota et al. (2024), who found that autocratic leadership negatively influenced agricultural enterprise performance (based on employee perceptions) in Kenya. Given the lack of directly comparable studies, the underlying components are compared to prior studies. The autocratic tone comprises activity, pessimism and certainty. While the market reaction to an active tone remains unexplored, it does indicate overconfidence. Overconfident CEOs believe their companies are undervalued and will convey signals to increase the firm value (Jang & Lee, 2024). The pessimism aspect contradicts the findings of Brockman et al. (2017) in Hong Kong, Price et al. (2012) in the United States and Tonin & Scherer (2022) in Brazil, who all found that optimism (rather than pessimism) is associated with a positive market reaction. However, general wordlists (such as DICTION) may understate optimism in a financial context. Finally, regarding certainty, prior studies by Cookson et al. (2022) and Druz et al. (2015) in the United States, and Pagliarussi et al. (2016) in Brazil found conflicting results.

There is no market reaction across the 40 days of the study associated with using a pragmatic tone in the absence of earnings management ($p>0.1$). As with the autocratic tone, there is a lack of comparable studies that use a composite tone. Moreover, the components of commonality and realism's association with the market reaction also remain unexplored. Prior South African studies that employed DICTION ignored the commonality and realism tones (Mokoaleli-Mokoteli et al., 2009; Totowa & Mokoaleli-Mokoteli, 2021), while Nel et al. (2022) found insignificant results for these tones in the CEO statement in relation to firm future performance.

Thus, in summary, for the top management tone, a positive association is found between the market reaction and an autocratic tone between days five and twenty-five. However, no association with a pragmatic tone is found. Thus, partial support for hypothesis two is found, specifically for the autocratic tone. While this finding may be surprising, as autocratic leadership styles are typically associated with worse performance than more participatory styles, studies have found autocratic leaders outperform in certain situations (Elenwo, 2024; Pizzolitto et al., 2023). Performing a systematic literature review, Pizzolitto et al. (2023) found that autocratic leadership positively affects performance compared to participatory leadership styles in high-stress environments and where hierarchies are well accepted. Both of these situations apply to South African companies. Further, Harris et al. (2022) noted that the autocratic leader is more likely to be viewed as a stereotypical strong leader. This is in contrast to pragmatic leaders who Crayne & Medeiros (2021) found tend to struggle to perform in the short term and require more time to become effective. Consequently, investors may be more comfortable with leadership that demonstrates autocratic rather than pragmatic traits.

4.2.3 The moderating effect of top management tone on the relationship between earnings management and the market reaction

Considering the interaction between earnings management and top management tone, a significant negative moderating effect is noted between earnings management and the autocratic tone. This moderating effect persists for the majority of the event window ($p<0.1$ other than $p<0.05$ for the [-1;0] and [-1;15] models; $p<0.01$ for [-1;10] model; $p>0.1$ for the [-1;3] and [-1;25] models). Thus, the market does not react to earnings management when there is a neutral tone, but under an autocratic tone, the market reacts negatively. An autocratic CEO is considered a red flag for fraud (Sanchez & Dunne, 2017); they may be driven to fraud from fear of losing their status and the dark personality traits associated with this leadership style (Harris et al., 2022; Rohmatin et al., 2021). Further corroborating this increased risk are findings related to the underlying components of the autocratic tone. Alshorman (2016) found that the activity component was associated with higher levels of earnings management, while Patelli & Pedrini (2015) found that the certainty component was associated with more aggressive financial reporting. Thus, while investors have no reaction to earnings management on its own, possibly not identifying it or not considering it a risk factor, this study found that the additional red flag of autocratic leadership resulted in an adverse market reaction.

The pragmatic tone does not moderate market reaction to earnings management for the study period ($p>0.1$). An exception is at the end, where a positive moderation effect is shown ($p<0.05$). Further investigation with a longer study period is required to determine if this positive effect persists. While Alshorman (2016) argued that a pragmatic CEO commits more fraud, the evidence related to the underlying components does not support this. Alshorman (2016) found no relationship between commonality and realism and the level of earnings management, while Patelli & Pedrini (2015) found that both commonality and realism had a negative association with aggressive financial reporting. Further, the underlying components of this leadership style are more widely associated with

women, who are considered more ethical and less likely to engage in aggressive earnings management (Allioui et al., 2021; Du et al., 2016). Thus, while earnings management may be considered a precursor to fraud and a fraud risk factor, a pragmatic tone does not moderate the market reaction to earnings management.

Thus, this study partially supports hypothesis three, specifically, that the autocratic tone intensifies the market reaction to earnings management, likely due to the dark personality traits associated with this leadership style and it being considered a red flag for fraud.

4.2.4 Control variables

Regarding the control variables, only firm size showed an independent and statistically significant negative relationship with the market reaction ($p<0.05$ for the [-1;0] to [-1;3] models; $p<0.01$ from the [-1;5] to [-1;40] models). This implies that larger firms exhibit lower cumulative abnormal returns.

4.3 Additional Tests

Several additional tests were performed to test the robustness of the above results. First, time-fixed effects were included. Second, the firm-fixed effects were replaced with industry-fixed effects. A chi-squared test of the joint significance of the time- and industry-fixed effects showed that the additional fixed effects did not improve the explanatory power of the models. Further, including time- and industry-fixed effects did not substantially change the original results.

Next, the analysis was repeated using the individual DICTION themes (rather than the composite variables) and their interactions with earnings management. Neither the individual tones nor their interactions revealed a statistically significant trend, highlighting the importance of considering composite tones rather than focusing on individual tones, as done in prior studies. Interestingly, while not statistically significant, the direction of the effect of the individual tones typically supported the results of the PCA.

Finally, industry-specific analyses were performed for the basic material, consumer goods, consumer services, and industrial sectors. No separate analysis was performed for the technology sector, as too few firms resulted in insufficient degrees of freedom. In line with the overall results presented in Table 4, earnings management, the pragmatic tone, and the interaction between the pragmatic tone and earnings management were predominantly statistically insignificant across the four industries. Contrary to the overall results, none of the sectors showed a market reaction to the autocratic tone. Finally, regarding the interaction between the autocratic tone and earnings management, the basic materials sector aligned with the overall results by revealing a negative, statistically significant relationship for most of the study period. While the consumer goods sector predominantly displayed a negative relationship for this interaction, it was only statistically significant from day 25 onwards. Interestingly, the consumer services sector revealed a negative relationship during the earlier part of the event window, but this swapped to a positive, statistically significant relationship from day 20 onwards. Finally, the industrial sector revealed no statistically significant relationship for the interaction between the autocratic tone and earnings management. These findings suggest that market sectors react differently, and future research should consider analysing the sectors separately.

The results of the additional tests are available upon request.

5. Conclusion

This study investigated how top management tone moderates the market reaction to earnings management in the annual report using a sample of 944 firm-year observations in South Africa. The study showed that the South African market does not respond to evidence of earnings management in the annual report. However, an autocratic tone negatively impacted the relationship between earnings management and the market reaction. Thus, while earnings management is not interpreted by investors as a fraud risk factor by itself, when paired with autocratic leadership, red flags are raised, and the market responds negatively. In contrast, the study found that the pragmatic tone does not moderate the market reaction to earnings management. Additionally, the market reacted positively to an autocratic tone between five and 25 days after the release of the annual report, in the absence of earnings management, but it did not respond to the pragmatic tone. These findings would interest analysts, regulators and investors as they show how the stock market reacts to earnings and tone management. Thus, these factors should be built into models for decision-making and risk-assessment purposes. To achieve this, larger stakeholders (such as auditors, regulators, institutional investors and market analysts) should develop models to detect earnings management and consider behavioural analysis and similar tools to assess the tone of top management. Smaller stakeholders and investors may consider using earnings management models and tone wordlists developed by academics, although these may not be as effective as they are not necessarily country and industry-specific. Finally, those charged with governance (particularly those in nominations committees) may employ psychometric tools when selecting potential top management candidates to identify their leadership tones and the presence of any dark personalities. Further, all stakeholders and future academic research should emphasise a range of tones rather than

just the positive-negative spread, as this research finds that multiple tones may influence earnings management practices and the market reaction.

This study contributes to the literature in several ways. Firstly, it uses PCA to develop composite measures of management tone based on a broader range of underlying tone variables. The study, therefore, shows how different management tones fit together to form the overall tone at the top, thereby extending the existing literature that predominantly focuses on optimism. Secondly, the study extends the current literature on the market reaction by considering the link between earnings management and impression management. This adds an additional layer to existing research on agency and signaling theories by showing that top management use multiple mechanisms to send signals to the market and reduce information asymmetries (or mislead stakeholders), thereby advancing the current economic dialogue. Prior South African studies have expressed concern that South African investors cannot distinguish between earnings-managed and non-earnings-managed companies. However, this study reveals that, while South African investors do not react to earnings management by itself, they take note of an additional red flag of autocratic leadership before acting. Finally, the study provides insight into the operation of an African economy, an under-researched geographical area to which the findings from developed economies may not apply.

This study was not without limitations. Firstly, top management tone was measured using CEO statements in the annual report. These statements are carefully planned and not spontaneous. Should spontaneous methods of communication become readily available in South Africa, future studies could analyse these to obtain a more insightful measure of top management tone. Secondly, the study measured top management tone using a general wordlist. While this approach is useful and allows for large quantities of data to be analysed, it does not consider the context or communicative intent of the word's usage. Future studies could use domain-specific or manual content analysis to address these issues. Next, this study did not consider sentiment positioning within the CEO statement. Sentiments expressed at the start or end of the report may be recalled better by investors and have a greater impact on the market reaction. Future studies can consider sentiment changes within the report and how these affect the market reaction. Finally, the study only considered the short-term market reaction. Future studies should include longer time periods, as prior literature argues that pragmatic leaders require more time to become effective.

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Data Availability

The data used to support the research findings are available from the corresponding author upon request.

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Conflicts of Interest

The author declares no conflict of interest.

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