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Jacques Totowa; Thabang Mokoaleli-Mokoteli

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Value relevance of discretionary and non-discretionary disclosure across reporting environments

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Authors:
Jacques Totowa[1]
Thabang Mokoaleli-Mokoteli[1]

Affiliations:
[1]Wits Business School, Faculty of Commerce, Law and Management, University of the Witwatersrand, Johannesburg, South Africa

Corresponding author:
Thabang Mokoaleli-Mokoteli, thabang.mokoaleli-mokoteli@wits.ac.za

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Orientation: Corporate disclosures have become increasingly important in financial reporting, leading to greater interest in understanding the value relevance of discretionary and non-discretionary disclosures. While prior studies often treat these disclosures as competing, this study explores whether they are complementary and how the reporting environment affects their value relevance.

Research purpose: This study examines the joint and separate value relevance of discretionary and non-discretionary disclosures in emerging and developed economies.

Motivation for the study: Inconsistent findings in the literature about the value relevance of these disclosures motivate this study. Previous research often analyses them in isolation, overlooking their potential complementary effects and the role of the reporting environment.

Research approach/design and method: A quantitative approach was used, with a sample of firms from two emerging and two developed economies. The generalised method of moments (GMM) was employed to assess the value relevance of discretionary and non-discretionary disclosures, both jointly and separately.

Main findings: Both discretionary and non-discretionary disclosures are value relevant when analysed separately and jointly. However, the value relevance of discretionary disclosures diminishes when considering the firm's reporting environment, while non-discretionary disclosures remain consistent.

Practical/managerial implications: Managers and financial analysts should incorporate both types of disclosures into their forecasting models, as they provide complementary insights into a firm's financial health.

Contribution/value-add: This study provides a nuanced understanding of the joint and separate value relevance of discretionary and non-discretionary disclosures and highlights the impact of the reporting environment, especially in emerging economies.

Keywords: discretionary disclosure; non-discretionary disclosure; value relevance; reporting environment; content analysis; emerging and developed economies.

Introduction

The debate surrounding the value relevance of discretionary and non-discretionary disclosures in financial reporting has captured significant attention from scholars, practitioners and regulators. Both mandatory (non-discretionary) and voluntary (discretionary) disclosures are crucial in influencing investor perceptions, market efficiency and corporate governance practices. Various studies have demonstrated that non-discretionary disclosures, such as earnings, are value relevant, although their impact varies by jurisdiction. For instance, in the United States (US), earnings are significant to investors (Burgstahler & Dichev 1997), whereas in Portugal, net earnings, goodwill and intangible assets show strong associations with stock prices (Oliveira, Rodrigues & Craig 2010).

Similarly, discretionary disclosures have shown substantial value relevance. Smith and Taffler (2000) found that the chairman's letter could predict future performance when analysed appropriately. Wilcox et al. (2010) suggest that predictive discretionary disclosures are more valuable than feedback-based ones. Demers and Vega (2010) and Davis, Piger and Sedor (2012) indicate that investors respond to earnings press releases, which reflects how managers use discretionary disclosures to signal firm value (Verrecchia 1983). Davis and Tama Sweet (2012) argue that managers employ discretionary disclosures strategically, potentially using them opportunistically for impression management (Hooghiemstra 2010).

While previous studies have largely examined the value relevance of these disclosures independently, their frequent intertwining in annual reports necessitates an understanding of their joint value relevance. Assessing both forms of disclosure is essential, considering their different motives and the lack of regulation for discretionary disclosures, which managers tend to use for impression management (Davis & Tama Sweet, 2012; Hooghiemstra 2010). Disclosures in financial reports play a critical role in addressing agency problems by mitigating information asymmetry between managers and other stakeholders (Iatridis 2010). This reduction in information asymmetry helps to lower agency costs that might otherwise arise from conflicts of interest between these parties (Healy & Palepu 2001). The consistent value relevance of non-discretionary disclosures can be attributed to their compliance with established accounting standards, such as International Financial Reporting Standards (IFRS) or US Generally Accepted Accounting Principles (GAAP). These standards enhance the quality of disclosed information by limiting the scope for opportunistic managerial discretion (Barth, Beaver & Landsman 2008; Dimitropoulos et al. 2013; Ewert & Wagenhofer, 2005).

Research suggests that accounting disclosures are affected by the country's institutional quality (e.g. Ball, Kothari & Robin 2000; Porta et al. 1998). On one hand, non-discretionary disclosures are governed by regulatory standards (e.g. IFRS or US GAAP) and are a reflection of coercive institutional pressures arising from legal and regulatory frameworks that mandate specific disclosure requirements to ensure consistency, comparability and transparency (e.g. DiMaggio & Powell 1983). The perceived quality and value relevance of non-discretionary disclosures may vary based on the strength of enforcement mechanisms and the credibility of institutions in a particular reporting environment (Ali & Hwang 2000; Ball et al. 2000; Robb & Zarzeski 2001). On the other hand, discretionary disclosures are shaped by normative pressures where professional norms and stakeholder expectations drive organisations to voluntarily disclose additional information to signal transparency and reliability (Healy & Palepu 2001). The value relevance of discretionary disclosures is sensitive to the institutional environment. For instance, in weak institutional settings with low regulatory oversight, discretionary disclosures may be viewed sceptically, as they provide room for managerial opportunism. Conversely, in strong environments, they can enhance the overall quality of financial reporting. Developed economies typically feature stable legal and institutional structures, whereas emerging economies face higher investment risks and capital costs due to underdeveloped frameworks (Rottig 2016; Skare & Hasic 2016).

In strong institutional environments, discretionary disclosures can supplement the high-quality baseline established by non-discretionary disclosures. Together, they provide a comprehensive view of the organisation's financial position and strategic direction, increasing their joint value relevance. In weak institutional settings, where the credibility of non-discretionary disclosures may be compromised, organisations may rely on discretionary disclosures to bridge informational gaps. However, this substitutability carries risks, as stakeholders may question the reliability and motives behind voluntary disclosures in such environments (Ball et al. 2000; Chen, Chen & Su 2001; Francis et al. 2005; Leuz & Wysocki 2016). By applying institutional theory, this research seeks to explore how different reporting environments influence the joint and separate value relevance of discretionary and non-discretionary disclosures. The findings will provide insights into the role of institutional factors in shaping disclosure practices and their implications for stakeholders, regulators and policymakers.

This study examines South Africa, India, the US and the United Kingdom (UK), chosen for their substantial economic influence. These countries, while sharing some reporting similarities, also exhibit crucial differences affecting the value relevance of disclosures. For example, India follows a common law system where IFRS has been mandatory since 2016, with GAAP enforcement overseen by Institute of Chartered Accountants of India (ICAI), subject to company and tax acts (Sharma, Joshi & Kansal 2017). India's bank-oriented economy often features family-owned businesses (Kaur, Kaur & Singh 2018).

Conversely, South Africa follows a Roman-Dutch legal system, enforcing IFRS since 2005 through the Financial Reporting Standards Council (FRSC) (Ames 2013). The UK, with a common law system, mandates IFRS application since 2005, enforced by the Financial Reporting Council (FRC) (Van Tendeloo & Vanstraelen 2005). The UK's market-oriented economy features diverse ownership among listed companies. The US also operates under a common law system, using US GAAP as the standard (Sutton 1997), with oversight by the Securities and Exchange Commission (SEC) and Financial Accounting Standards Board (FASB). The US economy is market-oriented, with a diverse company ownership structure.

These differences in legal frameworks, regulatory enforcement and economic structures underscore the need to consider country-specific factors when examining the value relevance of disclosure practices. By analysing these contexts, this study aims to provide insights into how reporting environments shape accounting disclosures' significance across economic landscapes.

The primary objective of this study is to investigate the separate and combined value relevance of discretionary and non-discretionary disclosures in annual reports. It also seeks to evaluate the impact of specific reporting environment factors, such as the rule of law, on these disclosures. The focus is on understanding whether the value relevance of these factors is consistent across emerging and developed economies.

This study contributes to academic literature in two key ways. Firstly, it distinguishes itself by examining discretionary and non-discretionary disclosures both independently and

jointly, unlike conventional research approaches. Secondly, it enhances our understanding of how the reporting environment impacts accounting disclosures' value relevance through comparative analysis of emerging and developed markets, characterised by differing institutional, economic and legal frameworks. This approach provides valuable insights into how contextual factors shape the relationship between accounting information and market valuation.

The article is organised as follows. Section 'Empirical literature review and hypothesis development' reviews empirical literature and develops hypotheses. Section 'Research design' details the research design and data. Section 'Emperical results' presents research findings. Section 'Discussion' examines the research findings in relation to the existing literature. Section 'Conclusion' summarizes the key research findings and their implications.

Empirical literature review and hypothesis development

Annual reports serve as vital sources of information for various stakeholders, including investors and creditors, who rely on this data to make informed financial and economic decisions. Within these reports, financial statements present a blend of GAAP information, such as earnings, and non-GAAP information, such as the chairman's letter. Extensive research in the literature has examined the value relevance of both strands of information (Bhatia & Mulenga 2019; Clinch, Tarca & Wee 2018; Venter, Emanuel & Cahan 2014), including investigations into how effectively accounting disclosures are reflected in share prices (Barth et al. 2001). Traditionally, users have placed trust in non-discretionary disclosures due to their alignment with accounting standards and legal regulations, endowing them with a certain degree of legitimacy (Baker & Persson 2021). However, a notable challenge with non-discretionary disclosure lies in its susceptibility to manipulation, often in the form of earnings management. This manipulation can occur either through managerial discretion within GAAP or through deliberate accounting practices aimed at concealing the true financial performance and position of the company.

Many users appear to place reliance on discretionary disclosure because, through this avenue, managers voluntarily divulge additional information they consider essential to elucidate a firm's activities (Meek, Roberts & Gray 1995). Such information not only underscores insiders' perspectives on the company's status but also serves to mitigate the information asymmetry between preparers and financial report users (Adhikari & Zhou 2021; Nagar & Schoenfeld 2021). Moreover, managers leverage discretionary disclosure as a signalling mechanism to communicate the true value of the firm to the market (Verrecchia 1983). Advocates of qualitative information in financial reports (e.g. Dhaliwal et al. 2012; Ittner & Larcker 1998) contend that such information is value relevant as it offers insights into both past performance and future prospects. Several studies have corroborated the incremental value of discretionary information on share prices (Arya et al. 2013; Robin & Wu 2015; Yoon 2013), suggesting that users may perceive this insider information as valuable constructs for predicting a firm's share price.

However, proponents of these two categories of disclosure often advocate for one over the other. Discretionary and non-discretionary disclosures are intertwined within the same report, with discretionary disclosure intended to provide supplementary information beyond GAAP disclosures and, in some cases, even referencing GAAP disclosures. Therefore, investigating the separate and joint value relevance of these two types of disclosures is crucial for gaining a comprehensive understanding of their respective roles:

H1: Discretionary and non-discretionary disclosures hold value relevance across both emerging and developed economies.

In addition to disclosures in annual reports, various factors within the institutional, legal and economic landscape of a firm, as well as its specific firm characteristics can influence firm value (Ali & Hwang 2000; Anandarajan & Hasan 2010; Ball et al. 2000). Mangena, Tauringana and Chamisa (2012) and Martínez and Requejo (2017) found a positive relationship between ownership structures and firm value in various regions, while Fauzi and Locke (2012) and Vintilă and Gherghina (2015) contend that specific types of ownership, such as block holders or employee ownership, may detrimentally affect firm value in different contexts. Moreover, the quality of law enforcement is crucial in assuring investors that unlawful appropriation of a firm's assets will be diligently addressed (Castro, Clementi & MacDonald 2004). Xie et al. (2017) suggest that the institutional environment significantly impacts firm performance. Elbakry et al. (2017) established a strong connection between the value relevance of earnings and economic policy variables, such as the real Gross Domestic Product (GDP) growth rate in Germany and the UK. Additionally, studies by Egbunike and Okerekeoti (2018) and Tanaka et al. (2020) have linked GDP to firm earnings (non-discretionary disclosure) in Nigeria and Japan. Anandarajan and Hasan (2010) argue that economic openness intensifies competition, thereby heightening the need for better disclosure and enhancing value relevance in the Middle East and North Africa (MENA) region. The foregoing discussion underscores the explanatory power of a firm's reporting environment (both in emerging and developed economies) in shaping firm value:

H2: The reporting environment of the firm exhibits additional value relevance beyond that conferred by discretionary and non-discretionary disclosures.

Research design

Sample

The present study investigates the value relevance of discretionary and non-discretionary disclosures in emerging (South Africa and India) and developed economies (the UK and US). These countries were selected for their pivotal roles

in their respective economic hubs. Our analysis targets the top 100 companies, by market capitalisation, listed on the primary stock exchanges of each nation. This choice is justified by several considerations. Firstly, larger firms are more likely to provide chairman's letters, which are essential for assessing discretionary disclosure scores. These letters were manually extracted from company websites for the period 2000 to 2019. Due to the labour-intensive nature of this task, it was impractical to collect such data from all listed firms in each country. Secondly, variations in the format of chairman's letters across countries necessitated a thorough examination of non-discretionary disclosures to establish equivalent measures. We collected 4266 company-years of chairman's letters, and consistent with Brown, He and Teitel (2006), we did not exclude any specific company subsets. Our study focuses on large firms to ensure comparability across countries but recognises the potential selection bias introduced by exclusively analysing large enterprises (Tucker 2010). The inclusion of only large market capitalisation firms introduces a selection bias which may restrict the generalisability of the results to large firms in the sample countries. By excluding medium and small-sized firms, the findings become less applicable and may be irrelevant or even misleading for these segments of the corporate landscape.

In South Africa and the UK, the presentation of chairman's letters was consistent over time. In contrast, the US saw some companies replace the chairman's letter with the Management's Discussion and Analysis (MD&A) section, leading to the inclusion of only those US firms that provided chairman's letters. In India, there was notable variability, with some companies including chairman's letters sporadically over different years. Non-discretionary disclosure metrics, such as earnings per share (EPS) and book value per share (BVPS), were sourced from *DataStream* and *Bloomberg*.

Model estimation

Deriving measures of discretionary disclosure

The chairman's letter was utilised as a primary source for assessing discretionary disclosure, as these letters are a common feature in annual reports and are recognised for their value relevance (e.g. Smith & Taffler 2000). As we focus on the underlying meaning of the chairman's letter, *Diction* text analysis software was used to extract five key language tone measures: activity, certainty, optimism, realism and commonality (Hart 2001). *Diction*'s advantage is its use of AI, which enhances the reliability of tone analysis beyond classical word count techniques. The following is an overview of the *Diction* measures of discretionary disclosure.

Certainty refers to language conveying resoluteness, inflexibility, completeness and an authoritative tone (Hart, Carroll & Spiars 2012). Certainty is computed as Equation 1:

$$\text{CERTAINTY} = [\text{Tenacity} + \text{Levelling} + \text{Collectiveness} + \text{Insistence}] - [\text{Numerical term} + \text{Ambivalence} + \text{self} - \text{reference} + \text{variety}] \quad \text{[Eqn 1]}$$

Optimism endorses individuals, groups, concepts or events, highlighting positive implications (Hart et al. 2012). It reflects praise and satisfaction (Patelli & Pedrini 2015), and is linked to impression management in financial reports. Optimistic tones are predictive of a firm's future performance. Patelli and Pedrini (2014) argue that optimism reflects genuine expectations of performance, while Alalwani and Mousa (2020) see it as a market signalling tool. Optimism is computed as Equation 2:

$$\text{OPTIMISM} = [\text{Praise} + \text{Satisfaction} + \text{Inspiration}] - [\text{Blame} + \text{Hardship} + \text{Denial}] \quad \text{[Eqn 2]}$$

Activity is characterised by language indicating movement, change, idea implementation and avoidance of inertia (Hart et al. 2012). It highlights movement and idea implementation, expressing aggressiveness while minimising embellishment (Patelli & Pedrini 2015). Assessing activity tone is important as it reveals a company's commitment to executing forecasted plans. Activity is calculated as (Equation 3):

$$\text{ACTIVITY} = [\text{Aggression} + \text{Accomplishment} + \text{Communication} + \text{Motion}] - [\text{Cognitive term} + \text{Passivity} + \text{Embellishment}] \quad \text{[Eqn 3]}$$

Realism refers to language describing tangible, immediate and recognisable issues affecting daily life (Hart et al. 2012). The emphasis on tangibility and recognisability enhances financial statement readability. Complexity in language may impede comprehension, and realism is linked to performance readability to prevent deception in financial statement narratives. Realism is computed as Equation 4:

$$\text{REALISM} = [\text{Familiarity} + \text{Spatial Terms} + \text{Temporal Terms} + \text{Present Concern} + \text{Human Interest} + \text{Concreteness}] - [\text{Past Concern} + \text{Complexity}] \quad \text{[Eqn 4]}$$

Commonality emphasises agreed-upon group values while rejecting unique engagement modes (Hart et al. 2012). It reflects adherence to a shared action plan and pertains to corporate governance and stakeholder relations (Patelli & Pedrini 2014). Commonality is calculated as Equation 5:

$$\text{COMMONALITY} = [\text{Centrality} + \text{Cooperation} + \text{Rapport}] - [\text{Diversity} + \text{Exclusion} + \text{Liberation}] \quad \text{[Eqn 5]}$$

Measures of non-discretionary disclosure

In this study, we measure non-discretionary disclosure using book value per share (BVPS), following previous research by Onali, Ginesti and Vasilakis (2017) and Omran and Tahat (2020). Earnings per share is also employed, guided by studies such as Clarkson et al. (2011). Our investigation uses the price regression model (PRM) by Feltham and Ohlson (1995) to examine the linear relationship between stock price or return and accounting variables. For non-US corporations, BVPS is calculated as the proportionate common equity divided by outstanding shares at the fiscal year-end, while for US corporations, it is calculated at the end of the last calendar quarter. Earnings per share represent the fully

diluted or basic EPS for US and non-US companies, respectively, over the last 12 months.

Model specification

Given the dynamic nature of our dataset, where lagged dependent and independent variables can influence estimation outcomes, we employ generalised method of moments (GMM) for hypothesis testing. GMM is preferred over ordinary least squares (OLS) as it eliminates unobserved country-specific effects from the panel, automatically resolves statistical issues like homoscedasticity and mitigates problems related to multicollinearity among variables. Crucially, GMM addresses endogeneity concerns in the data.

Hypothesis 1 was examined through equations 6 to 8. Equation 6a assessed hypothesis 1 by examining the value relevance of non-discretionary disclosure on the share prices across the selected sample countries. Equation 6b scrutinises the same hypothesis but employs the change in discretionary disclosure as an independent variable.

$$MP_{it} = \propto_{it} + \beta_1 MP_{it-1} + \beta_2 \text{NONDISC}_{it} + \varepsilon_{it} \quad \text{[Eqn 6a]}$$

$$\text{MP}_{it} = \propto_{it} + \beta_1 MP_{it-1} + \beta_2 \Delta NONDISC_{it} + \varepsilon_{it} \quad \text{[Eqn 6b]}$$

where, MP_{it} is the market price (MP) of the share of a company i at the end of year *t*. MP_{it}-1 is the lag of the dependent variable MP_{it}. NONDISC_i ($\Delta\text{NONDISC}_{it}$) is a measure of non-discretionary disclosure (Book value and EPS) at the end of year *t*, and Ɛ_{it} is the error term.

Equation 7 tests the value relevance of discretionary disclosure (*Diction* variables – certainty, optimism, activity, commonality and realism).

$$MP_{it} = \propto_{it} + \beta_1 MP_{it-1} + \beta_2 DISC_{it} + \varepsilon_{it} \quad \text{[Eqn 7]}$$

where, MP_{it} is the MP of the share of the company *i* at the end of year *t*. MP_{it}-1 is the lag of the dependent variable MP_{it}. $DISC_{it}$ measures discretionary disclosure as proxied by optimism, certainty, activity, realism and commonality at the end of year *t* and $\mathcal{E}_{it}$ is the error term.

Equation 8 evaluates the combined value relevance of both non-discretionary and discretionary disclosure. The test involved employing individual discretionary disclosure measures alongside the composite discretionary disclosure variable derived through principal component analysis (PCV). The composite variable enabled us to assess the collective impact of the discretionary disclosure measures in explaining the MP of listed firms in sample countries.

$$MP_{it} = \propto_{it} + \beta_1 MP_{it-1} + \beta_2 NONDISC_{it} + \beta_3 DISC_{it} + \varepsilon_{it} \quad \text{[Eqn 8]}$$

where, MP_{it} is the MP of the share of the company $_i$ at the end of year *t*. MP_{it}-1 is the lag of the dependent variable $\text{MP}_{it.}$ $NONDISC_{it}$ is non-discretionary measures of firm $_i$ at the end of year *t*; $DISC_{it}$ is discretionary disclosure scores (activity, certainty, optimism, realism and commonality) for firm $_i$ at the end of year t as measured by *DICTION;* and $\mathcal{E}_{it}$ is the error term.

Hypothesis 2 was evaluated through Equation 9, which examines the value relevance of firms' reporting environment in conjunction with accounting disclosure. The model is specified as follows:

$$MP_{it} = \propto_{it} + \varnothing_i MP_{it-1} + \sum_{i=1}^{n} \varnothing_2 DISC_{it} + \sum_{i=1}^{n} \varnothing_3 NONDISC_{it} + \sum_{i=1}^{n} \varnothing_i G_{it} + \sum_{i=1}^{n} \varnothing_i X_{it} + \varepsilon_{it} \quad \text{[Eqn 9]}$$

where MP_{it} is the MP of the share of the company $_i$ at the end of year *t*; MP_{it-1} is the lag of the dependent variable MP_{it}. $DISC_{it}$ is a vector representing discretionary disclosure (activity, certainty, optimism, realism and commonality) as measured by *DICTION*. $NONDISC_{it}$ is the vector representing non-discretionary disclosure of company (EPS and book value per share) *I*; G_{it} is a vector representing reporting environment variables including ownership, macroeconomics, legal framework factors; X_{it} is a vector of control variables including age of company, size, risk and $\mathcal{E}_{it}$ is the error term.

The analysis controlled for firm size, based on research indicating that larger firms often have more diverse shareholdings, which can lead to improved disclosure practices (e.g. Chau & Gray 2002). Firm size was measured by firms' market capitalisation at year-end. Risk was another crucial control variable, given its well-documented relationship with firm value (e.g. Bhagat & Bolton 2008). Following the approach of Anandarajan and Hasan (2010), the debt-to-asset ratio was utilised as a proxy for risk. In addition, we control for the age of the firm, as the literature suggests a nuanced relationship between firm age and performance, including MP dynamics. Older firms are often perceived as more valuable, although they may exhibit a declining trend in profitability over time (e.g. Habib & Hasan 2019). Table 1 describes other variables used in the current study in addition to discretionary and non-discretionary disclosure.

Univariate analysis

Table 2 provides a univariate analysis of sample firms across emerging economies (represented by South Africa and India) and developed economies (represented by the UK and US). In terms of mean optimism, the US exhibits the highest value (56.5061), trailed by the UK (55.8093), India (54.2642) and South Africa (54.0300), respectively. Mean activity is highest for the UK (49.4496), followed by India (49.3010), South Africa (49.1457) and the US (49.0644). Regarding mean certainty, India records the highest value (49.5102), followed closely by the UK (49.4832), South Africa (48.6269) and the US (48.4119). Mean realism is highest in the US (53.8341), succeeded by India (53.2319), the UK (52.7466) and South Africa (51.3524). Mean commonality is also highest in the US (49.5824), followed by the UK (49.4463), South Africa (49.2615) and India (48.8266).

Figure 1 compares discretionary disclosure across the sample countries. Notably, the figure underscores that optimism and realism scores in the language used in chairman's letters are

TABLE 1: Description of other variables.

Variable name	Name used in the model	Description	Sign
Ownership variables			
Local ownership	Local ownership	The percentage of local shareholdings in the total number of shares issued	-
Foreign ownership	Foreign ownership	The percentage of foreign shareholdings in the total number of shares issued	+
Institutional ownership	Institutional ownership	The percentage of institutional shareholders in the total number of shares issued	+
Economic variables			
GDP growth	GDP growth	The change in the GDP	+
Economic openness	Economic openness	The extent of foreign investors in the local economy	+
Regulatory variables			
Regulatory quality	Regulatory quality	Quality of the regulatory environment	+
Rule of law	Rule of law	Law and order in a country	+
Control variables			
Age of the firm	Age	Number of years of existence of a firm at year-end	+
Size	Market capitalisation	The number of shares issued multiplied by the share price of a firm at year-end	+
Risk	Debt	Variation of debt levels of a company at year-end	-

GDP, gross domestic product.

consistently high across all countries, with India and South Africa (representatives of emerging economies) scoring higher than those in developed economies. Conversely, activity, certainty and commonality tend to be consistently lower across all countries.

Figure 2 presents a comparison of non-discretionary disclosure across the sample countries. Interestingly, non-discretionary disclosure, as measured by EPS, BVPS and MP, is substantially higher and shows an increasing trend in the US. The UK follows this trend, although in the UK, the non-discretionary measures generally remain flat and are closer to those observed in emerging economies over the sample years.

Figure 2 presents the trend of non-discretionary disclosure measures (EPS and BVPS) and MP over the sample period for each sample country.

Empirical results

Table 3 presents the impact of non-discretionary disclosure, measured by BVPS and EPS, as well as changes in these metrics on MP. The results reveal a significantly positive relationship between MP and non-discretionary disclosure at the 1% significance level (BVPS = 0.302 and EPS = 0.187 in Model I; BVPS = 0.081 and EPS = 0.063 in Model II). This indicates that, ceteris paribus, the GAAP information provided in annual reports holds value relevance in both emerging and developed economies, with the relationship being inelastic. The significant autoregressive 1 (AR1) coefficient and insignificant autoregressive 2 (AR2) coefficient, along with the Sargan tests, confirm the model's robustness. These findings align with Clarkson et al. (2011) among others.

Table 4 presents the results of the impact of discretionary disclosure on market value. In Model I, where discretionary disclosure variables are included individually, certainty (coefficient = 0.273) and commonality (coefficient = 0.705) positively and significantly impact share price at the 10% level. Conversely, realism has a significantly negative impact at the 10% level, with a coefficient of –0.102. These findings suggest that ceteris paribus, share prices respond positively to the tone of language in the chairman's letter characterised by resoluteness, inflexibility, completeness and authoritative language (certainty), as well as a tone emphasising shared values and rejecting unique engagement methods (commonality). However, the focus on tangible and recognisable issues in the chairman's letter (realism) tends to reduce share prices. When all discretionary variables are combined into a composite variable, the effect on share price is positive and significant (coefficient = 0.028). This result aligns with studies by Dhaliwal et al. (2012), and Ittner and Larcker (1998), suggesting that discretionary disclosures are value relevant. However, Casonato, Farneti and Dumay (2018) argue that discretionary disclosure, particularly in the chairman's letter, may lose legitimacy if not supported by corresponding actions.

Table 5 presents the joint modelling of discretionary and non-discretionary disclosure. The results demonstrate that both non-discretionary and individual discretionary disclosure measures in Model II, as well as the composite discretionary disclosure measure (PCV) in the same model, exhibit value relevance. These findings suggest that users of annual reports use both strands of disclosure as inputs in their decision-making process. The simultaneous importance of these two sets of disclosures confirms the findings of Cooray et al. (2020).

Table 6 presents the impact of reporting environment factors – ownership structure, rule of law, and macroeconomic conditions – along with control variables, on firm value, specifically focusing on discretionary and non-discretionary disclosure. Prior research (e.g. Ali & Hwang 2000; Ball et al. 2000; Robb & Zarzeski 2001) indicates that these factors and firm characteristics are relevant to firm value. Non-discretionary disclosure remains positively significant across all models, indicating its robustness even when reporting environment variables are introduced. In contrast, the significance of discretionary disclosure diminishes with the inclusion of certain reporting environment factors. Specifically, Models I and II show that adding ownership structure variables reduces the explanatory power of

TABLE 2: Descriptive statistics – The mean, median and the standard deviation of all the variables for sample countries.

Variables	India (n = 626)			SA (n = 1289)			UK (n = 1163)			US (n = 998)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Market price	7.8626	3.6195	12.1311	11.3739	6.4810	18.9171	25.6798	14.6265	60.6726	78.1197	58.4400	88.0759
Discretionary disclosure												
Activity	49.3010	49.2300	4.4404	49.1457	49.0600	3.5571	49.4496	49.4600	1.7912	49.0644	49.1900	2.2238
Optimism	54.2642	54.0300	3.5018	54.0645	53.8900	3.5730	55.8093	55.6150	3.1806	56.5061	56.1400	3.7570
Certainty	49.5102	50.0600	3.5596	48.6269	49.4700	3.6606	49.4832	49.9900	2.9468	48.4119	49.0000	3.2602
Realism	53.2319	53.3600	3.1548	51.3524	51.9500	4.2124	52.7466	52.8200	2.5988	53.8341	54.1000	3.0590
Commonality	48.8266	48.8150	1.8897	49.2615	49.3150	2.2070	49.4463	49.4400	1.7664	49.5824	49.5100	1.9886
Non-discretionary disclosure												
EPS	0.3615	0.1600	0.5346	0.5854	0.3300	0.8639	1.3102	0.8900	1.3142	3.7435	2.8300	4.3654
Book value per share	2.9160	1.2695	8.2351	3.7464	2.0410	4.6748	6.1152	4.3450	6.7969	2734.376	14.9090	19096.71
Ownership variables												
Local ownership	45.6381	51.7108	27.6826	42.9555	39.5259	20.9127	39.0685	36.0783	18.2882	68.0630	67.9960	14.8319
Foreign ownership	54.3619	48.2892	27.6826	18.4473	13.2618	16.8519	35.7112	35.2556	15.4519	9.5752	9.3165	4.4567
Institutional ownership	20.9142	18.5740	12.7535	33.0392	32.0358	18.1546	64.0561	64.5240	19.0752	73.0750	74.9903	16.3977
Economic environment												
GDP growth	6.8430	7.4102	1.5175	2.5025	2.4852	1.8503	1.5519	1.9181	1.6951	1.4236	1.3812	0.1642
Economic openness	1.7478	1.6350	0.6755	1.3961	1.1672	0.8948	4.2054	2.6960	3.4904	1.8191	1.7166	0.5772
Regulatory quality	-0.3479	-0.3445	0.0840	0.4131	0.4067	0.1681	1.7457	1.7607	0.0800	1.1431	1.1098	0.0899
Rule of law	0.0131	0.0047	0.0833	0.1066	0.1162	0.0791	1.7211	1.7081	0.0735	1.5884	1.6000	0.0570
Control variables												
Age of the firm	14.2536	14.0000	7.9015	21.879	17.0000	19.4760	26.8070	19.0000	21.4442	41.3358	36.0000	26.3769
Market capitalisation	12 054 883	3 966 108	47 639 405	4 336 010	1 657 672	8 186 823	29 427 139	9 752 287	45 545 921	82 108 390	52 283 700	86 179 861
Debt	2 567 214	339 150	4 462 039	681 814	242 934	1 099 971	7 468 747	2 491 074	11 680 035	23 767 062	8 901 000	58 526 252

EPS, earnings per share; SD, standard deviation; SA, South Africa; UK, United Kingdom; US, United States; GDP, gross domestic product.

discretionary disclosure on share price, although the composite measure remains positively significant in both Model I (coefficient = 0.018) and Model II (coefficient = 0.022). Similarly, when rule of law is incorporated in Models II and III, the composite variable continues to positively influence share price. Regulatory quality positively affects share price, while the rule of law has a negative impact. The inclusion of macroeconomic factors in Models III and IV positively influences share price but diminishes the relevance of discretionary disclosure, suggesting that macroeconomic factors may outweigh discretionary disclosure in users' decision-making processes.

Comparison of emerging and advanced economies

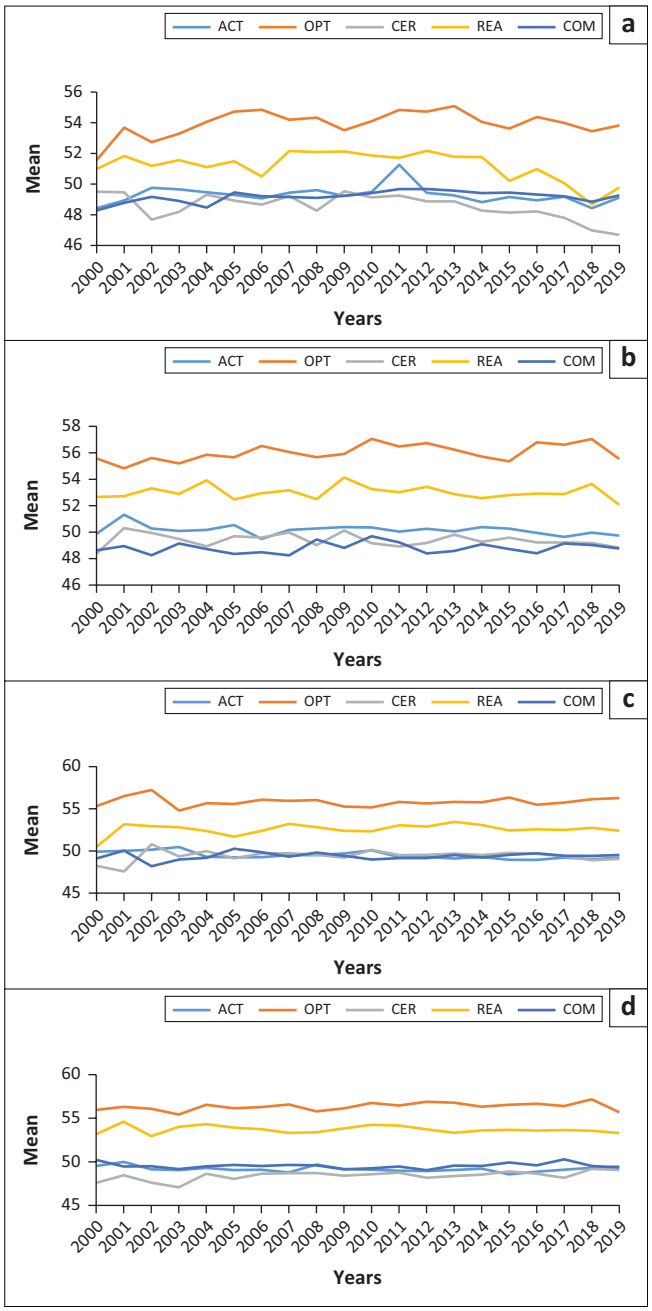
This section examines the impact of discretionary and non-discretionary disclosure on firm value in emerging and developed economies, with South Africa and India representing the former, and the UK and US the latter. Table 7 shows that price momentum (MP_{it}-1), non-discretionary disclosure, and a composite measure of discretionary disclosure (PCV) significantly and positively influence share prices in emerging economies. Specifically, activity and certainty boost share prices in emerging economies, while optimism has a diminishing effect. In developed economies, commonality increases share price, while certainty has a reducing effect. Overall, the results indicate that both non-discretionary and composite discretionary disclosure are highly value relevant in both settings, with significance at the 1% level. The model's robustness is supported by the AR1, AR2 and Sargan tests.

Table 8 compares the value relevance of reporting environment measures and accounting disclosures in emerging and developed economies. The findings indicate that non-discretionary disclosure is consistently value relevant across both settings, suggesting that users of financial information rely heavily on this type of disclosure regardless of the reporting environment. Discretionary disclosure, however, shows greater value relevance in developed markets, with the combined measure being significant at the 1% level. Optimism stands out as the only discretionary disclosure measure significant in both contexts, although it has opposite effects: reducing value relevance in developed markets and enhancing it in emerging markets.

In developed economies, all forms of ownership are significant, with institutional ownership showing a positive relationship with value relevance, underscoring the governance role of institutional investors in ensuring report quality. Regulatory quality is significantly positive in developed economies but not in emerging markets. The rule of law is significant in both, although it reduces value relevance in developed economies while enhancing it in emerging markets. Economic openness negatively impacts value relevance in both contexts, while GDP positively affects it. Control variables have similar effects across both markets, with the exception of debt, which reduces value relevance in emerging markets but not in developed ones.

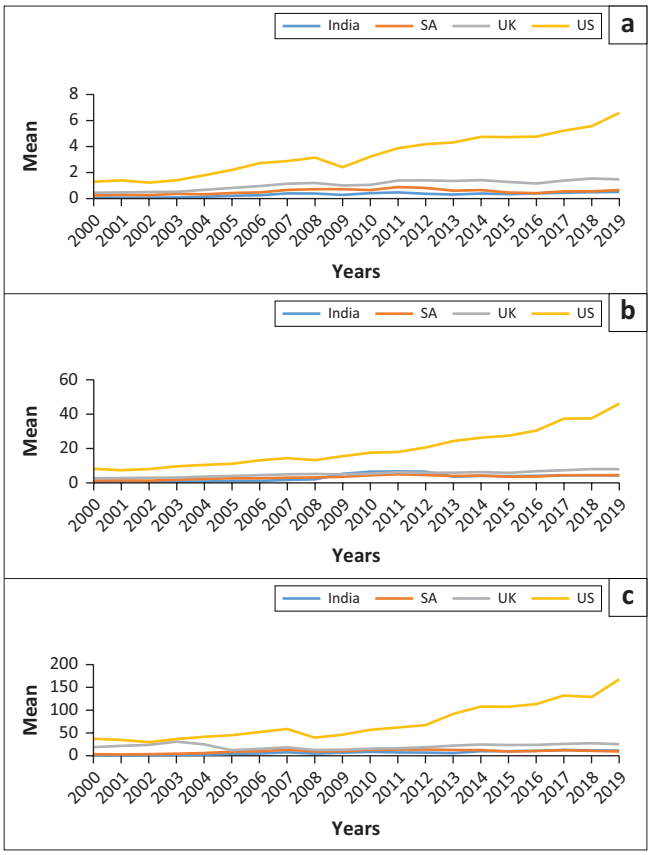
Discussion

This study examines the effects of discretionary and non-discretionary disclosures on share prices in emerging and



Note: (a), South Africa (SA); (b), India; (c), United Kingdom (UK); (d), United States (US). ACT, activity; OPT, optimism; CER, certainty; REA, realism; COM, commonality.

FIGURE 1: Comparative presentation of discretionary disclosure for sample countries.



Note: (a), earnings per share EPS; (b), book value per share BVPS; (c), market price MP. SA, South Africa; UK, United Kingdom; US, United States.

FIGURE 2: Comparative non-discretionary disclosure in sample countries.

TABLE 3: The impact of non-discretionary disclosure on market price.

Variables	Model I	Model II
MP_{t-1}	0.283†	0.607†
BVPS	0.302†	0.081†
EPS	0.187†	0.063†
AR1	0.000	0.003
AR2	0.275	0.251
Sargan	0.067	0.107

Note: Table 3 presents the impact of non-discretionary (EPS and BVPS) disclosure and a change in non-discretionary disclosure market price (MP). Model 1 presents the impact of non-discretionary disclosure BVPS on market price while model II presents the impact of a change in non-discretionary disclosure on the share price.

EPS, earnings per share; BVPS, book value per share; AR1, autoregressive 1; AR2, autoregressive; MP, market price.

†, represents significant at 1%, 5% and 10%.

developed economies, alongside the role of the reporting environment. Findings indicate that both disclosure types are value relevant, consistent with prior research by Anandarajan and Hasan (2010). Non-discretionary disclosures, often compiled under standards like IFRS or US GAAP, continue to influence company valuation due to their perceived reliability, despite potential manipulation in financial reporting (Healy & Wahlen 1999).

The significant impact of discretionary disclosures highlights their importance in share price forecasting, even as these disclosures may be strategically used by managers (Davis & Tama Sweet 2012). Despite concerns over narrative quality, users effectively analyse these disclosures for critical insights. The combined relevance of both disclosure types suggests they complement each other in predicting share prices, challenging the need to prioritise one over the other.

The findings suggest that both discretionary and non-discretionary disclosures play critical roles in mitigating information asymmetry between managers and stakeholders. This supports the agency theory perspective that effective disclosures can reduce agency costs by aligning the interests of managers with those of shareholders. These findings support Hypothesis 1, which posits that both discretionary and non-discretionary disclosures exhibit value relevance in

TABLE 4: The impact of discretionary disclosure on market price.

Variables	Model I	Model II
MP (t-1)	0.423†	0.506†
Activity	-0.140	-
Optimism	0.003	-
Certainty	0.273†	-
Realism	-0.102†	-
Commonality	0.705†	-
PCV	-	0.043†
AR1	0.000	0.000
AR2	0.164	0.551
Sargan	0.106	0.131

Note: Table 4 presents the relationship between market price (MP) and discretionary disclosure. Model I presents the impact of non-discretionary disclosure on MP while model II presents the impact of a composite measure (PCV) of all discretionary disclosure on MP.

PCV, principal component analysis; AR1, autoregressive 1; AR2, autoregressive; MP, market price.

†, represents significant at 1%, 5% and 10%.

TABLE 5: The joint impact of non-discretionary and discretionary disclosure on market price.

Variables	Model I	Model II
MP (t-1)	0.361†	0.264†
Book value per share	0.155†	0.228†
EPS	0.054†	0.097†
Activity	-0.298‡	-
Optimism	0.139†	-
Certainty	0.313†	
Realism	-0.213†	-
Commonality	0.309†	-
PCV	-	0.026†
AR1	0.000	0.000
AR2	0.490	0.975
Sargan	0.292	0.109

Note: Table 5 presents the relationship between market price (MP) and discretionary and non-discretionary disclosure while modelled jointly. In model I, discretionary disclosure variables are included separately while they are combined in model II.

EPS, earnings per share; PCV, principal component analysis; AR1, autoregressive 1; AR2, autoregressive; MP, market price.

†, ‡, represents significant at 1%, 5% and 10%.

both emerging and developed markets. Consequently, Hypothesis 1 is accepted.

The study also reveals that the value relevance of non-discretionary disclosures is consistent across different reporting environments, unlike discretionary disclosures, whose relevance diminishes with the introduction of additional reporting factors. This aligns with Ball et al. (2000) and Ali and Hwang (2000), who observed varying value relevance across different legal environments.

Non-discretionary disclosures are governed by regulatory standards (e.g. IFRS, US GAAP) that represent coercive institutional pressures. These pressures ensure that non-discretionary disclosures adhere to standardised frameworks, fostering consistency, comparability and transparency across different reporting environments. This alignment with regulatory mandates explains why the value relevance of non-discretionary disclosures remains stable irrespective of variations in institutional quality. Furthermore, institutional theory posits that organisations conform to regulatory standards to gain legitimacy. Non-discretionary disclosures, being standardised and legally mandated, are perceived as credible and reliable across institutional contexts, reinforcing their consistent value relevance. These findings align with Hypothesis 2, which asserts that the reporting environment of a firm provides additional value relevance beyond that offered by discretionary and non-discretionary disclosures. Accordingly, Hypothesis 2 is accepted.

Limitations of the study include potential selection bias due to the sample of top 100 companies and the possible oversimplification in distinguishing between emerging and developed economies. This limitation can be addressed in different ways in future research. Firstly, include a more diverse sample of firms across various market capitalisations (small, medium and large) to improve representativeness and enhance the generalisability of findings. Secondly, incorporate firms from a wider range of industries to examine whether the observed relationships hold across different sectors and thirdly, include firms from a broader array of countries within each economic category (emerging and developed) to capture regional variations and reduce geographic bias. Despite these, the study contributes to understanding the relationship between disclosures, reporting environments and firm valuation.

Conclusion

This study explores the value relevance of discretionary and non-discretionary disclosures in both emerging and developed economies, while also examining the influence of the reporting environment on these relationships. The findings provide compelling evidence that both types of disclosures significantly contribute to share price valuation, consistent with the theoretical underpinnings of agency and institutional theories. Non-discretionary disclosures are governed by regulatory standards such as IFRS and US GAAP and demonstrate consistent value relevance across various reporting environments. Their standardisation and alignment with coercive institutional pressures ensure reliability, comparability and transparency, reinforcing their credibility in valuation models. This stability underscores their role in mitigating information asymmetry and reducing agency costs.

Discretionary disclosures also play a pivotal role, offering critical insights for share price forecasting. However, their relevance diminishes in environments where additional reporting factors are present, reflecting the complementary but context-dependent nature of these disclosures. This finding highlights the normative and mimetic institutional pressures that shape voluntary disclosures and their strategic use by managers. Together, discretionary and non-discretionary disclosures enhance predictive accuracy, challenging the notion of prioritising one type over the other.

The reporting environment provides additional value relevance beyond individual disclosure types. The findings affirm that institutional quality moderates the effectiveness of disclosures, with strong institutional environments amplifying their joint relevance, while weaker environments

TABLE 6: The joint impact of discretionary and non-discretionary disclosure in sample countries when control variables are included.

Variables	Model 1		Model 2		Model 3		Model 4	
	(a) MP	(b) MP(PCV)	(a) MP	(b) MP(PCV)	(a) MP	(b) MP(PCV)	(a) MP	(b) MP(PCV)
MP (t-1)	0.164†	0.172†	0.086†	0.113†	0.108†	0.107†	0.059†	0.045†
Non-Discretionary disclosure								
Book value per share	0.112†	0.111†	0.158†	0.163†	0.296†	0.287†	0.256†	0.238†
EPS	0.162†	0.167†	0.238†	0.217†	0.230†	0.239†	0.197†	0.200†
Discretionary disclosure								
Activity	0.017	-	-0.122	-	0.290†	-	0.021	-
Optimism	0.022	-	0.0620‡	-	-0.066†	-	-0.073†	-
Certainty	-0.008	-	-0.082	-	-0.121	-	0.036	-
Realism	-0.017	-	0.008	-	0.016	-	-0.085†	-
Commonality	0.506†	-	0.398†	-	0.290†	-	0.202	-
PCV	-	0.018†	-	0.022†	-	0.001	-	0.001
Reporting environment – Ownership structure								
Local Ownership	0.100†	0.097†	0.029	0.013	0.044‡	0.046‡	0.013	-0.000
Foreign Ownership	0.061†	0.074†	0.077†	0.084†	0.082†	0.096†	-0.019	0.068‡
Institutional Ownership	0.251†	0.264†	0.261†	0.285†	0.171†	0.172†	0.040	0.266†
Reporting environment: Rule of law								
Regulatory Quality	-	-	0.067‡	0.085†	0.089‡	0.120†	0.244†	0.238†
Rule of Law	-	-	-0.070†	-0.077†	-0.079†	-0.079†	-0.132†	-0.048
Reporting environment-Macroeconomic factors								
Economic Openness	-	-	-	-	0.056†	0.064†	0.085†	-0.134†
GDP	-	-	-	-	0.101†	0.104†	0.104†	0.111†
Control variables								
Age of the firm	-	-	-	-	-	-	0.278	-0.011‡
Debt	-	-	-	-	-	-	-0.011‡	0.214†
Market Capitalisation	-	-	-	-	-	-	0.209†	0.049†
AR1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR2	0.197	0.221	0.219	0.337	0.464	0.493	0.608	0.610
Sargan	0.280	0.276	0.149	0.222	0.296	0.299	0.509	0.634

Note: Table 6 presents four models. Column (a) in each model includes individual discretionary disclosure as dependent variable while column (b) presents composite discretionary disclosure measure (PCV). The reporting environment independent variables are included in the four models using a stepwise process.

EPS, earnings per share; PCV, principal component analysis; AR1, autoregressive 1; AR2, autoregressive.

†, ‡, represents significant at 1%, 5% & 10%.

TABLE 7: Discretionary and non-discretionary disclosure in emerging and developed economies.

Variables	Model I – Emerging economies		Model II – Developed economies	
	(a)	(b)	(a)	(b)
MP_{it-1}	0.189†	0.314†	0.295†	0.331†
Book value per share	0.281†	0.244†	0.138†	0.143†
EPS	0.331†	0.241†	0.133†	0.151†
Activity	0.275†	-	-0.108§	-
Optimism	-0.066§	-	-0.059†	-
Certainty	0.304‡	-	-0.116†	-
Realism	-0.053	-	-0.062†	-
Commonality	0.074	-	0.188‡	-
PCV	-	0.003†	-	0.014†
AR1	0.044	0.000	0.852	0.000
AR2	0.882	0.121	0.971	0.942
Sargan	0.618	0.443	0.481	0.420

Note: Models I and II present the relationship between share price and discretionary and non-discretionary disclosure in emerging and developed economies, respectively. Column (a) includes all discretionary disclosure and column (b) includes composite discretionary measure (PCV).

EPS, earnings per share; PCV, principal component analysis; AR1, autoregressive 1; AR2, autoregressive.

†, ‡, §, represents significant at 1%, 5% & 10%.

necessitate discretionary disclosures to compensate for deficiencies in mandatory reporting.

This study contributes to the understanding of the relationship between disclosure practices, institutional contexts and firm valuation. It underscores the critical role of regulatory frameworks and reporting environments in shaping disclosure effectiveness and offers practical insights for policymakers, standard setters and corporate managers aiming to enhance transparency and market efficiency. Future research should

TABLE 8: The joint impact of discretionary and non-discretionary disclosure in emerging and developed economies.

Variables	Model I		Model II		Model III		Model IV	
	(a) MP	(b) MP(PCV)	(a) MP	(b) MP(PCV)	(a) MP	(b) MP(PCV)	(a) MP	(b) MP(PCV)
Panel 1 Joint discretionary and non-discretionary disclosure in emerging economies								
MP_{it-1}	0.139†	0.229†	0.212†	0.199†	0.039†	0.273†	0.804†	0.814†
Non-Discretionary disclosure								
Book value per share	0.153†	0.186†	0.154†	0.196†	0.349†	0.256†	0.053‡	0.021‡
EPS	0.345†	0.339†	0.204†	0.213†	0.380†	0.261†	0.075‡	0.069‡
Discretionary disclosure								
Activity	0.261‡	-	0.348†	-	0.203‡	-	-0.048	-
Optimism	-0.000	-	-0.093†	-	0.028	-	0.083‡	-
Certainty	0.343†	-	-0.685†	-	0.013	-	-0.004	-
Realism	-0.049	-	-0.232†	-	-0.073	-	0.001	-
Commonality	0.149	-	-0.847†	-	0.867†	-	-0.018	-
PCV	-	0.008†	-	-0.015	-	0.019†	-	0.002
Reporting environment – Ownership structure								
Local Ownership	0.115†	-0.011	0.071†	0.039‡	0.092†	0.066†	-0.014	-0.014
Foreign Ownership	-0.068†	0.027‡	0.016	0.022	-0.022	-0.020	-0.007	-0.006
Institutional Ownership	0.110†	0.069†	0.066†	0.062‡	0.075†	0.018	0.056‡	0.057‡
Reporting environment: Rule of law								
Regulatory Quality	-	-	0.684†	0.547†	-0.215‡	-0.388†	-0.052	-0.053
Rule of Law	-	-	-0.025†	-0.028†	-0.034‡	0.013	0.735†	0.763†
Reporting environment- Economic measures								
Economic Openness	-	-	-	-	0.006	-0.146a	-0.051†	-0.052†
GDP	-	-	-	-	0.131†	0.181†	0.079†	0.082†
Control variables								
Age of the firm	-	-	-	-	-	-	-0.042‡	-0.040‡
Debt	-	-	-	-	-	-	-0.013†	-0.012†
Market Capitalisation	-	-	-	-	-	-	0.033†	0.034†
AR1	0.908	0.000	0.011	0.522	0.801	0.970	0.000	0.000
AR2	0.897	0.431	0.221	0.815	0.895	0.986	0.989	0.912
Sargan	0.533	0.566	0.416	0.435	0.316	0.345	0.498	0.362
Panel 2 Joint discretionary and non-discretionary disclosure in developed economies								
MP_{it-1}	0.402†	0.429†	0.261†	0.232†	0.340†	0.339†	0.390†	0.362†
Non-Discretionary disclosure								
Book value per share	0.081†	0.029†	0.091†	0.219†	0.134†	0.151a	0.018	0.082†
EPS	0.069†	0.043†	0.207†	0.219†	0.151†	0.139†	0.126†	0.186†
Discretionary disclosure								
Activity	-0.092	-	-0.201	-	0.091	-	-0.635†	-
Optimism	0.111†	-	0.049†	-	0.085†	-	-0.066†	-
Certainty	-0.142‡	-	-0.174§	-	-0.308†	-	0.233‡	-
Realism	-0.061‡	-	0.032	-	-0.015	-	-0.193†	-
Commonality	0.140	-	0.032	-	0.041	-	0.365†	-
PCV	-	0.012†	-	0.052†	-	-0.004	-	0.016†
Reporting environment – Ownership structure								
Local Ownership	0.062‡	-0.025†	-0.313†	-0.076†	-0.262†	-0.235†	-0.049	-0.103†
Foreign Ownership	0.126†	0.126†	0.150†	0.278†	0.117†	0.111†	0.135†	0.149†
Institutional Ownership	0.242†	0.233†	0.344†	0.197†	0.321†	0.333†	0.089§	0.021
Reporting environment: Rule of law								
Regulatory Quality	-	-	0.109†	0.109†	0.066a	0.076†	0.200†	0.175†
Rule of Law	-	-	-0.183‡	0.330†	-0.111	-0.169§	-0.411†	-0.509†
Reporting environment- Economic measures								
Economic Openness	-	-	-	-	0.044†	0.042†	-0.047†	-0.027†
GDP	-	-	-	-	0.171†	0.170†	0.042	0.147†
Control variables								
Age of the firm	-	-	-	-	-	-	-0.102†	-0.072§
Debt	-	-	-	-	-	-	0.006	-0.002
Market Capitalisation	-	-	-	-	-	-	0.123†	0.070
AR1	0.954	0.992	0.482	0.356	0.000	0.001	0.977	0.999
AR2	0.999	0.998	0.894	0.909	0.623	0.722	0.992	0.999
Sargan	0.575	0.436	0.594	0.514	0.452	0.426	0.478	0.367

Note: Table 8 presents four models. Column (a) includes all independent variables (individual discretionary disclosure measure, non-discretionary disclosure, reporting environment measures and control variables) while column (b) presents all independent variables but with composite discretionary disclosure measure (PCV). The reporting environment independent variables are included in the four models using a stepwise process.

EPS, earnings per share; PCV, principal component analysis; AR1, autoregressive 1; AR2, autoregressive; MP, market price.

†, ‡, §, represents significant at 1%, 5% & 10%.

address identified limitations, such as sample selection bias and simplified economic classifications, to further refine these insights.

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Competing interests

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

Authors' contributions

J.T. conceptualised the study, developed the methodology, collected data and wrote the original draft. T.M.-M. supervised the project and contributed to the article revisions. All authors reviewed and approved the final version of the article.

Ethical considerations

An application for full ethical approval was made to the University of the Witwatersrand Human Research Ethics Committee (Non-Medical) and ethics consent was received on 01 August 2023. The ethics waiver number is HRECNMW23/08/05.

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Data availability

The data supporting the findings of this study are available in Repository name: Mendeley Data at doi: 10.17632/fhbb8tgvtm.1

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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