

Sustainability reporting, board gender diversity and earnings management: evidence from East Africa community

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Abstract

Purpose – The purpose of this study is to investigate the moderating effect of board gender diversity on the relationship between sustainability reporting (SR) and earnings management (EM) in the East Africa Community (EAC).

Design/methodology/approach – The study analyzed a sample of 71 publicly traded companies from 2011 to 2021.

Findings – The study finds that both SR and board gender diversity have a negative and significant effect on EM and that board gender diversity moderates the relationship between SR and EM.

Practical implications – The findings suggest that boards should support the adoption of SR and increase female representation as a practical way to reduce EM. Policymakers should also implement appropriate measures, such as imposing mandatory SR and gender quotas on corporate boards, to address EM.

Originality/value – This research adds to the limited knowledge of SR and EM in the EAC and also fills a gap in the existing literature by investigating the influence of board gender diversity on the link between SR and EM.

Keywords Sustainability reporting, Board gender diversity, Earnings management, East Africa community

Paper type Research paper

1. Introduction

The 21st century has seen several high-profile corporate accounting frauds, resulting in the collapse of large companies such as Enron, Tyco, Sunbeam and WorldCom. To address this issue, standard setters and regulatory bodies have introduced a range of reforms in accounting standards and policies to combat corporate fraud. For example, the United States Congress passed the Sarbanes-Oxley Act (SOX) in 2002 to improve accountability and transparency among profit-making corporations. To improve the quality of accounting information and prevent earnings management (EM), many countries have also made the use of International Financial Reporting Standards (IFRS) mandatory for publicly traded firms (Sellami and Slimi, 2016). Interestingly, studies show that the increased regulatory scrutiny of financial reporting has led managers to switch from accrual-based EM to real EM (Zhang *et al.*, 2008).

The principal-agent conflict is at the root of EM practices, where managers use unethical and deceptive accounting techniques to gain private benefits (Hill and Jones, 1992; Jensen and Meckling, 1976). Since financial reporting standards are flexible, managers may mislead stakeholders about a company's true economic performance (Healy and Wahlen, 1999;



Gordon *et al.*, 2017). Consequently, studies have investigated the impact of disclosure practices on EM. According to Healy and Palepu (2001), extensive, timely and transparent disclosure reduces agency costs related to the information asymmetry between managers and shareholders, which, in turn, restrains opportunistic managerial behavior. Jo and Kim (2007) argue that if shareholders are provided with comprehensive information about the company, they will be more proactive in monitoring EM.

Sustainability reporting (SR), which is the practice of reporting on a company's economic, environmental and social performance, is gaining popularity. Amran (2012) notes that firms are adopting and reporting their sustainability practices due to the increased public awareness of climate change. Furthermore, Goal 12.6 of the Sustainable Development Goals (SDGs) encourages businesses to include sustainability information in their reporting cycle. Stakeholders are pressuring corporations to take on more responsibility as their operations have an impact on the environment. According to a survey conducted in the UK, USA and Australia, more than 80% of shareholders demand environmental disclosure in the annual report (De Villiers and Van Staden, 2010). According to Blasco and King (2017), both developed and developing nations have seen an increase in corporate environmental and social disclosure during the past decade. Global Reporting Initiatives (GRI, 2010) reports that Europe, with a rate of 45%, has the highest percentage of companies reporting their social and environmental performance, followed by Latin and North America (28%), Asia (20%), Oceania (4%) and Africa (3%).

Although companies continue to incorporate sustainability initiatives into their operations, empirical research on sustainability disclosure practices (such as environmental and social performance) and EM has shown inconsistent and contradictory results (Litt *et al.*, 2013; Velte, 2021; Habbash and Haddad, 2019; Zhang *et al.*, 2021; Hickman *et al.*, 2021). This highlights the importance of examining contextual and moderating factors that may affect the link between SR and EM. In fact, aside from a few recent studies (Jordaan *et al.*, 2018; Ehsan *et al.*, 2022; Habbash and Haddad, 2019), most existing research focuses on advanced markets. Given that little is known about the relationship between SR and EM in developing markets, which are characterized by weak corporate governance (CG) structures and low SR adoption, exploring this relationship in the East African Community (EAC) may provide a new perspective on this debate.

Board gender diversity is a key factor in determining board effectiveness in monitoring the executive (Wang *et al.*, 2021). Studies show that boards with more women are more independent, have better oversight capabilities, provide high-quality advice and have access to more resources (Carter *et al.*, 2010; Gul *et al.*, 2011). Studies based on gender have shown that male and female board members tend to think and act differently (Adams, 2015). Hence, board gender diversity can influence CG practices and organizational performance (Adams and Ferreira, 2009). Previous studies have demonstrated that gender-diverse boards are more ethical and are more likely to consider the interests of various stakeholders (Adams and Ferreira, 2009; Kennedy and Kray, 2014). Literature also suggests that board gender diversity affects a firm's sustainability practices and financial reporting quality (Githaiga and Kosgei, 2022; Isidro and Sobral, 2015; Dobija *et al.*, 2022). Furthermore, compared to their male counterparts, female directors are generally considered to be more risk-averse and more stakeholder-focused (Wang *et al.*, 2022a, b). Zalata *et al.* (2019) also find that having female directors on the board significantly improves the accuracy of financial reports. Given the mixed results of previous studies, board gender diversity may influence the way SR affects EM, but there is little research on this topic. This study aims to contribute to the existing body of literature in three ways. First, the study will empirically investigate the relationship between SR and EM in the EAC. The EAC is a rapidly growing region that has recently seen significant stock market developments and CG reforms, but it is still lagging behind advanced nations in the adoption of SR. Second, the study will assess the effect of board

gender diversity on EM in a region with a low representation of women on corporate boards. EAC member states are progressively implementing affirmative action to reduce gender disparities in public and private spheres. Currently, women make up 61.4% of the parliament of Rwanda, followed by Uganda (34.0%), Tanzania (36.6%), Burundi (36.3%) and Kenya (21.61%). Finally, this study will explore whether board gender diversity has an impact on the relationship between SR and EM, an area that has received little attention in the literature. The remainder of this paper is organized as follows. [Section 2](#) discusses the institutional setting; [Section 3](#) presents a theoretical review; [Section 4](#) reviews empirical literature; [Section 5](#) describes the research methodology; [Section 6](#) presents the empirical findings. [Section 7](#) concludes and [Section 8](#) highlights the limitations and suggestions for further research.

2. Institutional setting

The EAC is a group of seven countries that includes the Democratic Republic of the Congo (DRC), Kenya, Uganda, Tanzania, Rwanda, Burundi, South Sudan and Uganda. On July 7, 2000, Kenya, Uganda and Tanzania signed a treaty that led to the rebirth of the EAC after the original EAC collapsed in 1977. Rwanda and Burundi joined in 2007, South Sudan followed in 2016 and, more recently, the DRC in 2022. The EAC is anchored by four pillars: the political federation, the common market, the customs union and the monetary union. This study focuses on listed companies in Kenya, Uganda, Tanzania and Rwanda for several reasons. First, only these four countries have effective and functional stock exchanges. The DRC's capital market is still underdeveloped and mostly consists of the issuance of treasury bonds and a small number of private equity firms actively financing the mining industry ([U.S. Department of State, 2018](#)). South Sudan has neither a stock exchange nor any publicly traded company. Second, several firms are cross-listed on the securities/stock exchanges of the four countries. Third, the regulatory environments, stock market structures and CG codes are comparable across the four countries.

Corporate entities in the EAC are increasingly adopting SR. [ACCA \(2014\)](#) reports that 13 companies operating outside South Africa engage in SR. These firms are from Nairobi Securities Exchange (4), Nigerian Stock Exchange (4), Zimbabwean Stock Exchange (2), Uganda Stock Exchange (1), Botswana Stock Exchange (1) and Lusaka Stock Exchange (1). However, this figure is relatively low, given that over 71% of listed companies in 41 advanced markets report on sustainability ([KPMG, 2008](#)). According to [Nyawira \(2022\)](#), around 10% of listed companies on the Nairobi Securities Exchange engage in environment, social and governance (ESG) disclosure in Kenya. These companies include East African Breweries, Nation Media Group, Bamburi Cement, KCB Bank Group, Kakuzi, BOC Kenya Plc, Safaricom PLC and Standard Chartered. According to [Lawi \(2022\)](#), 30 businesses in Kenya are implementing integrated reporting with 11 listed companies having voluntarily adopted SR. The Nairobi Securities Exchange also plans to introduce a new index that will allow investors to select firms to invest in based on sustainability performance and reporting. In addition, the exchange has also published guidelines on ESG compliance to help Kenyan-listed companies adopt SR. The Central Bank of Kenya has issued guidelines to raise awareness among the banking industry about the opportunities and risk mitigation related to climate change. Other initiatives in Kenya supporting sustainable development include the 2017 Green Bond, which aims to mitigate climate change. [Tilt et al. \(2021\)](#) claim that Kenya, Botswana and Nigeria are home to the top SR firms in Sub-Saharan Africa. The [Sustainable Stock Exchanges Initiative \(2016\)](#) reports that there are no specific rules requiring issuers in Kenya, Tanzania or Rwanda to disclose their ESG activities. However, the report shows that Kenya's securities exchange informs its stakeholders about initiatives to enhance market sustainability. This suggests that Kenya is leading the EAC countries in promoting environmentally and socially responsible corporate practices.

Studies on SR adoption in Uganda have shown inconsistent results. According to [Tauringana \(2020\)](#), 80% of Ugandan companies engage in SR. However, [Bananuka et al. \(2022\)](#) claim that just 59% of Ugandan companies apparently adhere to the GRI guidelines for SR reporting. This raises questions about how SR is implemented and whether SR reports follow the relevant reporting standards and guidelines. The majority of Dar es Salaam Stock Exchange (DSE)-listed companies in Tanzania have yet to begin reporting on sustainability due to challenges such as cost, the scope of reporting and a lack of experience with the practice ([DSE, 2022](#)). As a first step toward SR, the DSE releases guidelines in 2022 requiring firms to disclose their social and environmental activities while reporting on CG.

3. Theoretical review

The stakeholder theory, legitimacy theory and agency theory are commonly used to explain why firms engage in SR. The stakeholder theory argues that firms should consider the interests and goals of a range of stakeholders in addition to their shareholders to achieve long-term profitability and a competitive edge ([Freeman, 1994](#)). According to the theory, firms should include stakeholders' goals and interests in their control systems and involve them to gain their support ([Durden, 2008](#)). [Omran and El-Galfy \(2014\)](#) argue that managing stakeholders involves identifying key players and determining how to address their needs. [Durden \(2008\)](#) similarly suggests that companies must involve all stakeholders in their social responsibility initiatives, to gain their support. If a company fails to do so, stakeholders may see a company's SR efforts as a superficial public relation tactic that has no real impact on the organization's sustainability performance. Moreover, the GRI 4.0 guidelines state that "the organization should identify its stakeholders, and explain how it has responded to their reasonable expectations and interests. Stakeholders can include those who are invested in the organization as well as those who have other relationships with the organization. The reasonable expectations and interests of stakeholders are a key reference point for many decisions in the preparation of the report." The guideline further provides that "organizations are faced with a wide range of topics on which they could report. Relevant topics are those that may reasonably be considered important for reflecting the organization's economic, environmental and social impacts, or influencing the decisions of stakeholders, and, therefore, potentially merit inclusion in the report" ([GRI, 2013](#), pp. 16–17). According to the principle of stakeholders' inclusivity, organizations should identify their stakeholders and detail how they have addressed their reasonable expectations and interests ([Kucukyalcin, 2018](#)). Therefore, SR should be seen as an effective and transparent way for a firm to communicate its sustainability performance to stakeholders.

The legitimacy theory suggests that companies engage in SR ([Deegan, 2002](#)) to fulfill a social contract with society, in which they pledge to act in a socially responsible manner to maintain legitimacy and acceptance in society ([O'donovan, 2002](#)). According to [Suchman \(1995\)](#), legitimacy is often understood to be a belief "... that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions." [Deegan \(2002\)](#) claims that a company's disclosure of sustainability information helps to legitimize its place in society and demonstrates its adherence to societal norms of relevance and usefulness ([Baumgartner et al., 2020](#)). [Davis \(1973\)](#) argues that if stakeholders perceive a company's performance as unsustainable, it may threaten the company's long-term sustainability and legitimacy. The adverse effects on a company's long-term sustainability include a poor reputation, dissatisfied clients, recruitment issues, lawsuits and increased regulations ([Ameer and Othman, 2012](#)). As the legitimacy theory is based on society's perception of a company, management may be obligated to disclose information that can influence the way the company is perceived by the outside world. According to [Dyball \(1998\)](#) and [O'Donovan \(2002\)](#), the annual report is seen as a significant source of legitimacy.

By analyzing the website content of six oil firms for the period 2011–2012 websites, [Du and Vieira \(2012\)](#) observe that companies use corporate social responsibility (CSR) activities and CSR communication to achieve legitimacy in a controversial environment. In the same vein, a study by [Hummel and Schlick's \(2016\)](#) reveals that underperforming corporations may prefer low-quality sustainability disclosure to hide their true performance while also maintaining their legitimacy. Consistent with the institutional theory, [Higgins and Larrinaga \(2014\)](#) claim that institutional norms and pressures can impact a company's decision to engage in social responsibility. According to [Dyer \(2007\)](#), environmental activism may be influenced by local norms and pressures from international aid and development institutions. This interaction between a company and the broader society can serve as the basis for the company's use of SR and its strategy for communicating sustainability information. The agency theory, proposed by [Jensen and Meckling \(1976\)](#), is another theoretical perspective used to explain why firms engage in sustainability disclosure. The theory postulates that information asymmetry, opportunistic behaviors and conflicts of interest may exist between the primary shareholders and agents (managers). As a result, the board may serve as a monitoring mechanism to address these issues and reduce agency costs. The empirical literature suggests that SR can be a practical, reliable and transparent tool for addressing information asymmetry between agents and shareholders ([Cuadrado-Ballesteros et al., 2017](#)).

From the standpoint of agency theory, [Shamil et al. \(2014\)](#) argue that managers typically improve the quality of CSR disclosure in response to the internal monitoring mechanism. [Chintrakarn et al. \(2016\)](#) argue that managers may be motivated to produce sustainability reports to conform to strict internal monitoring mechanisms and to mitigate the principal-agent problem and costs.

4. Empirical review and hypotheses development

4.1 Sustainability reporting and earnings management

Empirical studies have examined the connection between SR practices and EM through two perspectives: stakeholder legitimacy and managerial opportunism ([Herbert and Graham, 2021](#); [Sandberg and Holmlund, 2015](#)). The first perspective argues that firms with strong commitments to sustainability practices are less likely to manipulate earnings, implying that SR is motivated by a long-term objective. By engaging in sustainability disclosure, a company demonstrates to its external stakeholders that it values the environment and society, and as a result, the public sees it as a corporate citizen who cares about social issues. Previous studies on SR and EM provide empirical evidence in support of these arguments. For example, [Cohen and Malkogianni \(2021\)](#) use a sample of 16 Malaysian companies from 2011 to 2013 and find insignificant results between SR and EM. The authors conclude that Malaysian firms have not used SR to manipulate earnings. Similarly, using a sample of 160 manufacturing firms in Pakistan and panel data from 2009 to 2018, [Ehsan et al. \(2022\)](#) find a negative relationship between CSR and EM. According to the study, the long-term perspective of the firm drives CSR activities. Furthermore, [Kumala and Siregar \(2019\)](#) find a negative connection between corporate social responsibility disclosures (CSRDs) and EM among mining companies listed on the Indonesian Stock Exchange, using data from 2012 to 2014. Similarly, [Xi and Xiao's \(2022\)](#) study examines the link between CED and EM practices, as well as accounting conservatism, using two different EM practices: accrual-based EM (AEM) and real EM (REM). The final sample includes 1,619 observations collected between 2015 and 2019. This study finds a negative relationship between CED and EM (AEM and REM). [Velte \(2021\)](#) discovers a negative relationship between environmental, social, and governance (ESG) performance and AEM, but not REM, for listed German firms from 2011 to 2017. Furthermore, when the three ESG performance metrics are considered, governance performance has the greatest negative impact on AEM compared to environmental and social

performance. The findings also reveal a bidirectional relationship between ESG performance and EM. [Gerged et al. \(2021\)](#) examine the link between corporate environmental disclosure (CED) and EM practices in a sample of 100 Jordanian-listed firms from 2010 to 2014. The findings reveal a negative relationship between CED and EM. The second perspective argues that managers may engage in sustainability activities solely for personal gain ([Buertey et al., 2020](#)). This argument suggests that sustainability practices are merely window-dressing or green-washing exercises ([Yu et al., 2020](#)). As a result, the disclosure of non-financial information is associated with earnings manipulation. [Buertey et al. \(2020\)](#) find a positive relationship between CSR and EM in a sample of 118 Johannesburg Stock Exchange companies with data from 2012 to 2015. In this vein, [Zhang et al. \(2021\)](#) report that Chinese firms with better voluntary CSR disclosure are more likely to engage in EM through discretionary accruals. Based on these theoretical and empirical debates, the first hypothesis is formulated as follows.

H1. Sustainability reporting has a negative effect on EM.

4.2 Board gender diversity and EM

The relationship between board gender diversity and unethical managerial practices, such as EM, has been the subject of much debate, but the findings are inconclusive. Some studies have found that companies with more gender-diverse boards are more effective at constraining EM. [Orazalin \(2019\)](#) finds that in emerging markets from 2010 to 2016, companies with more gender-diverse boards are more effective at constraining EM. [Kyaw et al. \(2015\)](#) and [Arun et al. \(2015\)](#) have reported similar findings. However, several empirical studies have found no association between EM and board gender diversity. For instance, [Sun et al. \(2011\)](#) find no relationship between the proportion of female directors on audit committees and the level of EM in S&P firms in a sample of 525 firm-year observations from 2003 to 2005. [Zalata et al. \(2022a, b\)](#) also find no association in a sample of 5,398 firm-year observations from 2007 to 2013, though they report that the proportion of female directors with financial backgrounds improves earnings quality. Given the mixed results in the empirical literature and the various gender-based theories, the second hypothesis is formulated as follows.

H2. Board gender diversity has a negative effect on EM.

4.3 The moderating role of board gender diversity

There are two different perspectives in the literature on the interaction between SR and EM. The first argument claims that involvement in environmental and social activities can reduce the negative effects of EM practices. The second argument, however, claims that executives may exploit sustainability initiatives and disclosure to mask opportunistic behaviors, which is consistent with agency theory. According to Jensen and Meckling, the board of directors is seen as the primary internal control mechanism for monitoring the executive, advancing and protecting shareholder interests (1976). In recent years, the participation of women on corporate boards has received increasing attention as a critical factor in determining the effectiveness of corporate boards and, ultimately, organizational outcomes ([Wang et al., 2021](#)). In addition, countries such as France, Belgium, Italy, Portugal, the Netherlands, Austria and Germany have even implemented corporate gender quotas ([Mensi-Klarbach and Seierstad, 2020](#)). Literature suggests that female board members are more ethical than their male counterparts. For instance, [Isidro and Sobral \(2015\)](#) find that the presence of more women on corporate boards enhances a company's adherence to ethical and social standards, eventually increasing the company's value. [Bernardi et al. \(2009\)](#) also find that companies with more women on their boards are more likely to be included on the Most Ethical

Companies List. Maulidi (2022) reports that female corporate executives are less likely to engage in corporate fraud. Wang *et al.* (2022) argue that companies with more female directors are less likely to engage in unethical behavior. Studies also demonstrate that female directors often hold their firms to higher ethical standards (Pan and Sparks, 2012). Additionally, female directors are thought to be less susceptible to taking risks, especially when making financial decisions, and are less likely to act unethically to benefit themselves (Powell and Ansic, 1997). Gender theory suggests that men and women behave in normatively anticipated ways and that those who adopt gender-congruent behaviors are viewed more positively by others (Eagly *et al.*, 1995). For instance, it is believed that men are more assertive and aggressive than women (Terjesen *et al.*, 2016), while women are more adaptive and capable of handling complex and uncertain situations (Rosener, 1995). These gender disparities may influence the effectiveness of the board of directors. Previous studies also indicate that female directors improve board effectiveness, and ultimately, environmental and social performance (Wang *et al.*, 2021). Scholars also argue that board gender diversity improves board knowledge, innovation, creativity, strategic decision-making and firm performance (Watson *et al.*, 1993). Furthermore, Kassinis *et al.* (2016) contend that female board directors are more stakeholder-oriented. Recent studies have also shown a positive link between the proportion of women on corporate boards and sustainability practices (Jizi, 2017; Haque, 2017). Based on these empirical studies, the third hypothesis is formulated as follows.

H3. Board gender diversity moderates the relationship between sustainability reporting and EM.

5. Research methodology

5.1 Sample and data

The study's population consists of 117 companies listed on four East Asia African Community Securities/Stock Exchanges: the Nairobi Securities Exchange (NSE), the Uganda Securities Exchange (USE), the Dar es Salaam Stock Exchange (DSE) and the Rwanda Stock Exchange (RSE). However, after excluding firms that were newly listed (32), cross-listed (10) or suspended (4), the final sample includes 71 firms. The data are collected for the period between 2011 and 2021. The Modified Jones model suggests that data on assets, liabilities, cash, debt and sales be lagged for one period. Consequently, data for 2011 was only used to calculate discretionary accruals, resulting in 710 firm-year observations being included in the analysis.

5.2 Measurement of variables

5.2.1 *Dependent variable-earnings management.* EM is measured using the Modified Jones model proposed by Dechow *et al.* (1995) to estimate discretionary accruals as a measure of the extent of EM. Prior studies have also used this model as a proxy measure of EM (Gull *et al.*, 2018; Mnif and Cherif, 2021).

$$\frac{TACC_t}{A_{t-1}} = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left[\frac{(\Delta REV_t - \Delta RECT_t)}{A_{t-1}} \right] + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) + \epsilon_{it} \quad (1)$$

where

TACC_t – total accruals in year t, measured as the difference between net profit and operating cash flows from activities in year t; A_{t-1} – total assets at the end of year t-1; ΔREV_t – the difference in operating revenues between year t and year t-1; ΔRECT – the difference in

net receivables between year t and year $t-1$; PPE_t - property plant and equipment at the end of year t . Based on the coefficients obtained in equation (1), we calculate non-discretionary accruals (NDACC) as provided in the equation

$$\frac{NDACC_t}{A_{t-1}} = A = \hat{\alpha}_1 \left(\frac{1}{A_{t-1}} \right) + \hat{\alpha}_2 \left[\frac{(\Delta REV_t - \Delta RECT_t)}{A_{t-1}} \right] + \hat{\alpha}_3 \left(\frac{PPE_t}{A_{t-1}} \right) + \epsilon_{it} \quad (2)$$

The discretionary accruals variable (DAC) is then calculated as $DAC_t = TACC_t - NDACC_t$. All variables were winsorized at the top and bottom 1% to account for outliers.

5.2.2 The independent variable. The Sustainability Report Disclosure Index (SRDI) is a measure of a company's SR. It is calculated as the ratio of the firm's actual score on sustainability to the maximum score achievable. On January 1, 2017, firms engaged in SR began following the GR4 guidelines. However, given that this study looks at SRDI from 2011 to 2021, it adheres to the GR3.1 guidelines, which consist of 79 items from three leading GRI-based performance indicators: economic dimension (9 items), environmental dimension (30 items) and social dimension (9 items), resulting in a total of 40 items). As a result, all indices are presented on a scale of 0.0 to 1.00. The items are hand-picked, as only a few EAC firms disclose economic, environmental and social performance following the GRI principles.

5.2.3 Moderating variables-board gender diversity. Board gender diversity, as suggested by previous research, refers to the proportion of women on corporate boards (Ellwood and Garcia-Lacalle, 2015). As a result, this variable is measured as the ratio of female board members to the total number of board members (Arun et al., 2015; Gavious et al., 2012).

5.2.4 Control variables. This study also considers the impact of various factors on EM, as suggested by previous research.

5.2.4.1 Firm size and EM. One factor is the firm size (FS), which is measured as the logarithm of total assets (Arun et al., 2015). Proponents of positive accounting theory argue that managers of large firms are more likely to exploit financial accounting flexibility, thereby engaging in EM (Watts and Zimmerman, 1986). However, analysts and securities market regulators typically scrutinize large firms more closely than small firms, which limits managerial accounting discretion (Koh, 2003). In contrast, Damak (2018) argues that smaller firms are more likely to manipulate earnings to avoid reporting losses.

5.2.4.2 Leverage and EM. The second factor is leverage, which is calculated as the ratio of long-term debt to total assets (Lakhal and Dedaj, 2019). Leverage may influence the level of EM because debt covenants can motivate the improvement of earnings quality. For instance, Lazzem and Jilani (2018) discover a positive relationship between leverage and EM among French firms using data from 185 non-financial French firms from 2006 to 2012. Conversely, Lakhal and Dedaj (2019) find a negative relationship between leverage and EM in a sample of 341 French firms between 2001 and 2012.

5.2.4.3 Firm performance and EM. Profit is an important component of a company's financial report. According to Collins et al. (2017), firms with very high performance and growth are less likely to engage in earnings manipulation compared to firms with low performance and growth. Ali et al. (2007) find a negative relationship between firm performance and EM. They also suggest that higher-performing firms use more conservative EM strategies, while lower-performing ones employ more aggressive EM policies. In this study, performance is measured using return on assets (ROA), a performance metric that evaluates a company's ability to generate earnings from its available assets (Ali et al., 2007).

5.3 Regression model and data analysis

The study employs stepwise regression to test the hypotheses. The regression models are shown as follows:

Model 1: Testing the effect of SR on EM.

$$DAC_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 FS_{it} + \beta_3 ROA_{it} + \beta_4 SRDI_{it} + \varepsilon_{it} \quad (3)$$

Model 2: Testing the effect of board gender diversity on EM.

$$DAC_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 FS_{it} + \beta_3 ROA_{it} + \beta_4 SRDI_{it} + \beta_5 BGD_{it} + \varepsilon_{it} \quad (4)$$

Model 3: Testing the effect of the interaction between SR and board gender diversity on EM.

$$DAC_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 FS_{it} + \beta_3 ROA_{it} + \beta_4 SRDI_{it} + \beta_5 BGD_{it} + \beta_6 SRD*BGD_{it} \quad (5)$$

where

DAC_{it} is the discretionary accruals in period “ t ” for the cross-sectional unit “ i ”; LEV_{it} is the firm leverage in period “ t ” for the cross-sectional unit “ i ”; FS_{it} is the firm size in period “ t ” for the cross-sectional unit “ i .” ROA_{it} is the return on assets in period “ t ” for the cross-sectional unit “ i .” BGD_{it} is the board gender in period “ t ” for the cross-sectional unit “ i .” $SRDI_{it}$ is the SR disclosure index in period “ t ” for the cross-sectional unit “ i .” $SRDI*BGD$ is the interaction between SR and board gender diversity. ε_{it} = error term.

The study uses STATA to perform the data analysis. The DAC is calculated as $DAC_{it} = TACC_{it} - NDACC_{it}$. All variables are winsorized at the top and bottom 1% to account for outliers.

6. Findings and discussions

6.1 Descriptive statistics

Table 1 presents descriptive statistics for each variable in the study. The average DAC is around 1.028. The average SRDI value of 0.348 suggests lower sustainability performance disclosure among EAC firms. The mean board gender diversity of 0.251 reveals low levels of women’s participation on corporate boards. The mean leverage of 0.646 indicates moderate use of debt financing. The mean FS of 16.399 and a standard deviation of 2.676 suggest low variability in FS. The mean ROA of 4.878% indicates low financial performance, while the standard deviation of 10.724 suggests high variability in profitability among EAC-listed companies.

6.2 Regression analysis

Based on the results of the Hausman test and the Breusch-Pagan Lagrange multiplier (LM) test, it was appropriate to use the random effect model to test the hypotheses. Model 1 in

Table 1.
Descriptive statistics
for the research
variables

Variable	Obs	Mean	Std. dev	Min	Max
DAC	710	1.028	0.760	0.234	2.083
SRDI	710	0.348	0.225	0.021	0.838
BGD	710	0.251	0.134	0.000	0.625
LEV	710	0.646	0.509	0.075	4.782
FS	710	16.399	2.676	9.084	22.749
ROA	710	4.878	10.724	-0.561	41.193

Table 2 presents the regression results for the effect of the SRDI on DAC. The results show that SRDI significantly and negatively affects DAC ($\beta = -0.495, p < 0.05$). This supports hypothesis H1 and is consistent with previous research (Ehsan *et al.*, 2022; Kumala and Siregar, 2019; Xi and Xiao, 2022; Velte, 2021). These findings support the legitimacy argument, which suggests that managers are motivated to engage in SR to justify their actions and improve a firm's survival (Kim *et al.*, 2012). However, these findings contradict those of García-Sánchez and García-Meca's (2017) that companies in environments with stricter regulations produce higher-quality earnings, as the results indicate that listed firms in weak regulatory regimes, like the EAC, are embracing sustainability practices and reporting high-quality earnings possibly due to increased stakeholder pressure and widespread environmental and social concerns.

The regression results of Model 2 in Table 2 are used to test the second hypothesis (H2). The findings indicate that board gender diversity has a significantly negative effect on DAC ($\beta = -0.533, p < 0.05$). This supports hypothesis H2 and is consistent with earlier research (Kyaw *et al.*, 2015; Arun *et al.*, 2015). Gavius *et al.* (2012) argue that incorporating women on corporate boards can improve a company's profitability and strengthen the functioning and productivity of the board. Similarly, Gull *et al.* (2018) and Mnif and Cherif (2021) claim that female directors are more risk-averse, hold themselves to higher ethical standards, provide greater oversight and exhibit more independent thought than their male counterparts. Furthermore, Damak (2018) finds that boards with more female members are more effective at monitoring, which reduces the risk of EM. In addition, studies show that women directors attend board meetings more frequently than men, which improves the board's oversight of the financial reporting environment and reduces the risk of EM (Adams and Ferreira, 2009).

The third hypothesis (H3) examines the moderating impact of board gender diversity on the relationship between SR and EM. The regression findings in Model 3 in Table 2 are used to test this hypothesis. The results show that the interaction term between board gender diversity and SR has a negative and statistically significant effect on DAC ($\beta = -0.431, p < 0.05$), supporting H3. This study argues that having more women on the board can boost the effectiveness of SR in reducing EM. Previous research has shown that firms with a high percentage of female board members are more likely to adopt sustainable policies and are more successful in curbing EM (Githaiga and Kosgei, 2022; Al-Shaer and Zaman, 2016). Furthermore, the study suggests that female directors actively support a healthy corporate financial reporting environment and are more aware of social and environmental issues (Zalata *et al.*, 2019; Atif *et al.*, 2020).

6.3 Robustness test

The study uses the Arellano-Bond system generalized method of moments (SGMM) estimator to analyze the dynamic relationship between SR, board gender diversity, and EM, as a robustness check. One advantage of GMM is its ability to provide reliable findings even in the presence of heteroscedasticity and to handle autocorrelation through differencing (Baltagi, 2008). GMM estimator, unlike OLS and RE, can account for unobserved heterogeneity (Wintoki *et al.*, 2012). Before analyzing the findings, the validity of the SGMM estimator is checked. Table 3 shows that the estimated coefficients for the Sargan and Hansen tests, as well as AR (2), are satisfactory for all three models. The null hypothesis of no autocorrelation cannot be rejected, indicating that the results pass the autocorrelation test AR (2). Additionally, the p -values of the Sargan and Hansen tests show that the null hypothesis cannot be rejected, indicating that the instruments are exogenous. Table 3 presents the results of the two-step system generalized method of moments. SRDI and BGD are negatively and significantly correlated with EM, supporting hypotheses H1 and H2. Additionally, the interaction between sustainability reporting and board gender diversity (SRDI*BGD) has a

Table 2.
Regression results for
the pooled OLS
estimation and random
effect

DAC	Model 1		Model 2		Model 3	
	OLS	RE	OLS	RE	OLS	RE
Intercept	1.220(0.182)**	1.225(0.297)**	1.429(0.191)**	1.514(0.306)**	1.459(0.192)**	1.502(0.304)**
<i>Controls</i>						
LEV	-0.263(0.063)**	-0.239(0.074)**	-0.275(0.062)**	-0.245(0.074)**	-0.284(0.062)**	-0.248(0.073)**
FS	0.005(0.011)	0.006(0.017)	0.006(0.011)	0.005(0.017)	0.006(0.011)	0.006(0.017)
FP	0.011(0.003)**	0.011(0.003)**	0.011(0.003)**	0.011(0.003)**	0.012(0.003)**	0.010(0.003)**
<i>Independent variable</i>						
SRDI	-0.495(0.125)**	-0.558(0.162)**	-0.390(0.126)**	-0.457(0.163)**	-0.423(0.125)**	-0.419(0.163)**
<i>Moderator</i>						
BGD	-	-	-0.533(0.159)**	-0.666(0.177)**	-0.522(0.159)**	-0.687(0.176)**
<i>Interaction term</i>						
SRDI*BGD	-	-	-	-	-0.397(0.134)**	-0.431(0.142)**
R-squared	0.083	0.085	0.111	0.100	0.106	0.111
Observation	710	710	710	710	710	710
Note(s): * $p < 0.05$; **indicates 5%						

Table 3.
Regression results for
the two-step
system GMM

DAC	Model 1	Model 2	Model 3
Intercept	1.281(0.924)**	1.644(0.933)**	1.662(0.925)
<i>Controls</i>			
LEV	-0.360(0.110)**	-0.366(0.110)**	-0.378(0.109)
FS	0.018(0.056)	0.010(0.060)	0.012(0.055)
ROA	0.013(0.004)**	0.013(0.004)**	0.012(0.004)
<i>Independent variable</i>			
SRDI	-0.874(0.312)**	-0.781(0.316)**	-0.656(0.317)
<i>Moderator</i>			
BGD		-0.582(0.284)**	-0.743(0.286)
<i>Interaction term</i>			
SRDI*BGD			-0.616(0.223)
<i>Post estimation tests</i>			
Instruments	41	42	43
AR(2)	0.370	0.389	0.474
Sargan test	0.955	0.953	0.930
Hansen test	0.911	0.929	0.930
Note(s): **indicates 5%			

negative and significant impact on DAC. Overall, the GMM findings are consistent with those of the random effect regression presented in [Table 2](#).

7. Conclusion

The purpose of this study is to investigate whether board gender diversity moderates the relationship between SR and EM. The study uses a sample of 71 listed firms and data for the period between 2011 and 2021. The regression analysis produces several findings. First, the results show that SR is negatively associated with EM, indicating that disclosing economic, environmental and social performance improves earnings quality. Second, the study finds that the presence of women on corporate boards reduces EM. Finally, the study finds that the interaction between board gender diversity and SR reduces EM. This is the first study to investigate the effect of SR and board gender diversity on EM among EAC-listed firms, expanding the research in this field. The results of this study have significant practical and policy implications. Corporate boards should put more effort into embracing SR and achieving gender parity to reduce EM. Regulators and financial reporting standard setters may consider making the disclosure of social and environmental activities mandatory. Policymakers should also examine national CG codes that address the inclusion of women on boards to determine whether mandatory gender quotas are necessary. Furthermore, increasing the number of women on company boards promotes greater gender equity and women's empowerment in developing regions such as the EAC, where women are often marginalized in the workforce.

8. Limitations of the study

The study has several limitations. First, board gender diversity was defined as the proportion of female directors on the board. Future studies may examine how particular attributes of female board members, such as age, experience, education and marital status, affect the relationship between SR and EM. Second, GRI was employed as an overall measure of SR. Future research may focus on the specific effects of different SR components on EM. Third, EM was estimated

through discretionary accruals, which are prone to measurement errors. Therefore, future studies may consider employing other metrics of EM (such as restatements and real EM), to provide more insights into how SR affects EM. Fourth, this study only focused on listed firms in the EAC. Future studies may compare and contrast these findings by examining the same issue in other regions. Finally, unlisted firms may also be considered in future research.

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