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Board characteristics and earnings management. Does firm size matter?

Peter Nderitu Githaiga^{1*}, Paul Muturi Kabete¹ and Tirisa Caroline Bonareri²

Abstract: The purpose of this paper is to extend the existing literature by empirically examining the effect of board characteristics on earnings management (EM) from a developing region perspective. The study further adds literature by examining whether firm size moderates the relationship between board characteristics and EM. This study employs data drawn from 88 listed firms in the East African Community (EAC) for the period between 2011 and 2020. The study used the system generalized method of moments (SGMM) estimation model to take care of potential endogeneity and reverse causality. The findings revealed a positive and significant relationship between board size and EM. The findings further indicated that board independence, board gender diversity, and board financial expertise had a negative and significant effect on EM. In addition, the findings confirmed that firm size moderated the relationship between board size, board independence, board gender diversity, and EM. The insights of this study may provide useful information for shareholders and regulators in evaluating board attributes that are effective in mitigating earnings management practices from a developing region. Further, board effectiveness in deterring EM should be evaluated with regard to firm size. Just a few empirical studies have examined the relationship between board characteristics and EM in developing regions. Thus, this study contributes to the existing literature by empirically examining the topic in the EAC. Further, the study fills the existing gap in literature by examining whether firm size moderates the relationship between board characteristics and EM.

Subjects: Gender Studies - Soc Sci; Corporate Finance; Business; Management and Accounting

Keywords: Board characteristics; earnings management; East African community

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PUBLIC INTEREST STATEMENT

The findings of this study have both managerial and policy implications for listed firms in East African Community. The regulators and shareholders should pay attention on board characteristics that mitigate earnings manipulation in light of firm size.

1. Introduction

Accounting earnings are the most extensively used measure of firm financial performance. Given that financial reporting standards and accounting policies provide managers of a firm with considerable opportunities for manipulating earnings, it is not surprising that the growing attention in accounting literature has been devoted to understanding the determinants of earnings management. The collapse of once profitable and prominent corporations (Enron, Xerox, WorldCom, HealthSouth, Tyco, Waste Management, Rite Aid and Subeam, to mention a few) because of financial reporting fraud further reveals the harmful nature of EM. Healy and Wahlen (1999) define earnings management (EM) as what happens “when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.” Flexibility in financial reporting (accounting methods and treatments) presents managers with opportunities by which they can manage earnings, which may either positively or negatively affect the quality of reported earnings and their value in the decision-making process (Goel, 2012). Research further confirms managerial motives in EM; for example, increasing executive stock-based compensation, avoiding debt covenants violation, earnings smoothing, and meeting or exceeding stock analysts’ forecasts (Kliestik et al., 2021).

The board of directors is a key internal control mechanism that serves as an interface between owners of capital (shareholders) and those who (managers) utilize that capital and create value (maximize shareholders’ wealth). Additionally, the boards of directors monitor the firm’s accounting system by ensuring the managers observe the relevant accounting principles and standards in preparing financial reports, thus guaranteeing the credibility of accounting information. The board’s supervisory role in financial reports is vital because opportunistic managerial behaviors associated with earnings manipulation may mislead shareholders. Fama and Jensen (1983) argue that the board of directors is at the heart of corporate governance and that board structure determines its effectiveness in monitoring the managers. Therefore, board characteristics (board size, independence, gender diversity, and financial expertise) are important attributes that improve its effectiveness in mitigating earnings manipulation.

Although prior studies have examined the effect of board characteristics on EM, the findings are mixed and inconclusive (Alareeni, 2018; Alzoubi, 2018; Arioglu, 2020; Arun et al., 2015; Asogwa et al., 2019; Rajeevan & Ajward, 2020). Institutional setting of these studies perhaps explain the inconclusive results considering most of them were done in countries with strong investors protection mechanism (Mnif & Cherif, 2021; Ferris & Liao, 2019; Ramachandran et al., 2015; X. Chen et al., 2015; Arun et al., 2015; Iqbal & Strong, 2010). Going by the findings of prior studies, there is a need to explore the possibility of factors that may moderate the relationship between board characteristics and EM. Similarly, the varied findings may be explained by contextual factors of where these studies were conducted.

Although some prior studies on EM have used firm size as either a predictor or a control variable (U. Ali et al., 2015; Naz et al., 2011; Purnama & Nurdiniah, 2019; Saftiana et al., 2014; Türegün, 2018), firm size could moderate the relationship between board characteristics and EM for two reasons. First, previous studies show a significant relationship between firm size and EM. For instance, Türegün (2018), found that large firms and those with large boards use EM more than those with small boards do, (Purnama & Nurdiniah, 2019) found that firm size negatively affect earnings management while the results of Saftiana et al. (2014) and Naz et al. (2011) show that firm size has no significant effect on EM. Second, a good number of scholars claim that there is an association between firm size and the nature of a firm’s internal governance structure. Abdullah (2014) and Kesner (1988) argue that larger firms have stronger boards as evidenced by a larger proportion of independent directors and more women in their boards. In the same vein, DeAngelo (1981) noted that large companies are normally audited by large audit firms (also called the “Big 4”), which accounting literature associates with higher quality earnings. Watts and Zimmerman’s (1978) political cost theory claims that large firms are more exposed to political cost than small firms and they face stronger monitoring and scrutiny by the

government and financial analysts, while Fama and French (1995) and Stigler (1958) suggest that larger firms report higher earnings as compared to smaller firms. Because of this, large firms have boards that are more effective and less likely to manage earnings compared to small firms. This study addresses the research gap and extends the literature in twofold. Firstly, despite much difference in the institutional environments between developed and developing economies, scarce attention has been given to the issue for developing economies in the literature. Therefore, the study investigated the association between board characteristics and EM in the East African Community (EAC), an economic community consisting of Burundi, Kenya, Rwanda, the United Republic of Tanzania, and Uganda. Secondly, the study investigated whether firm size moderates the relationship between board characteristics and EM.

EAC presents a unique understudied setting because of three reasons. First, the regulators adopt a principles-based corporate governance (CG) structure under which regulators suggest rather than mandate compliance. Second, unlike many European countries that have mandatory gender quotas in board composition, majority of them with a 40% quota, CG codes in EAC member states recommend that corporate boards should be diverse and sensitive to gender representation. Third, the CG codes recommend that board size should be sufficient to allow diversity and that independent directors be more than a third. Finally, the EAC capital markets regulators lack capacity to enforce compliance to CG code due to the intrusive control by the parent ministries and legislative hurdles. The rest of this paper is organized as follows. The next section reviews literature. The section after that discusses the research methodologies, sample, data, and measurement of variables. The next section provides the empirical results of the fixed-effects and the random-effect model estimation. Finally, the last section concludes.

2. Review of literature

Corporate governance literature indicates that board effectiveness is key in mitigating opportunistic managerial behavior such as earnings manipulation; thus maximizing shareholders wealth (Fama & Jensen, 1983). This study investigated the effect of board characteristics (board size, board independence, board gender diversity, and board financial expertise) on EM.

2.1. Board size and earnings management

There has been significant research work seeking to investigate the association between earnings manipulation and the number of directors. Proponents of the agency theory argue that the size of the board influences its effectiveness (Jensen, 1993). Arguably, a large board improves the board's oversight role, likely affecting firm performance—the greater the number of members on the board, the greater the monitoring activity of management. From a resource-based view and resource dependency theory, larger boards enjoy the advantage of having members have different expertise and experience human that improves the quality of board decisions and ultimately enhances firm value” (Loderer & Peyer, 2002). Alareeni (2018), who used a sample of 20 listed firms in Bahrain and data for 2011–2015, reported a negative association between EM and board size implying that large board offer better oversight hence lowering the propensity of managers engaging in earnings manipulation. Eisenberg et al., (1998) and Ebrahim (2007) also found that larger boards are associated with lower levels of discretionary accruals. Inversely, large boards suffer from agency problems (director free riding) as the board becomes more symbolic and neglects its monitoring and control duties (Beiner et al., 2004). Large boards are considered ineffective owing to lack of coordination, slow decision-making, and free riding amongst directors (Lipton & Lorsch, 1992). CEOs supervised by large boards are more likely to apply sophisticated strategies such as creating coalitions, dividing, and conquering to exert their will on the board members (Alexander et al., 1993). Therefore, smaller boards may be more effective in monitoring unethical managerial behaviours than larger ones. Türegün (2018), Kao and Chen (2004), Rahman et al. (2006), and Jaggi and Leung (2007) report a positive and significant relationship between board size and EM. However, Ferris and Liao (2019) who used a sample of 51,147 firm-year observations drawn from 46 countries found no relationship between size of the board and EM.

Charfeddine, Riahi, and Omri (2013) also found no relationship among firms listed in Tunisian Stock Exchange. Based on the above arguments, we propose the following:

H1. Board size has no significant effect on earnings management.

2.0.2. Board Independence and earnings management

According to Fama (1980) and Fama and Jensen (1983) board's effectiveness is a function of its characteristics. Correspondingly, Jensen and Meckling (1976) suggest that agency conflicts can be mitigated by increasing the number of non-executive directors on the boards. Non-executive directors are a powerful tool for monitoring opportunistic managerial owing to their independent judgment and vast expertise (Rediker & Seth, 1995). Fama and Jensen (1983) claim that non-executive directors tend to be more effective in monitoring the executives because they seek to safeguard their professional reputations and providing relevant complementary knowledge. Prior research studies have examined the effect of board independence on constraining opportunistic earnings manipulation. Klein (2002), using US data, found a significant negative association between the level of abnormal accruals and the ratio of outside directors to board size. Using a sample of 1178 firm-year observations for UK non-financial firms over 1993–1996UK, Pope et al. (1998) investigated whether board composition affected EM. Using a sample of UK firms, Peasnell et al. (2000) examine the effect of the Cadbury Committee Report of 1992 on the association between board composition and EM. While findings of this study show no relationship between board independence and EM during the pre-Cadbury period, they confirm a significant negative association between the magnitude of abnormal accruals and the proportion of outside board members in the post-Cadbury period. Alves (2011) empirically examined the effect of board structure on the magnitude of EM among firms listed in Portugal. The study used a sample of 34 non-financial companies. The findings of this study indicate that a high proportion of non-executive directors on the board lower the magnitude of discretionary accounting accruals implying that boards consisting of more non-executive members limit EM practices. More recently, Rajeevan and Ajward (2020) examined the association between corporate governance attributes and the extent of EM among quoted companies in Sri Lanka. The study employed a sample of 70 listed companies in the Colombo Stock Exchange (CSE) for 2015 to 2017 and reported that firms with a higher proportion of non-executive directors could constrain EM. Türegün (2018) also reported a negative relationship between the proportion of independent directors and EM among firms listed in Borsa Istanbul. Conversely, Alareeni (2018) who considered listed firms from Bahrain found that the proportion of independent directors had a positive effect on EM. Therefore, non-executive directors are expected to constrain executives to monitor the financial information elaboration process. Hence, the following hypothesis:

H2. Board independence has no significant effect on earnings management

2.1. Board gender diversity and earnings management

There is a growing interest in corporate governance literature on how the unique attributes of women in senior executive positions affects decision-making and organizational outcomes. According to Morrison et al. (2004), women on board complement their male counterparts' in management, which improves board's effectiveness. Literature suggests that the unique attributes of female directors affect decision-making and risk-taking. For instance, Barber and Odean (2001) avers that women take fewer risks compared to men. Corporate governance literature depicts that women are more ethical in their judgments and behaviour (O'Fallon & Butterfield, 2013; Vermeir & Van Kenhove, 2008). They are thus less likely to engage in unethical behavior, thus effectively mitigating managerial opportunism (Zalata et al., 2019). Recent research studies further demonstrate female directors are ethical and risk-averse in financial decision-making (Doan & Iskandar-Datta, 2020; Yahya et al., 2020). In a similar vein, a study by J. Chen et al. (2019) found that female

directors are important in industries characterized by male CEO overconfidence. J. Chen et al. (2019) also noted that female directors were less aggressive in investment and acquisition decisions, thus, higher financial performance. Therefore, there is a greater possibility that women on boards will restrain unethical practices such as EM. However, studies that sought to examine the nexus between board gender diversity and EM contrast in findings. Arun et al. (2015) found that firms with a higher percentage of female and independent female directors have a higher earning quality adopting restrained EM practices in the UK. Gavius et al. (2012) reported a similar finding among Israeli high technology firms listed in the USA (traded on the NYSE or the NASDAQ) between 2002 and 2009.

Arioglu (2020), who studied non-financial companies listed on the Borsa Istanbul between 2009 and 2017, found no evidence of female directors' impact on EM. Abdullah and Ismail (2016), non-finance firms listed on Bursa Malaysia for four years, i.e., from 2008 until 2011, also found that the influence of women on boards and audit committees on EM was not significant. Similarly, Sun et al., (2011) reported no association between the proportion of female directors on audit committees and EM. At the same time, Thiruvadi and Huang (2011) found that female directors on the audit committee is negatively associated with EM. Based on the organizational theory and the above arguments, we propose the following:

H3. Board gender diversity has no significant effect on earnings management

2.2. Board financial expertise and earnings management

Board members' educational and knowledge level is a key determinant of board effectiveness (Yusoff, 2010). Members of the board with financial and accounting knowledge are familiar with the financial reporting framework and have a deeper understanding of the preparation and interpretation of financial reports, thus mitigating earnings manipulation. Dienes and Velte (2016) argue that it is impossible for board members without sufficient financial expertise to advise other board members. Using a sample of 86 industrial companies listed on the Amman Stock Exchange from 2007 to 2010; Alzoubi (2018) found that the financial expertise of the board is significant and negatively associated with EM, thus suggesting that board members with accounting and finance expertise are efficient in limiting EM. Bédard et al. (2004) examined the association between the financial and governance of board audit committees and aggressive EM. The authors considered a sample of 100 firms with the highest income-decreasing abnormal accruals and the 100 with the lowest abnormal accruals drawn from the population of US firms whose financial data appeared on Compustat in 1996. The findings of this study show a negative and significant association between audit committee financial and governance expertise and EM. Using a sample of 37 firms listed in the Nigerian Stock Exchange and data for 2014 to 2018, Asogwa et al. (2019) found that the quality of earnings improved significantly with a proper mix of financial expertise and legal skills in the board. Yang and Krishnan (2005), who used a sample of 250 publicly traded firms that were randomly drawn from 10,386 US firms on the 1997 COMPUSTAT firms over the period from 1996 to 2000, found no relationship between board financial expertise and discretionary accruals. Equally, Ghosh et al. (2010) reported that earnings management did not vary with board financial expertise before and after Sarbanes-Oxley Act (SOX). The authors considered a sample of 9,290 observations from firms publicly traded in the US and data for the years 1998 to 2005. According to the discussion above, the paper proposes the following hypothesis:

H4. Board financial expertise has no significant effect on earnings management

2.3. Moderating role of firm size

The contingency theory suggests that firm size may possibly be considered as one of contingency organizational factors (Child, 1975). Empirical studies have identified firm size as one of the significant moderating variables which may facilitate or constrain firms' activities, such as decision-making process (Damanpour, 2010; Zona, Zattoni & Minichilli, 2013). Although firm size is considered as a key factor in firm's activities and management, previous studies only include it as one of the control variables in analyzing the relationship between gender diversity and firm performance (Adams & Ferreira, 2009; Rose, 2007)

Accounting literature show that size is an important firm characteristic that influences the choice of accounting standard; thus, the extent of earnings manipulation. According to Watts and Zimmerman (1978), they contend that large firms are subject to a lot of attention than small firms do, therefore are more likely to distribute wealth through mechanisms such as taxes and insurance. Additionally, from a positive accounting theory, Watts and Zimmerman (1978) argue that large firms choose accounting policies that permit postponing the earnings disclosure to future periods. Similarly, Cormier et al. (1998) argues that managers of large firms tend to choose accounting methods that reduce earnings to lessen political associated with accounting figures. Jones (1991) provides evidence that during times of investigation, managers are more likely to decrease earnings by accruals manipulation. The relationship between firm size and EM has also been subject to empirical studies. Using a sample of 179 publicly available stock companies listed at Borsa Istanbul between 2006 and 2013, Türegün (2018) found that large firms use EM more than small firms. Employing data drawn from 19 firms listed at Tunisian stock exchange for the years 2003–2009, Charfeddine, Riahi, and Omri (2013) reported that managers select the practices that reduce earnings to lower the amount of tax payable in Tunisia. In addition, a study by K. Y. Chen et al. (2005) that considered sample of 367 new issues between 1999 and 2002 listed in the Taiwan Stock Exchange (TSE), reported a positive association between firm size and EM. Consequently, large firms have a high probability to practice EM in an opportunistic manner. Conversely, some studies claim that large firms enjoy economies of scale and scope thus less likely to manipulate earnings (Peni et al., 2010; Zamri et al., 2013).

Less effective boards are not able to monitor, control and evaluate the behaviour of management sufficiently. Meek et al., (2007) notes that large firms have stronger governance structures, lower information asymmetries, and are generally subject to greater monitoring by auditors and financial analysts. The effectiveness of the board in mitigating EM may vary based on firm size. Corporate governance literature indicate that in smaller firms, boards face difficulties in monitoring and making decisions; hence, more likely to have less effective boards (Larmou & Vafeas, 2010). Small firms provide outside directors with relatively low support in monitoring and controlling managers that increases the likelihood of earnings manipulation. Oxelheim et al. (2013) found that smaller firms faced logistical and financial challenges in recruiting foreign directors who were more knowledgeable on foreign markets. This means that smaller firms may not benefit from board gender diversity, skills, and expertise of board member and outside directors' representation. Conversely, large firms are more complex and the directors may lack firsthand information of the firms' daily operation and are likely to make decisions using only annual reports (Zona et al., 2013). A firm's board composition, for instance, the number of board members and outside directors, is interrelated with firm size (Di Pietra et al., 2008). It is expected that in smaller companies bigger boards are less effective than in bigger companies. Prior studies document that larger firms have stronger boards as evidenced by a larger proportion of independent directors (Kesner, 1988; Mautz & Neary, 1979). This means that a large board is more effective in large companies than small one. Also, Abdullah (2014) reports that large firms are more likely to adopt mandatory gender quotas since they have resources and the capacity to implement the policy more readily compared to smaller firms. Abdullah's (2014) study further revealed a positive association between board gender diversity; implying that the larger the board, the more likely it is that women sit on it. Based on the empirical literature, we hypothesize as follows:

H5. Firm size does not significantly moderate the relationship between: Board size and earnings management

Board independence and earnings management

Board gender diversity and earnings management

Board financial expertise and earnings management

3. Research methodology

3.1. Sample and data

The sample covered all the listed firms in EAC for the period 2011 to 2020. Two conditions were applied in the selection of the sample. First, firms must have sufficient data to estimate the discretionary accruals during the sample period. Second, firms should not be involved in any merger or acquisition events for the data to be consistent. The data was extracted manually from annual reports of the selected firms. Data on assets, liabilities, cash, debt, and sales were lagged for one period as suggested by the Modified Jones model. These processes yielded a final data set of 792 firm-year observations, representing 88 firms over 9 years.

3.2. Measurement of variables

3.2.1. Dependent variable

Earnings management is the dependent variable. Drawing from previous literature, this study uses the modified Jones model to estimate discretionary accruals as a measure for the extent of EM (Alves, 2011; Dechow et al., 1995)

$$\frac{TA_t}{A_{t-1}} = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left[\frac{(\Delta REV_t - \Delta RECT)}{A_{t-1}} \right] + \alpha_3 \left(\frac{PPE_t}{A_{t-1}} \right) + \varepsilon_{it}$$

Where:

TA_t —total accruals, measured as the difference between net profit and operating cash flows from activities; A_{t-1} —total assets at the end of year t-1; ΔREV_t —the difference in operating revenues in year t and year t - 1; $\Delta RECT$ —the difference in net receivables in year t and year t-1; PPE_t —property plant and equipment at the end of year t.

3.2.2. Independent variables

The main dimension of board characteristics selected for this study includes board size, board independence, gender diversity, and board financial expertise. *Board size* was measured as the number of sitting directors on the board of a company (Ntim et al., 2015; Rashid et al., 2010). *Board Independence* is the number of outside directors on the board. This variable was measured as the ratio of an independent director to the total number of directors (Suyono & Al Farooque, 2018). *Board financial expertise* is another dimension of board characteristics, and it denotes the number of board members with knowledge in accounting and finance. Consistent with Bala and Gugong (2015), this variable was measured as the ratio of the number of board members with financial expertise to the total number of the board of director members. *Board Gender Diversity*. Prior studies conceptualized board gender diversity as the presence of women in corporate boards. Accordingly, the study measured this variable as the ratio of female board members to total board members sitting on the board (Arun et al., 2015; Gavius et al., 2012).

3.2.3. Moderator variable

As described earlier, we examined the influence of firm size on the relationship between board characteristics and EM. Following previous studies, this variable was measured as the logarithm of total assets (Ghaleb et al., 2021; Shu & Chiang, 2014),

3.2.4. Control variables

This paper controls the impact of two firm-specific characteristics as suggested by prior studies; firm age and firm performance. Extant literature shows that firm age significantly affects EM (Das et al., 2018; Kouwenberg & Thontirawong, 2015; Bouaziz et al., 2020). Therefore, firm age was included and measured as the natural logarithm of the number of years since incorporation (Bhutta et al., 2021). Following studies that established a relationship between firm performance and EM, the study incorporated return on assets (ROA) as a control variable (Collins et al., 2017; A. Ali et al., 2007; Damak, 2018).

3.3. Regression model and data analysis

The following regression equation was adopted to test the proposed hypotheses:

$$EM_{it} = \beta_0 + \beta_1 FA_{it} + \beta_2 ROA_{it} + \beta_3 BS_{it} + \beta_4 BI_{it} + \beta_5 BGD_{it} + \beta_6 BFE_{it} + \beta_7 FS_{it} + \beta_8 (BS * FS)_{it} + \beta_9 (BI * FS)_{it} + \beta_{10} (BGD * FS)_{it} + \beta_{11} (BFE * FS)_{it} + \epsilon_{it}$$

Where;

EM_{it} is the earnings management in period “t” for the cross-sectional unit “i”. FA_{it} is the firm age in period “t” for the cross-sectional unit “i”. ROA_{it} is the firm performance in period “t” for the cross-sectional unit “i”. BS_{it} is the board size in period “t” for the cross-sectional unit “i”. BI_{it} is the board independence in period “t” for the cross-sectional unit “i”. BFE_{it} is the board’s financial expertise in period “t” for the cross-sectional unit “i”. BGD_{it} is the board gender in period “t” for the cross-sectional unit “i”. FS_{it} is the firm size in period “t” for the cross-sectional unit “i”. To measure the moderating role of firm size on the relationship between board characteristics and EM, the study created interactions variables: $BS*FS_{it}$, $BI*FS_{it}$, $BGD*FS_{it}$ and $BFE*FS_{it}$. ϵ_{it} is the random error term

Data were analyzed using STATA 13 because of its wide application and acceptance in panel data estimation models. Based on prior studies, the study applies the system generalized method of moments (SGMM) to address the possibility of endogeneity and reverse causality (Dang et al., 2021; Leszczensky & Wolbring, 2019)

4. Results and discussion

Table 1 presents the sample descriptive statistics for the research variables for the period 2011 to 2020. The mean value of EM was -0.033, suggesting that listed firms in East Africa Community tend to be more conservative and prefer to engage in income-decreasing (negative) EM. These results are close to those reported by Arun et al. (2015). Regarding board size, Table 1 shows the mean number of 9 and the maximum number of 17. The average proportion of independent directors was 79.2%, suggesting that there is a greater proportion of outside directors than executive directors on the board. The mean proportion of board gender was 0.231%, implying a relatively low female participation in board among listed firms in the EAC. The average

Table 1. Descriptive statistics for the research variables for the period 2011–2020

Variable	Obs	Mean	Std. Dev.	Min	Max
EM	792	-0.033	0.338	-1.016	0.977
BS	792	9.047	2.595	4.000	17.00
BI	792	0.792	0.123	0.231	1.000
BGD	792	0.231	0.145	0.000	0.667
BFE	792	0.657	0.180	0.200	1.000
FS	792	7.085	1.262	3.873	10.137
FA	792	4.102	0.545	2.303	5.167
ROA	792	0.059	0.099	-0.294	0.483

Table 2. Pairwise correlation

	EM	BS	BI	BG	BFE	FS	ROA	FA
EM	1.000							
BS	0.486*	1.000						
BI	-0.117*	-0.091*	1.000					
BG	-0.352*	-0.239*	0.164*	1.000				
BFE	-0.158*	-0.130*	0.256*	0.233*	1.000			
FS	0.113*	0.202*	-0.100*	-0.071*	-0.064	1.000		
ROA	0.156*	-0.046	-0.018	0.032	-0.049	0.009	1.000	
FA	0.099*	-0.098*	0.061	0.067	0.072*	-0.102*	0.115*	1.000

* $p < 0.05$

proportion of directors with financial expertise was 65.6%. The mean firm size was 7.085 and the standard deviation of 1.262 suggests low variability in size.

4.1. Correlation Analysis

The purpose of correlation analysis is to understand the nature and magnitude of the relationship between research variables. The pairwise correlation coefficients for the study variables are presented in Table 2. Pearson pairwise correlation coefficients indicate that the association between board gender diversity ($r = -0.352$; $p < 0.05$), board independence ($r = -0.117$; $p < 0.05$), board financial expertise ($r = -0.158$; $p < 0.05$) and EM is negative and statistically significant. The correlation between board size ($r = 0.486$; $p < 0.05$), firm age ($r = 0.159$; $p < 0.05$), firm size ($r = 0.113$; $p < 0.05$), ROA ($r = 0.156$; $p < 0.05$) and EM is positive and statistically significant.

4.2. Regression results

Prior to testing the hypotheses, the validity of the instrument is tested using Sargan-Hansen test for over-identifying restrictions. The test results that are reported in Table 3 confirm that the models do not reject the null hypothesis of valid instruments (because all p -values are higher than 0.1). Additionally, the Arellano and Bond (1991) AR (2) tests for second-order serial autocorrelation. The results show that the instruments applied to the models were appropriate. GMM system estimator and distinguishing by size. Based on the findings, all the specifications of the Hansen/Sargan test does not reject the used instruments and the AR (2) test does not reject the null hypothesis of no second-order autocorrelation. Therefore, the specifications were valid.

The results for the direct effect are presented in Model 1 in Table 3. Based on the findings, board size had a positive and significant effect on EM ($\beta = 0.407$, p -value <0.05); hence, hypothesis H1 is rejected. The results are consistent with those of Rahman et al. (2006). However, they contradict Damak (2018) and Orazalin (2019) who reported a negative relationship. While Joubert and Fakhfakh (2011) found no relationship between board size and EM. The results suggest that large boards are ineffective in preventing earnings manipulation relative to smaller boards. One explanation for the results is the fact that coordinating and problem solving get difficult as the board becomes too big. Moreover, smaller boards are more likely to reduce the possibility of free riding by individual board members that increases their accountability and oversight role. The results further indicated that board independence had a negative and significant effect on EM ($\beta = -0.424$ and p -value <0.05); hence, H2 was rejected. Chen et al., (2007) reported similar results. However, Orazalin (2019) found no significant association between board independence and EM. Outside directors perform an important supervisory and monitoring function. They are expected to offer an independent and objective review of the financial reporting process, internal controls, and the audit function. Therefore, a more independent board constraints EM. The results also indicated that board gender diversity had a significantly negative effect on EM ($\beta = -0.881$, $p < 0.05$);

Table 3. Regression results for system generalized method of moments

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-.180(0.571)	-.885(0.615)	-.826(0.612)	-.632(0.615)	-.534(0.612)	-.575(0.620)
<i>Controls</i>						
FP	.373(0.090)**	.369(0.090)**	.355(0.090)**	.330(0.090)**	.330(0.090)**	.330(0.090)**
FA	.338(0.311)	.415(0.312)	.341(0.312)	.310(0.310)	.357(0.309)	.371(0.310)
<i>Board characteristics variables</i>						
BS	.407(0.158)**	.402(0.157)**	.388(0.156)**	.390(0.156)**	.333(0.156)**	.338(0.157)**
BI	-.424(0.141)**	-.396(0.142)**	-.385(0.141)**	-.493(0.148)**	-.508(0.148)**	-.511(0.148)**
BGD	-.881(0.128)**	-.868(0.128)**	-.867(0.127)**	-.871(0.127)**	-.866(0.126)**	-.860(0.126)**
BFE	-.463(0.123)**	-.486(0.123)**	-.457(0.123)**	-.447(0.123)**	-.470(0.122)**	-.459(0.123)**
<i>Moderating variable</i>						
FS		.079(0.025)**	.086(0.025)**	.078(0.255)**	.064(0.026)**	.065(0.026)**
<i>Interactions</i>						
BS*FS			-.249(0.114)**	-.320(0.117)**	-.343(0.117)**	-.355(.119)**
BI*FS				.352(0.157)**	.376(0.156)**	.382(0.157)**
BGD*FS					.272(0.112)**	.281(0.114)**
BFE*FS						-.059(0.096)
<i>Post estimation tests</i>						
AR(2)	0.547	0.587	0.806	0.835	0.844	0.806
Sargan	0.068	0.073	0.152	0.159	0.152	0.139
Hansen	0.258	0.292	0.360	0.356	0.355	0.356
Observations	704	704	704	704	704	704
Groups	88	88	88	88	88	88
Wald chi2	158.14	168.81	177.26	186.89	193.55	193.03
No instrument	42	43	44	45	46	47

** p < 0.05, standard errors in parentheses

therefore, H3 was rejected. The results are consistent with those of Zalata et al. (2018) and Arun et al. (2015). However, Arioglu (2020) found no association between board gender diversity and EM practices. The empirical confirms that firms with greater board gender diversity are more effective in constraining EM. From an agency theory perspective, female directors improve board's effectiveness in monitoring the quality of financial reporting practices and deterring earnings manipulation. Further, board financial expertise has a negative and significant effect on EM ($\beta = -0.463$ and $p < 0.05$); implying that H4 was rejected. These results agree with previous studies by Alzoubi (2018), Bédard et al. (2004), and Asogwa et al. (2019). Conversely, the results contradict Ghosh et al. (2010) and Yang and Krishnan (2005), who found no statistically significant relationship. Board members possessing knowledge in finance and accounting can perform their oversight role in the financial reporting process more effectively and competently. Additionally, financial expertise enhances the board's ability to evaluate internal controls and detect a material misstatement. Therefore, firms with a high percentage of directors with finance and accounting knowledge are less likely to engage in EM. The effect of firm size on EM was positive and significant effect on EM ($\beta = 0.079$ and $p < 0.05$), and the results agree with those of Türegün (2018) and K. Y. Chen et al. (2005); however, they disagree with Paiva et al. (2019) who reported a negative association. Therefore, the findings suggest that large firms are more likely to engage in EM. Firm performance had a positive and significant effect on EM ($\beta = 0.373$ and $p < 0.05$). The findings are consistent with those of Ali and Zhang (2015) and Kothari et al. (2005) who argue that high-performing firms have a high propensity of managing earnings. However, they contradict A. Ali et al. (2007) who reported a negative association. The association between firm age and EM is positive and significant ($\beta = 0.338$ and $p < 0.05$), suggesting that older firms tend to have a higher level of EM than younger ones. This result agrees with Bassiouny (2016). However, they contradict Bouaziz et al. (2020) who found a negative association.

Table 3 reports the regression results for Model 6, testing the moderating effect of the firm size on the relationship between board characteristics and EM. Based on the results, the interaction coefficient of board size and firm size is negative and significant ($\beta = -0.355$ and $p < 0.05$); therefore, H5a was rejected. Although, it is believed that smaller boards are effective in constraining EM than larger board size, this may not be true for large firms. Moreover, the inclusion of firm size as a moderating variable influenced the interaction between board independence and EM positively and significantly ($\beta = 0.382$ and $p < 0.05$); therefore, H5b was rejected. These findings suggest that the favorable impact of outside directors in deterring EM is reduced as the firm size increases. For large firm, outside directors may not fully monitor the managers and assess the credibility of financial reports. The beta coefficient of the interaction between firm size and board gender diversity is positive and significant ($\beta = 0.281$ and $p < 0.05$); therefore, H5c was rejected. These findings reveal that firm size may reduce the negative relationship between board gender diversity and EM. This can be attributed to the low level of women representation in corporate boards on the EAC. This implies that large firms may not benefit from the effective monitoring and high-quality financial reporting disclosure associated with female directorship. Additionally, the results confirm that the interaction between board financial expertise and firm size had no significant effect on EM; therefore, H5d was accepted ($\beta = -0.059$ and $p > 0.05$). Hence, board financial expertise will not reduce or increase earnings manipulation behaviour as firm size changes. Therefore, large firms are less likely to leverage finance and accounting skills of board members in monitoring the financial reporting environment. As the firm grows in size, it becomes more difficult for the board to accurately monitor and ensure that the executives adheres to the accounting ethics and financial reporting standards, which creates incentives for manipulating earnings.

5. Conclusions and recommendations

The incentives for managers to engage in unethical behaviours of managing earnings are constrained by board characteristics that determine its effectiveness. Therefore, this study examined the relationship between board characteristics and EM among listed firm in EAC. The study considered a sample of 88 firms and panel data for 2011 and 2020. In light of previous literature,

the study focused on four dimensions of board characteristics: board size, board independence, board financial expertise, and board gender diversity. The findings showed that firms characterized by large boards are more likely to engage in EM. Inversely, the association between board independence, board gender diversity, board financial expertise, and EM was negative. These imply that the three dimensions effectively prevents opportunistic behaviors related to EM. In addition, this paper found support for considering firm size as a moderating factor between board characteristics and EM, which may explain the inconsistent findings on the impact of board dimensions and EM. Specifically, the study found that the interaction between board independence, board gender diversity, and firm size as significantly positive to EM. Further, the findings reveal that the interaction between firm size and board size minimizes EM. The moderation results of this paper enrich our understanding of how board characteristics are related to EM from the perspective of contingency approach.

The findings of this study provide useful insights to investors in assessing the effect of board characteristics on EM. Regulators should consider defining an acceptable level of corporate governance that are aligned to firm size. In particular, they must consider board characteristics that improve board monitoring processes and enhance the quality of earnings, which may positively impact investors' confidence. Despite the novelty of these findings, and like other studies, the findings of this study should be interpreted cautiously. First, there may be possible errors in the measurement of variables. For instance, the proxy of EM was discretionary accruals; however, prior studies might have used different measurements. Secondly, the study may have omitted other board characteristics and control variables that may affect EM which further studies can consider. Third, the sample was drawn from developing countries characterized by the relatively weak legal and institutional environment; therefore, multi-country studies could further broaden our understanding of the subject. Fourth, the study uses finance and accounting knowledge to define a "financial expert"; therefore, future research considers other parameters for financial expertise and differentiates an accounting and non-accounting expert. Finally, the findings may not apply to other periods due to the evolving nature of corporate governance guidelines and institutional settings.

Moreover, board characteristics may change annually and averaging these variables for 10 years may affect the validity of the relationships. Despite the previously mentioned limitations, this study contributes to the ongoing debate on the relationship between board characteristics and EM. However, this study is limited because the sample only covers 10 years of data from the firms listed in East African security exchanges. In addition, only four broad characteristic variables were considered in this study. Therefore, future research may consider other board characteristics variables not considered in this study. In addition, based on the shortcomings of the modified Jones model adopted in this study to measure EM, future research could examine other models to estimate EM. Third, the results of this study may be the outcome of a lack of variability in board characteristics due to the similarity of corporate governance codes in East Africa Community. Finally, future studies may consider an exhaustive set of corporate governance dimensions such as compensation structure, audit committee characteristics, and stock ownership, which are likely to have a higher propensity to mitigate earnings manipulation.

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