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Article

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CEO attributes, board independence, and real earnings management: Evidence from Nigeria

Auwalu Musa^{1,2*}, Rohaida Abdul Latif² and Jamaliah Abdul Majid²

Abstract: Motivated by agency conflicts of real earnings management and upper echelons in CEO demographic characteristics, this study examines the effect of CEO attributes on real earnings management and addresses the question of whether the presence of an independent board ensures accurate and reliable financial reporting practice. The study also examines the extent to which independent boards moderate the relationship between CEO attributes and real earnings management. Using a sample of 292 observations from Nigeria, an emerging market, from 2018 to 2021, a feasible generalized least square (FGLS) regression model was used to analyze the data. The authors also consider alternative measures of real earnings management. Our results demonstrate that CEO financial expertise, compensation, and CEO nationality reduce real earnings management and improve the financial reporting quality. Accordingly, the results show that independent directors on the board strengthen the CEO's ability to reduce likely earnings manipulation. However, we find that the presence of a female CEO does not mitigate real earnings manipulation, but that the presence of independent directors enhances the ability of female CEOs to reduce earnings manipulation and produce reliable financial reports. Our results are robust and may have implications for regulators, shareholders, managers, and researchers because it shows that CEO attributes and the presence of independent directors on the board are associated with higher earnings quality.

Subjects: Accounting; Corporate Governance

Keywords: real earnings management; CEO attributes; independent board; financial reporting; upper echelon theory

1. Introduction

The purpose of financial reporting is to present the true financial position of companies, which helps the users of financial statements make informed decisions based on the relevant information disclosed. The chief executive officer's (CEO's) responsibility for corporate decisions on the release of financial information, corporate performance, and influencing the board may raise the possibility of earnings management practices. However, issues related to earnings manipulation and accounting information transparency through different accounting treatments exercised by the CEOs to meet specific benchmarks have been attracting the attention of accounting researchers and practitioners (Habib et al., 2022). The accounting treatments where managers try to meet specific benchmarks to mislead stakeholders about the real firm's financial position are referred to

as earnings management (Deegan, 2014). The company CEO's is generally regarded as the most influential person in the firm they are managing because they have the authority to access all relevant information about the companies' operational activities. This superiority of information access increases CEOs' ability over the company's decisions and benefits from their position as top managers to boost their remuneration by managing earnings.

Past studies posit that CEOs may exercise discretion over reported earnings because of three types of incentives (Ali & Zhang, 2015; Gunny, 2010; J. J. Chen & Zhang, 2014; Joubert & Fakhfakh, 2014). First is the capital market incentive, where managers have the incentive to modify their reported earnings to meet analysts' forecasts or to maintain their performance by increasing reported earnings (Gunny, 2010). The second motivation for managers is regulatory and tax incentives, where managers may alter earnings to avoid the costs related to government regulations (J. J. Chen & Zhang, 2014). The third is contractual incentives, where managers may manage earnings to maximize their compensation (Ali & Zhang, 2015). However, accrual earnings management (AEM) has received much attention from researchers across the world (Habib et al., 2022), and real earnings management (REM) is regarded as an emerging area that nowadays requires to be investigated because firm managers shift their earnings management practice to real activities manipulation (Cohen & Zarowin, 2010; Roychowdhury, 2006).

Accordingly, agency theory argues that managers and shareholders have conflicting interests (Jensen & Meckling, 1976). Moreover, the central idea of the agency's theory is the issues related to information asymmetry, where managers are ambitious in the quest for their interests at the expense of shareholders' interests (Jensen, 1986). The agency theory described the contractual agreement where one or more person(s) engage another person to execute some services on their behalf, which includes assigning some decision-making authority to the agent (Smulowitz et al., 2019). The theory suggests some major incentives for managers to engage in earnings management, leading to an agency problem (Jensen & Meckling, 1976). Several control mechanisms are recommended as part of checks and balances to minimize agency conflict and achieve corporate objectives in a cost-effective way. These consist of external control mechanisms, such as the market for corporate control or takeover, and internal control mechanisms, which involve board monitoring (Pearce & Zahra, 1991). According to Baysinger and Butler (1985), the "board of directors' is the only one of many institutional arrangements that have been invented for controlling agency costs" (p. 120).

On the other hand, the upper echelon theory (UET) has raised a lot of debates on CEO attributes. The theory suggests that organizational outcomes such as earnings quality are a reflection of the CEO's decision-making which originate in their attitudes (Hambrick & Mason, 1984). Moreover, specific skills and personal characteristics of CEOs can influence the company's value creation, financial reporting decisions, and strategic decisions (Hambrick & Mason, 1984). The theory also predicts that the CEO's personality, values, and experience had a significant effect on their tactical decisions by clarifying the status quo they encounter (Hambrick, 2007). Therefore, it is assumed that CEO attributes can have a significant effect on a company's management and strategic plans.

Furthermore, CEO demographic characteristics have a considerable influence on the company's strategic choice which in turn affects their cognitive values (Hambrick & Mason, 1984). This suggests that a company's financial information can be influenced by CEO characteristics. Prior studies observed that CEOs' international experience (Lin et al., 2020), gender diversity (Bouaziz et al., 2020), duality (Nuanpradit, 2019), and tenure (Ali & Zhang, 2015) as part of the important attributes that influence CEO decision-making. Other characteristics such as education (Kouaib & Jarboui, 2016), financial expertise (Gounopoulos & Pham, 2018), and political connections (Griffin et al., 2021) are found as CEO powers that contribute to reducing financial reporting errors and thus preserve shareholders' interests. Consequently, Hambrick and Mason (1984) posit that narcissistic CEOs tend to make ambiguous accounting choices in the best possible light to present

their company's financial information. Moreover, Jensen and Meckling (1976) proposed that an independent board should be an effective monitor in constraining opportunistic REM practice.

Therefore, the relationship between CEO attributes and earnings management is a rich topic, while studies that explored the topic in emerging markets, especially real-activities manipulation are limited and deserve further investigation (Habib et al., 2022). This study is motivated by the contractual incentives to investigate whether CEOs' attributes influence REM. This study also examines whether the presence of independent directors moderates the relationship between CEO attributes and REM in the context of Nigeria.

2. Literature review

2.1. Earnings management

According to (Healy & Wahlen, 1999), earnings management occurs “when managers use judgment in financial reporting and in structuring firm's 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” (p. 6). Likewise, earnings manipulation is referred to as a purposeful accounting method used by managers to report desired accounting information (Chandren, 2016).

Generally, earnings management is split into accrual and real earnings management. Accrual earnings management (AEM) refers to a situation where managers use accounting techniques and estimates to influence the accounting information and thus, deceive the stakeholders (Healy & Wahlen, 1999). While real earnings management (REM) involves a deliberate departure from normal operational processes motivated by the managers' desire to mislead the users about the firms' actual performance (Healy & Wahlen, 1999). These include manipulation of real business activities that have a direct influence on the firm's cash flows to achieve the desired earnings. However, it is important to understand that AEM is usually performed at the end of the financial year, whereas REM is performed during the financial year. This may be a situation where a firm engaged in overproduction during the financial year minimizes the production cost or increase sales by offering discounts or decreasing discretionary expenses (Cohen & Zarowin, 2010; Roychowdhury, 2006; Zang, 2012).

2.2. Hypotheses development

Prior studies show that CEO plays an important role in preparing the financial reporting of an entity (Bouaziz et al., 2020; Habib et al., 2022; Jiang et al., 2013). Evidence has also demonstrated that CEO characteristics such as financial expertise, compensation, nationality, and gender help the CEO to prepare quality financial reports. This is confirmed by some scholars who established that the possibilities of earnings management are reduced due to the CEO attributes that help increase his skill to prevent the firm's resources (Chou & Chan, 2018; Sani et al., 2020). Therefore, the hypotheses development regarding the relationship between CEO characteristics and earnings management are discussed in the following sub-sections.

2.2.1. CEO financial expertise and earnings management

The rise of corporate scandals in the accounting world of nowadays and the creation of the Sarbanes Oxley-Act (SOX) 2002 has increased the need to employ accounting/finance experts to hold strategic positions in the company. Statistics have shown that pre-SOX, most of the CEOs had a sales or marketing background. After the SOX-Act 2002, it is shown that a big preference for hiring CEOs with accounting/finance backgrounds had increased to 51% the UK's Financial Times Stock Exchange [FTSE] (Fino, 2018). Financial expert CEO will pay significant attention to finance/accounting and internal audit departments to closely develop and oversee the tasks performed. This close monitoring may facilitate the task of discovering and curbing irregularities in preparing the company's financial statement. Consistent with the upper-echelon theory, which suggests that CEO's specific skills and attributes can influence the company's value creation, strategic decisions,

and financial reporting quality (Hambrick & Mason, 1984). Similarly, a meta-analytic method of study to synthesize UET on the relationship between CEO characteristics (tenure, prior experience, and formal education) was conducted by Bamber et al. (2010) and Wang et al. (2016). They established that CEO characteristics are significantly associated with firm strategic decisions. In Nigeria, companies are recommended to employ CEOs who are experts in the companies' areas of business and to show truthfulness and sincerity to attract board and shareholders' confidence (Nigerian Code of Corporate Governance [NCCG], 2018).

Empirical findings from prior studies demonstrate that the financial expertise of a CEO reduces the effect of earnings management. For instance, Jiang et al. (2013) established that financial expert CEOs are associated with higher quality financial information and provide more reliable earnings. Likewise, Oradi et al. (2020) found that the relationship between CEO financial expertise and internal control weaknesses is negative and significant. The findings also indicate that the relationship is stronger if the CEO is hired from inside the company. Equally, Sani et al. (2020) reveal a negative and significant relationship between CEO financial expertise and REM. Conversely, Altarawneh et al. (2022), Ason et al. (2021), and Bouaziz et al. (2020) do not establish any significant relationship between financial expert CEO and earnings management. Therefore, a CEO with accounting/finance expertise and previous experience in finance is expected to use his/her skills to mitigate irregularities and enhance the quality of financial reporting. This led to the following hypothesis:

H1: *CEO financial expertise is negatively associated with real earnings management.*

2.2.2. CEO compensation and earnings management

Executive compensation policy is one of the significant factors in a company's success (Fama, 2012). Compensation has been a prominent attribute in determining the employee's job satisfaction and motivation and thus, influences employee performance (Martono et al., 2018). In line with the agency theory, Datar et al. (2001) show that the composition of CEO compensation contracts can help associate their interest with those of the company owners. Likewise, Carter et al. (2005) posits that higher compensation can facilitate lower agency problems. In contrast, Bebchuk and Fried (2012) argue that executive compensation does not reduce agency conflicts. Their findings established that the board of directors can set their compensation in an environment with weak corporate governance by increased earnings management practice. This opportunistic act perhaps depicts the level of ethical values possessed by the executives.

In Nigeria, the NCCG 2018 defines executive compensation as fees, salaries, bonuses, and other benefits in cash or kind, such as share-based payment. In this study, CEO compensation is considered the total compensation earned by the CEO at the end of the company's financial year. Empirically, Almadi and Lazic (2016) establish that CEO incentive-based compensation lowers the level of earnings management in countries within the Anglo-American model (UK and Australia), which provides higher quality corporate governance and greater investor protection. Conversely, Assenso-Okofu et al. (2021) documents that the association between CEO compensation and earnings management is stronger during the pre-and-post global financial crisis (GFC) than during the GFC. Likewise, Park (2019) finds that CEO compensation is positively connected with earnings management among industries with peer products. In addition, Harakeh et al. (2019) reveal a CEO incentive compensation is positively related to earnings management, while the presence of female directors moderates the relationship between CEO compensation and earnings management. This study predicts that CEO compensation contracts can help align their interests with owners' interests and thus, reduce earnings management. Therefore, the study hypothesized as follows:

H2: *CEO compensation is negatively associated with real earnings management.*

2.2.3. CEO nationality and earnings management

The extent of cultural background affects the way individuals manage companies, where a CEO with one or different nationalities or cultural backgrounds might be most suitable for a given firm. According to Huang (2013) and Tarukoski and Jonsson (2017) different nationalities mean different business cultures. The upper echelon theory assumes that a CEO's background can influence his/her decision-making based on different alternative choices, comprising the firm's financial decisions (Hambrick & Mason, 1984). Foreign CEOs who are new need to adapt to the business environment which may be their first challenge compared to CEOs of the same nationality (Bouaziz et al., 2020). Having a foreign national CEO may reduce earnings management because of their broad industry experience which is beneficial to the company.

Some researchers provided evidence on the link between CEO nationality and earnings management. For instance, Ashraf and Qian (2021) find that a higher proportion of foreign directors on the board reduces the level of REM. Equally, Elaoud et al. (2022) document a negative association between CEO nationality and earnings management after the COVID-19 pandemic among European companies. This is consistent with the findings of Masruroh and Carolina (2022), who establish that CEO nationality reduced the level of financial reporting irregularities and considered it as one of the financial statement fraud prevention mechanisms. On the other hand, Bouaziz et al. (2020) document a positive relationship between CEO nationality and earnings management. However, the studies from Huang (2013) do not find any significant relationship between CEO nationality and firm performance. Based on the assumption of upper echelon theory which argues that CEO background can influence his/her decision-making based on alternative choices because of the level of experience gathered. This study predicts that CEO nationality will play a significant role in reducing the practice of earnings management. Accordingly, the following hypothesis is formulated:

H3: *CEO nationality is negatively associated with real earnings management.*

2.2.4. Female CEO and earnings management

Management studies suggest that gender-based variations in ethical decision-making are shown in the firm because of males' higher possibility to break the rules when compared to their female counterparts (Roxas & Stoneback, 2004). This supports the work of Barua et al. (2010), who establish that females show a higher level of ethical conduct than males. Similarly, other studies from business ethics literature have tremendously revealed that women are more principled than males (Deshpande et al., 2006). Hence, they bring different values and attitudes to the firm which have been strengthened through social customs (DiFonzo & Bordia, 1998).

Prior empirical studies documented inconsistent results on the relationship between CEO gender and earnings management. For instance, Gull et al. (2018) demonstrates a negative connection between female directors and earnings management. This finding is confirmed by Harakeh et al. (2019) and Kouaib and Almulhim (2019), who document that female board members and both accrual and real activities manipulation are negatively related. On the contrary, Lakhal, (2015) and Shauki and Oktavini (2022) concludes that there is no linear relationship between CEO gender and earnings management. However, the results of Harris et al. (2019) shows that female CEOs do not necessarily lessen earnings management. In addition, they found that CEOs, regardless of their gender, engaged in a higher degree of earnings management practices. Accordingly, the following hypothesis is proposed:

H4: *Female CEO is negatively associated with real earnings management.*

2.2.5. Board independence and earnings management

In response to several financial reporting scandals that were highly publicized (e.g., Enron and WorldCom), regulators had proposed new corporate governance rules demanding boards to have many independent directors in their mix. One of the primary goals of this transformation was to enhance board monitoring, especially monitoring of financial reporting to ensure its quality and reliability. The advocates of the agency theory assume that independent directors are an effective mechanism for monitoring managerial activities (Klein, 2002) and consequently help in curbing earnings management (Xia X. Chen, Cheng, Lo, et al., 2015). In Nigeria, NCCG 2018 have answered the clarion calls of other regulators, such as the New York Stock Exchange (NYSE) and the National Association of Securities Dealers (NASD), requiring a combination of executive and non-executive directors of which the majority should be independent directors to provide effective monitoring of their company's financial statement. However, previous studies in Nigeria by Sani et al. (2021) recommended that regulators should improve the board independence to monitor politically connected CEOs in providing less quality financial information.

Findings from prior empirical studies proved that an independent board could ensure effective monitoring of financial reporting. For example, X. Chen, Cheng, Lo, et al. (2015) document that on average, firms that complied with the majority of independent directors on their board experience a significant decline in earnings management after the reform of corporate governance. Likewise, some recent findings demonstrate a negative relationship between board independence and earnings management, confirming that the absence of higher board independence leads managers to engage more in earnings management (Aleqab & Ighnaim, 2021; Putra, 2022; Rajeevan & Ajward, 2019). On the other hand, the result from Bansal (2021) on family-controlled firms, shows that board independence is weaker in reducing the practices of earnings management among first-generation family firms. Likewise, Alquhaif et al. (2021) find that independent boards with longer-serving tenure are engaged in real earnings management through an accretive share buyback. Therefore, the study hypothesized that:

H5: *Board independence is negatively associated with real earnings management.*

2.2.6. CEO attributes, board independence, and earnings management

The quality financial statement provides information to outsiders to assess how the CEO is accomplishing the firm expectation efficiently. It is therefore assumed that CEO attributes (financial expertise, compensation, nationality, and gender diversity) could help to provide effective monitoring and improve the quality of financial information (Bouaziz et al., 2020; Habib et al., 2022; Ngo & Nguyen, 2022). Though the attributes of a CEO that could enhance the quality of financial information may be ratified by the level of board independence. This confirms that any strategic and economic decision taken by the CEO may be subject to the board's approval. In Nigeria, for instance, the NCCG 2018 maintains that CEOs should be answerable to the board. This shows that the CEO may need to have a cordial relationship with the board to improve the quality of reporting earnings.

Existing literature on board independence assumes that independent directors can help to improve their firm value, financial information quality, and connection because of their experience on other boards (Klein, 2002; Wu & Li, 2015). In contrast, the supporters of agency theory argue that board independence contributes to the integrity and quality of the firm's financial statement as well as control of top management (Rajeevan & Ajward, 2019; X. Chen, Cheng, Lo, et al., 2015). Therefore, a company with a majority of independent directors might use its power to weaken or inspire the CEO in ensuring the company's financial reports convey quality and reliable information. Building on this argument, the following hypothesis is formulated:

H6: *Board independence will moderate the relationship between CEO attributes and real earnings management.*

2.3. Control variables and earnings management

2.3.1. Firm size and earnings management

Previous studies utilized numerous control variables in earnings management research. For example, the studies on the effect of firm size on earnings management argue that larger firms can influence accounting information, thereby reducing the quality of their financial statement (Baatwah et al., 2015; Harris et al., 2019; Jiang et al., 2013; Le et al., 2022). In contrast, larger firms have better financial reporting because of their greater internal control system and internal auditor competence (Al-Dhamari & Ku Ismail, 2015; Bouaziz et al., 2020; Wimelda & Chandra, 2018). This study suggests that larger firms have stronger financial ability and business strategies with the incentive to smooth earnings than smaller firms.

2.3.2. Firm leverage and earnings management

Numerous research has recognized the influence of financial leverage on earnings management and asserted that higher leverage reduces the level of firm financial management, thereby increasing the financial information quality (Bédard et al., 2004; Rashid, 2020). Equally, Aburishah et al. (2022) establish that financial leverage lower earnings management practices. However, some studies have demonstrated that increase in firm leverage motivates managers to manipulate earnings (An et al., 2016; Bouaziz et al., 2020; Lazzem & Jilani, 2018). The increase in financial leverage can enhance the quality of financial reporting and profitability and can therefore affect the company's financial stability.

2.3.3. Firm age and earnings management

Evidence has shown that older firms can enhance their market reputation by increasing the quality of their financial statement (Akhtaruddin, 2005; Stubben, 2010). Prior empirical research documents that older companies tend to lower earnings management practices because of their market reputation than newly established companies that are new to the system (Ghaleb et al., 2021; Liu et al., 2018).

2.3.4. Return on assets and earnings management

Return on assets (ROA) is a measure of a company's financial performance. Many studies establish that companies with greater ROA tend to improve their earnings quality (Call et al., 2017; Jiang et al., 2013; Rashid, 2020). Equally, Alzoubi (2018), Shabeeb Ali et al. (2020) and O'callaghan et al. (2018) demonstrate ROA and earnings management are negatively related. On the other hand, Ngo and Nguyen (2022) find that ROA is positively linked with financial reporting quality. Therefore, it is expected that CEOs may be influenced by performance measures to generate earnings.

3. Data and methodology

3.1. Sample size and method of data collection

The study population consists of 168 firms listed on the Nigerian Stock Exchange as of 31st December 2021. Companies from the financial services sector were excluded because of their different financial reporting behavior. Equally, the study removed newly listed and delisted companies during the period of study. Furthermore, companies with insufficient annual reports and incomplete data required by this study were dropped. The final sample consists of 292 firm-year observations from 2018 to 2021. The details of the sample selection procedure are provided in Table 1. Additionally, the CEO attributes (financial expertise, compensation, nationality, female gender, and board independence) data were manually collected from companies' annual reports which are downloaded from the Nigerian Stock Exchange (NSE) and companies' websites. While data on REM and other financial data related to control variables were gathered from Thomson Reuters Database.

Table 1. Details of sample technique and industry group

Panel A: Sample selection				No. of companies	
Companies listed on the Nigerian Stock Exchange				168	
Excluded companies:					
Financial services companies				(52)	
Delisted companies for the period of 2018 to 2021				(16)	
Incomplete data during the period 2018 to 2021				(27)	
Total excluded companies				(95)	
Total final sample				73	
Total final observations (73 companies *4 years)				292	
Panel B: Sample summary by industry			No. of companies	Obs.	% of the sample
Agriculture			5	20	6.8
Conglomerate			5	20	6.8
Construction and Real Estate			7	28	9.6
Consumer Goods			18	72	24.7
Healthcare			7	28	9.6
ICT			8	32	11
Industrial Goods			11	44	15.1
Natural Resources			3	12	4.1
Oil and Gas			9	36	12.3
Total			73	292	100

3.2. Model specification and variables measurement

3.2.1. Dependent variable

The model employed in this study is the estimated aggregate of real earnings management (Roychowdhury, 2006), which considers cross-sections for industry and year. According to (Roychowdhury, 2006), companies generally engage in real business activities through (1) abnormal cash flow from operations (Ab_CFO), (2) abnormal production costs (Ab_PROD), and (3) abnormal discretionary expenses (Ab_DEXP), which constitute the sum of selling, general and administrative expenses, research and development, and advertisement expenses. Therefore, Ab_CFO, Ab_PROD, and Ab_DEXP are shown as the difference between the actual values of each activity minus the normal values which are estimated by the residuals of equations (1), (2), and (3) as follows:

$$CFO_{it}/A_{it-1} = \alpha_0 + \alpha_1[1/A_{it-1}] + \beta_1(S_{it}/A_{it-1}) + \beta_2(\Delta S_{it}/A_{it-1}) + \varepsilon_{it} \quad (1)$$

$$PROD_{it}/A_{it-1} = \alpha_0 + \alpha_1(1/A_{it-1}) + \beta_1(S_{it}/A_{it-1}) + \beta_2(\Delta S_{it}/A_{it-1}) + \beta_3(\Delta S_{it-1}/A_{it-1}) + \varepsilon_{it} \quad (2)$$

$$DEXP_{it}/A_{it-1} = \alpha_0 + \alpha_1(1/A_{it-1}) + \beta(S_{it-1}/A_{it-1}) + \varepsilon_{it} \quad (3)$$

Where:

CFO_{it} = implies cash flow from operating activities for firm i in year t .

$PROD_{it}/A_{it-1}$ = signifies the sum of cost of goods sold ($COGS_{it}$) and changes in inventory (ΔINV) during the year.

$DEXP_{it}$ = represents discretionary expenses during period t ; it is the sum of selling, general, and administrative expenses, (SG&A) expenses, advertisement expenses, and R&D expenses.

A_{it-1} = denotes lagged total assets at the end of year t .

S_{it} = signifies current year sales.

ΔS_{it} = represents a change in total sales (i.e., current year sales minus last year sales).

3.2.1.1. Real Earnings Management (REM). This research follows previous studies that used the aggregate of three measurements to estimate REM (Baatour et al., 2017; Cohen et al., 2008; Eng et al., 2019; Gao et al., 2017; Ghaleb et al., 2020; Pappas et al., 2019). It was argued that the three aggregate REM measures provide stronger information than one REM measure and hence, indicate greater earnings management activities (Braam et al., 2015; Eng et al., 2019). However, it is important to note that lower values of Ab_CFO and Ab_DEXP imply higher REM, while higher values of Ab_PROD signify higher REM practice (Cohen et al., 2008; Roychowdhury, 2006). Therefore, this study estimates the REM based on the aggregate measures in equations (1), (2), and (3) by multiplying the standardized residuals of Ab_CFO and Ab_DEXP by negative one (-1) and adding to the Ab_PROD standardized residuals (Baatour et al., 2017; Cohen et al., 2008; Pappas et al., 2019), where higher values of these measures indicate greater REM activities. Therefore, equation (4) is used to measure the REM.

$$REM = Ab_CFO^* - 1 + Ab_PROD + Ab_DEXP^* - 1 \quad (4)$$

3.3. Measurement of independent and control variables

3.3.1. Independent variables

Consistent with the existing literature, this study explores the effect of CEO attributes on earnings management, which classifies the CEO attributes into continuous and dichotomous group. Hence, the study applies the following measures:

CEO financial expertise (CFEX): is coded as 1 if the CEO has accounting, finance qualification, or previously worked in accounting department or hold a professional certificate (Institute of Chartered Accountants of Nigeria [ICAN] or Association of National Accountants of Nigeria [ANAN]), and 0 if otherwise.

CEO compensation (CCOM): is the natural log of total compensation received by the CEO at the end of the financial year.

CEO nationality (CNAT): is coded as 1 if the CEO is from foreign country, and 0 if otherwise.

Female CEO (FCEO): is coded as 1 if the CEO is female, and 0 if otherwise.

Board independence (BIND): is the percentage of independent non-executive directors to the number of board members.

Table 2. Summary of variables definition and measurements

Variables		Definition	Author(s)
<i>Dependent variable</i>			
REM		<i>Real earnings management.</i>	Roychowdhury (2006),
		Abnormal cash flow from operations,	Cohen et al. (2008), and
		Anormal production costs, and	Al-Shattarat et al. (2022).
		Abnormal discretionary expenses.	
<i>Independent variables</i>			
CFEX		<i>CEO financial expertise.</i>	
		Is a dichotomous variable coded as 1 if the CEO	Ason et al. (2021),
		have accounting, finance qualification, or hold	Jiang et al. (2013),
		professional certificate, and 0 if otherwise.	Kouaib and Almulhim (2019).
CCOM		<i>CEO Compensation.</i>	
		Is a natural logarithm of total compensation	Assenso-Okofe et al. (2021),
		at the end of financial year.	Ason et al. (2021),
			Harakeh et al. (2019).
CNAT		<i>CEO Nationality.</i>	
		Is a dichotomous variable coded as 1 if the CEO	Ashraf and Qian (2021),
		is from foreign country, and 0 if otherwise	Huang (2013).
FCEO		<i>Female CEO</i>	
		Is a dichotomous variable coded as 1 if the CEO	Gull et al. (2018),
		is a female, and 0 if otherwise.	Harris et al. (2019).
BIND		<i>Board independence.</i>	
		Proportion of non-executive directors to the	X. Chen, Cheng, Lo, et al. (2015),
		total number of board members.	Chouaibi et al. (2018).
<i>Control variables</i>			
FSIZ		<i>Firm size.</i>	
		Is a natural logarithm of firm total assets at	Al-dhamari & Ku Ismail (2015),
		the end of financial year.	Ashraf and Qian (2021).
FLEV		<i>Firm leverage.</i>	
		Proportion of liabilities to total assets at	An et al. (2016),
		the end of financial year.	Gull et al. (2018).
FAGE		<i>Firm age.</i>	
		Is a natural logarithm of years since the	Bouaziz et al. (2020),

(Continued)

Variables		Definition	Author(s)
		company was incorporated.	Park (2019).
ROA		Return on assets.	
		Proportion of net income to total assets	Alzoubi (2018),
		at the end of financial year.	Ngo and Nguyen (2022).

3.3.2. Control variables

Firm size (FSIZ): is the natural log of a company's total assets at the end of the financial year.

Firm leverage (FLEV): is the proportion of liabilities to total assets.

Firm age: is the number of years since the company was established.

Return on assets (ROA): is the proportion of net income to total assets.

3.4. Regression models

To test the hypotheses, two regression models were proposed for the purpose of analysis. Model 1 investigates the effect of CEO attributes (CFEX, CCOM, CNAT, CGEN, and BIND) on REM. Model 2 investigates whether board independence moderates the relationship between CEO attributes and REM.

3.4.1. Models 1

$$REM_{it} = \beta_0 + \beta_1 CFEX_{it} + \beta_2 CCOM_{it} + \beta_3 CNAT_{it} + \beta_4 FCEO_{it} + \beta_5 BIND_{it} + \beta_6 FSIZ_{it} + \beta_7 FLEV_{it} + \beta_8 FAGE_{it} + \beta_9 ROA_{it} + \varepsilon_{it}$$

(Regression Model 1)

3.4.2. Models 2

$$REM_{it} = \beta_0 + \beta_1 CFEX_{it} + \beta_2 CCOM_{it} + \beta_3 CNAT_{it} + \beta_4 FCEO_{it} + \beta_5 BIND_{it} + \beta_6 BIND * CFEX_{it} + \beta_7 BIND * CCOM_{it} + \beta_8 BIND * CNAT_{it} + \beta_9 BIND * FCEO_{it} + \beta_{10} FSIZ_{it} + \beta_{11} FLEV_{it} + \beta_{12} FAGE_{it} + \beta_{13} ROA_{it} + \varepsilon_{it}$$

(Regression Model 2)

4. Results and discussions

4.1. Descriptive statistics

Table 2 summarized the descriptive statistics of the research variables. REM is calculated by the aggregate of three Roychowdhury (2006) models that encompass Ab_CFO, Ab_PROD, and Ab_DEXP. However, the study used the estimated residual values of all three models based on cross-sectional regression over the periods of 2018-to-2021 from 9 industry groups. The regression estimated residuals of the three models are an indicator of the existing practices of REM (Abad et al., 2018; Roychowdhury, 2006) and aggregated into one to estimate the overall REM (Cohen et al., 2008; Pappas et al., 2019; Tulcanaza-Prieto & Lee, 2022). Table 3 shows the mean, minimum, and maximum values of REM are 0.934, -0.273, and 1.638, respectively. These results entail that companies listed on the Nigerian Stock Exchange engaged in both downward and upward REM activities.

Table 3. Descriptive statistics

Variable	Obs	Mean	SD	Minimum	Maximum
REM	292	0.934	0.118	−0.273	1.638
CFEX	292	0.685	0.465	0.000	1.000
CCOM	292	8.596	0.732	7.309	10.696
CNAT	292	0.329	0.471	0.000	1.000
FCEO	292	0.295	0.457	0.000	1.000
BIND	292	0.210	0.130	0.000	0.500
FSIZ	292	16.274	2.383	8.458	21.538
FLEV	292	0.565	0.327	0.000	9.879
FAGE	292	3.697	0.535	1.609	4.585
ROA	292	3.785	13.397	−35.180	174.540

The average value of CEO financial expertise (CFEX) is 0.685, suggesting that 69 percent of the CEOs have accounting, financial, or hold professional certificates, which help the CEOs in preparing the financial reporting. This is relatively lower than 85 percent and higher than the 27 percent reported by Sani et al. (2020) and Ason et al. (2021). The statistics related to CEO compensation (CCOM) show the mean value is 8.596 million with a minimum and maximum of 7.039, and 10.696 million respectively. This implies that the average CEO compensation is 8.596 million per annum. Moreover, the data related to CNAT shows a mean value of 0.329, indicating that about 33 percent of the company CEOs in Nigeria are managed by fore-foreign citizens. The study conducted by Sani et al. (2020) reveals that 42 percent of CEOs in Nigeria are from foreign countries. However, Bouaziz et al. (2020) document only 22 percent of the CEOs in France are foreign nationals. In addition, the average value of female CEOs (FCEO) is 0.295, signifying that about 30 percent of CEOs in Nigeria are women. This result is rather higher than the 3.63 percent documented in France by Gull et al. (2018) and lower than the 46 percent reported in the United States by Harris et al. (2019). Furthermore, the statistics show that the average board independence (BIND) is 0.210. This indicates that about 21 percent of board members are independent non-executive directors from the sample. The result is comparatively lower than the 49 percent reported by Kapoor and Goel (2019) in India.

With regards to the control variables, the mean, minimum, and maximum value of firm size (FSIZ) is 16.274, 8.458, and 21.538 respectively. This suggests that the average firm size among the sample firms is 16.274bn. The average value of firm leverage (FLEV) is 0.565, indicating that about 57 percent of the firm's total assets are financed by external sources. This is relatively lower than 86 percent revealed by 2022). We also noted that the average firm age (FAGE) is 3.697, indicating that sample firms listed on the NSE have been in existence for about 37 years since incorporation. Finally, the average value of return on assets (ROA) is 3.785, with a minimum and maximum value of −35.180 and 174.540 respectively. These results show that the average ROA of sample firms is 3.785 bln which is relatively lower than the 7.628 reported by Ali et al. (2020).

4.2. Univariate analysis

The Pearson correlation matrix of the study variables is presented in Table 4. The outcome indicates 0.448 as the highest correlation coefficient between firm size (FSIZ) and CEO nationality (CNAT), implying a positive significant correlation between the two variables at 1 percent. This coefficient is less than 0.8 as suggested by Hair et al. (2011), signifying there is no serious multicollinearity issue among the variables. Likewise, the variance inflation factors (VIFs) tests were conducted for all explanatory variables after each estimation and the outcome indicates the absence of a serious multicollinearity problem. In addition, Table 4 demonstrates that CFEX and REM are negatively correlated at a 5 percent significance level. However, Table 4 proves that CCOM

Table 4. Pearson correlation analysis

Variables	1	2	3	4	5	6
1 REM	1					
2 CFEX	−0.107**	1				
3 CCOM	−0.076	−0.044	1			
4 CNAT	−0.027***	0.051	0.237***	1		
5 FCEO	0.083*	0.066	−0.099	−0.164	1	
6 BIND	0.100**	−0.098**	0.362***	0.336***	−0.194***	1
7 FSIZ	0.066	0.085	0.206***	0.448***	−0.243	0.377***
8 FLEV	−0.125***	0.029	−0.116	−0.129	0.176*	−0.047
9 FAGE	−0.058	−0.118**	0.123**	0.199**	0.159***	−0.019
10 ROA	0.059	−0.096	0.107*	0.134**	−0.071	0.098*
	7	8	9	10	VIF	
2					1.08	
3					1.20	
4					1.42	
5					1.16	
6					1.38	
7	1				1.43	
8	−0.152	1			1.07	
9	−0.007	−0.103*	1		1.16	
10	0.149***	−0.051	−0.056	1	1.06	

Notes: ***, **, and * representing 0.01; 0.05; and 0.10 significance level.

and REM are negative but not significant. Furthermore, evidence shows a negative correlation coefficient between CNAT and REM, suggesting that foreign CEO and REM are negatively associated. On the other hand, the correlation between FCEO and BIND shows a positive coefficient with REM at 10 and 5 percent respectively. This implies that female CEO and board independence do not reduce REM activities.

4.3. Multivariate regression results

To avoid biased statistical inference in presenting the result, the Breusch-Pagan/Cook-Weisberg test was conducted, and the result confirmed the existence of heteroscedasticity. In addition, the Durbin-Watson statistics test was performed on the models, and the outcomes show the presence of autocorrelation in the models. To correct these problems, feasible generalized least square (FGLS) was employed, because of its proper estimation for correcting both heteroscedasticity and autocorrelation (Bai et al., 2021; Baltagi, 2011; Wooldridge, 2010).

Table 5 shows the results of FGLS regression for the two models. Model 1 is proposed to investigate the effect of CEO attributes on REM, while Model 2 was established to explore the moderating effect of board independence on the relationship between CEO attributes and REM. The results for Model 1 from Table 5 indicate that CFEX is negative and significant at a 1% level ($\beta = -0.046$, $p = 0.002$), implying that CEOs accounting, finance, or professional accounting certificate help to reduce REM practices, consistent with *H1*. This supports the recommendation of the Nigeria Code of Corporate Governance (NCCG) 2018 that companies should hire CEOs with relevant skills, knowledge, and expertise in their area of business that will help to provide credible financial information to various users. Likewise, the findings support upper echelon theory which emphasizes the importance of CEO skills and personal attributes in influencing better decisions. The result

Table 5. FGLS multivariate regression analysis

FGLS	Model 1					Model 2				
Variables	Coeff.	z-value	p-value	Sig.	Coeff.	z-value	p-value	Sig.		
CFEX	-0.046	-3.11	0.002	***	0.010	-5.06	0.000	***		
CCOM	-0.001	-0.09	0.040	**	0.003	-3.02	0.001	***		
CNAT	-0.011	-2.77	0.006	***	0.076	-6.98	0.000	***		
FCEO	0.025	3.05	0.002	***	0.007	3.68	0.000	***		
BIND	-0.072	-6.44	0.000	***	0.138	7.21	0.000	***		
CFEX*BIND	-	-	-	-	-0.029	-2.88	0.004	***		
CCOM*BIND	-	-	-	-	0.046	2.61	0.009	***		
CNAT*BIND	-	-	-	-	-0.179	-6.85	0.000	***		
FCEO*BIND	-	-	-	-	-0.039	-1.77	0.077	*		
FSIZ	-0.006	-12.85	0.000	***	0.007	16.21	0.000	***		
FLEV	0.014	9.82	0.000	***	0.014	7.28	0.000	***		
FAGE	-0.019	-20.31	0.000	***	-0.022	-17.18	0.000	***		
ROA	-0.203	-1.81	0.071	*	-0.137	-2.13	0.033	**		
Constant	0.696	31.68	0.000	***	0.661	20.73	0.000	***		
Year Effect		Yes				Yes				
Industry Effect		Yes				Yes				
Observations		292				292				
Wald Chi2		522				818				
Prob of Chi2		0.000				0.000				

Notes: ***, **, and * representing 0.01, 0.05, and 0.10 significant level
Model 1 = Direct effect, model 2 = Moderating effect.
Table 2 summarizes descriptions of variables.

is consistent with the findings of Oradi et al. (2020) and Sani et al. (2020), who established that CFEX reduces the extent of internal control weakness and earnings management, thereby improving the quality of financial reporting. Similarly, the interaction effect of board independence (BIND) and CEO financial expertise (CFEX) on REM from Model 2, indicates a negative coefficient at a 1% significance level ($\beta = -0.029$, $p = 0.004$), consistent with *H5*. This signifies that the presence of independent directors on the board strengthens the financial reporting quality. These findings also support the assumption of agency theory that independent boards are effective monitoring mechanisms of managerial activities that help strengthen firm decisions.

The findings reported in Table 5 show that the coefficient of CEO compensation (CCOM) and REM are negative and significant at a 5% level ($\beta = -0.001$, $p = 0.040$), which is consistent with *H2*, suggesting that total compensation of the CEO is effective in constraining REM practices. These findings are consistent with the results of Almadi and Lazic (2016), who report that CEO compensation and corporate governance quality reduce the risk of CEO behavior of earnings manipulation. The results also support the agency theory, which assumes that CEO compensation contracts can help lower agency problems. However, Model 2 reveals that the interaction of CCOM and BIND on REM is positive and significant at a 1% level ($\beta = 0.046$, $p = 0.009$). This indicates that independent directors turn the negative association of CCOM into a positive one. The possible reason for this positive relationship may be attached to the connivance between the CEO and the board of directors in increasing their optimal compensation (Bebchuk & Fried, 2012).

Regarding the CEO nationality (CNAT), evidence has shown that the relationship between CNAT and REM is negatively significant at a 1% level ($\beta = -0.011$, $p = 0.006$), consistent with *H3*. This suggests that foreign CEOs are associated with quality financial reporting because of their experience in managing diverse firms. These findings corroborate with Masrurah and Carolina (2022), who demonstrate that the presence of foreign CEO is negatively associated with financial reporting irregularities. Equally, our result is consistent with Baatwah et al. (2015), who concluded that foreign CEOs are less expected to manipulate earnings. Model 2 provides evidence of the interaction of BIND on the relationship between CNAT and REM. The result demonstrates a strong negative coefficient ($\beta = -0.179$, $p = 0.000$) at a 1% significance level. This implies that independent directors have further strengthened the negative association between CEO nationality and REM.

Table 5 demonstrates a positive coefficient on the relationship between female CEO and REM at a 1% significance level ($\beta = 0.055$, $p = 0.002$), implying that female CEOs are associated with REM activities, which is not consistent with *H4*. These results support the findings of Harris et al. (2019), who conclude that CEOs regardless of their gender, do not mitigate earnings management. However, evidence of the interaction BIND from Model 2 on the association between FCEO and REM reveals that BIND turned and improved the positive association to negative at a 10% significance level ($\beta = -0.039$, $p = 0.077$). This implies that the presence of independent directors overpowered female CEOs' ability to engage in earnings manipulation and ensure earnings quality.

The coefficient of the direct association between board independence (BIND) and REM is negative and significant at a 1% level ($\beta = -0.072$, $p = 0.000$), consistent with *H5*. These findings signify that firms with independent non-executive directors experience higher-quality financial reporting. The finding supports previous studies (Putra, 2022; Rajeevan & Ajward, 2019) that the presence of an independent board is associated with lower earnings management. Furthermore, the findings support the agency theory which presumes that an independent board is an effective monitoring mechanism that can help improve the quality of firm financial reports.

With regards to the control variables, firm size (FSIZ) and REM coefficient are negative and significant ($\beta = -0.006$, $p = 0.000$), signifying that larger firms in terms of assets are less engaged in earnings manipulation. However, the result from Table 5 shows that the association between firm leverage (FLEV) and REM is positive and significant ($\beta = 0.014$, $p = 0.000$), implying that firms with higher leverage are related to lower financial reporting quality. While the outcome for firm age

Table 6. FGLS multivariate regression analysis with alternative REM measurement (REM, REM 1, and REM 2)

FGLS	REM		REM_1		REM_2	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Variables	z-value		z-value		z-value	
CFEX	-0.046	0.002***	-0.034	0.023**	-0.031	0.075*
	-3.11		-2.27		-1.78	
CCOM	-0.001	0.040**	-0.024	0.000***	-0.005	0.056*
	-0.09		-8.02		-1.91	
CNAT	-0.011	0.006***	0.027	0.016**	0.013	0.000***
	-2.77		2.41		3.54	
FCEO	0.005	0.002***	0.011	0.000***	0.010	0.000***
	3.05		7.82		5.08	
BIND	-0.072	0.000***	-0.035	0.000***	-0.046	0.000***
	-6.44		-5.99		-4.34	
CFEX*BIND	-0.029	0.004***	-0.015	0.002***	-0.003	0.811
	-2.88		-1.75		-0.24	
CCOM*BIND	0.002	0.009***	-0.042	0.000***	0.027	0.000***
	2.61		-0.16		3.65	
CNAT*BIND	-0.179	0.000***	-0.160	0.040**	-0.087	0.000***
	-6.85		-7.60		-3.98	
FCEO*BIND	-0.029	0.077*	-0.049	0.058*	-0.024	0.060*
	-1.77		-3.05		-1.96	
FSIZ	-0.006	0.000***	0.003	0.000***	0.019	0.000***
	-12.85		11.39		9.48	
FLEV	0.014	0.000***	-0.022	0.067*	-0.029	0.021**
	9.82		-1.83		-2.30	
FAGE	-0.019	0.000***	0.020	0.000***	0.005	0.136
	20.31		5.75		1.49	
ROA	-0.002	0.071*	-0.051	0.003***	-0.001	0.000***
	-1.81		-2.94		-9.64	
Contant	0.696	0.000***	0.344	0.000***	0.056	0.039**
	31.68		21.72		2.06	
Year Effect		Yes		Yes		Yes
Industry Effect		Yes		Yes		Yes
Observations		292		292		292
Wald chi2 (DE)		522		517.76		593
Wald chi2 (ME)		818		528.08		724
Prob > chi2 (DE)		0.000		0.000		0.000
Prob > chi2 (ME)		0.000		0.000		0.000

Notes: DE = Direct effect; ME = Moderating effect; Table 2 summarize definitions of variables.

***significant at 0.01 level; **significant at 0.05 level; and *significant at 0.10 level.

(FAGE) is negative and significantly associated with REM ($\beta = -0.019$, $p = 0.000$), indicating that older listed companies are less engaged in earnings management practices. Likewise, the regression result on the relationship between return on assets (ROA) and REM shows a negative coefficient and significant ($\beta = -0.203$, $p = 0.077$). This implies that companies with good performance

are associated with higher-quality financial reporting. This is consistent with the conclusions of existing studies that establish that greater ROA tends to improve earnings quality (Ali et al., 2020; Rashid, 2020).

4.4. Additional robust analysis

As earlier stated, this research is consistent with prior studies in estimating REM as the cumulative value of residuals calculated by the three measures (Chi et al., 2011; Cohen et al., 2008; Pappas et al., 2019). Though, earlier studies argued that over-reliance on the summation of abnormal cash flow from operations to abnormal production costs is just a reputation, as these amounts are the product of the same activities (Cohen & Zarowin, 2010). Hence, researchers developed other alternative measures by adding the three estimated residuals into two measurements: REM_1 is the sum of abnormal discretionary expenses multiplied by negative one (−1) and abnormal production costs. While REM_2 is the sum of abnormal cash flow from operations and abnormal discretionary expenses multiplied by negative one (−1) and then aggregated into one measure (Al-Shattarat et al., 2022; Cohen & Zarowin, 2010). Therefore, this study reexamined the FGLS estimation by employing an alternative REM model into REM_1 and REM_2.

Table 6 shows the findings from both models based on the two combined measurements. Interestingly, the result is almost similar to those in the main analysis. Exclusively, the coefficients of both Models (REM_1 and REM_2) for CFEX and CCOM are negative and significant which supports the result of the main analysis. While for CNAT, the coefficient values from additional analysis of both REM_1 and REM_2 models are positive and significant which are opposite to that of the main analysis. The result for BIND from the additional analysis is negative and significant for both Models, which supports the main results. However, the coefficient of the moderating interaction shows that BIND moderates the association between CEO attributes and REM. Consequently, it is concluded that the findings are robust, suggesting that CEO attributes play a significant role in constraining REM in Nigeria. Similarly, we established that BIND strengthens and improves the CEO's power to provide reliable financial information.

5. Conclusion

The current study examined the relationship between CEO attributes and real earnings management, and whether the presence of independent directors on the board influence CEOs' REM practices. The sample comprises 292 firm-year observations of Nigerian-listed non-financial service firms for the period from 2018 to 2021. The study employed real earnings management measures as developed by Roychowdhury (2006).

By using the FGLS model, the results obtained generally indicate that CEO attributes mitigate real activities manipulation. Furthermore, the presence of independent directors strengthens CEOs' efforts in providing higher-quality financial reporting. Specifically, our results show that CEOs with financial expertise, CEO total compensation, and foreign citizens CEO are negative and significantly related to REM practices. Therefore, these findings indicate that CEO attributes (financial expertise, compensation, and nationality) improve the quality of financial information by ensuring the reliable practice of financial reporting. This result supports the upper-echelon theory which assumes that CEO demographic characteristics influence the company's value creation and strategic decisions making. While the result on female CEO appears to have a positive relationship with REM practices. Furthermore, the result on board independence shows that independent non-executive directors in Nigerian markets play a significant role in strengthening the powers of the CEO to provide quality financial information. This finding is consistent with the argument of agency theory that independent directors are an effective monitoring mechanism of managerial decision-making, that can help reduce earnings manipulation (Klein, 2002; X. Chen, Cheng, Lo, et al., 2015). However, further additional analysis by employing alternative REM measures supports the main regression results.

The findings of our study have implications for regulators, shareholders, potential managers, and researchers. Regulators in Nigeria may consider the significant roles played by CEO attributes (financial expertise, compensation, and nationality) and independent directors in reducing earnings manipulation and hence, should encourage companies to appoint CEOs with relevant skills and the stated attributes to properly manage their businesses. Considering the finding of this study which shows a positive effect of female CEO on REM, regulators should closely ensure that companies comply with the recommendations of the NCCG 2018 on gender diversity to reduce its positive effect. Similarly, shareholders could have a better understanding of the significant role played by CEO attributes in curbing REM, while considering such attributes necessary when appointing prospective managers. Researchers of earnings management should consider board independence as an effective monitoring mechanism that influences CEOs in constraining REM activities.

This research is subject to some constraints. Initially, the study samples are based on non-financial listed firms in Nigeria and do not represent the entire sector. Hence, the generalization of the outcomes is limited to markets in comparable sectors with a similar institutional background. Secondly, estimating REM with measurements different from those applied in this research may provide dissimilar findings. Consequently, the authenticity of other findings should be in line with the same measurements used in this research. Future studies may explore other CEO attributes rather than those used in the current research, which may have different effects on REM. Further, other streams of earnings management e.g., initial public offering (IPO), accretive earnings management, and share repurchase are other avenues for future studies. In addition, some important insight may be suggested through qualitative research by conducting interviews with CEOs regarding REM activities.

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Data availability statement

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