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Corporate Characteristics and Real Earnings Management: Evidence from Listed Cement Companies Nigeria

Umar Salim Ibrahim¹, Babagana Abba², Najib Muhammad Sani³, Fatihu Shehu Isa⁴, Abubakar Musa⁵ & Usman Sabo⁶

Department of Accounting,
Faculty of Management Science,
Federal University Dutse,
Jigawa State, Nigeria

³Department of Accounting,
Faculty of Management Science,
Federal University Gusau,
Zamfara State

salim.umar@fud.edu.ng

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Abstract

This study examines the relationship between corporate characteristics and real earnings management among listed cement firms in Nigeria. The study adopts a quantitative research design and employs secondary data obtained from the annual reports and financial statements of all listed cement firms in Nigeria, namely Dangote Cement Plc, BUA Cement Plc and Lafarge Africa Plc. Given the small population, the study employs a census sampling technique, whereby all three listed cement firms are included in the analysis. The study covers the period of eight years from 2014 to 2021. The data were analysed using pooled ordinary least squares, fixed-effects, and random-effects panel estimation techniques. The findings reveal that profitability has a negative and significant relationship with real earnings management. Leverage indicates a positive and insignificant relationship with earnings management. Firm size shows a positive but statistically insignificant relationships. Audit quality also shows a negative and significant relationship with real earnings management, indicating the monitoring role of high-quality external audits. Firm age is positively and significantly associated with real earnings management. The findings provide useful implications for managers, auditors, investors, and regulators seeking to strengthen financial reporting quality within Nigeria's cement industry.

Keywords: Corporate characteristics; Real earnings management; Profitability; Leverage; Audit quality; Firm age

Introduction

Financial statements constitute an important channel through which firms communicate

financial information to shareholders, creditors, regulators and other stakeholders. Among the information contained in financial

reports, reported earnings remain particularly important because they provide an indication of corporate performance and are frequently used in investment, lending and contract decisions. However, the discretion available to managers in financial reporting may create opportunities to influence reported earnings in ways that do not fully reflect the underlying economic condition of the firm. Earnings management therefore arises when managerial discretion is exercised over accounting choices or business activities to achieve reporting objectives, potentially reducing the transparency and reliability of financial information available to stakeholders (El Diri et al., 2020). Recent evidence further indicates that earnings-management behavior remains an important financial-reporting concern because managerial incentives and governance conditions can influence the extent to which reported performance reflects underlying economic activities (Habib et al., 2022).

Earnings management is commonly undertaken through accrual-based earnings management or real earnings management. Accrual-based earnings management involves managers' discretionary use of accounting estimates, assumptions and recognition choices without necessarily altering the firm's underlying business activities, whereas real earnings management involves deliberate departures from normal operating practices to influence reported accounting outcomes. Such real activities may include altering production levels, sales-related decisions, operating cash flows and discretionary expenditures to achieve desired earnings targets (Habib et al., 2022). Managers may also substitute between accrual-based and real earnings-management strategies depending on their relative costs, detectability and constraints, with empirical evidence demonstrating a substitution relationship between the two approaches (Shah et al., 2024). REM is particularly important because manipulation through

actual operational decisions may affect both current-period earnings and the firm's future economic performance, while being relatively less transparent to external stakeholders (El Diri et al., 2020).

Corporate characteristics have consequently received considerable attention as potential determinants of managers' incentives and opportunities to engage in earnings management. Characteristics such as profitability, leverage, firm size, firm age and cash-flow conditions reflect differences in firms' financial position, operating capacity, financing pressure, organizational maturity and exposure to external monitoring. Empirical evidence demonstrates that these characteristics can explain variations in earnings-management behavior across firms and industries (Cudia et al., 2021). Profitability may create incentives to maintain previous earnings performance or satisfy market expectations, while highly leveraged firms may experience greater pressure to meet debt-related obligations. Firm size may influence earnings management through differences in operational complexity, political visibility and monitoring, whereas firm age can capture organizational maturity and differences in firms' reporting environments. Audit quality also represents an important external monitoring mechanism because the competence and independence of auditors may affect managers' ability to manipulate reported performance. Recent studies nevertheless report variations in the relationships between these corporate attributes and earnings-management practices across institutional and firm settings (Adeneye & Kammoun, 2022; Musa et al., 2023; Shah et al., 2024). These variations provide a basis for examining whether profitability, leverage, firm size, audit quality and firm age are associated with real earnings management among listed cement firms in Nigeria.

The tendency to engage in real earnings management may differ according to firms' financial, operational and governance characteristics. Profitability may influence managerial incentives to sustain previous performance levels or meet market expectations, while leverage may increase pressure associated with debt obligations and contractual requirements. Firm size may expose companies to greater public scrutiny and stronger monitoring, although larger firms may also possess greater operational flexibility to manipulate real activities. Similarly, firm age may affect earnings-management behavior through differences in organizational maturity, reputation and internal control systems. Audit quality may further constrain opportunistic financial-reporting practices by strengthening external monitoring and enhancing the credibility of reported financial information. Empirical evidence, however, suggests that these relationships are not uniform across countries and industries. Das et al. (2018), for instance, documented different relationships between firm-specific characteristics and real earnings management, while Choi et al. (2018) showed that the ability of high-quality auditors to constrain REM can vary across institutional environments. These differing findings make it important to examine the determinants of real earnings management within specific economic and industrial settings.

Problem Statement

Earnings management has become a serious problem encountered by corporate organization in Nigeria despite corporate governance codes put in place to ensure accuracy and reliability of financial reports and disclosures (Obigbemi *et al.*, 2016). Earnings manipulation is problematic because it lowers the quality of financial information that is publicly disclosed and thereby distorts the correlation between stock returns and reported earnings, misleading stakeholders

and the public about a company's present and future performance (Wasiuzzaman, 2018). Due to the conflicting interests of the various users of the accounting information, many firm managers in Nigeria have been charged with engaging in various forms of earnings management practices to either keep their jobs or avoid reporting the situation in the company (Okoye & Alao, 2008). As a result, the value that users place on financial reports has decreased.

Real earnings management remains an important financial-reporting concern because managerial manipulation of actual business activities may improve reported earnings in the short term while potentially damaging the firm's long-term economic performance. Unlike accrual manipulation, which primarily involves accounting estimates and choices, REM can influence production levels, operating cash flows and discretionary expenditures, making its economic consequences potentially more substantial and its detection more difficult (Roychowdhury, 2006; Zang, 2012). This concern is particularly relevant in industries characterised by substantial capital investment, production intensity and financing requirements, such as the cement industry. Managers operating under profitability expectations, financing pressures and performance targets may have incentives to alter real operating decisions, thereby affecting the quality of reported earnings and the reliability of financial information available to investors and other stakeholders. Although previous studies have examined the determinants of earnings management in Nigeria, much of the available evidence has been drawn from broad samples of manufacturing or non-financial firms. Such aggregation combines companies with different operating structures, capital requirements, competitive conditions and financial-reporting incentives, which may obscure industry-specific patterns of real

earnings management. Moreover, existing empirical findings concerning profitability, leverage, firm size, firm age and audit quality remain inconsistent. For example, some studies report that leverage and profitability increase the tendency toward real earnings management, whereas others document insignificant or opposite relationships. Similar inconsistencies exist regarding firm size, firm age and the monitoring role of audit quality (Shittu & Amao, 2022; Muhammad, 2024). Consequently, it remains unclear how these corporate characteristics are associated with real earnings management specifically among listed cement firms in Nigeria.

This lack of focused evidence represents an important empirical gap because conclusions drawn from heterogeneous samples may not adequately explain earnings-management behavior within Nigeria's cement industry. Without sector-specific evidence, investors, auditors, regulators and other stakeholders may have limited understanding of the corporate conditions that increase or reduce the likelihood of real activities manipulation in listed cement companies. Therefore, this study examines Corporate Characteristics and Real Earnings Management: Evidence from Nigeria's Listed Cement Industry. Specifically, the study investigates the relationships between profitability, leverage, firm size, audit quality and firm age and real earnings management among listed cement firms in Nigeria.

Conceptual Framework and Literature Review

Profitability

Profitability and market competitiveness are among the major objectives of business organizations. Profit also represents an important indicator of financial stability and corporate performance, as it reflects the return generated from firms' operations and the value created for shareholders (Khuong, Ha, & Thu, 2019). Consequently, managers seek

to maintain or improve reported profitability through effective operational decisions. However, current earnings and expected future profitability may also create incentives for managers to engage in earnings management, particularly where they seek to maintain dividend payments, achieve performance targets, or reduce tax obligations (Kasanen et al., 1996). Profitability may therefore influence both the motivation and extent of earnings-management practices.

Leverage

Leverage refers to the use of debt to finance a firm's activities and operations (Shehu & Bello, 2013). It represents a financing strategy whereby firms borrow funds to acquire assets and potentially enhance returns to shareholders (Wasiuzzaman, 2018). Firms generally finance their operations through a combination of debt and equity (Wakaisuka-Isingoma et al., 2016). However, excessive leverage may increase the risk of financial distress, default, and insolvency. Dang et al. (2018) suggest that highly indebted firms may have stronger incentives to engage in earnings management. Debt covenants often require firms to maintain certain financial thresholds, thereby creating pressure on managers to improve reported earnings and avoid covenant violations (Cudia & Dela Cruz, 2018). Conversely, greater leverage may also strengthen creditor monitoring, thereby limiting managerial opportunism because lenders tend to scrutinize highly indebted firms more closely (Ardison et al., 2012).

Firm Size

Firm size is an important corporate characteristic that may either encourage or constrain earnings-management practices and also serves as a relevant consideration in investment decisions (Githaiga, Kabete, & Bonareri, 2022). Positive accounting theory suggests that large firms may face greater political and public scrutiny, thereby influencing their choice of accounting policies and earnings-reporting strategies (Watts &

Zimmerman, 1978, 1986). Larger firms may also adopt accounting methods that shift reported earnings across periods. From an agency perspective, greater organizational complexity may increase agency costs and create additional opportunities for managerial discretion (Jensen & Meckling, 1976). At the same time, large firms often possess stronger internal controls, greater monitoring mechanisms, and increased bargaining power with auditors, which may influence the extent of earnings management reported in their financial statements (Nelson et al., 2002).

Audit Quality

Audit quality is an important monitoring mechanism that contributes to the credibility and reliability of financial reporting. Higher-quality audits provide greater assurance that reported financial information reflects the underlying economic activities of the firm (DeFond & Zhang, 2014). DeAngelo (1981) defines audit quality as the joint probability that an auditor will detect and report material misstatements or irregularities in financial statements. Similarly, the US Government Accountability Office (GAO, 2015) considers a quality audit as one conducted in accordance with generally accepted auditing standards and capable of providing reasonable assurance that financial statements comply with applicable accounting principles and are free from material misstatement arising from error or fraud. Accordingly, higher audit quality strengthens confidence in financial reports and may reduce managerial opportunities to engage in earnings manipulation (DeFond & Zhang, 2014).

Firm Age

Firm age represents the length of time a company has been in operation and is another characteristic that may influence earnings-management behaviour (Hamzah, Gozali, & Khamisah, 2022). As firms mature, they accumulate experience, develop more established operating procedures, improve coordination, and adopt more efficient

production and control systems (Ericson & Pakes, 2015). Older firms may therefore engage in less earnings management because they have established reputations, greater market visibility, and stronger incentives to comply with regulatory requirements. Bassiouny, Soliman, and Ragab (2016) argue that mature firms are generally more knowledgeable about applicable regulations and have stronger reputational concerns than younger firms. Similarly, Ahmad-Zaluki, Campbell, and Goodacre (2011) report a negative relationship between firm age and earnings management. Bassiouny et al. (2016) likewise found that older firms exhibit lower levels of earnings manipulation, suggesting that organizational maturity and established reputation may constrain opportunistic financial-reporting behaviour.

Earnings Management

Earnings management refers to the deliberate use of managerial discretion in financial reporting or transaction structuring to influence reported accounting outcomes, either to affect stakeholders' perceptions of firm performance or to influence contracts based on accounting numbers (Healy & Wahlen, 1999). Wasan and Mulchandani (2020) further describe earnings management as the intentional alteration of financial information to communicate private information about future performance or enhance stakeholder value. From an agency perspective, managers may also manipulate earnings to conceal relevant information or influence contractual outcomes in ways that strengthen their own position relative to shareholders and other stakeholders (Iturriaga & Hoffman, 2005).

Empirical Review

The relationship between firm-specific element and earnings management has received substantial consideration in the literature over the last decade with mixed findings.

Biswas et al. (2022) examined the relationship between corporate governance mechanisms and earnings management among 22 listed commercial banks in India over the period 2010 to 2019. Using Panel Corrected Standard Errors and Two-Stage Least Squares estimation techniques, the study found that board size, board independence, audit committee size, and the frequency of board and audit committee meetings significantly constrained earnings-management practices. However, female board representation was positively associated with earnings management, suggesting that gender diversity alone may not necessarily reduce opportunistic managerial reporting behavior. Pham et al. (2022) investigated the effect of corporate governance on earnings management among 658 listed non-financial firms in Vietnam from 2015 to 2019. Applying a fixed-effects estimation technique, the study reported that board size, board independence, and audit quality were negatively associated with earnings management, indicating that stronger governance and high-quality external auditing can limit managerial discretion in financial reporting. In contrast, firm size and profitability were positively related to earnings management, implying that larger and more profitable firms may face stronger incentives to manage reported earnings to maintain market expectations and corporate image.

Wu et al., (2020) examined the relationship between corporate governance mechanisms and earnings management among non-financial firms in Nigeria and Ghana between 2012 to 2016. Their findings showed that effective governance structures, particularly those relating to board processes and

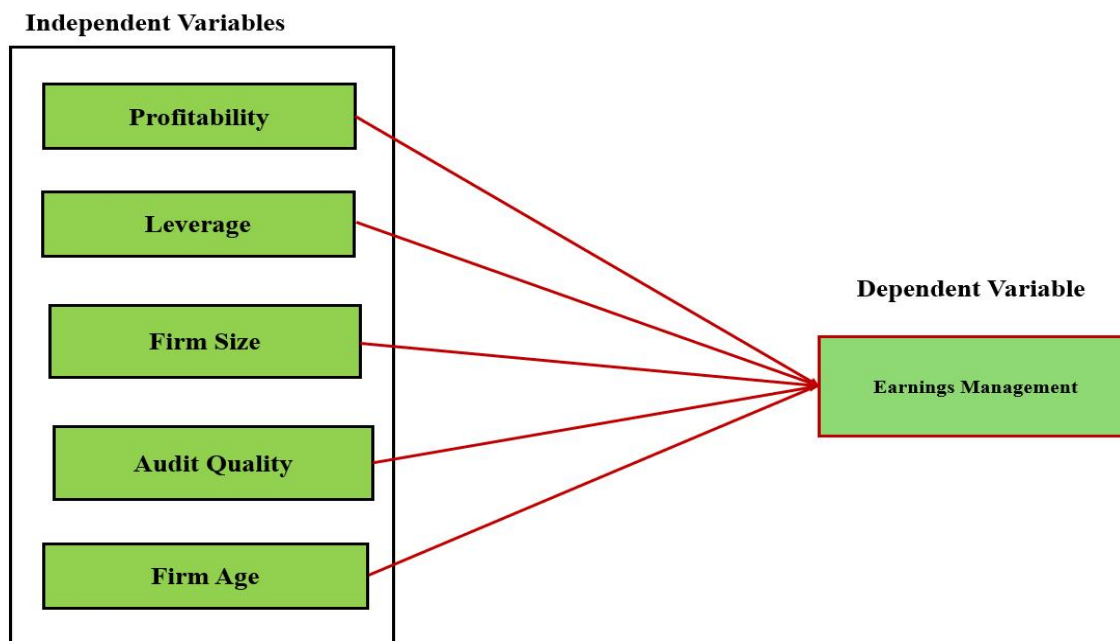
ownership arrangements, helped to constrain managerial manipulation of corporate expenditures. The study therefore highlighted the importance of sound governance practices in improving reporting quality and reducing opportunistic behavior by managers.

Ghani et al., (2019) investigated the relationship between firm-specific characteristics and earnings management among 83 firms over the period 2015 to 2016. The study focused on firm size, profitability, and leverage as key corporate attributes. The findings showed that firm size was positively associated with earnings management, suggesting that larger firms may have greater opportunities or incentives to manipulate reported earnings. Conversely, profitability and leverage were negatively related to earnings-management practices, indicating that more profitable and highly leveraged firms engaged less in earnings manipulation.

Putri and Indriani (2019) examined the influence of profitability, leverage, and firm size on financial reporting quality among 36 listed property and real estate firms in Indonesia from 2015 to 2017. Using discretionary accruals as a measure of earnings management, the study found that profitability and leverage had significant positive effects on discretionary accruals. This suggests that firms with stronger profitability and greater debt exposure were more likely to engage in earnings-management practices, thereby reducing the quality and credibility of reported financial information.

Conceptual Framework

Figure 1 explains the independent variables (Profitability, Leverage, Firm size, Audit Quality and Firm Age), and the dependent variable (Earnings Management).



Source: Authors Conceptualization 2025

Figure 1: Conceptual Framework of the study independent and dependent variables

Theoretical Review

This sub-section presents the theories on the linkage between firm characteristics and earning management. They include:

Agency Theory

Agency theory, associated with Ross (1973) and Jensen and Meckling (1976), explains earnings management because of separation between ownership and control. Conflicts may arise when managers pursue personal interests that differ from those of shareholders (Watts & Zimmerman, 1986). Because managers possess greater access to firm-specific information, they may manipulate reported earnings to achieve desired performance targets, thereby increasing information asymmetry (Nermeen, 2014). Effective monitoring by shareholders and governance mechanisms is therefore important in constraining opportunistic managerial behaviour and protecting owners' interests.

Signalling Theory

Signalling theory, attributed to Spence (1977), explains how managers use financial information to communicate private

information about a firm's prospects to external stakeholders. In the presence of information asymmetry, financial reporting can reduce the information gap between managers and investors (Ross, 1977). Managers may therefore engage in earnings management to signal favourable performance and future earnings expectations (Sun & Rath, 2008). However, because managers possess superior information, such discretion may also be used opportunistically to influence reported results and conceal the firm's underlying economic position (Yimenu & Surur, 2019). Thus, signalling theory provides a basis for understanding earnings management as either an informative or opportunistic managerial practice.

Methodology

This study adopts a quantitative research design to examine the relationship between corporate characteristics and real earnings management among listed cement firms in Nigeria. The population comprises all cement firms listed in Nigeria as of 31 December 2021, namely Dangote Cement Plc, BUA

Cement Plc and Lafarge Africa Plc. Given the small population, the study employs a total enumeration (census) sampling technique, whereby all three listed cement firms are included in the analysis. Secondary data are obtained from the published annual reports and financial statements of the sampled firms for the period 2014 to 2021. The study employs panel-data estimation techniques to determine the relationship between corporate characteristics and real earnings management. Specifically, pooled panel ordinary least squares, fixed-effects and random-effects estimation models are considered because the dataset combines cross-sectional observations across firms with time-series observations over the study period. Panel estimation is suitable for controlling unobserved firm-specific heterogeneity that may otherwise influence the estimated relationships between the explanatory variables and real earnings management. The fixed-effects model controls for time-invariant firm-specific characteristics that may be correlated with the explanatory variables, whereas the random-effects model assumes that unobserved firm-specific effects are uncorrelated with the regressors. The appropriate specification between the fixed-effects and random-effects models is determined using the Hausman

specification test, thereby providing a basis for selecting the panel estimator most consistent with the characteristics of the study data.

Model Specification

In consonance with standard accounting literature and resemblance with model specification by Kargi and Zakariya (2021), Olusola and Abdulasisi (2020) and Farouk *et al* (2019), the model to assay the influence of firm elements on earning management of listed cement firms in Nigeria is specified as follows:

$$EM = f(FC)$$

$$EM = f(PRF, LEV, SIZ, AQ, AGE)$$

Expressing Eq. [3.3] in econometric form becomes

$$EM_{it} = \alpha_i + \phi PRF_{it} + \psi LEV_{it} + \varphi SIZ_{it} + \lambda AQ_{it} + \gamma AGE_{it} + \varepsilon_{it}$$

Where EM denote earnings management, α denotes firm – specific intercept, while PRF denote profitability while LEV , SIZ , AQ and AGE represents leverage, firm size, audit quality and firm age respectively.

α = Regression Constant; $\phi, \psi, \varphi, \lambda$ and γ are the coefficient of profitability, leverage, firm size, audit quality and firm age respectively.

Measurement of Variables

The following list of relevant variables and their measurement methods:

Table 1. Summary of Explanatory Variables

Variables	Definition and Measurement of Variables
Dependent Variable	
Earning Management (EM)	Earning management is the deliberate alteration of financial or accounting data by managers of a corporation to indicate information about the firm's future performance that is unknown to markets in order to maximize value for stakeholders. In accordance with Roychowdhury (2006), the manipulation of production cost measured in real earnings and based on real activities is expressed as: $\frac{PROD_{i,t}}{TA_{i,t-1}} = \beta_0 + \beta_1 \left[\frac{1}{TA_{i,t-1}} \right] + \beta_2 \left[\frac{Sales_{i,t}}{TA_{i,t-1}} \right] + \beta_3 \left[\frac{\Delta Sales_{i,t}}{TA_{i,t-1}} \right] + \mu_{i,t}$ Where $PROD_{i,t}$ = production cost measured by cost of goods sold;

	TA =total asset and $TA_{i,t-1}$ =Total Assets in period $t-1$; $Sales_{i,t}$ = is yearly sales while $\Delta Sales_{i,t}$ = change in yearly sales.
Independent Variables (Firm Characteristics)	
Profitability (PRF)	Net income to total assets (Putri & Indriani, 2019).
Leverage (LEV)	Leverage is measured as ratio of debt to Equity. Agrawal et al., (2020)
Firm size (Size)	It is measured as the natural logarithm of a firm's total assets (Ishak, Amran & Abdul-Manaf, 2018).
Audit Quality (AQ)	Dummy variable that has a value of 1 if the Big Four (Deloitte, PWC, KPMG, and Ernst & Young) have audited the company's financial accounts and a value of 0 otherwise (Cudia & Dela Cruz, 2018).
Firm Age (AGE)	Number of years since the incorporation of the company (Hasnan, Razali & Hussain, 2020).

Source: Authors' Compilation (2025)

Data Presentation and Analysis

Descriptive Statistics

Table 2. Descriptive Statistics

Variable	OBS	Mean	Std. Dev.	Max	Min
EM	24	0.0232	0.0296	0.1186	0.0013
PRF	24	0.1127	0.0756	0.2491	0.0071
LEV	24	0.5663	0.321	1.3271	0.0427
SIZE	24	9.6314	1.098	11.884	8.5360
AQ	24	0.75	0.4423	1	0
AGE	24	47.166	15.87	63	22

Source: STATA 14.

Table 2 presents the descriptive statistics for the sampled listed cement firms in Nigeria from 2014 to 2021, providing an overview of the distribution and variability of the study variables. Real earnings management recorded a mean value of 0.0232 and a standard deviation of 0.0296, with values ranging from 0.0013 to 0.1186. Profitability averaged 0.1127, with a standard deviation of

0.0756 and a range of 0.0071 to 0.2491. Leverage had a mean value of 0.5663 and a standard deviation of 0.3210, ranging from 0.0427 to 1.3271. Firm size recorded an average of 9.6314, with a standard deviation of 1.0980 and values ranging between 8.5360 and 11.8844. Audit quality had a mean of 0.75, with values ranging from 0 to 1, indicating variation between Big Four and

non-Big Four auditors among the sampled firms. Finally, firm age averaged 47.17 years,

with a standard deviation of 15.87 years.

Correlation Matrix

Table 3. Correlation

	EM	PRF	LEV	SIZE	AQ	AGE
EM	1.0000					
PRF	-0.0881	1.0000				
LEV	0.1177	-0.1126	1.0000			
SIZE	0.4096	-0.1610	0.0279	1.0000		
AQ	-0.1513	0.3254	0.1490	-0.5754	1.0000	
AGE	0.3074	-0.0879	0.1334	0.2478	-0.3096	1.0000

Source: STATA 14.

Table 3 presents the correlation matrix for the variables used in the study. The analysis provides preliminary evidence on the direction of relationships among the variables and helps assess the possibility of multicollinearity among the explanatory variables. The correlation coefficients among real earnings management (EM), profitability (PRF), leverage (LEV), firm size (SIZE), audit quality (AQ), and firm age (AGE) are all below the commonly applied threshold of 0.80, indicating that multicollinearity is unlikely to pose a serious problem in the estimated model. The results further show that

real earnings management is negatively correlated with profitability and audit quality, but positively correlated with leverage, firm size, and firm age. Profitability is negatively associated with leverage, firm size, and firm age, while leverage exhibits positive correlations with firm size, audit quality, and firm age. Overall, the relatively low correlations among the explanatory variables suggest the absence of severe multicollinearity and support their simultaneous inclusion in the regression model.

Multicollinearity Test

Table 4. Variation Inflation Factor (VIF)

Variable	VIF	1/VIF
PRF	5.08	0.197033
AGE	5.06	0.197730
AQ	1.75	0.572073
SIZE	1.62	0.616408
LEV	1.08	0.925512
Mean VIF	2.92	

Source: STATA 14.

Table 4 presents the Variance Inflation Factor (VIF) results for the explanatory variables. The mean VIF of 2.92 indicates that multicollinearity is generally not a serious concern in the model. Leverage, firm size, and audit quality recorded relatively low VIF values of 1.08, 1.62, and 1.75, respectively. However, profitability and firm age recorded VIF values of 5.08 and 5.06, indicating moderate collinearity between these variables

and the other regressors. Although these values are below the conventional threshold of 10, they are marginally above the stricter threshold of 5. Overall, the results suggest that multicollinearity is not severe enough to invalidate the regression estimates, although the relatively higher VIF values for profitability and firm age should be acknowledged.

Regression Results

Table 5. Regression Results

Dependent Variable: Earnings Management (EM)			
	Pooled OLS	Fixed Effect	Random Effect
Constant/Intercept	-0.1874 [0.027]**	0.1127 [0.687]	-0.1874 [0.016]**
PRF	-0.2968 [0.094]*	0.0549 [0.220]	-0.2968 [0.077]*
LEV	0.0056 [0.761]	-0.0143 [0.564]	0.0056 [0.757]
SIZE	0.0093 [0.168]	-0.0310 [0.339]	0.0093 [0.151]
AQ	-0.0049 [0.027]**	-0.0675 [0.227]	-0.0049 [0.767]
AGE	0.0016 [0.047]**	0.0034 [0.306]	0.0016 [0.033]**
N	24	24	24
R-sq	0.1706	0.2697	0.1927
L-M Statistics	0.00, (P=1.0000)		
F-Statistics	6.95** [0.0063]	5.18** [0.0019]	9.73*** [0.032]
Hausman Test	1.72 [0.8864]		

Source: STATA 14

Table 5 presents the regression results on the relationship between corporate characteristics and real earnings management of listed cement firms in Nigeria. The Hausman test was statistically insignificant ($\chi^2 = 1.72$, $p = 0.8864$), indicating that the random-effects estimator is preferable to the fixed-effects estimator. However, the Breusch–Pagan Lagrange Multiplier test was also insignificant ($LM = 0.00$, $p = 1.0000$),

indicating the absence of significant panel-level effects. Consequently, the pooled OLS model is adopted for interpretation. The pooled OLS results show that profitability has a negative and statistically significant relationship with real earnings management ($\beta = -0.2968$, $p = 0.094$), indicating significance at the 10% level. Leverage exhibits a positive but statistically insignificant relationship with real earnings management ($\beta = 0.0056$, $p =$

0.761). Firm size also shows a positive and insignificant relationship ($\beta = 0.0093$, $p = 0.168$). Audit quality has a negative and statistically significant relationship with real earnings management ($\beta = -0.0049$, $p = 0.027$), whereas firm age records a positive and statistically significant relationship ($\beta =$

0.0016, $p = 0.047$). The model is jointly significant ($F = 6.95$, $p = 0.0063$), while the R^2 of 0.1706 indicates that profitability, leverage, firm size, audit quality and firm age jointly explain approximately 17.1% of the variation in real earnings management among the sampled firms.

Diagnostic Test

Table 6. Diagnostic Tests based on the estimated Pool Ordinary Least Square model.

ARDL model	
Test	F-statistic/P-Value
Serial correlation LM test	1.367 [0.3628]
Heteroscedasticity test (ARCH)	0.84 [0.3581]
Ramsey RESET Test (specification form)	1.15 [0.3726]

Note: Probability in parentheses

Source: Author's Computation 2025

Table 6 presents the diagnostic tests for the estimated pooled OLS model. The serial correlation LM test is statistically insignificant, indicating the absence of serial correlation in the residuals. Similarly, the ARCH heteroscedasticity test is insignificant, suggesting that the model does not suffer from heteroscedasticity. The Ramsey RESET test is also insignificant, indicating that the model is appropriately specified with no evidence of functional-form misspecification. Overall, the diagnostic results suggest that the estimated model satisfies the relevant regression assumptions and is suitable for statistical inference.

Conclusion

This study examined the relationship between corporate characteristics and real earnings management among listed cement firms in Nigeria over the study period, with specific attention to profitability, leverage, firm size, audit quality and firm age. The findings reveal that profitability has a negative and significant relationship with real earnings management, indicating that more profitable firms are less likely to engage in earnings manipulation. Leverage and firm size exhibit positive but

statistically insignificant relationships with real earnings management, suggesting that increases in debt financing and firm size do not significantly explain earnings-management behaviour among the sampled firms. Audit quality shows a negative and significant relationship with real earnings management, implying that higher audit quality constrains managerial manipulation of reported earnings. In contrast, firm age has a positive and significant relationship with real earnings management, indicating that earnings-management practices tend to increase as firms mature. Overall, the study concludes that profitability and audit quality play important constraining roles in real earnings management, while firm age is associated with greater earnings-management behaviour among listed cement firms in Nigeria.

Recommendations

Based on the findings, listed cement firms in Nigeria are encouraged to strengthen mechanisms that can constrain real earnings management and improve financial reporting quality. The firms should enhance operational efficiency and profitability through

sustainable business expansion and improved production capacity, as stronger profitability appears to reduce the incentive for earnings manipulation. They should also engage reputable high-quality external auditors, particularly Big Four audit firms, to strengthen monitoring, improve the credibility of financial reporting and reduce opportunities for managerial manipulation. In addition, audit committees should include members with appropriate financial expertise and substantial ownership interests to enhance effective oversight and protect shareholders' interests. Furthermore, management should ensure that debt obtained from external creditors is prudently and efficiently utilised to support productive activities and improve financial performance rather than creating additional pressure for earnings manipulation. Overall, stronger profitability, audit quality, effective governance oversight and prudent debt management are recommended as important mechanisms for improving earnings quality among listed cement firms in Nigeria

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