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ESG PERFORMANCE AND EARNINGS MANAGEMENT BEHAVIOUR: THE MODERATING ROLE OF BOARD INDEPENDENCE

Saba Nazir Ghardazi[1], Zaighum Abbas[2], Hamna Ramzan[*3], Sohail Rizwan[4], Yasir Mehmood[5]

*[1,*3,4]Department of Commerce, Fatima Jinnah Women University Rawalpindi*
[2]Business Administration Department, University of Chakwal
[5]Department of Management Science, Islamic International University Islamabad

[1]22-20611-024@com.fjwu.edu.pk, [2]nazirsaba91@gmail.com, [*3]sohailrizwan@fjwu.edu.pk,
[4]zaighii.abbas@gmail.com, [5]yasir.mehmood.vt2001@iiu.edu.pk

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Corresponding Author: *
Hamna Ramzan

Abstract

This study examines the relationship between environmental, social, and governance (ESG) performance and earnings management among non-financial firms listed on the Pakistan Stock Exchange, alongside the moderating role of board independence. Utilizing panel data from 20 non-financial listed firms spanning 2021 to 2025, the empirical inquiry assesses reported profit discretionary behavior while controlling for firm size, leverage, and audit quality. Panel regression techniques are employed to account for unobserved heterogeneity and the panel structure of the dataset. While bivariate correlation results indicate that superior ESG performance and greater board independence are associated with reduced earnings management, these associations do not retain statistical significance after introducing control variables. The empirical model accounts for 42% of the variance in earnings management R^2 = 0.42. These findings offer actionable insights for Pakistani regulatory authorities, statutory auditors, and corporate boards. Specifically, listed entities should enhance ESG transparency, strengthen board independence, and ensure alignment between sustainability disclosures and financial reporting practices. Consequently, this study extends empirical understanding of ESG practices, corporate governance, and financial reporting discretion within emerging market contexts

INTRODUCTION

Over the past three decades, global market dynamics have prompted a significant shift in corporate objectives. Beyond maximizing shareholder wealth, firms increasingly emphasize the welfare of employees, communities, and the environment—dimensions formally synthesized within the framework of Environmental, Social, and Governance (ESG) performance. Escalating scrutiny of unethical practices alongside corporate debacles has diminished stakeholder trust. High-profile crises, including Enron, the 2008 global financial crisis, Volkswagen, and Wirecard, underscore the necessity of examining corporate environmental accountability, financial integrity,

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and governance structures. Within this landscape, ESG metrics provide an integrated approach to quantifying operational transparency and responsibility.

Concurrently, earnings management remains a central focus of accounting and finance scholarship. Defined as managerial intervention in financial reporting to alter perceived economic reality and influence contractual outcomes, it encompasses two primary forms. Accrual-based earnings management involves altering accounting estimates and methods within the parameters of Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS). In contrast, real earnings management entails modifying operational activities—such as adjusting production schedules or accelerating sales—to attain reporting benchmarks.

This investigation examines public firms listed on the Pakistan Stock Exchange (PSX), spanning both financial and non-financial sectors. Pakistan represents a distinctive context characterized by blended organizational traditions and an emerging ESG disclosure framework. Regulatory initiatives, notably the Securities and Exchange Commission of Pakistan's guidelines (SECP, 2019), mandate enhanced reporting on sustainability initiatives, board composition, and financial integrity.

The core motivation of this study is to evaluate the intersection of non-financial sustainability (ESG) and financial reporting integrity (earnings management), alongside the moderating role of board independence. The proliferation of green washing—where corporate sustainability claims diverge from actual practices—has heightened stakeholder demand for genuine accountability. Consequently, evaluating whether robust ESG performance deters opportunistic reporting, and how corporate governance conditions this mechanism, remains vital (Refinitiv, 2022). Although corporate social responsibility can signal operational integrity, empirical insights suggest that certain firms utilize superficial ESG commitments to obscure opportunistic reporting and ethical transgressions. When managerial reporting discretion leads to distorted disclosures, stakeholder trust erodes, exacerbating market inefficiency and litigation risk.

Accordingly, this study addresses three primary objectives: (1) to examine the relationship between ESG performance and earnings management across listed firms; (2) to assess the direct effect of board independence on earnings management; and (3) to evaluate whether board independence moderates the relationship between ESG performance and earnings management. These objectives translate into three empirical questions: First, does ESG performance significantly influence earnings management? Second, does board independence directly mitigate earnings management? Third, does board independence strengthen or attenuate the relationship between ESG performance and earnings management?

By intersecting sustainability reporting with financial accounting through the lens of independent governance, this inquiry bridges theoretical silos, elucidating how corporate sustainability interacts with reporting quality. Furthermore, by operationalizing board independence as a moderating construct rather than merely a direct antecedent, this study clarifies the boundary conditions under which corporate governance structures moderate the link between ESG performance and financial reporting integrity.

Literature Review And Hypothesis Development

Auditors must evaluate the critical nexus between environmental, social, and governance (ESG) performance and financial reporting quality. ESG performance assesses firm engagement across three foundational pillars: environmental stewardship, encompassing resource efficiency, emissions reduction, and pollution management (Refinitiv, 2023; S&P Global, 2024); social responsibility, evaluating workforce welfare, human rights, and community engagement (Sustainalytics, 2024); and corporate governance, examining board configuration, shareholder protections, and business ethics (Abbas et al., 2026; Refinitiv, 2023). Prior literature articulates

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two competing theoretical perspectives linking ESG performance to reporting quality. Under the ethical (or "virtuous circle") perspective, authentic corporate commitment to sustainability fosters an overarching culture of transparency and managerial accountability that extends to financial disclosure, yielding a negative association between ESG performance and earnings manipulation (Tsang et al., 2023; Velte, 2017). Conversely, the opportunistic perspective posits that managers strategically exploit ESG disclosures as a cosmetic heuristic to establish public goodwill while simultaneously engaging in earnings management.

Board Independence:

Board independence denotes the capacity of outside, non-executive directors—defined by the absence of material financial or personal ties to executive management—to objectively evaluate corporate decisions (OECD, 2019). Grounded in agency theory, independent directors are expected to mitigate information asymmetry between managers and shareholders, thereby constraining managerial incentives to inflate earnings for private gain. Nevertheless, empirical evidence regarding this monitoring efficacy remains equivocal. Within the energy sector, for instance, a higher proportion of independent directors correlates with diminished rather than enhanced corporate sustainability performance—an outcome attributed to heightened reputational prudence among outside directors and persistent information asymmetry between management and the board.

Theoretical Prospective:

This study grounds its theoretical foundation in three complementary frameworks—agency theory, stakeholder theory, and institutional theory—to examine the nexus among environmental, social, and governance (ESG) performance, board independence, and earnings management. Together, these frameworks explain how independent directorship shapes corporate sustainability disclosures and constrains opportunistic reporting practices, such as greenwashing (Kim et al., 2012; Klein, 2002).

Agency Theory posits that information asymmetry enables self-interested managers to pursue private benefits at the expense of shareholder wealth and fundamental firm profitability (Jensen & Meckling, 1976). Within this framework, independent directors serve as an essential internal governance mechanism, mitigating agency costs and preventing managers from utilizing ESG disclosures merely as a superficial façade to obfuscate aggressive earnings manipulation (Klein, 2002).

Stakeholder Theory asserts that corporations are accountable to a broad spectrum of constituents beyond equity holders, including employees, customers, and communities (Freeman, 1984). Independent directors enhance corporate ethical orientation and stakeholder alignment, curbing managerial opportunism and fostering authentic, value-creating relationships across all stakeholder groups (Freeman, 1984; Kim et al., 2012).

Institutional Theory suggests that firms conform to external coercive, mimetic, and normative pressures to secure social fitness and organizational legitimacy (DiMaggio & Powell, 1983). Under these institutional expectations, firms implement formal ESG structures and appoint independent directors to comply with industry norms and regulatory benchmarks, thereby safeguarding corporate reputation and standing (DiMaggio & Powell, 1983).

Hypothesis Development:

This research examines how a company's ESG performance relates to earnings management and how its board of directors is independent and how that influences that relationship.When managers rely on aggressive accounting choices to meet profit targets, strong ESG performance is expected to reflect genuine concern for the firm, its employees and ethical conduct.Companies that prioritise sustainability are expected to be more transparent and honest with the public; when managers behave ethically, they are less likely to manipulate financial records and more likely to

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remain accountable to company oversight (Khan & Hussain,2025)

H1:ESG performance has significant negative impact on earning management behaviour:

The impact of ESG on earning management behavior:

Firms with superior environmental, social, and governance (ESG) performance exhibit reduced capacity to manipulate financial reports. Larger enterprises characterized by robust sustainability records tend to generate transparent disclosures that reflect accountability to shareholders, rendering managers less predisposed to mislead capital providers (Kolsi et al., 2022). Furthermore, a higher proportion of independent directors bolsters board oversight; lacking operational involvement or direct financial stakes in management decisions, these directors act as effective governance monitors. Grounded in agency theory, independent directors are positioned to detect governance vulnerabilities, institutional challenges, and information asymmetries, thereby safeguarding financial reporting integrity and preserving corporate reputation. Two competing theoretical perspectives elucidate the nexus between sustainability and reporting fidelity: the ethical hypothesis and the opportunistic hypothesis. The ethical hypothesis posits that entities with elevated ESG ratings genuinely internalize corporate social responsibility, yielding transparent and faithful financial statements (Kolsi et al., 2022). Conversely, the opportunistic hypothesis asserts that executives leverage favorable ESG profiles strategically to enhance personal standing, deploying symbolic environmental initiatives as a protective mechanism to divert stakeholder scrutiny from underlying financial performance (Saleh et al., 2023).

H2:Board Independence is negatively related to earning management behaviour

Board independence denotes the proportion of non-executive directors who evaluate corporate decisions objectively (Fama & Jensen, 1983). In alignment with core corporate governance frameworks, independent directors safeguard shareholder interests by detecting and mitigating fraudulent activities, thereby enhancing the credibility and quality of financial reporting (Dechow et al., 1996; Klein, 2002). Grounded in agency theory (Jensen & Meckling, 1976), an independent board serves as an essential internal governance mechanism designed to alleviate principal–agent conflicts, align managerial and shareholder interests, and rigorously monitor executive discretion to constrain opportunistic earnings manipulation.

H3:The Board Independent serves as a link between overall ESG performance and ESG Performance

An independent board serves as a vital monitoring mechanism, constraining managerial opportunism such as using green assets or sustainability initiatives to disguise financial misstatements and cover repayment obligations. Because independent directors typically lack direct personal stakes in short-term earnings, they are better positioned to scrutinize environmental claims, evaluate financial disclosures, and verify reported figures. Consequently, a highly independent board ensures that sustainability practices remain transparent and substantive rather than serving as instances of corporate greenwashing, thereby fostering long-term value creation.

Population and Sample Selection:

This study examines non-financial firms listed on the Pakistan Stock Exchange (PSX). Publicly listed entities are mandated to publish audited annual reports and statutory financial statements, providing substantially greater transparency and data accessibility than private enterprises. Accordingly, the PSX provides a suitable empirical context for this investigation, with historical corporate disclosures retrieved through regulatory reporting frameworks established by the Securities and Exchange Commission of Pakistan (SECP, 2021).

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The analytical sample comprises 20 non-financial companies tracked longitudinally across a five-year observation window from 2021 to 2025. This multi-year horizon facilitates an evaluation of intertemporal corporate developments, yielding a balanced panel of 100 firm-year observations (20 firms $\times$ 5 years). The dataset systematically records temporal shifts across environmental, social, and governance (ESG) metrics, board structures, and accounting practices over the specified observation window.

Table 1 Summary of Data

Total Companies Registered	2467
Total Companies Based ESG Score	20
Companies Excluded Based on Data Availability	20
Total Companies Chosen for Analysis	20
Oil and Gas corporation	3
Energy Corporations	1
Banks	2

Data Analysis:

This study utilizes Stata to conduct panel data estimation, a standard analytical approach in accounting and corporate finance research for managing complex datasets and potential estimation biases. Prior to estimation, the dataset was screened for missing values, duplicate records, and data entry anomalies. All continuous corporate variables are winsorized at the 1st and 99th percentiles to mitigate the distortionary influence of extreme outliers. The primary empirical specification examines the relationship between environmental, social, and governance (ESG) performance and earnings management via panel regression. A Hausman test determines whether a fixed effects or random effects specification is more appropriate for controlling unobserved, time-invariant firm-level heterogeneity. Additionally, an interaction term is incorporated into the model to evaluate the moderating effect of board independence on this relationship, reflecting the link between corporate sustainability performance and financial reporting quality.

Dependent Variable: Earnings Management Behaviour

In this study, the dependent variable is earnings management, defined as the intentional manipulation of financial statements by managers to achieve specific financial objectives or obscure the firm's true performance. The research examines two distinct forms: accrual-based earnings management (AEM) and real earnings management (REM). To robustly measure AEM, the study employs the modified Jones model to isolate non-discretionary accruals arising from standard operating activities from discretionary interventions. Total accruals (TA) are calculated by subtracting operating cash flows from net income. The non-discretionary component is estimated based on firm size, changes in revenue, and gross property, plant, and equipment. The remaining unexplained residual represents discretionary accruals (DA), which serve as the primary proxy for financial reporting quality in this investigation (Habib et al., 2022).

Independent Variable: ESG Performance

The primary independent variable is environmental, social, and governance (ESG) performance, reflecting an organization's commitment to sustainable operations and non-

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financial accountability. This construct is operationalized via the ESG Disclosure Score, which evaluates firms on a 0–100 scale across more than 186 sustainability metrics structured into 10 categories and three overarching pillars. Specifically, the environmental pillar captures resource efficiency, emissions mitigation, and product innovation; the social pillar evaluates workforce diversity, human rights, and community engagement; and the corporate governance pillar assesses board oversight, shareholder rights, and anti-corruption mechanisms. To facilitate cross-firm comparability, environmental and social dimensions are benchmarked against global industry peers, whereas governance practices are benchmarked against country-specific standards. The aggregate ESG score represents a weighted average across these three pillars, providing an empirical basis to examine whether substantive sustainability integration constrains opportunistic behavior or merely serves greenwashing objectives (LSEG, 2026).

Moderating Variable: Board Independence

Board independence serves as a moderating variable in this study, reflecting the board's capacity to monitor internal corporate activities. It is operationalized as the ratio of independent directors to total board members (Core et al., 1999; Fama & Jensen, 1983). Because independent directors maintain no financial relationships with executive management, they are structured to provide objective oversight (Klein, 2002). This study evaluates board independence across two primary analytical dimensions: as an independent variable and as a dependent variable. Additionally, an interaction term ($\text{ESG} \times \text{board independence}$) is modeled to determine whether independent directors moderate the relationship between ESG performance and earnings management. Prior governance literature indicates that independent boards mitigate executive dominance and ensure that corporate sustainability initiatives remain substantive rather than symbolic (Garcia-Sanchez & Martinez-Ferrero, 2018; Marquis & Qian, 2014).

3.9.4 Control Variables:

Point estimates vary across model specifications with updated data, indicating that omitted variable bias and the estimated coefficients for ESG performance and scores may shift in subsequent iterations. To account for potential confounders that influence managerial earnings manipulation, several financial control variables are included in the empirical model. Firm size is incorporated because larger enterprises face heightened public and regulatory scrutiny and may engage in distinct accounting practices; this variable is operationalized as the natural logarithm of total assets. Additionally, financial leverage captures the firm's debt burden, as highly leveraged firms may inflate earnings to avert loan default, potentially distorting reported performance metrics (Salehi et al., 2021).

Model Specification:

To test the baseline effect of ESG performance on earnings management, the moderation effect of board independence, and the controlling effects of firm size and leverage, two panel data regression models are specified: the Baseline Model 1 and 2

Direct Effect:DA= 0 +1 ESG+ 2 IND+ 3 SIZE+ 4 LEV +varepsilon (1)

Moderation Model (Interaction Effect):DA= 0 +1 ESG+ 2 IND+ 3 (ESGtimes IND) +4 SIZE +5 LEV+varepsilon (2)

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Table 2 Variation Description and Sources

Variables	Definitions	Sources
Discretionary Accruals	Residuals (varepsilon) are the difference between Total Accruals (Net Income – Operating Cash Flow) and estimated non-discretionary accruals from the Modified Jones Model.	AL-Sraheen et al 2022 Habib et al 2022
ESG	Overall ESG Disclosure Score (scale 0 - 100), which is the weighted composite score of the Environmental, Social and Governance pillars.	LSEG 2026
Board Independence	Independent Directors' Percentage of the Board: Number of Independent Directors/Total Board Members	Saeed 2024: Younas 2024
Interaction Term ESD*BIND	Interaction product term is the cross product of the mean-centered ESG performance score and the board independence ratio.	Saeed 2024: Younas 2024
Firm Size	Log of Total Assets (base e): (Total Assets)	Standard Empirical literature
Leverage	Leverage ratio is the ratio of total debt to total assets, which is calculated as: Leverage ratio=Total Debt/Total Assets	Salehi et al 2021

Results And Discussion

Descriptive Analysis

Table 3 shows the descriptive statistics of the dependent, independent, moderating and control variables.The 100 observations' values of variables.The average size of boards is 7.8 members which is an indication of a reasonably consistent board composition throughout companies.The average ESG rating for this index is of 60.06 which implies that:The performance of these companies is moderate on environmental, social and governance measures (ESG) independent variable).The moderating variable, board independence has a mean level of 42.72. Less than half (49%) of the members of the board are independent directors who are not affiliated with company management.The mean value of the ESG-board independence interaction term is 27.44, reflecting the combined effect of these two variables.The mean earnings management score (the dependent variable) is 0.0766 suggesting relatively limited earnings manipulation among sampled firms.The mean firm size is 23.99 and the mean leverage ratio is 44.33 percent, indicating

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that firms carry a moderate amount of debt relative to their assets.The mean return on equity is 13.84 percent, indicating that firms are generally profitable.The mean audit quality score is 0.62, meaning that 62 percent of firms are audited by major accounting firms.These figures indicate meaningful variation across firms, supporting further statistical analysis.Table 3 reports the number of observations, mean, standard deviation, minimum and maximum values for each variable.

Table 3: Descriptive Analysis

Variable	obs	Mean	Std.Dev.	Min	Max
BS	100	7.8	0.9320337	7	9
ESG	100	60.0627	9.149721	44.84	82.27
BINB	100	0.4572	0.0873757	0.28	0.62
ESG*BIND	100	27.44397	6.563543	14.2296	42.0012
EMB	100	0.076626	0.0138696	0.0488	0.1081
FS	100	23.9899	1.378939	20.25	26.54
LV	100	0.4433	0.147251	0.17	0.79
ROE	100	0.13847	0.0991913	-0.12	0.39
AU	100	0.62	0.487831	0	1

Note:Panel regression data related to the ESG performance and earning management behaviour the moderating role of board independence from 20 companies.N=100 EMB:earning management behaviour dependent variable measure as discretionary accruals, ESG: environmental, social and governance performance independent variable, BIND:board independence moderating variable ratio of the independent directors,esg*bind:interaction term,bs:board size,fs:firm size,lv:leverage,roe:return on assets.au:external audit quality control variables.

Correlation Matrix

The correlation matrix presented in Table 4 shows the relationships among the study variables. ESG performance shows a negative correlation with earnings management (r = -0.5387) suggesting that stronger ESG performance is associated with lower levels of earnings management.Board independence also shows a negative correlation with earnings management (r = -0.3360) indicating that firms with more independent directors tend to exhibit less earnings manipulation.The interaction term (ESG x BIND) shows an even stronger negative correlation with earnings management (r =-0.6051) suggesting that the combined effect of ESG performance and board independence is associated with reduced earnings manipulation.The highest correlation among the independent and moderating variables is between board independence and the interaction term (r = 0.7797) which remains below the commonly accepted threshold of 0.80 indicating that multicollinearity is not a serious concern and that the variables are suitable for regression analysis.

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Table 4:Correlation Matrix

	BS	ESG	BIND	ESG*BIND	EMB	FS	LV	ROE	AU
ESG	-0.1383	1.0000							
BIND	-0.1099	-0.0211	1.0000						
ESG×BIND	-0.1667	0.5963	0.7797	1.0000					
EMB	0.1447	-0.5387	-0.3360	-0.6051	1.0000				
FS	0.2157	-0.2664	-0.1233	-0.2538	0.1445	1.0000			
LV	-0.0204	0.0268	0.3581	0.2909	-0.0891	-0.2112	1.0000		
ROE	0.0382	-0.0445	0.0201	-0.0184	0.0142	-0.0123	0.1081	1.0000	
AU	-0.0144	0.1017	-0.1021	-0.0328	0.0444	-0.0445	0.0389	0.0220	1.0000

Note: BS:board size, ESG:esg score, BIND:board independence, ESG*BIND:interaction term, EMB:earning management behavior, FS:firm size, LV:leverage, ROE:return on equity, AU:audit quality.

Diagnostic Test:
Before interpreting the regression coefficients a series of diagnostic tests were conducted to confirm that the panel data satisfies the assumptions required for reliable ordinary least squares and panel estimation.

Table 5: Summary of Diagnostic Tests

Diagnostic Test	Test Statistic	p-value	Decision
VIF(mean) 16.52			
Durbin-Watson Alternative Test (Serial Correlation)	Chi2(1) = 1.290	0.2560	No serial correlation
Wooldridge Test (Autocorelation)	F(1,17) = 1.462	0.2431	No autocorrelation
Modified Wald Test (Group-wise Heteroskedasticity, FE)	Chi2(20) = 13.06	0.8748	Homoskedastic
Hausman Test (Model Selection)	Chi2(8) = 3.48	0.9008	Random Effects preferred

In this study of the moderating effect of board independence elevated VIF values are common once an interaction term is included, since interaction terms are inherently correlated with their component variables.Creating the interaction term between ESG and board independence (ESG x BIND) does not affect the meaning or interpretation of the board

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independence coefficient.Serial correlation was tested using both the Durbin-Watson alternative test and the Wooldridge test.The Durbin-Watson test produced a p-value of 0.2560, while the Wooldridge test produced a p-value of 0.2431.Since both p-values exceed the conventional 0.05 threshold the null hypothesis of no first-order serial correlation cannot be rejected.This indicates that the panel data does not exhibit autocorrelation, satisfying the assumption of independent error terms required for the regression model.

The Modified Wald test for groupwise heteroskedasticity was conducted on the fixed effects model to assess whether the variance of the error terms is constant across firms.The test produced a chi-square value of 13.06 with 20 degrees of freedom (p = 0.8748), as shown in Table 4.4. Since the p-value exceeds 0.05, the null hypothesis of constant variance (homoskedasticity) cannot be rejected.The Hausman specification test was conducted to select the most appropriate model between Fixed Effects and Random Effects.The test produced a chi-square value of 3.48 (p = 0.9008).Since the p-value exceeds 0.05 the null hypothesis cannot be rejected, indicating that the Random Effects model is more appropriate for this study.This result suggests that differences between the sampled companies do not systematically bias the explanatory variables and that the Random Effects model produces reliable estimates.Pooled OLS, Fixed Effects and Random Effects models were all estimated for this panel dataset and a Hausman test was conducted to determine the most appropriate specification.The null hypothesis favours the Random Effects model as the more efficient estimator while the alternative hypothesis favours the Fixed Effects model.

Panel Regression Results:

Table 4.5 presents the results of the three panel regression models: Pooled OLS, Fixed Effects and Random Effects.Together ESG performance, board independence, the ESG x BIND interaction term and the control variables explain a meaningful share of the variation in earnings management, with an R-squared of 0.4239 under Pooled OLS and 0.4240 (overall) under Random Effects.The Pooled OLS model is statistically significant ($F(8,91) = 8.36$, $p < 0.01$), the Fixed Effects model is statistically significant ($F(8,72) = 2.46$, $p < 0.05$) and the Random Effects model is statistically significant (Wald $chi2(8) = 66.19$, $p < 0.01$).

Variable	Pools OLS	Fixed Effects	Random Effects
Dependent Variable: EMB	**(1)**	**(2)**	**(3)**
ESG	-0.0004 (0.4764)	-0.0000 (0.9196)	-0.0004 (0.2647)
BIND	-0.0002 (0.9978)	-0.0229 (0.5972)	-0.0011 (0.9789)
ESG × BIND	-0.0009 (0.4782)	-0.0043 (0.2016)	-0.0010 (0.3773)
Board Size (BS)	0.0006 (0.6112)	0.0399 (0.2942)	0.0008 (0.4526)
Firm Size (FS)	-0.0004 (0.6150)	-0.0140 (0.4078)	-0.0005 (0.5475)

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Leverage (LV)	0.0045 (0.6444)	0.0203 (0.4947)	0.0049 (0.5610)
ROE	-0.0023 (0.8580)	-0.0024 (0.8645)	-0.0023 (0.8436)
Audit Quality (Au)	0.0017 (0.4925)	0.0000 (0.9965)	0.0017 (0.4552)
Constant	0.1308*** (0.0039)	-0.1838 (0.7252)	0.1317*** (0.0011)
Observations	100	100	100
R-squared	0.4239	0.2144 (within)	0.4240 (overall)
Model Statistic	F(8,91) = 8.36***	F(8,72) = 2.46**	Wald $\chi^2(8)$ = 66.19***

Note:Coefficients are re[ported with p-values in parentheses *p<0.10,**p<0.01.EMB=earning management behaviours(discretionary accruals),ESG =esg performance score, BIND=board independence, ESG*BIND=interaction term between esg performance and board independence, BS=board size, FS=firm size, LV=leverage, ROE=return on equity, AU=audit quality.

The models are jointly significant but the individual coefficients for ESG performance and board independence are not statistically significant on their own.ESG performance has a coefficient of -0.0004 which is not significant (p = 0.265).Board independence has a coefficient of -0.0011 which is not significant (p = 0.979).The interaction term between ESG performance and board independence has a coefficient of -0.0010 which is not significant (p = 0.377).These results are broadly consistent with the negative relationships observed in the correlation matrix in Table 4 even though they do not reach statistical significance in the regression.The constant term is significant in both the Pooled OLS model (0.1308, p < 0.01) and the Random Effects model (0.1317, p < 0.01), suggesting that ESG performance, board independence and their interaction do not have statistically significant individual effects on earnings management in this sample.

Conclusion

This study examined the relationship between environmental, social, and governance (ESG) performance and earnings management among publicly listed firms in Pakistan from 2021 to 2025, while evaluating the moderating role of board independence. The correlation analysis revealed an inverse association between ESG performance and earnings management, indicating that firms with superior ESG performance engage in less earnings manipulation. This finding aligns with the premise that firms committed to ESG principles prioritize transparency and reporting integrity. Furthermore, correlation results indicated that lower board independence is associated with higher earnings manipulation, suggesting that independent directors reinforce managerial oversight and facilitate the execution of ESG commitments.

In the panel regression analysis, the estimated coefficients for ESG performance, board independence, and their interaction were negative but statistically insignificant ($p > 0.05$). A plausible explanation for the lack of statistical significance is that governance structures and ESG frameworks evolve gradually; consequently, a five-year observation window may capture insufficient temporal variation to detect significant empirical shifts in this sample. Among the control variables, firm size, financial leverage, return on equity, and

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audit quality exhibited measurable associations with earnings management. The overall model explained 42.40% of the variation in earnings management, demonstrating satisfactory explanatory power. Based on the Hausman test, the random effects model was selected over the fixed effects specification to provide more efficient and reliable estimates.

These findings offer practical implications for listed firms, regulators, and policymakers in Pakistan. Corporate leadership and supervisory bodies should continue promoting ethical business standards, sound governance mechanisms, and ESG standardization. Implementing these initiatives can enhance financial reporting credibility, reinforce investor confidence, and foster the sustainable development of capital markets.

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