Creative Economics and New Business Management Approaches
Volume 7, Issue 1, Dec 2025, PP 15-36
www.bmjournal.ir   ISSN: 3060-5962

ESG Disclosure Quality, Audit Committees, and Real Earnings Management: Evidence from the Tehran Stock Exchange

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Abstract: *This study empirically investigates the impact of Environmental, Social, and Governance (ESG) disclosure quality on real earnings management (REM) and examines the moderating role of audit committee characteristics. Drawing upon agency theory and stakeholder theory, the research addresses a critical gap in emerging market literature where economic volatility and evolving governance mandates intersect. Utilizing a comprehensive panel dataset of non-financial firms listed on the Tehran Stock Exchange (TSE) from 2019 to 2024, advanced econometric frameworks, including firm-fixed effects and the dynamic generalized method of moments (GMM), are deployed to rigorously control for endogeneity and unobserved firm-specific heterogeneity. The empirical findings reveal a robust, statistically significant negative relationship between the quality of ESG disclosures—measured through a comprehensive index of sustainability reporting—and the magnitude of REM. This indicates that superior sustainability reporting effectively reduces information asymmetry, constraining managerial opportunism regarding real economic activities such as abnormal discretionary expenditures and production costs. Furthermore, the analysis demonstrates that this mitigating effect is significantly amplified by the presence of a strong audit committee. Specifically, audit committee independence and the inclusion of members with financial expertise provide the critical oversight necessary to prevent managers from utilizing ESG disclosures as a greenwashing tool to mask underlying financial manipulations. The results offer vital insights for regulators, investors, and policymakers in emerging economies, highlighting that the true efficacy of non-financial reporting in safeguarding fundamental earnings quality is profoundly dependent on the concurrent strength of internal corporate governance mechanisms.*

Keywords: *ESG Disclosure Quality, Real Earnings Management, Audit Committee Characteristics, Corporate Governance, Tehran Stock Exchange, Panel Data Analysis.*

I. Introduction

The modern corporate environment has experienced a profound structural evolution characterized by an increasing demand for transparency that extends far beyond traditional financial metrics. In recent years, Environmental, Social, and Governance (ESG) disclosures have transitioned from being voluntary, peripheral activities to becoming central components of corporate strategy and institutional investment decision-making. Stakeholders, including institutional investors, regulatory bodies, and the broader public, now scrutinize corporate sustainability initiatives as fundamental indicators of long-term viability and risk management capability (Christensen et al., 2021). This paradigm shift is predicated on the theoretical assertion that firms committed to high-quality ESG reporting inherently possess superior ethical standards, which in turn theoretically permeates their financial reporting practices. Consequently, a substantial body of academic literature has begun to explore the intersection between non-financial disclosures and the fundamental quality of reported earnings. The underlying premise is that a firm's dedication to stakeholder value maximization, as evidenced by robust ESG disclosures, aligns management's incentives with those of shareholders, thereby mitigating opportunistic behaviors such as earnings manipulation (Kim et al., 2012). However, the literature remains unequivocally divided on whether ESG disclosures genuinely reflect a commitment to transparency or merely serve as a strategic obfuscation mechanism—often termed "greenwashing"—designed to divert stakeholder attention away from underlying financial irregularities or deteriorating economic performance (Martinez-Ferrero et al., 2016). This theoretical tension necessitates rigorous empirical investigation, particularly concerning the subtle and often undetected mechanisms of financial manipulation.

While early academic inquiry predominantly focused on accrual earnings management (AEM), whereby managers exploit the flexibility inherent in Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS) to alter reported earnings, regulatory tightening and enhanced auditor scrutiny have increasingly constrained these practices. As a direct consequence, opportunistic managers have systematically shifted their focus toward real earnings management (REM). Unlike AEM, which is fundamentally an accounting construct that reverses over time, REM involves the intentional alteration of actual operational activities to meet specified financial targets. Examples of REM include the abnormal reduction of discretionary expenditures such as research and development (R&D) or advertising, the aggressive offering of price discounts to temporarily boost sales volume, and the overproduction of inventory to lower the fixed cost per unit sold (Roychowdhury, 2006).

The pernicious nature of REM lies in its severe long-term economic consequences; while it may successfully artificially inflate short-term earnings to meet analyst forecasts or trigger executive compensation thresholds, it fundamentally destroys long-term shareholder value by disrupting optimal business operations (Cohen & Zarowin, 2010; Zang, 2012). The relationship between ESG disclosure quality and REM is therefore of paramount importance. If ESG-proactive firms are genuinely ethical, they should exhibit lower levels of REM. Conversely, if managers utilize ESG disclosures strategically to build moral capital that later insulates them from the repercussions of financial manipulation, a positive association might exist. The ambiguity surrounding this relationship suggests that external disclosures alone are insufficient to guarantee financial integrity, highlighting the indispensable role of internal corporate governance structures.

The audit committee, acting as a crucial sub-committee of the board of directors, represents the primary internal governance mechanism tasked with overseeing the financial reporting process, internal controls, and overall risk management framework. The efficacy of the audit committee is theoretically contingent upon specific structural and compositional characteristics, most notably its independence from executive management and the financial expertise of its members (Bédard et al., 2004). Independent audit committee members are less susceptible to managerial pressure, enabling them to objectively evaluate subjective accounting estimates and operational decisions. Furthermore, members possessing profound financial expertise—such as certified public accountants or former chief financial officers—are uniquely equipped to identify sophisticated forms of earnings manipulation, including the nuanced operational deviations characteristic of REM (Zalata et al., 2018). While the direct inhibitory effect of a strong audit committee on standard financial misreporting is well-documented, its moderating influence on the complex interplay between non-financial ESG disclosures and REM remains a critical void in contemporary accounting literature (Sun et al., 2014). A highly effective audit committee is hypothesized to possess the requisite authority and technical acumen to scrutinize not only the firm's financial trajectory but also the authenticity of its sustainability claims. In doing so, a competent audit committee actively prevents opportunistic managers from weaponizing ESG disclosures as a superficial shield to mask value-destroying REM activities.

This study seeks to bridge these critical gaps in the literature by focusing on a unique and highly relevant emerging market setting: the Tehran Stock Exchange (TSE). The empirical context of Iran offers an exceptionally compelling laboratory for examining corporate governance, ESG disclosures, and earnings quality. Between 2019 and 2024, the Iranian economic landscape has been characterized by acute macro-economic volatility, severe inflationary pressures, and complex geopolitical sanctions, creating an environment where managerial incentives to smooth earnings or meet survival thresholds are exponentially magnified (Moradi et al., 2021). Concurrently, the regulatory framework governing the TSE has undergone significant evolutionary phases, gradually introducing more stringent corporate governance directives and increasingly emphasizing the necessity of sustainability and social responsibility reporting to align with global market expectations, despite localized institutional constraints (Salehi et al., 2020). In such high-volatility emerging markets, the information asymmetry between internal management and external stakeholders is often more pronounced than in developed economies, thereby amplifying the theoretical impact of both ESG disclosures and internal governance mechanisms. By analyzing a comprehensive panel dataset of non-financial firms listed on the TSE over this transformative six-year period, this study systematically investigates whether higher quality ESG disclosures constrain REM in an environment rife with economic uncertainty, and crucially, whether the structural characteristics of the audit committee—specifically independence and financial expertise—serve as the definitive moderating force that ensures the integrity of this relationship. The findings of this research intend to provide robust, evidence-based contributions to the global discourse on corporate sustainability, offering vital insights for policymakers, regulatory standard-setters, and institutional investors navigating the complex governance dynamics of emerging capital markets.

II. Literature Review

The theoretical foundation of Environmental, Social, and Governance (ESG) reporting is deeply embedded in the dialectic between stakeholder theory and agency theory, providing a complex framework for understanding corporate behavioral dynamics. Stakeholder theory posits that a corporation's fundamental responsibility extends beyond the mere maximization of shareholder wealth to encompass a broader spectrum of constituents, including employees, local communities, environmental ecosystems, and regulatory authorities (Freeman, 1984). Within this paradigm, high-quality ESG disclosures are interpreted as a genuine manifestation of a firm's inherent ethical posture and its strategic commitment to sustainable value creation. Scholars advocating this perspective argue that managers who prioritize robust sustainability reporting are intrinsically less predisposed to engage in opportunistic behaviors, as their operational ethos is fundamentally aligned with long-term stakeholder well-being rather than myopic financial gains (Kim et al., 2012; Velte, 2019). Conversely, agency theory introduces a profound skepticism regarding the motivations underlying voluntary non-financial disclosures. From an agency perspective, information asymmetry between corporate insiders and external stakeholders creates an environment ripe for managerial opportunism. Opportunistic executives may strategically deploy ESG disclosures as an obfuscation mechanism—a practice frequently conceptualized as "greenwashing"—to cultivate moral capital and divert stakeholder scrutiny away from underlying financial distress, suboptimal operational performance, or systemic earnings manipulation (Martinez-Ferrero et al., 2016). This theoretical tension forms the crux of contemporary academic debate, suggesting that the mere presence of sustainability reports does not unequivocally guarantee the integrity of a firm's fundamental economic activities. Transitioning from the conceptualization of sustainability to the mechanics of financial manipulation, the academic literature has systematically documented a structural migration from accrual-based earnings management (AEM) to real earnings management (REM) following periods of intensified regulatory oversight. While traditional AEM involves the exploitation of accounting flexibilities within standard frameworks such as IFRS to alter the timing or classification of revenues and expenses without affecting underlying cash flows, REM entails the intentional, sub-optimal deviation from normal business operations. Pioneering work by Roychowdhury (2006) operationalized REM as encompassing aggressive sales manipulations through unsustainable price discounts, the overproduction of inventory to artificially lower the cost of goods sold, and the myopic reduction of discretionary expenditures such as research, development, and employee training. The literature extensively corroborates that while REM is less susceptible to detection by external auditors compared to AEM, its long-term economic consequences are significantly more detrimental. Managers engaging in REM deliberately sacrifice long-term value creation to meet short-term earnings targets, thereby inflicting severe structural damage on the firm's future competitive viability (Cohen & Zarowin, 2010; Zang, 2012). The intersection of ESG disclosure quality and REM therefore presents a highly nuanced area of academic inquiry. If the ethical perspective holds true, a robust negative association should exist, as socially responsible firms eschew the value-destroying practices inherent in REM (Garcia-Sanchez & Garcia-Meca, 2017). However, if the opportunistic perspective dominates, managers might aggressively utilize high-profile ESG initiatives to mask the severe operational deviations characteristic of REM, thereby necessitating a deeper examination of the conditional factors that govern this relationship. Addressing this theoretical bifurcation inherently requires the integration of internal corporate governance mechanisms, which serve as the primary institutional bulwark against managerial opportunism. The literature identifies the audit committee as the most critical sub-structure of the board of directors, tasked explicitly with the oversight of the financial reporting process, the efficacy of internal controls, and the overarching risk management architecture. However, the overarching effectiveness of the audit committee is not a monolithic attribute; rather, it is highly contingent upon its specific structural and compositional characteristics (Bédard et al., 2004). Within the context of the ESG-REM nexus, the audit committee functions as a vital moderating force. A highly effective audit committee possesses the mandate and the capacity to rigorously scrutinize both the veracity of financial trajectories and the authenticity of non-financial sustainability claims, thereby preventing the strategic weaponization of ESG disclosures. Focusing specifically on the structural attributes of audit committees, independence emerges as a paramount determinant of governance efficacy. Independent audit committee members—those completely devoid of pecuniary or familial ties to executive management—are theoretically and empirically less susceptible to managerial coercion or the pressures of groupthink. The literature demonstrates that audit committee independence is negatively associated with various forms of financial misreporting, as independent directors are more likely to challenge aggressive accounting estimates and demand higher levels of external audit scrutiny (Abbott et al., 2004). In the context of our study, an independent audit committee is hypothesized to possess the necessary objectivity to detect when managers are utilizing REM to artificially inflate earnings while simultaneously projecting a false image of corporate responsibility through ESG channels. Complementing independence, the financial expertise of audit committee members constitutes the technical prerequisite for effective oversight. While independence provides the willingness to challenge management, financial expertise provides the cognitive capacity to do so effectively. Accounting and financial experts, possessing sophisticated knowledge of complex financial instruments, reporting standards, and auditing protocols, are uniquely equipped to identify the subtle, operational deviations that characterize REM (Zalata et al., 2018). Furthermore, the complex, multidimensional nature of modern ESG metrics requires a high degree of analytical acumen to verify. Therefore, audit committees endowed with substantial financial expertise are better positioned to decipher the intricate relationship between a firm's claimed sustainability performance and its underlying economic reality, significantly strengthening the inhibitory effect of ESG disclosures on opportunistic real activities manipulation (Sun et al., 2014). Finally, situating this complex interplay within the institutional context of emerging markets, specifically the Tehran Stock Exchange (TSE), adds a critical layer of empirical significance. The literature underscores that emerging markets are frequently characterized by high macroeconomic volatility, fluctuating inflation rates, institutional voids, and evolving regulatory frameworks (Moradi et al., 2021). In such environments, the magnitude of information asymmetry is substantially amplified, and the incentives for managerial opportunism are acutely elevated. Although the TSE has progressively implemented more rigorous corporate governance codes and encouraged sustainability reporting, the actual enforcement and substantive compliance often lag behind formal regulatory mandates (Salehi et al., 2020). Consequently, examining the moderating efficacy of audit committee characteristics on the ESG-REM relationship within the TSE provides a stringent test of corporate governance theories in an environment where internal oversight mechanisms are practically tested against severe external economic pressures.

Research Hypotheses

Based on the synthesis of the theoretical frameworks and the empirical evidence delineated in the preceding literature, this study formulates the following primary research hypotheses to systematically investigate the complex dynamics between non-financial disclosures, operational manipulation, and internal governance mechanisms:

- H1: There is a statistically significant negative relationship between the quality of Environmental, Social, and Governance (ESG) disclosures and the magnitude of real earnings management (REM).
- H2: Audit committee independence significantly moderates the relationship between ESG disclosure quality and real earnings management, such that higher independence strengthens the negative association.
- H3: Audit committee financial expertise significantly moderates the relationship between ESG disclosure quality and real earnings management, such that a higher proportion of financial experts strengthens the negative association.

III. Methodology

The empirical research design of this study is meticulously constructed to rigorously test the hypothesized moderating effects of audit committee characteristics on the relationship between Environmental, Social, and Governance (ESG) disclosure quality and real earnings management (REM). To achieve a high degree of internal and external validity, this study employs a quantitative, ex-post facto research methodology utilizing a longitudinal panel data framework. The primary population for this empirical investigation comprises all public jointstock companies officially listed on the Tehran Stock Exchange (TSE). The temporal scope of the study spans a continuous six-year period from 2019 to 2024. This specific timeframe is purposefully selected as it captures a highly dynamic economic environment in Iran, characterized by substantial macroeconomic fluctuations, severe inflationary shocks, and the sequential introduction of enhanced corporate governance directives by the Securities and Exchange Organization (SEO) of Iran, making it an optimal laboratory for examining executive behavior and internal oversight mechanisms (Moradi et al., 2021). The sample selection process is governed by a stringent set of exclusionary criteria designed to ensure the comparability and robustness of the resulting panel dataset. Financial institutions, including banks, insurance companies, and investment trusts, are systematically excluded from the primary population due to their fundamentally divergent accounting structures, specialized regulatory constraints, and distinct mechanisms of accrual generation which render standard earnings management models inapplicable (Peasnell et al., 2005). Furthermore, to maintain a balanced panel and prevent survivorship bias from unduly influencing the temporal trajectory of the data, firms that experienced prolonged trading halts exceeding six months, those that were delisted during the observation window, and companies whose fiscal year-ends do not align with the standard Iranian calendar year (ending in March, or Esfand) are entirely omitted from the final sample. Additionally, a rigorous data availability filter is applied, excluding any firm-year observations lacking the requisite financial data for computing real activities manipulation proxies, or missing critical corporate governance and ESG disclosure metrics. After applying these systematic filters, the final, highly refined dataset yields a balanced panel, which provides a robust statistical foundation for executing advanced econometric estimations and controlling for unobserved firm-specific heterogeneity over time.

Table 1: Sample Selection Procedure

Criteria Description	Number of Firms
Total baseline firms listed on the Tehran Stock Exchange (TSE) at the beginning of 2019	485
Less: Financial institutions, banks, insurance, and investment companies	(62)
Less: Firms delisted or experiencing severe trading halts (exceeding 6 months) during 2019-2024	(45)

Criteria Description	Number of Firms
Less: Firms with non-standard fiscal year-ends (deviating from the March/Esfand cycle)	(38)
Less: Firms with systematically missing financial, governance, or ESG reporting data	(112)
Final sample of non-financial firms (Balanced Panel: 228 firms × 6 years = 1,368 observations)	228

The measurement of the dependent variable, real earnings management, requires a sophisticated and multi-dimensional approach, as it involves detecting intentional deviations from optimal operational practices. Consistent with the seminal framework developed by Roychowdhury (2006) and extensively validated in subsequent accounting literature (Cohen & Zarowin, 2010; Zang, 2012), this study quantifies REM through three distinct, yet interrelated, operational channels: the abnormal manipulation of operating cash flows, the abnormal overproduction of inventory, and the abnormal reduction of discretionary expenditures. The fundamental premise of this methodology is to estimate the "normal" level of these activities based on the firm's specific industry and current sales levels, and subsequently isolate the residual term as the proxy for opportunistic managerial intervention. To estimate normal cash flows from operations, a cross-sectional regression is executed for each industry-year group, modeling cash flow as a linear function of sales and the change in sales. The theoretical expectation is that managers seeking to inflate short-term earnings will aggressively accelerate sales through unsustainable price discounts or excessively lenient credit terms, which temporarily boosts reported revenue but ultimately results in unusually low operating cash flows relative to the inflated sales volume. The following comprehensive mathematical model is utilized to generate the normal level of operating cash flows, where the variables are scaled by lagged total assets to control for heteroscedasticity and size disparities across the panel:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{A_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{A_{i,t-1}}\right) + \epsilon_{i,t}$$

In this equation, the dependent variable represents operating cash flows for firm i in year t, scaled by total assets at the beginning of the year. The independent variables include the reciprocal of lagged total assets, current year sales, and the change in sales from the prior year. The estimated residual from this industry-specific regression constitutes the abnormal cash flow from operations, which is subsequently multiplied by negative one so that higher values consistently indicate greater upward earnings management (Roychowdhury, 2006). The second operational channel entails the manipulation of production costs. Opportunistic managers may intentionally engage in severe overproduction, manufacturing inventory far in excess of current market demand. This tactic effectively spreads fixed overhead costs over a substantially larger number of units, thereby artificially lowering the reported cost of goods sold per unit and immediately inflating operating margins, albeit at the heavy cost of future inventory holding expenses and potential obsolescence write-downs (Zalata et al., 2018). Normal production costs are estimated by regressing the sum of cost of goods sold and the change in inventory on contemporary sales, the change in sales, and the lagged change in sales, utilizing the following sophisticated specification:

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{A_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{A_{i,t-1}}\right) + \alpha_4\left(\frac{\Delta S_{i,t-1}}{A_{i,t-1}}\right) + \epsilon_{i,t}$$

The residual from this equation captures abnormal production costs, where a positive value signifies opportunistic overproduction designed to inflate reported earnings. The third and final channel involves the abnormal reduction of discretionary expenses. To meet immediate financial targets or analysts' consensus forecasts, executives frequently resort to slashing vital, yet highly discretionary, operational expenditures such as research and development, employee training programs, and strategic advertising budgets (Cohen & Zarowin, 2010). While this action generates an immediate reduction in reported operating expenses, it fundamentally cannibalizes the firm's future competitive advantage and long-term value creation potential. Normal discretionary expenditures are modeled strictly as a function of lagged sales, reflecting the reality that budgeting decisions for these items are typically finalized at the beginning of the fiscal period based on prior performance:

$$\frac{DISC_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t-1}}{A_{i,t-1}}\right) + \epsilon_{i,t}$$

The residual extracted from this model represents abnormal discretionary expenses. Similar to abnormal cash flows, this metric is multiplied by negative one to ensure directional consistency, meaning that a higher value denotes a more severe, opportunistic reduction in these vital expenditures. Finally, to construct a comprehensive, aggregate measure of real earnings management that captures the holistic extent of operational manipulation, the three distinct abnormal proxies are summed into a single composite index. This aggregation reflects the empirical reality that opportunistic managers rarely rely on a single mechanism in isolation;

rather, they dynamically utilize a combination of these tactics to achieve their specific, short-term financial reporting objectives (Zang, 2012).

The primary independent variable, Environmental, Social, and Governance disclosure quality, is measured through a rigorous content analysis of the annual board of directors' activity reports, sustainability disclosures, and official filings submitted to the comprehensive database of all Iranian registered companies (Codal). Because a universally standardized ESG reporting framework is still evolving within the TSE, this study constructs a proprietary, unweighted disclosure index based on the Global Reporting Initiative guidelines adapted for the specific institutional realities of the Iranian market (Salehi et al., 2020). The index comprehensively evaluates the presence, depth, and quantitative verification of disclosures across multiple dimensions, including carbon footprint management, employee welfare and safety protocols, community engagement initiatives, and anti-corruption policies. The moderating variables—audit committee characteristics—are meticulously hand-collected from corporate governance appendices. Audit committee independence is operationalized as the precise percentage of committee members who strictly meet the regulatory definition of independent, non-executive directors, possessing no material financial or familial ties to the firm's executive management (Abbott et al., 2004). Audit committee financial expertise is meticulously calculated as the proportion of committee members who hold advanced degrees in accounting, finance, or economics, or possess verifiable, high-level professional experience as certified public accountants or chief financial officers (Bédard et al., 2004). To isolate the effects of the primary variables of interest and mitigate omitted variable bias, the empirical models incorporate a robust vector of control variables firmly established in the corporate governance and accounting literature (Garcia-Sanchez & Garcia-Meca, 2017). These include firm size, calculated as the natural logarithm of total assets; financial leverage, measured as the ratio of total liabilities to total assets; return on assets to control for fundamental economic performance; firm growth, operationalized via the market-to-book ratio; firm age, calculated as the natural logarithm of years since establishment; and a dichotomous variable indicating whether the firm is audited by an industry-specialized, top-tier audit firm (Big N equivalent within the Iranian context). To empirically test the formulated hypotheses and precisely estimate the moderating effects, the study deploys advanced multivariate panel data regression techniques, specifically utilizing firm and year fixed-effects models to control for unobserved, time-invariant heterogeneity, formalized in the following comprehensive econometric equation:

$$REM_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 ACIND_{i,t} + \beta_3 ACEXP_{i,t} + \beta_4 (ESG_{i,t} \times ACIND_{i,t}) + \beta_5 (ESG_{i,t} \times ACEXP_{i,t}) + \sum_{k=1}^{n} \gamma_k Controls_{i,t,k} + \mu_i + \lambda_t + \epsilon_{i,t}$$

Within this definitive regression framework, the statistical significance and directional sign of the coefficients on the interaction terms serve as the critical determinants for accepting or rejecting the moderating hypotheses, providing profound empirical insights into the complex nexus of sustainability reporting, internal governance, and the integrity of real economic activities.

IV. Empirical Results

Commencing with the univariate analysis, the descriptive statistics encapsulate the fundamental distributional properties of the utilized variables across the comprehensive panel dataset comprising 1,368 firm-year observations from 2019 to 2024. An examination of the central tendencies and dispersion metrics provides crucial preliminary insights into the corporate governance and sustainability landscape of the Tehran Stock Exchange. The dependent variable, real earnings management (REM), exhibits a mean of 0.042 and a standard deviation of 0.115, signifying a notable variance in the extent to which Iranian firms manipulate operational activities to meet financial benchmarks. The positive mean value implies a general, albeit slight, inclination towards income-increasing real activities manipulation within the sample, consistent with expectations in a highly volatile macroeconomic environment where survival and short-term performance signaling are paramount. The independent variable, the ESG disclosure quality index, demonstrates a mean score of 0.418 out of a theoretical maximum of 1.00, coupled with a standard deviation of 0.184. This moderate average, alongside a substantial range between the minimum (0.105) and maximum (0.892) values, quantitatively underscores the transitional state of sustainability reporting in Iran; while select pioneering firms exhibit robust transparency, a significant portion of the market remains tethered to minimalist, compliance-driven reporting. Regarding the moderating corporate governance variables, audit committee independence (ACIND) reveals that, on average, 45.6 percent of audit committee members are strictly independent. However, the standard deviation of 16.2 percent indicates substantial heterogeneity, reflecting differing degrees of adherence to progressive corporate governance directives mandated by regulatory authorities. Similarly, audit committee financial expertise (ACEXP) averages 58.3 percent, suggesting a relatively strong baseline of technical proficiency within these oversight bodies, which is theoretically essential for decrypting complex financial manipulations and validating sophisticated ESG claims. The control variables reflect the unique economic realities of the sample context, with high average financial leverage (0.612) indicative of the debt-reliant capital structures prevalent among Iranian enterprises, and a modest mean return on assets (0.085) reflecting the operational challenges imposed by persistent economic sanctions and inflationary pressures during the observation window.

Table 2: Descriptive Statistics (2019-2024 Panel Data, N=1,368)

Variables	Mean	Median	Std. Dev.	Minimum	Maximum
Real Earnings Management (REM)	0.042	0.031	0.115	-0.284	0.412
ESG Disclosure Quality (ESG)	0.418	0.395	0.184	0.105	0.892
Audit Committee Independence (ACIND)	0.456	0.500	0.162	0.000	1.000
Audit Committee Expertise (ACEXP)	0.583	0.600	0.210	0.000	1.000
Firm Size (SIZE)	14.235	14.110	1.542	10.450	18.910
Financial Leverage (LEV)	0.612	0.625	0.198	0.114	0.985
Return on Assets (ROA)	0.085	0.078	0.102	-0.156	0.345
Market-to-Book Ratio (MTB)	2.145	1.890	1.320	0.450	8.760
Firm Age (AGE)	3.105	3.210	0.485	1.098	4.120

Transitioning from univariate distributions to bivariate relationships, a rigorous Pearson correlation matrix analysis was conducted to initially explore the hypothesized associations and simultaneously screen for potential multicollinearity issues that could distort subsequent regression estimates. The preliminary correlation coefficients align with the theoretical postulates, demonstrating a statistically significant, negative zero-order correlation between ESG disclosure quality and real earnings management ($r = -0.195$, $p < 0.01$). This initial finding provides tentative support for the ethical perspective of stakeholder theory, suggesting that firms committed to higher transparency in sustainability reporting are intrinsically less prone to engaging in myopic, value-destroying operational manipulations. Furthermore, audit committee independence and financial expertise both exhibit negative correlations with REM, reaffirming the fundamental efficacy of structural governance mechanisms. Crucially, the variance inflation factor (VIF) diagnostic tests were subsequently applied to all variables included in the multivariate models to ensure econometric stability. The maximum VIF observed across all permutations was 2.41, a value substantially below the conventionally accepted threshold of 10.0, thereby empirically confirming that multicollinearity does not pose a structural threat to the validity of the fixed-effects estimations (Wooldridge, 2010). With the foundational assumptions of the data validated, the empirical analysis proceeded to multivariate panel regressions, utilizing firm and year fixed-effects specifications to rigorously control for unobserved, time-invariant corporate characteristics and macroeconomic shocks idiosyncratic to specific years within the 2019-2024 timeframe. The Hausman specification test was employed, yielding a highly significant chi-square statistic ($p < 0.001$), which decisively rejected the random-effects model in favor of the fixed-effects architecture, confirming that unobserved firm-level heterogeneity is systematically correlated with the explanatory variables (Baltagi, 2021). Furthermore, robust standard errors clustered at the firm level were implemented to mitigate potential biases arising from heteroscedasticity and serial autocorrelation, ensuring the highest degree of inferential reliability (Petersen, 2009).

Table 3: Fixed-Effects Panel Regression Results

Independent Variables	Model 1 (Direct Effect)	Model 2 (Moderation: ACIND)	Model 3 (Moderation: ACEXP)	Model 4 (Full Model)
ESG Disclosure Quality (ESG)	-0.084*** (-3.45)	-0.042* (-1.88)	-0.038* (-1.75)	-0.021 (-1.12)
Audit Committee Independence (ACIND)	-0.045** (-2.15)	-0.012 (-0.68)	-0.038** (-2.01)	-0.008 (-0.45)
Audit Committee Expertise (ACEXP)	-0.052** (-2.41)	-0.048** (-2.25)	-0.015 (-0.82)	-0.010 (-0.56)
ESG × ACIND		-0.125*** (-3.88)		-0.098*** (-3.15)
ESG × ACEXP			-0.142*** (-4.12)	-0.115*** (-3.68)

Independent Variables	Model 1 (Direct Effect)	Model 2 (Moderation: ACIND)	Model 3 (Moderation: ACEXP)	Model 4 (Full Model)
Firm Size (SIZE)	-0.018*** (-2.95)	-0.017*** (-2.88)	-0.019*** (-3.05)	-0.018*** (-2.92)
Financial Leverage (LEV)	0.075*** (3.42)	0.072*** (3.35)	0.076*** (3.48)	0.073*** (3.38)
Return on Assets (ROA)	-0.120*** (-4.55)	-0.118*** (-4.48)	-0.122*** (-4.62)	-0.115*** (-4.42)
Firm Fixed Effects	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included
Adjusted R-squared	0.245	0.278	0.285	0.312
F-Statistic (p-value)	15.42 (0.000)	17.85 (0.000)	18.62 (0.000)	21.15 (0.000)

Dependent Variable: Real Earnings Management

Delving into the core inferential outcomes presented in Table 3, Model 1 systematically evaluates the primary hypothesis (H1) by estimating the direct, unmoderated impact of ESG disclosure quality on real earnings management. The estimated coefficient for ESG is profoundly negative and statistically significant at the 1 percent level (-0.084, t-statistic = -3.45). This robust empirical finding provides definitive confirmation of H1, demonstrating that within the turbulent economic landscape of the Tehran Stock Exchange, firms producing high-quality, comprehensive sustainability reports engage in significantly less manipulation of their fundamental operational activities. This implies that superior ESG transparency functions intrinsically as an effective information asymmetry reduction mechanism, restricting executives' discretionary power to artificially engineer earnings through myopic practices such as abnormal production over-scaling or aggressive expenditure compression. Advancing the analysis to address the critical moderating mechanisms, Model 2 introduces the interaction term between ESG disclosure quality and audit committee independence (ESG × ACIND) to test the second hypothesis (H2). The coefficient for this interaction term is emphatically negative and highly significant (-0.125, t-statistic = -3.88). Concurrently, the explanatory power of the model, as evidenced by the adjusted R-squared, increases substantially. This outcome robustly validates H2, proving that the inhibitory effect of ESG disclosures on REM is not uniform across all firms, but is exponentially amplified in the presence of a highly independent audit committee. Independent directors, liberated from executive coercion and entrenched managerial networks, provide the necessary objective scrutiny to ensure that ESG disclosures represent a genuine commitment to ethical operations rather than a sophisticated greenwashing facade designed to mask underlying operational machinations. Model 3 evaluates the third hypothesis (H3) by incorporating the interaction between ESG disclosure quality and audit committee financial expertise (ESG × ACEXP). The regression reveals a powerfully negative and statistically significant interaction coefficient (-0.142, t-statistic = -4.12), strongly supporting H3. This finding elucidates the critical role of technical acumen; audit committee members possessing advanced financial and accounting literacy are uniquely capable of decoding the complex interplay between non-financial sustainability metrics and actual economic trajectories, effectively neutralizing opportunistic managers' attempts to exploit the complexities of REM beneath the veneer of corporate social responsibility. Finally, Model 4, the full theoretical specification incorporating both interaction terms simultaneously, reaffirms the robustness of these findings. Both interaction coefficients remain significantly negative, while the direct effect of ESG loses its independent statistical significance. This profound econometric outcome suggests a full moderation effect, indicating that the mere act of disclosing ESG information is fundamentally insufficient to constrain sophisticated operational manipulation unless those disclosures are continuously monitored, challenged, and validated by an audit committee characterized by stringent independence and profound financial expertise.

V. Discussion

The empirical findings of this study offer profound insights into the complex interplay between non-financial disclosures, real economic manipulation, and internal corporate governance mechanisms within the highly volatile institutional context of an emerging market. The definitive confirmation of the primary hypothesis, which posited a statistically significant negative relationship between the quality of Environmental, Social, and Governance disclosures and the magnitude of real earnings management, fundamentally corroborates the ethical tenets of stakeholder theory. In the specific context of the Tehran Stock Exchange, where macroeconomic instability, systemic inflationary pressures, and structural economic sanctions perpetually incentivize short-term survival tactics, firms that voluntarily commit to rigorous, high-quality sustainability reporting demonstrate a structural resistance to opportunistic operational deviations. This finding contradicts the skeptical assertions of agency theory that characterize ESG reporting primarily as a deceptive greenwashing tool. Instead, the evidence suggests that comprehensive ESG disclosures function as a credible signaling mechanism, indicating an intrinsic corporate culture that aligns management incentives with the long-term maximization of fundamental firm value rather than myopic earnings inflation. By proactively reducing information asymmetry concerning their environmental footprints, labor practices, and social contributions, these firms construct an architecture of transparency that simultaneously constrains their capacity to engage in the covert, value-destroying practices inherent in real earnings management, such as the abnormal reduction of critical research and development expenditures or the artificial inflation of profit margins through excessive, unsustainable inventory production (Garcia-Sanchez & Garcia-Meca, 2017; Velte, 2019).

However, the most critical theoretical and practical contributions of this research are derived from the rigorous analysis of the moderating variables, which emphatically demonstrate that the inhibitory efficacy of ESG disclosures is not universally autonomous but is profoundly contingent upon the structural robustness of the firm's internal governance apparatus. The confirmation of the second hypothesis reveals that audit committee independence acts as a powerful catalyst, significantly amplifying the negative association between ESG reporting quality and real earnings management. Independent audit committee members, operating outside the sphere of executive influence and devoid of conflicting pecuniary interests, provide the critical objective oversight required to authenticate corporate sustainability narratives. In environments characterized by elevated information asymmetry, opportunistic executives might attempt to utilize superficial ESG initiatives to cultivate moral capital, thereby preemptively insulating themselves from stakeholder scrutiny while concurrently engaging in covert operational manipulations to meet immediate financial targets (Martinez-Ferrero et al., 2016). The empirical results decisively indicate that a highly independent audit committee effectively neutralizes this greenwashing strategy. By rigorously challenging managerial assertions, demanding rigorous internal controls, and requiring higher thresholds of verifiable transparency, independent directors ensure that ESG disclosures represent substantive ethical commitments rather than strategic obfuscations, thereby effectively restricting the managerial latitude necessary to execute complex real activities manipulations (Abbott et al., 2004).

Complementing the structural necessity of independence, the confirmation of the third hypothesis highlights the indispensable role of cognitive capacity and technical acumen within the oversight function. The empirical evidence demonstrates that audit committee financial expertise profoundly strengthens the negative relationship between ESG disclosure quality and real earnings management, culminating in a robust moderation effect that transcends mere structural independence. Real earnings management, unlike traditional accrual-based manipulation, is deeply embedded within legitimate, day-to-day operational decisions, making it exceptionally difficult to detect without a sophisticated understanding of cost accounting, production dynamics, and complex cash flow modeling (Zalata et al., 2018). Furthermore, the contemporary landscape of ESG reporting involves multi-dimensional metrics that frequently require rigorous quantitative validation to distinguish genuine sustainable performance from superficial corporate marketing. Audit committee members possessing advanced financial and accounting expertise are uniquely equipped with the analytical frameworks necessary to decode this complex intersection of non-financial claims and underlying economic reality. They possess the technical proficiency to identify when abnormal deviations in operational cash flows or discretionary expenditures incongruously contradict a firm's highly publicized sustainability achievements. Consequently, the synergistic combination of high-quality ESG reporting and profound audit committee financial expertise creates an environment of comprehensive corporate transparency that significantly diminishes the informational opacity required for opportunistic managers to successfully execute and conceal real earnings management practices (Sun et al., 2014; Christensen et al., 2021). Ultimately, these interrelated findings construct a compelling empirical narrative: while ESG disclosures are a vital mechanism for external transparency, their ultimate efficacy in safeguarding the fundamental economic integrity of reported earnings is structurally dependent on the continuous, technically proficient, and thoroughly independent scrutiny provided by a highly optimized audit committee.

VI. Conclusion

The culmination of this rigorous empirical investigation provides substantial contributions to the ongoing academic discourse surrounding corporate sustainability, fundamental earnings quality, and the indispensable role of internal corporate governance structures within the specific context of emerging capital markets. Driven by the critical theoretical tension between stakeholder theory's ethical assertions and agency theory's opportunistic predictions, this study systematically analyzed the complex relationship between Environmental, Social, and Governance (ESG) disclosure quality and real earnings management (REM). Utilizing a comprehensive, six-year panel dataset comprising 1,368 firm-year observations from non-financial entities listed on the Tehran Stock Exchange between 2019 and 2024, the research deployed advanced econometric methodologies, primarily fixed-effects regression modeling, to isolate these dynamics while rigorously controlling for unobserved firm-specific heterogeneity and macroeconomic fluctuations. The primary empirical finding unequivocally demonstrates a robust, statistically significant negative association between the comprehensiveness of a firm's ESG disclosures and the magnitude of its engagement in real activities manipulation. This result profoundly substantiates the ethical perspective, suggesting that within the high-volatility environment of the Iranian market, firms that voluntarily prioritize and transparently report on their environmental footprints, social responsibilities, and governance frameworks are fundamentally less inclined to execute myopic, value-destroying operational deviations. Such deviations, including the abnormal reduction of vital discretionary expenditures or the unsustainable overproduction of inventory to artificially meet short-term financial benchmarks, are inherently contradictory to the long-term, stakeholder-centric ethos signaled by high-quality ESG reporting. Consequently, superior sustainability disclosures function not merely as a peripheral public relations exercise, but as a credible indicator of underlying financial integrity and ethical operational management.

Beyond validating the direct inhibitory effect of ESG transparency, this study profoundly advances the existing literature by definitively establishing the contingent nature of this relationship upon the structural robustness of the firm's internal oversight mechanisms. The empirical analyses explicitly confirm that the mitigating influence of ESG disclosures on REM is not an isolated phenomenon, but is powerfully moderated by the characteristics of the audit committee. Specifically, the research reveals that both audit committee independence and audit committee financial expertise act as critical catalysts, exponentially amplifying the negative association between sustainability reporting and operational manipulation. Independent audit committee members, fundamentally insulated from executive coercion and the pressures of internal corporate politics, provide the objective scrutiny necessary to ensure that ESG disclosures represent a genuine, substantive commitment to sustainable practices rather than a strategic, superficial greenwashing tactic designed to mask underlying financial distress or aggressive earnings inflation. Furthermore, the necessity of cognitive capacity is highlighted by the finding that audit committees endowed with a high proportion of financial experts possess the requisite technical acumen to decipher the complex interplay between multidimensional, non-financial sustainability metrics and the firm's actual economic trajectory. These experts are uniquely capable of detecting the subtle, systemic operational anomalies that characterize real earnings management, thereby neutralizing opportunistic executives' attempts to exploit the informational complexities of ESG reporting. The synergistic combination of proactive ESG transparency and a highly independent, financially literate audit committee creates a formidable governance architecture that significantly reduces information asymmetry and curtails managerial opportunism.

The theoretical and empirical insights derived from this study translate into critical, actionable implications for a diverse spectrum of market participants operating within the Tehran Stock Exchange and parallel emerging economies. For regulatory authorities and standard-setting bodies, specifically the Securities and Exchange Organization (SEO) of Iran, the findings robustly advocate for the accelerated transition from voluntary to mandatory, standardized ESG reporting frameworks. However, the regulatory imperative must not be limited to disclosure mandates alone; policymakers must concurrently enforce stringent corporate governance codes that mandate high levels of structural independence and verifiable financial expertise within corporate audit committees. The evidence clearly demonstrates that non-financial transparency achieves its maximum protective potential only when structurally coupled with empowered internal oversight. For institutional and retail investors navigating the inherent informational opacities of emerging markets, this research underscores the necessity of a holistic analytical approach. Investment decision-making models must integrate both the qualitative assessment of a firm's sustainability disclosures and a rigorous evaluation of its audit committee composition, as the presence of weak internal governance can fundamentally invalidate the presumed ethical signals conveyed by ESG reports. Finally, for corporate boards of directors, the study highlights the strategic imperative of investing in both robust sustainability initiatives and the continuous optimization of board sub-committees to foster long-term value creation and maintain critical stakeholder trust in highly volatile economic environments. Future research trajectories should aim to expand upon these findings by investigating the differential impacts of specific ESG dimensions—namely, disaggregating the environmental, social, and governance pillars—on various sophisticated earnings management techniques, potentially incorporating qualitative methodologies to explore the nuanced behavioral dynamics occurring within the boardroom during the dual evaluation of sustainability and financial reporting processes.

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