A QUANTITATIVE ANALYSIS OF THE IMPACT OF SUSTAINABILITY RATINGS ON EARNINGS MANAGEMENT IN UK-LISTED COMPANIES

Xiaoxi Chen *, Saira Kharuddin **, Jalila Johari **

* *Corresponding author*, School of Business and Economics, University Putra Malaysia, Serdang, Malaysia
Contact details: School of Business and Economics, University Putra Malaysia, 1 Jalan Universiti, Serdang, 43400 Selangor, Malaysia
** School of Business and Economics, University Putra Malaysia, Serdang, Malaysia

OPEN ACCESS

How to cite this paper: Chen, X., Kharuddin, S., & Johari, J. (2026). A quantitative analysis of the impact of sustainability ratings on earnings management in UK-listed companies. *Corporate Governance and Sustainability Review, 10*(2), 123–133.
https://doi.org/10.22495/cgsrv10i2p11

ISSN Online: 2519-898X
ISSN Print: 2519-8971

Received: 11.07.2025
Revised: 14.02.2026; 27.02.2026
Accepted: 20.03.2026

JEL Classification: M14, G34, M41
DOI: 10.22495/cgsrv10i2p11

Abstract

This study examines the relationship between environmental, social and governance (ESG) risk ratings and earnings management (EM) in 450 United Kingdom (UK) listed companies in 2024, taking firm size as a moderator. Based on the cross-sectional regression analysis and discretionary estimated accruals via the modified Jones model, the results show a statistically weak relationship between ESG ratings and EM. Contrary to a significant part of the previous literature that records an inverse relationship between ESG performance and earnings manipulation, the findings indicate that ESG ratings in the UK do not translate into earnings quality. Moreover, firm size does not have a direct influence on the EM; neither does it moderate the relationship between ESG and EM. The findings are relevant to the sustainability literature as they indicate the complexity of ESG performance and earnings quality, suggesting that ESG ratings are limited in terms of predicting financial reporting integrity in developed regulatory contexts.

Keywords: ESG Risk Ratings, Earnings Management, Firm Size, Moderating Role

Authors' individual contribution: Conceptualization — X.C.; Methodology — S.K.; Formal Analysis — S.K.; Investigation — X.C.; Resources — X.C. and J.J.; Data Curation — S.K.; Writing — X.C. and J.J.; Supervision — J.J.; Funding Acquisition — J.J.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

In the contemporary era, sustainability considerations, captured through environmental, social and governance (ESG) factors, have gained immense attention. From being minor concerns, they have become central parts of business strategy, investor decisions, and government regulations as well. Performing for ESG goals is now considered not only as something that builds the company's image, but is also considered a significant factor for its long-term value and financial stability. The mounting pressure from stakeholders for ethical and responsible behavior has prompted many firms, especially in developed countries like the United Kingdom (UK), to include ESG principles in their operations as well as in their management systems (Kotsantonis & Serafeim, 2019). In the UK, the UK Corporate Governance Code (Financial Reporting Council, 2024), and the UK Stewardship Code (Financial Reporting Council, 2020) have enforced rules about transparency, accountability, long-term stakeholder engagement, and ethical investment. This positions the UK as a mature and highly regulated environment for sustainability disclosure, making it important to explore how ESG activities impact different financial activities, such as earnings management (EM).

EM is the deliberate modification of accounting estimates or fundamental business activities for the purpose of affecting reported financial outcomes (Dechow et al., 2010). Even though not all EM is

illegal, it conceals a corporation's real performance and deceives executives on resource allocation by investors and other stakeholders. Methods used include accrual-based manipulations, such as changing depreciation estimates, and real activities manipulation, such as tweaking discretionary spending.

Moreover, the extent of the firm has a significant effect on corporate behavior. Larger firms are subject to more intense scrutiny from regulators, bringing in higher reputational risk in the case of EM. The larger firms possess better internal control systems (Handayati et al., 2025). Smaller companies have, however, few external monitoring mechanisms but more flexibility in judgement when using accounting standards. Because of this, firm size would likely restrain the interaction between ESG presentation and EM.

While some studies report that higher ESG engagement reduces discretionary accruals through enhanced monitoring and reputational concerns (Buertey et al., 2020; Adeneye et al., 2024). Conversely, other scholars argue that ESG disclosure may function symbolically, serving legitimacy purposes without necessarily improving financial reporting quality (Clementino & Perkins, 2021). These contradictory findings raise important questions regarding whether ESG risk ratings genuinely reflect governance quality or merely capture disclosure practices. This study addresses this debate by examining whether ESG risk ratings constrain EM in UK-listed firms and whether firm size conditions this relationship. By focusing on a single developed institutional context, the study contributes to clarifying whether ESG ratings retain explanatory power in environments characterized by already strong regulatory oversight.

The inspiration for analyzing the connection between EM and ESG activities is to see how business ethics influence financial reporting. The UK is a good example because it has strict laws and financial markets and better rules for ESG reporting. These conditions create a situation where companies must balance being honest and ethical while trying to stay profitable. Studying EM and ESG in this context helps understand how company rules and systems affect what managers do. It also gives useful ideas to policymakers and investors who focus on real sustainability instead of just following rules for appearance.

The research aims to explore the effect of ESG ratings on the EM of UK firms and to analyze the moderating effect of firm size and financial performance on such association. In order to accomplish these goals, we formulate these objectives.

The main objectives of the study are as follows:

- to establish that firms with more ESG ratings engage less in EM;
- to determine whether larger firms manage earnings differently from smaller ones;
- to examine whether firm size strengthens or weakens the impact of ESG ratings on EM in the UK context.

This study aims to develop an understanding of how ESG relates to EM in the UK. By including firm size as an independent variable and also as a moderating factor in two different models, the study identifies whether ESG practices are more effective in larger firms versus smaller firms. The findings will add to corporate governance literature and, at the same time, it also helps investors to evaluate ESG ratings as pointers of financial integrity. The UK has a unique institutional and regulatory environment, which emphasizes corporate transparency and strong investor protection. However, empirical work directly addressing this interaction for UK-listed companies is scarce. At the same time, advanced ESG disclosure standards are also mandatory. By examining whether firm size influences or moderates this relationship, the study provides deep knowledge. The findings will also help to learn whether larger UK firms, often under higher scrutiny, exhibit more responsible financial reporting as compared to smaller ones. The findings help clarify whether ESG ratings truly determine the integrity of EM in developed and mature frameworks like the UK.

The remaining parts of the study are structured as follows: Section 2 provides the theoretical framework as well as a review of studies, Section 3 presents the methodology, Section 4 depicts the results, Section 5 discusses the findings, whereas the conclusion and recommendations, along with limitation are provided in Section 6.

2. LITERATURE REVIEW

2.1. Theoretical framework

The present study is formulated on the theoretical framework of agency theory, legitimacy theory, and stakeholder theory (Jensen & Meckling, 1976; Freeman, 2015; Bass & Riggio, 2006).

The agency theory is an important framework for understanding how EM is impacted by ESG practices. It explains how conflicts between managers and shareholders can lead to EM. This is usually done to meet performance expectations. According to this theory, managerial opportunism may result in earnings manipulation regardless of their duty when monitoring mechanisms are weak (Jensen & Meckling, 1976). EM is one of those opportunistic behaviors. ESG performance and firm size are relevant to the agency framework as both are likely to reduce agency costs. Thus, if ESG engagement reflects stronger governance structures and reduced agency costs, a negative relationship between ESG risk and EM is expected based on the agency theory. However, critics suggest that inconsistencies in ESG rating methodologies make ESG scores non-uniform and unreliable proxies for governance quality (Berg et al., 2022). Thus, while this theory provides a strong explanation of managerial behavior, we need to contextualize managers' motives with ESG credibility and enforcement intensity to understand how Agency theory operates for EM in UK-listed firms.

The legitimacy theory suggests that firms usually participate in ESG activities to maintain social approval. According to this theory, organizations are continuously trying to act within socially acceptable limits and meet the expectations to obtain legitimacy and maintain their continued operation in society. Firms with good ESG performance may be less likely to take part in earnings manipulation because they are associating themselves with accountability and transparency.

On the other hand, Almubarak et al. (2023) signify that some firms might use ESG reporting as a way to create a false image of responsibility and hide unethical actions like EM behind positive ESG disclosures. This creates a paradox between ESG disclosure reflecting a genuine commitment to transparency or just serving as a symbolic "greenwashing" that masks opportunistic reporting behavior. This dual possibility explains why prior empirical findings are mixed. In the UK, expectations and requirements from both investors and regulators for firms to act sustainably or ethically are increasing (Legal Foundations, 2026). The present study, thus, applies the legitimacy theory to evaluate whether UK firms use a strategy of disclosing ESG to hide unethical financial reporting or do so genuinely to enhance legitimacy.

The stakeholder theory argues that firms need to generate value for all stakeholders, and the focus is not only on shareholders (Freeman & Dmytriyev, 2017). It accentuates that firms must balance the interests of diverse groups, including employees, society, and investors. In this context, it helps to justify how higher industry engagement may reduce EM by increasing accountability to multiple stakeholders. Good ESG ratings indicate the extent to which an individual company conduct stakeholders' relationship well, maintaining a balance between social and environmental consequences. Thus, according to this theory, a company would not manipulate earnings since such conduct hampers trust and value creation in the long run (Freudenreich et al., 2020). In the context of our study, the UK, where stakeholder capitalism is becoming stronger than ever before, with regulatory changes in investor activism, this research offers a strong framework for understanding the nexus between ESG and EM

2.2. Review of literature about ESG and earnings management nexus

Research indicates that strong ESG performance enhances transparency, reduces agency costs, and minimizes earnings manipulation, suggesting that firms adopting ESG frameworks act more responsibly toward society and report more ethically (Adeneye et al., 2024). For instance, Buertey et al. (2020) established that European firms with higher ESG scores exhibited fewer discretionary accruals.

However, some argue that ESG ratings may reflect symbolic actions or "greenwashing" rather than actual governance quality (Clementino & Perkins, 2021). Certain firms might utilize ESG disclosure to conceal unethical reporting practices. Ekawati (2025) discovered that even high-ESG firms sometimes engage in income smoothing and aggressive accruals. Conversely, Ilori et al. (2023) demonstrate that firms having robust ESG and integrated reporting face stricter monitoring and reputational risk considerations, discouraging such behavior.

Recent studies view ESG as a moderating factor that improves earnings quality. Handayati et al. (2025) note that ESG-oriented firms typically possess independent boards, robust internal controls, and enhanced risk reporting, reducing managerial discretion. Evidence from Europe and the UK supports this, indicating that ESG-driven governance reduces abnormal accruals and real EM (Shi & Yao, 2025). Critics point out that ESG scores can be inconsistent across rating agencies and may not accurately reflect firm-level governance (Kimbrough et al., 2024). Nevertheless, when examined over time, long-term ESG commitment shows a strong negative correlation with both accrual-based and real earnings manipulation (Al Barrak & Kouaib, 2024). Thus, while measurement issues persist, most evidence suggests that genuine, sustained ESG practices reduce EM.

The size of the firm is related to EM, but its impact is debated and not absolute. As large firms have to undergo more checking from regulators, they avoid opportunistic reporting (Dechow & Dichev, 2022). This is in alignment with agency theory as discussed earlier. Larger firms have stronger governance systems that constrain managerial discretion (Ahmed et al., 2013). Siregar and Utama (2008) found an inverse link between discretionary accruals and firm size. This suggests that stronger monitoring reduces manipulation. However, others argue that larger firms have complex structures and possess multiple resources, and thus they can use sophisticated EM methods (Rahman et al., 2013). These are often hard to detect. Despite this, reputational and regulatory risks usually outweigh the benefits of manipulation, particularly under the UK's strict post-Brexit environment.

Another perspective signifies that firm visibility and stakeholder pressure influence how size affects earnings quality. Stakeholder theory suggests that larger firms face greater public and investor expectations, thus motivating them to report more ethically (Antonelli et al., 2016). Chowdhury and Eliwa (2021) observed that well-known UK firms with institutional investors used to engage less in accrual EM. Although visibility can also create pressure in order to meet goals in the short run, which could lead to manipulation (Roychowdhury, 2006). Additionally, when the ownership is widely spread, internal controls may weaken, making governance quality more important than firm size itself (Barua et al., 2010). Moreover, studies suggest that firm size, when supported by effective administrative and governance systems, helps to reduce manipulation (Khalil & Ozkan, 2016). Therefore, while firm size alone cannot fully prevent EM, it becomes a stronger deterrent when combined with sound governance and stakeholder oversight.

In recent literature, the mounting significance of ESG practice in shaping firm financial performance is frequently discussed. Ahmad et al. (2021) studied Financial Times Stock Exchange (FTSE) 350 UK firms and revealed that ESG engagement positively affects financial performance. Whereas the individual impact of various pillars of ESG may vary. Similarly, Shaikh (2022) provided evidence from 17 different nations for the period 2010 to 2018, and noticed that governance practices generally enhance performance. Rasyad et al. (2024) analysed Indonesian and Malaysian listed companies and reported that ESG initiatives are generally linked to improved firm value and performance, although the effects are heterogeneous across different ESG pillars. Empirical evidence indicates that

management is affected by specific financial characteristics of firms and can also influence future firm performance. Iatridis and Kadorinis (2009) investigated UK-listed firms and found that companies with low profitability and high leverage are more likely to engage in EM. Similarly, Nguyen et al. (2022) developed an EM signal index and asserted that firms exhibiting higher EM tend to underperform in subsequent stock returns. Later, Asim and Ismail (2019) examined the manufacturing sector in Pakistan and reported that higher leverage significantly drives accruals, which indicates a strong financial reason for EM.

The scholars in some contemporary studies highlighted the theoretical foundations linking ESG practices to the behavior of the firms. Peng and Isa (2020) examined 461 Shariya firms across 20 countries for the time spanning 2010 to 2017 and revealed that ESG engagement positively influences firm performance in consistency with stakeholders' theory over agency theory. In a multinational context, Gavana et al. (2022) studied related party transactions and established that strong ESG performance can moderate the relationship between related party dealings and both accruals and real earnings. This implies that focusing on ESG goals reduces opportunistic managerial behavior. Additionally, Del Gesso and Lodhi (2025) systematically reviewed 142 studies and identified legitimacy, stakeholders, and signaling theories as the basis for studying ESG disclosures.

Firm size as the moderating factor between ESG activities and EM is a more recent concern in the literature, especially with heightened sustainability reporting requirements and regulatory pressures in developed economies such as the UK. Adherents to this moderating perspective posit that firm size boosts the governance and transparency implications of ESG activities, enhancing their influence on earnings quality (Adeneye et al., 2024). Large firms, based on stakeholder and resource-based perspectives, are capable of institutionalizing the practices of ESG based on the availability of capital, specialized human capital, and pressure from various groups of stakeholders (Dechow & Dichev, 2002). Empirical evidence from Akgun et al. (2021) identifies that ESG's inverse relationship with EM is strongest in large-cap firms included in the FTSE 350 index, where the quality of disclosure and scrutiny by stakeholders is higher. Yet, while critics claim that larger firms might employ ESG disclosures as a strategic tactic to hide earnings manipulation instead of reducing it (Clementino & Perkins, 2021), big companies can use "selective transparency" more easily. This means that their ESG participation may not always translate into uniformly improved earnings quality. Nevertheless, Khalil and Ozkan (2016) rebuttal evidence shows that ESG diminishes EM more effectively for larger firms, especially when combined with high-quality corporate governance systems. Therefore, although firm size might create enabling as well as constraining dynamics, the majority of recent studies indicate that it strengthens the ESG-EM relationship by ensuring institutional responsibility.

Firm size also plays a moderating role by interplaying with reputational risk and compliance. Large companies, particularly in the UK following its Brexit experience, are more attuned to reputational risk, which encourages genuine ESG involvement and prudent EM (Akyildirim et al., 2025). This reinforces that ESG-dedicated companies, those with greater market capitalization, less frequently employ discretionary accruals or activity manipulation (Al Barrak & Kouaib, 2024). However, this impact is uneven; opponents argue that the advantages of size only take effect when there are strong monitoring mechanisms in place, like audit committee independence and regulation. Chowdhury and Eliwa (2021) in their study discovered that in poorly governed firms, firm size by itself could not significantly moderate the ESG-EM relationship. Conversely, strongly governed firms showed a strong negative ESG-EM relationship, particularly observed in the case of larger firms. Rebuttals to the above studies hold that market expectations are more stringent on large firms' ESG performance and, therefore, more capable of restricting misreporting (Arvidsson & Dumay, 2022). Overall, the literature indicates that the size of the firm operates as a conditional enhancer of the effect of ESG on EM, especially with external and internal governance forces supporting it. Therefore, the size of the firm does not, in itself, influence the ESG-EM nexus but serves a critical moderating role in defining the efficacy and validity of ESG endeavors to deter earnings manipulation.

2.3. Research gap

Notwithstanding, there is an increasing literature on the link between ESG and EM. Previous studies offer disconnected and sometimes divergent evidence, especially for UK-listed companies. While most research finds an inverse association between ESG activities and earnings manipulation, others point to the possibility of ESG disclosures acting as symbolic legitimacy in place of substantive accountability (Clementino & Perkins, 2021). Additionally, much of this research is either based on aggregate global or United States (U.S.) data or pools of different institutional contexts, thus ignoring the reporting and regulation subtleties characteristic of the UK's post-Brexit corporate governance context. Concurrently, the firm size factor has frequently been explored as a standalone determinant of EM, but its moderating or interaction effects, particularly on the ESG and EM relationship, are still underdeveloped and inconclusive. While some research, like Al Barrak and Kouaib (2024), used firm size as a control variable for calculating ESG's impact on earnings quality in developing countries with varying institutional frameworks. There has been minimal research on combining all three factors — ESG performance, earnings manipulation, and firm size — within one single analytical framework and applying it to recent UK-specific quantitative data. With increasing standardization of ESG and mounting pressure for transparent financial conduct, it is imperative to know how firm attributes such as size affect the credibility and functioning of ESG disclosures. This research fills these knowledge gaps by performing a regression analysis of listed firms in the UK.

3. METHODOLOGY

3.1. Data description

The study uses all non-financial firms listed on the London Stock Exchange (LSE) main market with a market capitalization above £100 million as of December 31, 2024, yielding a cross-sectional sample of approximately 450 firms. Firms classified as banks, insurers, or other regulated financial intermediaries are excluded because their accounting standards and regulatory environment differ substantially from those of non-financial firms, which could distort earnings-management measures. Thus, the sample consists of 450 non-financial firms listed in the UK with market capitalization above £100 million as of December 31, 2024.

Financial statement items for calculating earnings-management proxies (e.g., modified Jones model) and control variables were extracted from the firms' audited annual reports for fiscal year 2024, supplemented with standardized databases where necessary. Market capitalization and listing data were obtained from the LSE and verified against Refinitiv. ESG risk ratings were collected primarily from Sustainalytics (Morningstar ESG risk ratings); where coverage was missing, alternative vendors (MSCI, Refinitiv) were harmonized to a 0–100 scale and used only for robustness checks. Firms with > 30% missingness on core variables were excluded, while isolated gaps were addressed using nearest-year backfill (± 1 year) or multiple imputation in robustness checks.

3.1.1. Dependent variable

The dependent variable is the EM of a company. In this study, the modified Jones model is utilized to estimate the level of EM in a company. It uses the non-discretionary model to estimate the discretionary accruals, which is the proxy for the EM (Costa & Soares, 2021). By making use of the difference between net income and cash flow from operations to get the total accruals (TA), we estimate the non-discretionary accruals (NDA) using the modified Jones model equations. Thediscretionary accruals are found by subtracting NDA from the TA. The following equations demonstrate the derivation of discretionary accruals for this study.

$$TA_{it} = NI_{it} - CFO_{it} \tag{1}$$

where,

- i — firm;
- t — year;
- TA — total accruals;
- NI — net income;
- CFO — cash flow from operations.

Estimation of the modified Jones model:

$$\frac{TA_{it}}{A_{it-1}} = \alpha_1\left(\frac{1}{A_{it-1}}\right) + \alpha_2\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \alpha_3\left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_{it} \tag{2}$$

Non-discretionary accruals:

$$\frac{NDA_{it}}{A_{it-1}} = \alpha_1\left(\frac{1}{A_{it-1}}\right) + \alpha_2\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \alpha_3\left(\frac{PPE_{it}}{A_{it-1}}\right) \tag{3}$$

where,

- NDA — non-discretionary accruals;
- A_{it-1}— total assets of the previous year;
- ΔREV — change in revenue;
- ΔREC — change in receivables;
- PPE — property, plant and equipment.

The discretionary accrual is as follows:

$$\frac{DA_{it}}{A_{it-1}} = \frac{TACC_{it}}{A_{it-1}} - \frac{NDA_{it}}{A_{it-1}} \tag{4}$$

The discretionary accruals calculated are used as a proxy for EM.

3.1.2. Independent variable: ESG risk rating

To compare the compliance with ESG parameters, the ESG rating is used. The ESG risk rating is provided to a company by an external rating agency for the quality of ESG-related disclosures. ESG depicts the focus of a company on the ESG aspects of the business. In terms of the ESG risk ratings, a company faces ESG-related requirements due to non-compliance. ESG rating and ESG risk ratings are opposite in nature, where one states the degree of compliance, and the other states the degree of non-compliance. In the case of Sustainalytics, the ratings are indicative of the risk in a business, for which a lower score is considered better for a company.

For meeting the objectives, three models, one respective to each hypothesis, are developed.

3.2. Hypotheses development

3.2.1. Impact of ESG risk ratings on earnings management

Theoretical and empirical research increasingly accentuates ESG performance as a channel for increasing corporate transparency and accountability. Based on stakeholder theory, companies with good ESG track records are subject to increased scrutiny by an array of stakeholders, which discourages opportunistic earnings manipulation. Empirical evidence lends credence to the debate that ESG-focused companies are less likely to utilize accrual-based EM. Some authors warn that ESG disclosures would be strategically used rather than substantively to obscure declining financial performances (Wahyuni, 2025). Thus, the ESG risk ratings are considered to have the opposite impact on EM.

H1: There is a negative association between ESG risk ratings and EM in UK-listed firms.

Model 1

$$EM_i = \beta_0 + \beta_1 ESG_i + \beta_2 ROA_i + \beta_3 DR_i + \beta_4 CR_i + \varepsilon_i \quad (5)$$

where,

- *ROA* — return on assets;
- *DR* — debt ratio;
- *CR* — current ratio.

3.2.2. Impact of firm size on earnings management

Firm size is commonly considered to be a predictor of financial reporting quality since larger firms usually experience higher public exposure, media scrutiny, and regulation. According to agency theory, larger companies are less likely to adopt advanced governance mechanisms, reducing agency issues and constraining managerial control over financial reporting. Although it may be thought that larger companies have more complicated operations which can camouflage EM, their higher auditor quality and stronger investor scrutiny neutralize this effect. Therefore, larger companies are supposed to display lower EM levels, which supports the notion that firm size acts as a limiting factor in financial misreporting.

H2: There is a negative association between firm size and the EM in UK-listed firms.

Model 2

$$EM_i = \beta_0 + \beta_1 F\_Size_i + \beta_2 ROA_i + \beta_3 DR_i + \beta_4 CR_i + \varepsilon_i \quad (6)$$

where,

- *F_Size* — firm size.

3.2.3. Moderating role of firm size in the relationship between ESG risk ratings and earnings management

Although the performance of ESG, in most cases, is linked to enhanced earnings quality, its effectiveness can differ between companies depending on structural aspects such as size. Larger companies not only draw closer attention from stakeholders but also receive intensified regulatory and market scrutiny, which enhances the credibility of ESG disclosures. This conforms to legitimacy theory, which advocates that larger companies are more inclined towards conformity to public expectations, especially through open ESG and financial disclosures. Some researchers state that ESG practices have a more deterring influence on earnings manipulation in larger firms owing to such firms' reputation concerns and institutional pressures. In contrast, small firms tend to embrace ESG practices superficially, thereby reducing their deterrent impact. Hence, it is predicted that firm size moderates the relationship between ESG and EM in that ESG's impact on curbing earnings manipulation is stronger in large firms.

H3: Firm size moderates the relationship between ESG risk ratings and EM, such that the association is stronger in larger firms.

Model 3

$$EM_i = \beta_0 + \beta_1 ESG_i + \beta_2 ROA_i + \beta_3 DR_i + \beta_4 CR_i + \beta_5 F\_Size_i + \beta_6 (ESG * F\_Size)_i + \varepsilon_i \quad (7)$$

Apart from this, there are control variables like return on assets (*ROA*), debt ratio (*DR*), and current ratio (*CR*). *ESG* and firm size (*F_Size*) are taken in the equation as they form the basis of the interaction term. The ROA is the proxy for the profitability of the firm. It is understood that firms with low or fluctuating profits are the ones that would be willing to manage their earnings. Also, the leverage of a company has a substantial role in deciding the behavior of the management in that company. As lenders generally impose debt covenants, the management in highly leveraged firms is more interested in managing their financials. The *CR* is also taken as a control that measures the liquidity in the firm. And $ESG * F\_Size$ is the interaction term for moderation.

4. RESULTS AND FINDINGS

4.1. Descriptive statistics and correlation analysis

The descriptive statistics and correlation analysis of the variables are provided in Tables 1 and 2.

Table 1. Results of descriptive analysis

Variable	*Mean*	*Std. dev.*	*Min*	*Max*	*Observations*
EM	0.1792	1.8760	0.0012	1.6946	450
ESG	29.6200	12.2301	4.7780	88.4063	450
ROA	0.0432	0.1498	0.0207	0.4512	450
DR	0.7830	0.6291	0.2963	1.0247	450
CR	1.9634	0.7544	0.3791	3.9672	450
F_Size	8.5624	0.3117	2.5387	19.8632	450
*ESG * F_Size*	119.7532	20.9921	29.8282	217.8923	450

Source: Authors' elaboration.

Table 2. Results of correlation analysis

	EM	*ESG*	*ROA*	*DR*	*CR*	*F_Size*	*ESG * F_Size*
EM	1						
ESG	0.0723	1					
ROA	-0.0812	-0.3543	1				
DR	-0.2974	0.0871	-0.2145	1			
CR	0.0432	0.6312	-0.0711	-0.4211	1		
F_size	-0.2155	0.5411	0.1922	0.1762	-0.1762	1	
ESG * F_size	0.0763	0.9062	-0. 3909	0.0298	0.3411	0.4119	1

Source: Authors' elaboration.

The correlation analysis is a statistical tool that analyzes the relationship between two variables. It is observed that the correlation between *EM* and *ESG* is positive, but the degree is on the lower side. On the other hand, *F_size* and *EM* have a negative correlation, and the degree of correlation is also high. Similarly, for the interaction term, it is observed that the *EM* has a positive but weak correlation. The control variables *DR* and *ROA* have negative correlations with *EM*, while *CR* has a positive correlation. Amongst the variables, *DR* has the highest correlation, but in the negative direction. Another interesting observation is the strong positive correlation between *ESG* and *F_size*, implying that firms with more market capitalization have higher ESG risk. Thus, the correlation analysis provides a solid starting point for the study.

4.2. Results of analysis

The outcome of the regression analysis of the three models is provided in Tables 3, 4, and 5.

Table 3. Results of regression analysis of Model 1

Variables	*Coefficients*	*Standard error*	*t-statistic*	*p-value*
Intercept	0.0321	0.0124	2.0672	0.0008
ESG	-0.0015	0.0007	-2.1242	0.0332
ROA	-0.0419	0.0241	-1.7111	0.0891
DR	-0.0121	0.0179	0.7112	0.4800
CR	-0.0041	0.0171	-0.5711	0.5672
Significance F	1.4881			
R^2	0.2989			

Source: Authors' elaboration.

The first regression model evaluates the impact of *ESG* on *EM* in UK-listed firms. The R^2 value suggests that approximately 29.9% explained variation is explained by independent variables. The F-value also suggests that the overall model is not highly significant. This implies that other factors may influence *EM* other than these variables. Model 1, we found *ESG* is statistically significant at 5% level, although the coefficient is very small. This indicates the firms with high *ESG* scores tend to engage slightly in an increase in *EM*. Furthermore, the significance of *ROA* suggests that more profitable firms manage earnings less aggressively. However, the other control variables were found to be insignificant in this model.

Table 4. Results of regression analysis of Model 2

Variables	*Coefficients*	*Standard error*	*t-statistic*	*p-value*
Intercept	0.1556	0.0029	2.5698	0.0127
ROA	-0.0481	0.0231	-2.099	0.0382
DR	-0.0225	0.0108	-2.2011	0.0291
CR	-0.0041	0.0139	-0.3457	0.7562
F_Size	-0.0121	0.0213	-0.5516	0.584
Significance F	0.0654			
R^2	0.1203			

Source: Authors' elaboration.

The second regression model analyses the impact of *F_Size* on *EM*. The model shows F-statistics have a value of 0.065, which indicates that the overall model is statistically significant and can be used to evaluate the relationship between *F_Size* and *EM*. The small value of R^2, about 0.120, indicates that only 12% variation is explained by the independent variables. Whereas the predictors are concerned, we found that *ROA* and *DR* are statistically significant, which suggests that profitability and leverage have a measurable impact on *EM*. In contrast, *F_Size* shows no statistical significance in the case of UK-listed firms. Overall results highlight that profitability and leverage to some extent affect *EM*, but *F_Size* itself does not play a significant role in determining *EM*.

Table 5. Results of regression analysis of Model 3

Variables	*Coefficients*	*Standard error*	*t-statistic*	*p-value*
Intercept	0.3994	0.2998	1.3322	0.6642
ESG	-0.0051	0.0142	-0.3692	0.7240
ROA	-0.0057	0.1562	-0.0365	0.9998
DR	-0.0190	0.0346	-0.5485	0.5920
CR	-0.0084	0.0978	-0.0858	0.5765
F_Size	-0.0887	0.1239	-0.7159	0.5998
*ESG * F_Size*	0.0022	0.0642	0.0342	0.7051
Significance F	0.9134			
R^2	0.1323			

Source: Authors' elaboration.

The last regression model analyzes the moderating effect of *F_Size* on the relationship between *ESG* score and *EM*. The overall model is not statistically significant, as shown by the F-statistic. This signifies that Model 3 does not have sufficient statistical evidence to establish the moderating effect of firms on the relationship between *ESG* score and *EM*. Moreover, the interaction term also has a very low coefficient with the high p-value indicating that *F_Size* does not have a significant moderating effect on the relationship in UK-listed companies. Apart from this, none of the controlling variables in this model has a significant impact on *EM*. Overall, the results suggest that this model is unable to define the moderating impact of *F_Size* on the relationship between *ESG* risk ratings and *EM*.

5. DISCUSSION

The study aimed to provide an analysis of the relationship between ESG risk ratings and EM while also considering the moderating effect of firm size on this relationship.

The Model 1 regression results show that there exists a very weak, significant link between ESG ratings and EM for UK-listed companies. Our results are consistent with some recent literature (Almubarak et al., 2023; Alharasis et al., 2025). Stakeholder theory is often the basis for such rationale by assuming that companies with ESG commitments are held responsible to a larger set of stakeholders and, as such, managerial discretion in financial reporting is reined in. This result is in contradiction with previous studies, which affirm a negative correlation between ESG performance and earnings manipulation. For example, earlier research like Buertey et al. (2020) and Adeneye et al. (2024) has revealed that greater ESG engagement is associated with lower discretionary accruals, which is explained by greater transparency, reputation issues, and stakeholder monitoring. Scholars like Clementino and Perkins (2021) have contended that ESG disclosures are likely to be symbolic or cosmetic and for public relations purposes instead of conveying authentic operational change. Likewise, Kimbrough et al. (2024) pointed out inconsistencies between ESG rating agencies, which call into question the comparability and accuracy of the ratings. Weak significance in this study may be due to the reason that ESG commitments do not necessarily feed into improved financial reporting quality uniformly, especially in the short run or if ESG is embraced mainly for positioning purposes. It could also be the case that UK companies are already under strict investor and regulatory scrutiny, constraining the substantial ESG impact on EM.

The findings from Model 2 indicate that there is no significant relationship between EM and firm size for UK-listed companies, contrary to most of the literature that tends to provide evidence of a negative association. The common belief is that large companies are subjected to greater scrutiny, which maximizes transparency and minimizes earnings manipulation (Dechow & Dichev, 2002). The insignificance of this study's results contradicts and suggests some limitations on the explanatory value of firm size as an independent variable for explaining EM practices. These findings would also capture the increasing sophistication of large companies, where company size is no longer a guarantee of improved monitoring. While research by Chowdhury and Eliwa (2021) and Antonelli et al. (2016) suggests that larger companies tend to have better financial reporting quality due to increased transparency and stakeholder scrutiny, the evidence is not yet conclusive. Conversely, studies by Rahman et al. (2013) and Roychowdhury (2006) indicate that larger firms may be more adept at manipulating earnings through complex techniques, particularly real activity manipulation, which can be difficult to detect. Our study's insignificant findings imply that firm size alone may not be a reliable predictor of EM, and other governance factors should be considered. This is consistent with prior research, such as Khalil and Ozkan (2016), which highlights the importance of combining firm size with other factors like audit quality and board independence to better understand its impact.

The estimates from Model 3 yield no statistical support that confirms the moderating effect of firm size in the link between ESG risk ratings and EM. This is in contrast to a lot of previous literature, which has argued that larger firms are more likely to internalize ESG practices and pass them on to better financial reporting quality (Adeneye et al., 2024). Earlier studies indicate that large companies, due to their greater stakeholder base, more robust governance framework, and reputation sensitivity, are likely to amplify the effect of ESG practices to alleviate earnings manipulation (Khalil & Ozkan, 2016). As there is no material moderating effect present in this study, the results of such studies cannot be applied to UK-listed firms. The results are in line with literature critiques that firm size, while typically associated with better governance and ESG disclosure, need not improve earnings quality unless supplemented by strong internal mechanisms such as board independence or audit committee performance (Chowdhury & Eliwa, 2021). The potential for "selective transparency" among large firms (Clementino & Perkins, 2021) may weaken the effectiveness of ESG as a deterring factor in EM, especially for firms with complex business

structures. In addition, the UK's post-Brexit regulatory framework may have added new determinants of firm behavior, for instance, variation in stakeholder pressure or compliance with ESG disclosure. Therefore, the findings suggest that the size of the firm in itself is not sufficient to cause the ESG and EM dynamics and indicate a call to consider other contextual factors, such as governance quality and regulatory enforcement, in order to better understand this dynamic.

Overall, the study contributes to sustainability and governance literature by demonstrating that in mature regulatory settings, ESG risk ratings may not function as effective proxies for earnings quality. The findings challenge the implicit assumption that ESG engagement necessarily constrains managerial opportunism. Additionally, it provides context-specific evidence from a developed governance environment.

6. CONCLUSION

This study examined the linkage between ESG risk ratings and EM, along with the moderating effect of firm size in the listed UK companies. It used 450 listed companies on the LSE with a market capitalization above £100 million as of December 31, 2024. The past research papers on this topic were focused on either ESG ratings or the firm size, only that too with only a few papers. Moreover, the papers were focused mainly on the US market, lacking global implications. The research gaps were overcome by bringing all factors into one framework. The findings specify that there is a very weak relationship between the ESG and EM of a company in the UK. This also invalidates the moderating impact of firm size on this relationship, accepting the *H1*. The *H2* about the negative impact of firm size on the EM is rejected, as it has been found that firm size is unable to impact the practices of a company in the UK. However, combining firm size with board independence or audit quality may result in more significant results. The *H3* of the study was that there is a moderating impact of firm size on the relationship between ESG risk ratings and EM of a company in the UK. By using the regression analysis in Model 3, *H3* is also rejected as it could not be proved that there is a moderating effect of firm size on the relationship between ESG risk ratings and the EM of a listed company in the UK.

Policymakers and practitioners must be careful when leveraging ESG ratings as stand-ins for the integrity of financial reports. Since there is a very weak link between ESG scores and EM, companies cannot rest assured that superior ESG scores will automatically translate to earnings quality. Regulators could consider strengthening disclosure requirements under ESG to look beyond the form and strive for substance, ensuring more accurate and comparable measures. Furthermore, boards and audit committees must incorporate ESG efforts into more comprehensive governance arrangements to ascertain true ethical alignment and diminish managerial discretion over financial reporting.

Like any other study, this study is also not free from limitations. In this study, we use publicly listed companies, and the research is constrained by the use of publicly disclosed ESG ratings. These ratings methodologies for ESG and their reliability are likely to vary among rating agencies. Another limitation is that in this study, we use cross-sectional data that do not reflect long-term patterns and effects of ESG adoption. Moreover, discretionary accruals that are extensively employed might not represent the complexity of EM. Especially in the case of real activity manipulation, the sample used in this study is UK-specific, which restricts the generalizability to other areas that have diverse institutional or different regulatory frameworks. This study also did not consider the individual dimensions of ESG, and the interaction effects of the firm-specific governance characteristics were also not examined.

The presence of limitations in this current study implicates future research directions for subsequent studies. Future studies should investigate the temporal and qualitative nature of ESG adoption in relation to EM. Future studies can ascertain if longer-term ESG commitment has a different impact on EM. The panel study can also have different outcomes as compared to the current cross-sectional study. Researchers might also split ESG into its constituents and evaluate their differential impacts on financial reporting quality. Cross-country studies with varying regulatory frameworks could provide valuable insights in ESG-EM nexus. Moreover, the inclusion of qualitative information and case studies may also help to evaluate the practices of ESG in different frameworks. This will provide detailed insight beyond the information that the numerical score is able to provide. In addition to those, separate pillars of ESG can give better information about the ESG-EM nexus.

REFERENCES

Adeneye, Y. B., Fasihi, S., Kammoun, I., & Albitar, K. (2024). Does earnings management constrain ESG performance? The role of corporate governance. *International Journal of Disclosure and Governance*, *21*(1), 69–92. https://doi.org/10.1057/s41310-023-00181-9

Ahmad, N., Mobarek, A., & Roni, N. N. (2021). Revisiting the impact of ESG on financial performance of FTSE350 UK firms: Static and dynamic panel data analysis. *Cogent Business & Management*, *8*(1), Article 1900500. https://doi.org/10.1080/23311975.2021.1900500

Ahmed, A. S., Neel, M., & Wang, D. (2013). Does mandatory adoption of IFRS improve accounting quality? Preliminary evidence. *Contemporary Accounting Research*, *30*(4), 1344–1372. https://doi.org/10.1111/j.1911-3846.2012.01193.x

Akgun, O. T., Mudge, T. J., III, & Townsend, B. (2021). How company size bias in ESG scores impacts the small cap investor. *The Journal of Impact and ESG Investing*, *1*(4), 31–44. https://bailard.com/wp-content/uploads/2023/01/Company-Size-Bias-in-ESG-Scores-Impacts-Small-Cap-JIESG-Bailard.pdf

Akyildirim, E., Conlon, T., Corbet, S., & Oxley, L. (2025). 'Take back control': The implications of Brexit uncertainty on investor perception of ESG reputational events. *European Financial Management*, *31*(1), 72–114. https://doi.org/10.1111/eufm.12490

Al Barrak, T., & Kouaib, A. (2024). Sustainability commitment versus earnings management practices: Saudi insights. *Sustainability*, *16*(12), Article 5100. https://doi.org/10.3390/su16125100

Alharasis, E. E., Alshdaifat, S. M., Almarayeh, T., Hasan, E. F., & Al-Hamadeen, R. (2025). Audit quality moderating effect on the relationship between earnings management and ESG reporting in the Jordanian banking industry. *Discover Sustainability*, *6*(1), Article 973. https://doi.org/10.1007/s43621-025-01803-8

Almubarak, W. I., Chebbi, K., & Ammer, M. A. (2023). Unveiling the connection among ESG, earnings management, and financial distress: Insights from an emerging market. *Sustainability*, *15*(16), Article 12348. https://doi.org/10.3390/su151612348

Antonelli, V., D'Alessio, R., & Cuomo, F. (2016). Beyond stakeholders theory: Financial reporting and voluntary disclosure in Italian SME according to a System dynamics point of view. *Economia Aziendale Online*, *7*(4), 285–304. https://doi.org/10.13132/2038-5498/7.4.285-304

Arvidsson, S., & Dumay, J. (2022). Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice? *Business Strategy and the Environment*, *31*(3), 1091–1110. https://doi.org/10.1002/bse.2937

Asim, A., & Ismail, A. (2019). Impact of leverage on earning management: Empirical evidence from the manufacturing sector of Pakistan. *Journal of Finance and Accounting Research*, *1*(1), 70–91. https://doi.org/10.32350/JFAR.0101.05

Barua, A., Davidson, L. F., Rama, D. V., & Thiruvadi, S. (2010). CFO gender and accruals quality. *Accounting Horizons*, *24*(1), 25–39. https://doi.org/10.2308/acch.2010.24.1.25

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership*. Psychology Press.

Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, *26*(6), 1315–1344. https://doi.org/10.1093/rof/rfac033

Buertey, S., Sun, E.-J., Lee, J. S., & Hwang, J. (2020). Corporate social responsibility and earnings management: The moderating effect of corporate governance mechanisms. *Corporate Social Responsibility and Environmental Management*, *27*(1), 256–271. https://doi.org/10.1002/csr.1803

Chowdhury, S. N., & Eliwa, Y. (2021). The impact of audit quality on real earnings management in the UK context. *International Journal of Accounting & Information Management*, *29*(3), 368–391. https://doi.org/10.1108/IJAIM-10-2020-0156

Clementino, E., & Perkins, R. (2021). How do companies respond to environmental, social and governance (ESG) ratings? Evidence from Italy. *Journal of Business Ethics*, *171*(2), 379–397. https://doi.org/10.1007/s10551-020-04441-4

Costa, C. M., & Soares, J. M. M. V. (2021). Standard Jones and Modified Jones: An earnings management tutorial. *Revista de Administração Contemporânea*, *26*(02), Article e200305. https://doi.org/10.1590/1982-7849rac2022200305.en

Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*(s-1), 35–59. https://doi.org/10.2308/accr.2002.77.s-1.35

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, *50*(2-3), 344–401. https://doi.org/10.1016/j.jacceco.2010.09.001

Del Gesso, C., & Lodhi, R. N. (2025). Theories underlying environmental, social and governance (ESG) disclosure: A systematic review of accounting studies. *Journal of Accounting Literature*, *47*(2), 433–461. https://doi.org/10.1108/JAL-08-2023-0143

Ekawati, E. (2025). The relationships between ESG responsibility, earnings management, and tax aggressiveness: Evidence of the Halo effect from Indonesia. *Journal of Indonesian Economy and Business*, *40*(1), 75–107. https://doi.org/10.22146/jieb.v40i1.10099

Financial Reporting Council. (2024). *UK corporate governance code 2024*. https://www.frc.org.uk/directors/corporate-governance-and-stewardship/uk-corporate-governance-code

Financial Reporting Council. (2020). *The UK stewardship code 2020*. https://www.ecgi.global/sites/default/files/codes/documents/stewardship-code_dec-19-final.pdf

Freeman, R. E. (2015). *Strategic management: A stakeholder approach*. Cambridge University Press. https://doi.org/10.1017/CBO9781139192675

Freeman, R. E., & Dmytriyev, S. (2017). Corporate social responsibility and stakeholder theory: Learning from each other. *Symphonya: Emerging Issues in Management*, *1*(1), 7–15. https://doi.org/10.4468/2017.1.02freeman.dmytriyev

Freudenreich, B., Lüdeke-Freund, F., & Schaltegger, S. (2020). A stakeholder theory perspective on business models: Value creation for sustainability. *Journal of Business Ethics*, *166*(1), 3–18. https://link.springer.com/article/10.1007/s10551-019-04112-z

Gavana, G., Gottardo, P., & Moisello, A. M. (2022). Related party transactions and earnings management: The moderating effect of ESG performance. *Sustainability*, *14*(10), Article 5823. https://doi.org/10.3390/su14105823

Handayati, P., Tham, Y. H., Yuningsih, Y., Sun, Z., Nugroho, T. R., & Rochayatun, S. (2025). ESG performance and corporate governance — The moderating role of the Big Four auditors. *Journal of Risk and Financial Management*, *18*(1), Article 31. https://doi.org/10.3390/jrfm18010031

Iatridis, G., & Kadorinis, G. (2009). Earnings management and firm financial motives: A financial investigation of UK listed firms. *International Review of Financial Analysis*, *18*(4), 164–173. https://doi.org/10.1016/j.irfa.2009.06.001

Ilori, O., Lawal, C. I., Friday, S. C., Isibor, N. J., & Chukwuma-Eke, E. C. (2023). A framework for environmental, social, and governance (ESG) auditing: Bridging gaps in global reporting standards. *International Journal of Social Science Exceptional Research*, *2*(1), 231–248. https://doi.org/10.54660/IJSSER.2023.2.1.231-248

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Khalil, M., & Ozkan, A. (2016). Board independence, audit quality and earnings management: Evidence from Egypt. *Journal of Emerging Market Finance*, *15*(1), 84–118. https://doi.org/10.1177/0972652715623701

Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. *The Accounting Review*, *91*(6), 1697–1724. https://doi.org/10.2308/accr-51383

Kimbrough, M. D., Wang, X. F., Wei, S., & Zhang, J. I. (2024). Does voluntary ESG reporting resolve disagreement among ESG rating agencies? *European Accounting Review*, *33*(1), 15–47. https://doi.org/10.1080/09638180.2022.2088588

Kotsantonis, S., & Serafeim, G. (2019). Four things no one will tell you about ESG data. *Journal of Applied Corporate Finance*, *31*(2), 50–58. https://doi.org/10.1111/jacf.12346

Legal Foundations. (2026, March 6). *UK startup fundraising: SEIS, EIS, SAFEs and how to structure your round*. https://legalfoundations.org.uk/guide/startup-fundraising-seis-eis-uk/

Nguyen, N. T. M., Iqbal, A., & Shiwakoti, R. K. (2022). The context of earnings management and its ability to predict future stock returns. *Review of Quantitative Finance and Accounting*, *59*(1), 123–169. https://doi.org/10.1007/s11156-022-01041-3

Peng, L. S., & Isa, M. (2020). Environmental, social and governance (ESG) practices and performance in Shariah firms: Agency or stakeholder theory? *Asian Academy of Management Journal of Accounting & Finance*, *16*(1), 1–34. https://doi.org/10.21315/aamjaf2020.16.1.1

Rahman, M. M., Moniruzzaman, M., & Sharif, M. J. (2013). Techniques, motives and controls of earnings management. *International Journal of Information Technology and Business Management*, *11*(1), 22–34. https://www.jitbm.com/volume11/

Rasyad, R. K., Afgani, K. F., & Ali, Q. (2024). The effects of ESG on firm performance and firm value: A study of Indonesian and Malaysian listed companies. *Journal Integration of Management Studies*, *2*(1), 1–17. https://doi.org/10.58229/jims.v1i2.118

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, *42*(3), 335–370. https://doi.org/10.1016/j.jacceco.2006.01.002

Shaikh, I. (2022). Environmental, social, and governance (ESG) practice and firm performance: An international evidence. *Journal of Business Economics and Management*, *23*(1), 218–237. https://doi.org/10.3846/jbem.2022.16202

Shi, Y., & Yao, T. (2025). ESG rating divergence: Existence, driving factors, and impact effects. *Sustainability*, *17*(10), Article 4717. https://doi.org/10.3390/su17104717

Siregar, S. V., & Utama, S. (2008). Type of earnings management and the effect of ownership structure, firm size, and corporate-governance practices: Evidence from Indonesia. *The International Journal of Accounting*, *43*(1), 1–27. https://doi.org/10.1016/j.intacc.2008.01.001

Wahyuni, P. D. (2025). Greenwashing or genuine governance? A review of ESG strategies in mitigating earnings management. *Journal of Accounting Management Business and International Research*, *4*(2), 168–180. https://doi.org/10.57235/jambuair.v4i2.6379