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ESG Performance, Audit Quality and Financial Efficiency: Empirical Evidence from Vietnam

Nguyen Quang Huy*, Nguyen Ha Phuong

Foreign Trade University, Vietnam

Abstract

Human living conditions are seriously threatened in the context of climate change, imbalanced economic development, and depleted resources. The call for sustainable development has become increasingly intense worldwide. ESG performance, a measure of a company's sustainability, has garnered significant attention from corporations and investors alike. The study explores the moderating role of audit quality in the relationship between environmental, social, and governance (ESG) factors and a firm's financial efficiency in Vietnam. Using data from 750 observations of 145 listed companies in Vietnam from 2019 to 2023 and controlling for company-specific characteristics, the research demonstrates that ESG positively impacts financial efficiency, as measured by asset turnover ratio (ATR). The regression model concludes that ESG performance positively correlates with the financial efficiency of listed companies in Vietnam, and audit quality significantly influences this relationship. These findings imply that companies with higher ESG performance and superior audit quality will likely achieve better financial outcomes. Furthermore, the study emphasizes the crucial role of audit quality in enhancing the credibility and effectiveness of ESG disclosures. High-quality audits, particularly those conducted by Big Four firms, provide greater assurance to investors and stakeholders about the reliability of ESG data and the effectiveness of a company's sustainability strategies.

Keywords: Environmental, social, and governance (ESG) performance, financial efficiency, audit quality, Vietnam

1. INTRODUCTION

In the context of climate change, economic imbalances, and resource depletion, sustainable development has become a global priority. Companies are increasingly integrating Environment, Social, and Governance (ESG) standards into their business strategies to enhance corporate image, emphasize social responsibility, and boost market value (Luo & Bhattacharya, 2006). With the rise of the Fourth Industrial Revolution and digital transformation, ESG standards have become crucial for global enterprises. Countries like the United States, Japan, South Korea, and those in Europe and Oceania are actively promoting these standards to improve environmental quality and achieve social balance (Porter et al., 2019).

In Vietnam, although there is a growing focus on sustainable development, ESG practices are still in the early stages. A 2022 PwC Vietnam survey revealed that 71% of Vietnamese companies are either exploring or have yet to start integrating ESG data (PwC, 2022). Issuing ESG reports requires significant resources and a long-term commitment, posing challenges for small and medium enterprises. Nonetheless, proper ESG implementation can enhance transparency, stakeholder assessment of non-financial performance, market expansion, and overall company reputation.

The relationship between ESG and firm efficiency has been widely studied, yielding mixed results. ESG is generally expected to reduce agency costs, narrow information gaps, and improve reputation, thereby enhancing operational efficiency and reducing financial costs. However, studies have reported varying impacts, with some

*Corresponding author. Tel.: +0-084-969812464
E-mail: huynq@ftu.edu.vn

finding positive effects (Wu et al., 2014; Cheng et al., 2014; Sassen et al., 2016), others negative (Said et al., 2013; Semenova et al., 2010), and some showing no significant impact (Dewi & Monalisa, 2016).

Despite extensive studies showing a positive correlation between ESG activities and financial efficiency, significant gaps remain. Developing countries lack standardized ESG measures and reliable indices, with unique characteristics that differ from developed nations, necessitating country-specific ESG indices. Additionally, the relationship between ESG factors and financial efficiency remains unclear, especially in developing economies like Vietnam, where understanding of social responsibility is limited. Most research has focused on large, developed economies, leaving emerging markets like Vietnam underexplored. This study addresses these gaps by examining the combined impact of audit quality on the ESG-financial efficiency relationship, highlighting audit quality's role in ensuring high-quality reporting and efficient resource allocation.

To address these discrepancies, this study examines the impact of ESG performance on the financial efficiency of enterprises, considering audit quality as a moderating factor. Audit quality is posited to enhance the accuracy of financial reporting, increase reliability, and reduce opportunistic behaviors (Knechel et al., 2013). Given the voluntary and uncommon nature of ESG disclosure in Vietnam's emerging market, this study aims to provide empirical evidence on the relationship between ESG performance, audit quality, and financial efficiency in Vietnam.

The rest of the article is structured as follows. Section 2 and 3 reviews the nexus between ESG performance and financial efficiency, as well as the moderating role of audit quality in the literature, and formulates the hypotheses. Section 4 outlines the research methodology employed, while Section 5 delves into the empirical results and provides a detailed discussion. Finally, Section 6 summarizes the key findings, acknowledges the significant limitations of the study, suggests avenues for future research, and offers recommendations for management and policy.

2. THEORETICAL FRAMEWORK

2.1 Economic theories

Signaling theory

Introduced by Ambarish et al. (1987), signaling theory highlights the importance of information issued by a company for stakeholders' investment decisions. It posits that comprehensive corporate disclosures help investors make informed decisions by providing insights into the company's past, present, and future conditions. In the context of ESG performance, signaling theory suggests that ESG disclosures serve as certified signals to the market. These disclosures reduce information asymmetry, allowing investors to better assess the company's quality and intentions. Empirical studies have shown that ESG disclosures improve the information environment, helping analysts predict future earnings more accurately and reducing forecast errors. Thus, signaling theory underscores the role of transparency in enhancing firm efficiency through better investor communication.

Agency theory

Rooted in the contractual relationship between owners (principals) and managers (agents), agency theory, introduced by Jensen & Meckling (1976), addresses conflicts arising from each party pursuing their own interests. This theory suggests that managers, due to information asymmetry, might make decisions that maximize their own benefits at the expense of shareholders. ESG disclosure acts as a monitoring mechanism in this scenario, reducing information asymmetry and mitigating agency problems. By promoting transparency and accountability, ESG disclosures help align the interests of managers and shareholders. Previous research indicates that companies with robust environmental and social policies exhibit less opportunistic behavior and engage more stakeholders. Auditing, from an agency theory perspective, further reduces information asymmetry, curbs opportunistic behavior, and enhances ESG performance, ultimately leading to improved firm efficiency.

2.2 Social and Political theories

Legitimacy theory

Legitimacy theory is based on the concept that an entity can only continue to exist if its value system aligns with the value system of the larger society, as defined by Dowling & Pfeffer (1975). This theory posits that companies engage in ESG practices to legitimize their actions and gain approval from society. By disclosing social and

environmental accounting information, companies demonstrate their adherence to societal norms and values. This disclosure helps companies build legitimacy, which is crucial for long-term sustainability and success. According to legitimacy theory, companies that align their operations with societal expectations are more likely to receive positive reactions from the public, thereby enhancing their performance and value. Consequently, ESG practices are seen as essential for maintaining a company's legitimacy and ensuring its continued existence within the social framework.

Stakeholder theory

Proposed by Freeman (1983), stakeholder theory argues that the goal of a business is to meet the needs of all its stakeholders, not just its shareholders. This theory suggests that if a business focuses solely on shareholder interests without considering the needs of other stakeholders, it risks failure. Stakeholders include anyone affected by the company's decisions, such as employees, customers, suppliers, and the community. High ESG scores reflect a company's commitment to balancing the interests of various stakeholders. By addressing the conflicting expectations of different stakeholder groups, companies can foster trust and loyalty, which are essential for long-term sustainability. ESG practices, therefore, send strong positive signals to financial markets and stakeholder groups, indicating the company's dedication to sustainable and responsible business operations. This holistic approach helps companies achieve better financial outcomes and enhances their overall efficiency.

3. LITERATURE REVIEW AND HYPOTHESES

3.1 Relationship between ESG performance and firm financial efficiency

Research in developed markets shows that ESG reporting tends to lower risks, reduce lawsuits, and elicit positive market reactions. Porter et al. (2019) highlighted ESG reporting's competitive advantage by aligning products with societal needs. However, Balabanis et al. (1998) found that environmental disclosures negatively impacted financial efficiency in the UK. Studies on S&P 500 companies revealed mixed results, with social and governance disclosures improving financial efficiency, while environmental information had the opposite effect. Cormier & Magnan (2007) and Cheng et al. (2014) emphasized that transparent ESG information lowers information risk and enhances access to capital. Eliwa et al. (2019) demonstrated that lenders favor transparent ESG disclosures, leading to reduced borrowing costs. Other studies corroborate these findings, suggesting that ESG disclosure builds stakeholder trust and enhances long-term profitability (Cai & He, 2014; Semenova et al., 2010).

In developing markets, ESG disclosure reduces information asymmetry and enhances investor awareness. Park (2017) found that CSR positively impacts long-term performance in South Korea. In Malaysia, integrating ESG into corporate strategy attracts talent and builds customer bases, though disclosures remain inconsistent (Said et al., 2013). Government support is crucial for developing ESG disclosure practices, positively impacting performance and competitive advantage (Haji, 2013; Arayssi & Jizi, 2019). In Taiwan, Wu et al. (2014) found high CSR transparency associated with lower capital costs. However, some studies, such as Dewi & Monalisa (2016) in Indonesia, found no significant relationship between ESG disclosure and firm value, attributing this to low investor awareness and lack of common standards.

In Vietnam, research has primarily focused on CSR rather than comprehensive ESG principles. Theoretical research addresses CSR reporting, international experiences, and corporate disclosure behavior (Cung & Duc, 2008; Duc, 2011; Chi, 2014). Empirical studies have shown mixed results. Trang & Yekini (2014) found almost no relationship between CSR and financial efficiency in large Vietnamese companies. Conversely, Hoang (2015) revealed a positive impact of CSR and market orientation on financial efficiency. Nhu (2020) indicated a positive relationship between mandatory environmental and social disclosures and market-based financial efficiency, but a negative relationship when considering accounting-based measures. Overall, domestic studies on ESG practices remain limited, highlighting the need for further research to understand the benefits of comprehensive ESG practices in Vietnam's emerging market context.

Theories such as Stakeholder Theory, Agency Theory, Legitimacy Theory, and Signaling Theory suggest that practicing and disclosing ESG initiatives can significantly enhance firm financial efficiency by building stakeholder trust, securing strategic resources, and improving investment efficiency. Good ESG performance indicates strong corporate governance, reduces agency costs, and mitigates external pressures (Friede et al., 2015). ESG investments also curb managerial short-sightedness by reducing free cash flow and improving investment efficiency. Furthermore, ESG performance mitigates financing constraints by providing nonfinancial information to investors, facilitating external financing, and increasing external supervision (Wu et al., 2014). ESG disclosure

reduces information asymmetry, fostering trust and enhancing investment efficiency. Despite potential costs, mandatory ESG disclosure promotes transparency, social programs, and firm efficiency through cost leadership or differentiation (Friede et al., 2015). Therefore, the long-term benefits of ESG practices for corporate efficiency and stability outweigh the drawbacks. The author proposes the following hypothesis:

H1: There is a significant positive impact of ESG performance on firm financial efficiency.

3.2 Moderating role of audit quality in ESG performance and firm financial efficiency nexus

Understanding the impact of audit quality on ESG performance is crucial for assessing how external auditing influences corporate sustainability practices. Empirical studies highlight the importance of audit quality, particularly the role of Big Four audit firms. Larger firms like the Big Four provide higher audit quality due to their expertise and significant investments in audit efforts, maintaining independence and protecting reputational capital (DeAngelo, 1981; Choi et al., 2010; Francis and Yu, 2009).

Research shows that clients of Big Four auditors tend to have better ESG performance and disclosure. This is attributed to the substantial resources these firms deploy during audits and their significant investments in human capital and technology, enhancing the credibility of disclosed information, including ESG data (Agyei-Mensah, 2019; Timbate & Park, 2018). For instance, Kolsi et al. (2021) found that auditor attributes like size and industry specialization positively impact ESG disclosures.

Other studies corroborate that clients of Big Four auditors report better CSR performance. Xiao et al. (2020) argue that Big Four firms facilitate the diffusion of innovative practices such as ESG. Bacha et al. (2021) found that high audit quality, indicated by Big Four auditors, significantly influences the perceived value of ESG, providing additional assurance for both financial and non-financial information, particularly CSR data.

Moreover, recent studies indicate that clients of Big Four auditors achieve higher firm efficiency. High-quality audits ensure reliable, transparent, and useful financial statements, boosting investment confidence and improving financial efficiency (Afza and Nazir, 2014; Phan et al., 2020; Aledwan et al., 2015). For example, Ching et al. (2015) reported that Big Four audits enhance financial efficiency among Malaysian listed companies, while Bouaziz (2012) found a positive impact of auditor size on financial performance in Tunisian firms.

In conclusion, existing literature underscores the significant role of audit quality, especially by Big Four firms, in enhancing ESG performance and financial outcomes. However, in Vietnam, research on audit quality and sustainable development remains fragmented. There is a notable lack of comprehensive studies on the correlation between audit quality, sustainable development, and ESG practices, highlighting the need for more in-depth research in the Vietnamese context. Given the importance of audit quality in enhancing both ESG performance and firm efficiency, it is proposed that:

H2: Audit quality has a significant positive effect on the relationship between ESG performance and firm financial efficiency.

4. DATA AND METHODOLOGY

4.1 Data description and sample selection

The quantitative research data was collected from financial reports, annual reports, and sustainable development reports of 145 companies listed on the HOSE exchange from 2019 to 2023, resulting in 725 observations. This panel data set combines cross-sectional data (145 companies) and time-series data (5 years), enhancing data quality and reducing multicollinearity issues. The data was analyzed using STATA 17 software through Pooled Ordinary Least Squares (OLS), Fixed Effects Model (FEM), Random Effects Model (REM), and Feasible Generalized Least Squares (FGLS). The study aims to examine the role of audit quality in the relationship between ESG performance and financial efficiency for high-market capitalization companies in Vietnam.

The sample includes companies that remained listed from 2019 to 2023, excluding those in the financial, banking, and investment sectors due to different accounting standards. From 417 companies, the study focused on the top 145 by market capitalization, ensuring comprehensive ESG practices and detailed sustainability reporting. These industry leaders provide valuable insights and set benchmarks for other companies. The sample distribution is as follows: Basic Materials (23 firms, 16%), Consumer Goods (35 firms, 24%), Consumer Services (9 firms, 6%),

Health Care (8 firms, 6%), Industrials (42 firms, 29%), Oil & Gas (2 firms, 1%), Technology (5 firms, 3%), and Utilities (21 firms, 14%).

4.2 Empirical models and variables description

This study examines the effect of ESG performance on firm financial efficiency and the moderating role of audit quality. The analysis proceeds in two steps:

(1) The impact of ESG performance on firm financial efficiency (to test the hypothesis H1):

$$ATRit = \boldsymbol{\beta}0 + \boldsymbol{\beta}1ESGit + \boldsymbol{\beta}2SIZEit + \boldsymbol{\beta}3LEVit + \boldsymbol{\beta}4ROEit + \boldsymbol{\beta}5PTBit + \varepsilon it$$

To examine the moderating effect of audit quality, the author introduces an interaction term between audit quality and ESG performance and estimates the following model:

(2) The impact of audit quality on the relationship between ESG performance and firm financial efficiency (to test the hypothesis H2):

$$ATRit = \boldsymbol{\beta}0 + \boldsymbol{\beta}1ESGit + \boldsymbol{\beta}2BIG4it + \boldsymbol{\beta}3ESG*BIG4it + \boldsymbol{\beta}4SIZEit + \boldsymbol{\beta}5LEVit + \boldsymbol{\beta}6ROEit + \boldsymbol{\beta}7PTBit + \varepsilon it$$

Where i is firm, and t is the time (fiscal year); βi is the estimated coefficient of each variable in the regression equation; ε is the error term; ATR represents the firm financial efficiency, measured by asset turnover ratio; ESG is environment, social and governance combined score, SIZE is the firm size, measured by (natural logarithm of total assets); LEV is financial leverage, measured as the ratio of total debt to total assets; ROE is return on equity of the firm; PTB is the price to book of the firm; BIG4 refers to audit quality, which is measured by a dummy variable to proxy for audit quality; ESG*BIG4 is the interaction term between ESG performance and audit quality.

4.3 Variables description

Four types of variables are employed to examine the influence of ESG performance on financial efficiency while considering the moderating effect of audit quality: dependent, independent, moderating, and control variables (Figure 1).

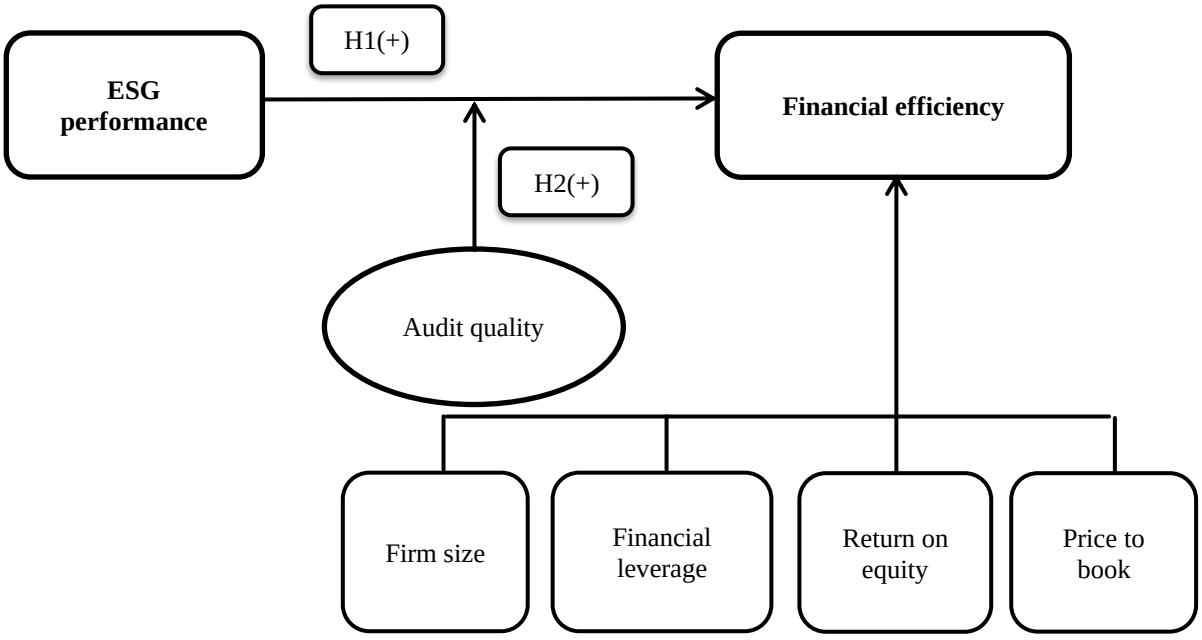

Figure 1: Research framework

4.3.1. Dependent variable

Firm financial efficiency (ATR)

Firm financial efficiency is assessed using the asset turnover ratio (ATR), which measures how effectively companies utilize their assets to generate sales. A higher ATR indicates more efficient asset management and revenue generation. This ratio includes all assets, both fixed and current, and is a widely accepted indicator of management efficiency (Alarussi, 2021).

$$\text{Asset turnover} = \frac{\text{Net sales}}{\text{Average total assets}} \quad (1)$$

4.3.2. Independent variable

ESG performance (ESG)

The independent variable is the ESG score, which includes Environment, Social, and Governance indices. ESG performance is measured using the revised 2020 GRI Standards, assessing sustainable reporting practices of companies listed on HOSE. Each company's compliance with the GRI framework is scored: 1 for disclosures and 0 for non-disclosures. The ESG score is the average of these criteria, covering 131 criteria across environmental, social, and governance aspects.

4.3.3. Moderating variables

Audit quality (BIG4)

Audit quality is measured by whether a company's financial statements are audited by one of the Big Four firms. These firms are known for providing higher quality audit services due to their established reputation, greater expertise, and higher ethical standards. It is a dummy variable, with a value of 1 if audited by a Big Four firm, and 0 otherwise.

4.3.4. Control variables

Firm size (SIZE)

Firm size, often measured by the natural logarithm of total assets, influences firm efficiency through diversification, production capacity, and economies of scope. Larger firms face more pressure regarding ESG issues, potentially reducing agency costs related to information asymmetry (Maso et al., 2020).

Financial leverage (LEV)

Financial leverage, indicating a firm's capital structure, enhances profitability through fixed financial costs. It is positively correlated with firm efficiency, especially in markets with higher information transparency, as creditors can effectively monitor business activities (Fatemi et al., 2018; Maso et al., 2020).

Return on total equity (ROE)

ROE measures net income return as a percentage of shareholders' equity. Higher ROE indicates efficient use of assets to generate revenue and reduces agency costs, making it a crucial indicator of profitability and efficiency (Nhu, 2020).

Price to book (PTB)

PTB compares a share's market value to its book value, reflecting market perceptions and investor confidence. A higher PTB ratio suggests a robust market valuation, while a lower ratio indicates undervaluation, providing insights into market conditions and company performance (Timbate & Park, 2018).

Table 1: Summary of the study variables

Variables	Description	Measurement	Reference
Dependent variable			
ATR	Firm financial efficiency	$= \frac{\text{Net sales}}{\text{Average total assets}}$	Alarussi (2021)
Independent variable			
ESG	ESG performance	A combined score on the three dimensions (environment, social and governance).	
Moderating variables			
BIG4	Audit quality	A dummy variable: where a value of 1 to be assigned if the firm's auditor is a Big Four audit firm, otherwise a value of zero is assigned	Bacha et al. (2021)
Control variables			
SIZE	Firm size	= Natural logarithm of total assets	Maso et al. (2020)
LEV	Financial leverage	$= \frac{\text{Total debt}}{\text{Total assets}}$	Maso et al. (2020)
ROE	Return on equity	$= \frac{\text{Net income}}{\text{Total equity}}$	Nhu (2020)
PTB	Price to book	$= \frac{\text{Market value of shares}}{\text{Book value of equity}}$	Timbate & Park (2018)

5. RESULTS AND DISCUSSIONS

5.1 Descriptive statistics and correlation analysis

Table 2 presents descriptive statistics for variables analyzing the role of audit quality in the relationship between ESG performance and financial efficiency based on 725 observations. The mean asset turnover ratio (ATR) is 0.9923, indicating good operational performance, with a standard deviation of 0.8255 and values ranging from 0.03 to 5.06, reflecting diverse asset utilization efficiency among firms. The mean ESG score is 0.5523, showing moderate ESG disclosure, with a range from 0.3398 to 0.9045, highlighting variability in ESG transparency. Audit quality (BIG4) has a mean of 0.5724, indicating that 58% of firms are audited by Big Four firms, with a standard deviation of 0.4951. Firm size (SIZE) has a mean of 2.9266 and a standard deviation of 0.1257, showing relatively high asset book values. Financial leverage (LEV) averages at 0.2454, indicating moderate reliance on debt, while the return on equity (ROE) has a mean of 0.1448, indicating moderate profitability. The price-to-book ratio (PTB) has a mean of 2.0816, with values ranging from -2.76 to 36.64 and a standard deviation of 1.9992, indicating significant market valuation variability.

Table 2: Descriptive statistics for the variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ATR	725	0.9923	0.8255	0.0300	5.0600
ESG	725	0.5523	0.1098	0.3398	0.9045
BIG4	725	0.5724	0.4951	0.0000	1.0000
SIZE	725	2.9266	0.1257	2.6593	3.2867
LEV	725	0.2454	0.1783	0.0000	0.7500
ROE	725	0.1448	0.2127	-3.2938	2.2703
PTB	725	2.0816	1.9992	-2.7600	36.6400

Note: ATR represents the firm financial efficiency; ESG is environment, social and governance combined score, SIZE is the firm size; LEV is financial leverage; ROE is return on equity of the firm; PTB is price to book of the firm; BIG4 refers to audit quality.

5.2 Regression analysis results of regression models

The regression results of Equation 2 on linear regression OLS, FEM, REM, and GLS models are shown in Table 3 and Table 4.

Table 3: Comparative Analysis between Pooled OLS, FEM, REM, and GLS: ESG performance and firm financial efficiency (equation 1)

	Pooled OLS	**FEM**	**REM**	**GLS**
ESG	0.4945*	0.0151	0.0394	0.4945*
	[1.75]	[0.08]	[0.23]	[1.76]
SIZE	-0.4854*	-1.3433***	-0.8100**	-0.4854*
	[-1.84]	[-2.91]	[-2.28]	[-1.85]
LEV	0.2155	-0.6835***	-0.5802***	0.2145
	[1.18]	[-4.18]	[-3.79]	[1.18]
ROE	1.1109***	0.3963***	0.4339***	1.1111***
	[7.24]	[6.14]	[6.73]	[7.27]
PTB	0.0809***	0.0086	0.0131*	0.0809***
	[5.02]	[1.13]	[1.75]	[5.04]
_cons	1.7586**	5.0085***	3.3934***	1.7579**
	[2.41]	[3.78]	[3.34]	[2.42]
N	725	725	725	725
R-sq	0.0849	0.1417		

t statistics in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Note: ATR represents the firm financial efficiency; ESG is environment, social and governance combined score, SIZE is the firm size; LEV is financial leverage; ROE is return on equity of the firm; PTB is price to book of the firm; ***, **, *: statistical significance at 99%, 95%, 90% confidence levels..

Table 4: Comparative analysis between Pooled OLS, FEM, REM, and GLS: ESG performance, audit quality and firm financial efficiency (equation 2)

	Pooled OLS	**FEM**	**REM**	**GLS**
ESG	0.5795**	0.0163	0.0386	0.5795**
	[2.24]	[0.09]	[0.22]	[2.26]
BIG4	-2.3813***	0.1403	-0.9361***	-2.3813***
	[-9.45)]	[0.37]	[-3.14]	[-9.50)]
ESG*BIG4	4.9417***	-0.0743	2.0122***	4.9417***
	[11.04]	[-0.11]	[3.72]	[11.10]
SIZE	-2.9720***	-1.500***	-1.3540***	-2.9720***
	[-9.48]	[-3.14]	[-3.63]	[-9.54]
LEV	0.6647***	-0.686***	-0.4964***	0.6647***
	[3.91]	[-4.25]	[-3.23]	[3.93]
ROE	0.6998***	0.3936***	0.4135***	0.6998***
	[4.85]	[6.08]	[6.34]	[4.88]
PTB	0.0290*	0.0084	0.0097	0.0290*
	[1.90]	[1.11]	[1.28]	[1.91]
_cons	8.7608***	5.4144***	4.8390***	8.7608***
	[10.03]	[3.98]	[4.58]	[10.08]
N	725	725	725	725
R-sq	0.2457	0.1443		

t statistics in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Note: ATR represents the firm financial efficiency; ESG is environment, social and governance combined score, SIZE is the firm size; LEV is financial leverage; ROE is return on equity of the firm; PTB is price to book of the firm; BIG4 refers to audit quality; ESG*BIG4 is the interaction term between ESG performance and audit quality; ***, **, *: statistical significance at 99%, 95%, 90% confidence levels.

The pooled OLS model results show that ESG performance positively impacts firm financial efficiency, with a coefficient of 0.5795 at the 5% and 10% significance levels. This aligns with prior studies (Friede et al., 2015; Porter et al., 2019; Sassen et al., 2016; Cheng et al., 2014; Wu et al., 2014), suggesting a global recognition of ESG's value to corporate performance. Additionally, the interaction term BIG4*ESG, with a positive coefficient of 4.9417 at the 1% significance level, indicates that Big Four audit quality enhances ESG's positive impact on efficiency. Conversely, BIG4 alone has a negative effect, implying that while Big Four auditors' stringent standards may initially reduce efficiency, they ultimately amplify ESG benefits.

The study also finds that while LEV shows no impact in equation (1), it positively affects financial efficiency at the 10% significance level in model (2). ROE and PTB positively influence efficiency, whereas SIZE has a negative impact. Given potential biases in the OLS model due to hidden endogeneity, the study employs fixed-effects models (REM and FEM) and conducts an F-test, confirming FEM as more appropriate. The Hausman test further supports FEM over REM, indicating significant correlations between ε_i and the independent variables. However, Wald and Wooldridge tests reveal heteroscedasticity and serial correlation in the FEM model, leading the authors to use the GLS model for more robust analysis.

5.3 GLS regression model results

Table 5: GLS model test results: ESG performance and firm financial efficiency (equation 1)

		Dependent variable = ATR			
Variable	**Predicted sign**	**Coef.**	**Std. Err.**	**z**	**P > |z|**
ESG	+	0.4945	0.2818	1.76	0.079*
SIZE	+	-0.4854	0.2631	-1.85	0.065*
LEV	-	0.2145	0.1813	1.18	0.237
ROE	+	1.1109	0.1527	7.27	0.000***
PTB	+	0.0809	0.0160	5.04	0.000***
_cons	+	1.7579	0.7269	2.42	0.016**

Note: ATR represents the firm financial efficiency; ESG is environment, social and governance combined score, SIZE is the firm size; LEV is financial leverage; ROE is return on equity of the firm; PTB is price to book of the firm; ***, **, *: statistical significance at 99%, 95%, 90% confidence levels.

Table 6: GLS model test results: ESG performance and firm financial efficiency: moderating role of audit quality (equation 2)

		Dependent variable = ATR			
Variable	**Predicted sign**	**Coef.**	**Std. Err.**	**z**	**P > |z|**
ESG	+	0.5795	0.2567	2.26	0.024**
BIG4	+	-2.3813	0.2506	-9.50	0.000***
ESG*BIG4	+	4.9418	0.4453	11.10	0.000***
SIZE	+	-2.9720	0.3116	-9.54	0.000***
LEV	-	0.6647	0.1691	3.93	0.000***
ROE	+	0.6998	0.1434	4.88	0.000***
PTB	+	0.0290	0.0152	1.91	0.056*
_cons	+	8.7608	0.8690	10.08	0.000***

Note: ATR represents the firm financial efficiency; ESG is environment, social and governance combined score, SIZE is the firm size; LEV is financial leverage; ROE is return on equity of the firm; PTB is price to book of the firm; BIG4 refers to audit quality; ESG*BIG4 is the interaction term between ESG performance and audit quality; ***, **, *: statistical significance at 99%, 95%, 90% confidence levels.

5.3.1. Direct relationship between ESG and firm financial efficiency

The study reveals that ESG performance positively impacts firm financial efficiency, with coefficients of 0.4945 (10% significance) and 0.5794 (5% significance) in the respective models. This supports the hypothesis that ESG engagement enhances financial efficiency and competitive advantage by improving access to financing. The findings align with Stakeholder Theory, emphasizing strong stakeholder relationships for value maximization. Consistent with previous studies (Porter et al., 2019; Bacha et al., 2021; Wu et al., 2014; Park, 2017), firms with robust ESG practices attract higher investor preference and consumer loyalty, reduce organizational costs, and increase shareholder wealth. In Vietnam, regulations promoting ESG activities have improved stakeholder relationships, reputation, and access to capital, benefiting companies like Vinamilk, which has been recognized for its sustainability efforts.

5.3.2. Moderating effect of audit quality

The study also explores the moderating effect of audit quality, finding that ESG-practicing companies audited by Big Four firms achieve superior financial efficiency. The interaction term ESG*BIG4 has a positive coefficient of 4.9417 at the 1% significance level, supporting the hypothesis that high audit quality amplifies the benefits of ESG on firm efficiency. This aligns with Agency Theory, highlighting the role of auditing in reducing information asymmetry and enhancing ESG performance (Bacha et al., 2021; Agyei-Mensah, 2019; Timbate & Park, 2018). Big Four auditors provide additional assurance regarding the reliability of ESG data, further boosting financial efficiency. Thus, the positive impact of ESG on financial efficiency is more pronounced for companies audited by Big Four firms.

Moreover, firm size (SIZE) negatively impacts efficiency, with a coefficient of -2.9720 ($p < 0.001$), possibly due to bureaucratic inefficiencies in larger firms. Financial leverage (LEV) positively affects efficiency, with a coefficient of 0.6647 ($p < 0.001$), indicating that leveraging financial strategies can enhance operational efficiency. Return on equity (ROE) and price to book (PTB) also positively impact efficiency, with coefficients of 0.6998 ($p < 0.001$) and 0.0290 ($p < 0.1$), respectively, reflecting the importance of profitability and investor confidence in driving firm efficiency.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

Sustainable development has become a global priority in the context of climate change, imbalanced economic development, and resource depletion. This study examines the impact of ESG activities on the financial efficiency of 145 listed companies in Vietnam from 2019 to 2023. The findings show that ESG performance positively correlates with financial efficiency, as measured by the asset turnover ratio (ATR), and that audit quality significantly moderates this relationship. Companies with higher ESG performance and superior audit quality, especially those audited by Big Four firms, tend to achieve better financial outcomes, highlighting the importance of credible ESG disclosures and practical sustainability strategies.

6.2. Recommendations

The research suggests several recommendations to strengthen ESG practices in businesses. Companies should set clear, measurable ESG goals and focus on optimizing specific activities within the Environmental (E), Social (S), and Governance (G) pillars. This includes increasing the use of recycled materials, improving employee well-being, and ensuring transparent governance policies. Effective ESG risk management is also crucial. For investors, integrating ESG criteria into investment strategies can mitigate risks and create long-term value. Governments should support businesses by enhancing the legal framework for ESG disclosures, providing incentives, and promoting public awareness of ESG's importance. Collaboration between businesses, NGOs, and government agencies is essential to create sustainable social solutions and reduce financial pressure on public budgets. These strategies will help enhance corporate sustainability and contribute to broader sustainable development goals in Vietnam.

Limitations of the study

The research encountered several limitations, such as the inconsistency in report presentation and disclosed information, which posed challenges for comparison and evaluation. Relying on disclosed information may overlook actual activities and other influencing factors. Additionally, focusing on the top 145 listed companies with high market capitalization in Vietnam might omit specific industry characteristics, potentially failing to fully reflect the impact of ESG application on financial efficiency.

Future research directions

Future studies could extend the research period and increase the sample size, focusing on specific industries to avoid biases. Expanding the research to include various industries would provide a more comprehensive assessment of ESG impact. Improving the legal framework for disclosing sustainability information and encouraging companies to adopt ESG practices through supportive policies would enhance the transparency and reliability of ESG reports. Moreover, future research should consider other micro and macro factors influencing ESG implementation and disclosure, such as the impact of technology and changes in international regulations.

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