Small Listed Firm's Insights: Increasing Importance of "Managerial Efficiency" on the Relationship between ESG and Financial Performance

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Abstract

The objective of this study is to examine the influence of environmental, social, and governance (ESG) performance towards financial performance. Financial performance is evaluated through return on assets (ROA) and Tobin's Q, while the study also examines the influence of managerial efficiency. The sample includes small listed companies on the Thai Stock Exchange from 2016 to 2021, comprising a total of 258 companies (1,391 samples). The data is collected from SETSMART and sustainability reports and analyzed based on Hayes' PROCESS analysis (2013).

The findings of this study indicate the absence of a relationship between ESG and Tobin's Q. However, ESG demonstrates a negative relationship with ROA. Additionally, the study reveals a positive influence of managerial efficiency on the relationship between ESG and financial performance (ROA and Tobin's Q). Managerial efficiency plays a crucial role in addressing debates and bridging gaps in previous research findings. It serves as a driving force for ESG practices, enabling small firms to outperform those with lower levels of management effectiveness.

Keywords: 1) ESG 2) managerial efficiency 3) financial performance 4) small listed firms

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Introduction

Environmental, social, and governance (ESG) concerns have arisen as urgent issues, compelling CEOs and boards of directors to define strategies and actions for sustainability (Sancha, et al., 2023, pp. 27-31). In terms of ESG in Thailand, progress has been made in integrating ESG principles into business policies and practices. Here are some significant ESG considerations in Thailand. Thailand encounters numerous environmental challenges due to factors such as air and water pollution, deforestation, and waste management. To address these issues, the government has implemented measures including stricter regulations, promotion of renewable energy, and support for sustainable tourism initiatives. Moreover, an increasing number of Thai businesses are prioritizing the reduction of their carbon footprint and the adoption of eco-friendly practices (The Stock Exchange of Thailand, 2022). Thailand has also made efforts to improve social conditions encompassing labor rights, human rights, and social welfare. The government has enacted policies to combat income inequality, enhance access to healthcare and education, and strengthen social safety nets. Additionally, Thai businesses are encouraged to consider the social impact of their decisions, including promoting diversity and inclusion, ensuring fair labor practices, and supporting local communities. Effective governance practices are crucial for instilling investor confidence and ensuring transparency and accountability. In Thailand, initiatives have been undertaken to bolster corporate governance regulations and standards. The Stock Exchange of Thailand (SET) has implemented guidelines for corporate governance, while the Securities and Exchange Commission (SEC) has urged listed companies to disclose ESG-related data. It is encouraged for companies in Thailand to have independent boards, transparent financial reporting, and ethical business practices (The Stock Exchange of Thailand, 2019).

In terms of sustainable investment in Thailand, the concept of sustainable investment has gained momentum. Institutional investors, including pension funds and asset management firms, are increasingly integrating ESG considerations into their investment decisions. Moreover, there is a growing demand for ESG-related financial products such as green bonds and sustainable funds. Thailand has taken steps to enhance ESG reporting and disclosure requirements. The SEC has issued guidelines mandating the disclosure of ESG-related information in the annual reports of publicly traded companies. Additionally, the SET has introduced an ESG disclosure platform that offers stakeholders and investors access to ESG information on listed companies. Overall, ESG principles and practices are gaining significance in Thailand, with both the government and private sector acknowledging the importance of sustainable and accountable practices. The country is making progress toward establishing a more sustainable and socially responsible business environment, although further efforts are needed to ensure widespread adoption of ESG principles across all sectors (The Stock Exchange of Thailand, 2023).

There is significant appeal in measuring the relationship between ESG and financial performance. The existing literature presents a range of findings, with positive results (Aboud and Diab, 2018, pp. 442-458; Lu and Taylor, 2018, pp. 107-130; Theparak, et al., 2022, pp. 53-80; Al Amosh, Khatib and Ananzeh, 2023, pp. 493-513; Kalia and Aggarwal, 2023, pp. 155-176; Maji and Lohia, 2023, pp. 175-177; Suttipun, Khunkaew and Wichianrak, 2023, pp. 89-96), negative results (Duque-Grisales and Aguilera-Caracuel, 2021, p. 315; Tampakoudis, et al., 2021, pp. 1117-1141), and inconclusive results (Velte, 2017, pp. 169-178; Bodhanwala and Bodhanwala, 2023, pp. 2442-2445). Additionally, different causal relationships have been proposed (Kalia and Aggarwal, 2023, pp. 155-176; Margolis and Walsh, 2003, pp. 268-305).

To assess corporate financial performance, two commonly used metrics are returns of assets (ROA) and Tobin's Q. Both metrics offer insights into different aspects of corporate financial performance. ROA primarily focuses on profitability and asset utilization efficiency, while Tobin's Q reflects market valuation and investor sentiment towards the company. By utilizing these metrics together, a comprehensive understanding of corporate financial performance can be obtained, encompassing profitability, efficiency, and market perception (Khan, 2022, pp. 1-10; Theparak, et al., 2022, pp. 58-80; Al Amosh, Khatib and Ananzeh, 2023 pp. 493-513).

In recent years, empirical research on corporate social responsibility (CSR) has increasingly incorporated top management characteristics (Velte, 2020 p. 497; Suttipun, Khunkaew and Wichianrak, 2023, p. 89). The role of top managers is crucial in emphasizing the importance of engaging with various stakeholders, including customers, employees, investors, and communities, to drive CSR, ESG, and financial performance. By understanding and addressing the expectations of these stakeholders, companies can cultivate strong relationships, attract loyal customers, retain talented employees, and earn the trust of investors, ultimately leading to financial success. Effective communication of the integration between ESG and financial performance by efficient top managers demonstrates that responsible business practices not only benefit society but also create sustainable value for the company and its stakeholders (Chen and Chen, 2020, pp. 1055-1073; Velte, 2020, pp. 497-502). According to stakeholder theory, managerial efficiency is assumed to positively influence the relationship between ESG and financial performance.

It is important to note that the research on ESG and large companies is an evolving field, and findings may differ across studies due to variations in methodologies, timeframes, and geographic contexts. However, the overall trend suggests that integrating ESG considerations into the strategies and operations of large companies can have a positive impact on financial performance, risk management, stakeholder relationships, and long-term sustainability. It should be recognized that small and large firms differ in terms of resources and stakeholder expectations, but both can contribute to sustainable practices and benefit from integrating ESG con-

sidерations into their operations. The specific approach to ESG may vary depending on the size, industry, and operational context of each firm.

While research findings on ESG practices vary across countries, they emphasize the need for a contextual approach to understanding ESG performance. Particularly, the study acknowledges the importance of small firms in the context of the Stock Exchange in Thailand, as a developing country, when examining ESG performance. Thus, this study is the first to comprehensively evaluate the impact of ESG on firm performance using a multi-year dataset of small firms in Thailand. Furthermore, it is the only study to demonstrate the moderating effect of managerial efficiency on the relationship between ESG and financial performance.

The structure of the article is as follows: first, a theoretical framework for stakeholders is presented, serving as the basis for formulating hypotheses. Second, the data and methodology are described, including the primary variables and the regression models using the PROCESS method. The correlation and regression analyses form the core of the findings. Third, the results are discussed. Finally, the conclusion highlights the limitations of the study and provides recommendations for future research.

Theoretical framework, literature review and hypotheses

Stakeholder theory

ESG performance and stakeholder theory share common principles and objectives, emphasizing the importance of stakeholders. Stakeholder theory posits that businesses should consider and manage the interests of all stakeholders, including employees, customers, suppliers, communities, and investors. Similarly, ESG recognizes the significance of engaging with stakeholders and incorporating their concerns and expectations when addressing environmental, social, and governance issues (Chantabutr, 2022, pp. 26-52). Stakeholder theory provides various explanations for the link between ESG performance and financial success (Freeman, 1994, pp. 409-421). Firstly, stakeholders have different expectations of businesses, and meeting ESG standards can earn their trust and loyalty, positively impacting finances. Secondly, reputation and brand value play a crucial role, as stakeholders prefer companies that excel in ESG practices, enhancing brand value and providing a competitive edge. This, in turn, attracts customers, investors, and other key parties, contributing to financial success. Thirdly, stakeholder theory emphasizes the importance of cultivating strong relationships, as positive stakeholder relationships lead to increased customer loyalty, employee productivity, and investor confidence (Theparak, et al., 2022, pp. 53-80). Fourthly, stakeholder theory recognizes that stakeholders can influence a company's risk environment (Suttipun, Khunkaew and Wichianrak., 2023, pp. 89-90). By effectively managing ESG risks and incorporating them into risk management strategies, companies safeguard their financial performance. Lastly, stakeholder theory encourages a long-term view, aligning with ESG's focus on responsible behavior and sustainable practices. Companies prioritizing

ESG performance are more likely to create long-term value, reduce risks, and maintain strong financial performance over time (Junius, et al., 2020, p. 21; Bhandari, Ranta and Salo, 2022, pp. 1525-1537; Al Amosh, Khatib and Ananzeh, 2023, pp. 493-513).

By incorporating stakeholder theory into our understanding of the relationship between ESG performance and financial performance, it becomes evident that companies prioritizing the interests of all stakeholders are more likely to enhance financial performance through improved ESG performance.

While empirical research on the relationship between ESG performance and financial performance has yielded varied and contradictory results (positive, negative, and insignificant), stakeholder theory and prior empirical findings suggest a positive relationship between ESG performance and financial performance (ROA and Tobin's Q). Successful ESG activities can enhance the reputation and performance of an organization (Al Amosh, Khatib and Ananzeh, 2023, pp. 493-513; Bodhanwala and Bodhanwala, 2023, pp. 2442-2443; Suttipun, Khunkaew and Wichianrak, 2023, pp. 89-92). According to stakeholder theory, positive reputational effects from ESG strategies may need to accumulate to a certain point for firms to meet stakeholder expectations. Therefore, the hypotheses are proposed as follows:

H1. ESG performance will result in increased ROA.

H2. ESG performance will result in increased Tobin’s Q.

Moderating effect of managerial efficiency

Managerial efficiency refers to the effective utilization of talent, abilities, and effort by top managers to make successful decisions for the company. This study examines the efficacy of management in converting corporate resources into revenue. Demerjian, Lev, and McVay (2012, pp. 1229-1248) demonstrate that managerial effectiveness is positively associated with improved firm performance. Chen and Lin (2018, pp. 171-182) find that firms with high managerial ability generate superior long-term returns for acquiring firms and pay lower acquisition premiums. Several researchers have also observed the influence of managerial efficiency on various aspects of firm performance (Yung and Chen, 2018, p. 1005; Salehi, Bazrafshan and Hosseinkamal, 2021, pp. 150-173; Zhang, 2023, pp. 219-243).

The role of the top manager in implementing stakeholder theory within the context of ESG performance can significantly impact the overall success and sustainability of an organization. Rather than solely focusing on maximizing shareholder value, stakeholder theory suggests that companies should consider the interests of all stakeholders, including employees, customers, suppliers, communities, and shareholders (Freeman, 1994, pp. 409-421). In relation to ESG, top management plays a crucial role in aligning the organization's strategy, operations, and culture with responsible and sustainable practices (Velte, 2020, pp. 497-520). In conclusion, implementing stakeholder theory within the ESG framework involves the top manager establishing strategic direction, engaging stakeholders, fostering a responsible culture, integrating ESG considerations into decision-making, measuring perfor-

mance, and advocating for sustainability. In a world increasingly conscious of ESG, managerial efficiency can contribute to long-term value creation, risk mitigation, and the enhancement of reputation and resilience within organizations adopting this strategy (Lee, Kim and Kim, 2023, pp. 685-695).

Placing emphasis on ESG factors can significantly influence a company's performance. By incorporating ESG considerations into business practices, the top manager can identify and mitigate potential environmental, social, and governance risks. This includes addressing labor practices, managing environmental impacts, ensuring ethical governance, and complying with regulations. Proactive management of these risks safeguards the company's reputation, prevents legal and operational disruptions, and improves long-term stability (Chen and Chen, 2020, pp. 1055-1073). Adopting sustainable practices and resource conservation can lead to cost savings and enhanced operational effectiveness. For instance, reducing energy consumption, waste production, and carbon emissions can lower utility and waste disposal costs. Focusing on ESG can also drive initiatives that optimize resource allocation, enhance supply chain resilience, and increase overall productivity (Jouber, 2022, pp. 1185-1217). A top manager with a focus on ESG is able to identify emerging market trends and opportunities associated with sustainable products, services, and technologies. By encouraging innovation and investing in ESG-related areas, the manager positions the company to benefit from evolving consumer preferences, regulatory changes, and emerging market demands. This can drive revenue growth, expand market share, and enhance competitiveness (Lee, Kim and Kim, 2023, pp. 685-695)

ESG commitments can facilitate the recruitment and retention of top talent. Employees seek organizations that align with their personal values. CEOs prioritizing ESG can cultivate a positive workplace culture, increase employee engagement, and strengthen the employer brand. This leads to higher employee satisfaction, productivity, and retention rates, ultimately improving overall performance (Duque-Grisales and Aguilera-Caracuel, 2021, pp. 315-320). Consumers are increasingly aware of ESG issues and are more likely to support and remain loyal to businesses that demonstrate responsible practices. Senior management's commitment to ESG contributes to trust-building, enhanced brand reputation, and gaining a competitive edge. A positive brand image fosters increased consumer loyalty, market differentiation, and revenue growth (Bhandari, Ranta and Salo, 2022, pp. 1525–1537). Investors seeking to align their investments with sustainable values place greater importance on ESG considerations. Managerial efficiency that prioritizes ESG can attract socially responsible investors, improve access to capital markets, and potentially reduce the cost of capital. Strong ESG performance and transparent reporting enhance investor confidence, strengthen stakeholder relationships, and contribute to long-term financial stability (Chen and Chen, 2020, pp. 1055-1073).

It is important to note that the impact of the top manager's focus on ESG on financial performance can vary depending on industry, market dynamics, and the specific ESG initiatives implemented. However, by embracing ESG principles and driving their integration throughout the organization, the top manager can establish a foundation for sustainable growth, resilience, and long-term value creation. Consequently, firms led by highly efficient managers are expected to experience an amplified positive impact of ESG on financial performance. Therefore, the hypotheses are proposed as follows:

H3. The positive relationship between ESG and ROA is more pronounced for firms led by high managerial efficiency.

H4. The positive relationship between ESG and Tobin's Q is more pronounced for firms led by high managerial efficiency.

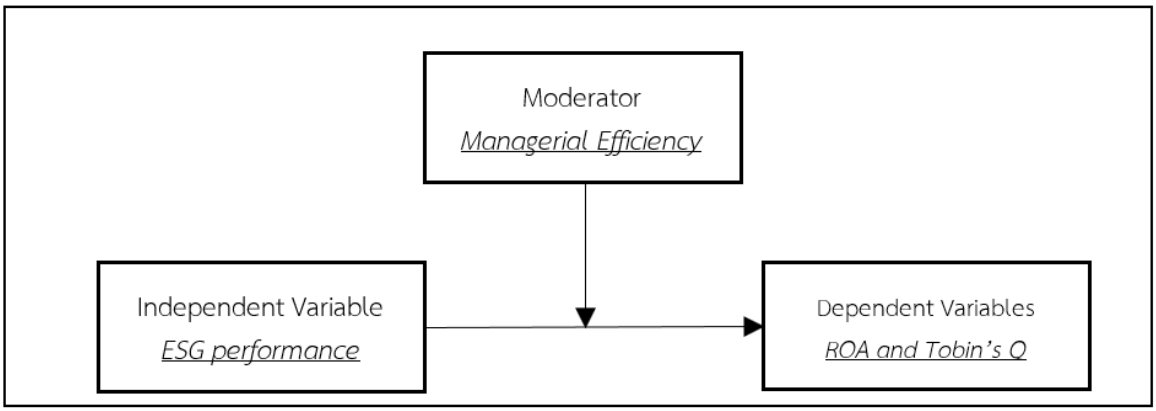

Figure 1 Moderator effect between ESG and financial performance

Research methodology

Sample and data

The population for this study comprises the small listed firms on the Stock Exchange of Thailand (SET). The firm size classification follows the given ESG awards criteria (Large, medium, and small size). The small companies that trade on the Stock Exchange of Thailand (SET) are the focus of this study. The sample for this research is selected from this accessible population using a non-probability sampling approach, specifically the purposive sampling method. This method allows for the selection of a sample that meets the research requirements.

There are specific criteria for selecting the sample. Firstly, the sample includes non-financial firms. Financial firms are excluded due to their adherence to specific regulatory requirements, which involve additional financial statements and disclosures. Financial firms utilize different financial ratios and metrics to evaluate their performance, including industry-specific metrics such as gross profit margin and inventory turnover. The measurement of managerial efficiency (M_Score) is not applicable to financial firms (Demerjian, Lev and McVay, 2012, pp. 1229-1248).

Secondly, the sample excludes firms with negative equity value. Similar to Simamora (2023, pp. 789-808), this study focuses on enterprises with a positive book value of equity. According to Simamora (2023, pp. 789-808), enterprises with negative equity are

more inclined to divest rather than invest due to insufficient resources and potential default. Therefore, risky investments in negative-equity enterprises are unlikely to occur. To eliminate bias in using Tobin's Q as a performance indicator, only firms with a positive book value of equity are considered.

Thirdly, the sample comprises small firms with a market capitalization of less than 10,000 million baht. Thus, this study is the first to comprehensively evaluate the impact of ESG on the performance of small firms in Thailand. Small firms are characterized by internal integration and integration throughout their value chain.

The data for this study are from 2016 to 2021. Since firms' websites and the Thailand Stock Exchange (SET Smart database) provide updated financial report data for the current year while removing previous data, the most recent data available for this study is from 2016. The study is limited in accessing data prior to 2016 as it is no longer publicly available. As indicated in Table 1.

Table 1 Research sample

Sample selection process	Firms	Obs.
Non- finance firms listed in Thailand Stock Exchange 2016–2021	523	3,138
Data missing (insufficient data to construct variables)	(150)	(900)
Total	373	2,238
Negative equity		(14)
Data outlier		(120)
Firms' market capitalization over 10,000 million Bath	(115)	(713)
Net sample	258	1,391

Financial performance measurement is the focus of this study, with the dependent variable being corporate financial performance. This performance is assessed using two metrics: return on assets (ROA) and Tobin's Q. The purpose of ROA is to gauge the company's profitability by measuring how effectively it utilizes its assets to generate profit. It calculates the net income as a percentage of the total assets, providing insights into the company's ability to generate profits relative to its asset base. A higher ROA suggests that the company is efficient in generating profits from its assets. The formula for ROA is as follows:

Net Income / Total Assets

Tobin's Q is a financial measure that assesses the market value of a company in relation to the total value of its assets. It is utilized to evaluate long-term performance and growth by comparing the market value of a company's outstanding equity and debt with its total assets. If Tobin's Q is greater than 1, it indicates that the market value of the company's assets surpasses the book value, suggesting that the company has generated value for its shareholders. Conversely, if Tobin's Q is below 1, it suggests that the company's assets are valued lower than their book value. Here is the formula for Tobin's Q:

(Market Value of Equity

+ Market Value of Debt) / Total Assets

The process of assessing ESG performance is considered an independent variable. When measuring environmental performance, the study focuses on evaluating carbon emissions (GHGs), water usage, and waste generation. The social criteria involve analyzing employee injury rates, employee turnover, and personnel costs, as outlined by the United Nations (2019). To gauge the environment (E) and social (S) factors, the proportion of large companies on a specific stock exchange that disclose relevant information is utilized, as stated by Velte (2020, pp. 497-520). In terms of governance (G) factors, calculations are performed based on the Thai Institute of Directors Association (IOD). Ultimately, the overall ESG score is determined by assigning weights of 24%, 35%, and 41% to the E, S, and G factors, respectively, according to the SEC in 2023.

The measurement of managerial efficiency (M_Score) involves considering the moderator variable in this study. Managerial efficiency (M_Score) is based on the research conducted by Demerjian, Lev, and McVay in 2012. The M_Score is determined by comparing corporate ability to convert corporate resources into revenue with that of its industry peers. According to Demerjian, Lev, and McVay (2012, pp. 1229–1248), managers with higher capabilities can generate greater revenue using the same amount of resources due to their understanding of technology, industry trends, product demand, and their skills in selecting profitable investment projects and managing employees. The assessment of managerial efficiency involves a two-step procedure.

In the first step, data envelopment analysis (DEA) is the output (sales revenue) to input (seven input variables: property, plant and equipment, operating leases, R&D, goodwill, other intangible assets, cost of goods sold, general and administrative expenses), is optimized to determine firm efficiency, where firm efficiency is denoted by Θ. The following model is proposed:

$$\Theta = \beta_0 + \beta_1 FirmSize_{i,t} + \beta_2 FirmAge_{i,t} + \beta_3 MarketShare_{i,t} + \beta_4 FreeCashFlow_{i,t} + \beta_5 BusinessSegment_{i,t} + \beta_6 ForignCurrenecy_{i,t} + YearDummy + \varepsilon_{i,t}$$

Control variables measurement: The models account for the effects of company size, leverage, growth, industry, and year. Company size (SIZE) is believed to affect its performance. A larger or more scalable company will find it easier to access both internal and external sources of finance (Berger and Ofek, 1995, pp. 39-65). Company size is calculated using the natural logarithm of total assets. Leverage (LEV) refers to corporate ability to utilize assets or funds with a fixed cost to generate more profits. The higher a business's leverage is, the greater the risks it must take. This also refers to the potential for higher returns (Lang, Ofek and Stulz, 1996, pp. 3-29). This study measures leverage by examining the total debt-to-equity ratio. A higher leverage ratio indicates a riskier company. Sales growth (GR) reflects how a company has expanded. High sales growth values indicate expectations of future profitability, making it an attractive investment opportunity for investors (Lang, Ofek and Stulz, 1996, pp. 3-29). This study measures growth by analyzing sales growth rates.

Study model

This study focused on examining the variable of financial performance, which

consists of two components: accounting performance and market performance. Additionally, certain factors are considered as control variables in order to maintain control over the model.

To explore the moderating role of managerial efficiency (M_Score) in the relationship between ESG and financial performance, the following approach was employed:

$$Perf_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 M\_Score_{i,t} + \beta_3 ESG * M\_Score_{i,t} + \beta_4 LnSIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 GR_{i,t} + Year/IndustryFixedEffects + \varepsilon_{i,t}$$

This equation is further divided into two sub-equations based on the performance criteria as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 M\_Score_{i,t} + \beta_3 ESG * M\_Score_{i,t} + \beta_4 LnSIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 GR_{i,t} + Year/IndustryFixedEffects + \varepsilon_{i,t}$$

$$Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 M\_Score_{i,t} + \beta_3 ESG * M\_Score_{i,t} + \beta_4 LnSIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 GR_{i,t} + Year/IndustryFixedEffects + \varepsilon_{i,t}$$

where Perf represents the dependent variable which is financial performance measured against two models (ROA and Q), β_0 represents the constant, and $\beta_{1\text{-}6}$ represents the slope of the independent and controls variable.

Reliability and validity

Data diagnostics. As shown in Table 2, the skewness and kurtosis tests were conducted to assess the normality of the data. The results indicate that not all of the skewness and kurtosis values fell within the acceptable range of -3 to +3, which is indicative of a departure from a normal univariate distribution (Kallner, 2018, pp. 22-27). The outcomes of all the tests suggest that the data did not exhibit a normal distribution. To address this issue, the natural logarithms of the variables related to firm size were taken into account as a means to address the problem.

Table 2 Normality tests

Variables	Labels	N	Skewness		Kurtosis	
			Statistic	Std. error	Statistic	Std. error
Dependent variables	ROA	1,391	.336	.066	2.220	.131
	Q	1,391	1.381	.066	1.056	.131
Independent variable	ESG	1,391	1.252	.066	.140	.131
Moderator variable	M_Score	1,391	.884	.066	1.924	.131
Firm-specific control variables	LnSIZE	1,391	.251	.066	-.046	.131
	LEV	1,391	.627	.066	-.834	.131
	GR	1,391	.569	.066	.191	.131

Variables diagnostics.

The effectiveness of the linear model relies on the assumption that the factors under consideration are independent of each other. In cases where multicollinearity is present, the standard errors of the estimated coefficients tend to increase. To assess whether the independent variables were interrelated, we utilized the variance inflation factor (VIF).

Table 3 Variables diagnostics

Variables	Labels	*N*	Collinearity test	
			Tolerance	VIF
Independent variable	ESG	1,391	.875	1.143
Moderator variables	M_Score	1,391	.832	1.202
Interaction (mean centering)	ESG * M_Score	1,391	.930	1.075
Firm-specific control variables	LnSIZE	1,391	.657	1.521
	LEV	1,391	.700	1.428
	GR	1,391	.903	1.108

According to Kallner (2018, pp. 102-103), if the variance inflation factor (VIF) exceeds 10 for an independent variable, it indicates a significant issue with multicollinearity. However, as depicted in Table 3, all the VIF values for the independent variables are below 10. This implies that the variables do not exhibit a severe problem with collinearity

Model diagnostics

Assumptions play a crucial role in the analysis, with heteroscedasticity being among the most important ones. To assess heteroscedasticity, the Breusch-Pagan test was employed. However, since this study is based on panel data, the Hausman test was first conducted as a preliminary step to determine whether to use the fixed-effect (FE) or random-effect (RE) methods. The "Hausman" chi-squared values for the two models, as presented in Table 4, are less than 5%. This indicates that the Fixed-effect model (FE) provides a better representation of the relationship. Consequently, the Breusch-Pagan test was subsequently used to examine heteroscedasticity.

Table 4 Models diagnostics

Models	Fixed vs random approach		Heteroscedasticity		Autocorrelation
	Hausman test	Prob	Breusch–Pagan	Prob	Durbin–Watson
ROA	66.89	0.000	3.256	0.065	2.012
Q	88.33	0.000	5.432	0.367	1.924

The presence of heteroscedasticity is a significant assumption in regression analysis. To test for heteroscedasticity, the Breusch-Pagan tests were employed. According to Table 4, the p-values for the Breusch-Pagan tests for the two financial performance measures were above the conventional level of significance of 5% (0.065, 0.367). As a result, we accepted the null hypothesis, indicating that the models do not exhibit heteroscedasticity issues.

Additionally, the Durbin-Watson (DW) statistic and the presence of residual autocorrelation were examined. Table 4 reveals that the DW values for the ROA and Q models (2.012, 1.924) fell within the range of 1.5-2.5. This suggests that there was no autocorrelation problem that could impact the results of this study.

Descriptive analysis

Table 5 Descriptive results

Variables	Independents				Moderat	Firm-specific control			Dependent	
	ESG	E	S	G	M_Score	LnSIZE	LEV	GR	ROA	Q
Mean	0.524	0.212	0.439	0.779	0.733	15.135	0.809	2.63	3.84	1.275
Median	0.428	0.000	0.285	0.800	0.722	15.143	0.644	0.73	3.30	1.066
SD	0.221	0.381	0.283	0.152	0.322	0.934	0.599	22.37	7.30	0.630
Minimum	0.296	0.000	0.143	0.600	0.002	13.016	0.102	-38.89	-19.27	0.524
Maximum	1.000	1.000	1.000	1.000	1.799	18.497	2.355	59.38	29.48	3.055

Table 5 presents the summary statistics for the regression variables used in this study. According to the reported data, the overall ESG score has an average (median) of 0.524 (0.428), (indicating that listed small firms provide ESG information in line with the UN 2019 guidelines. The managerial efficiency (M_Score) in the sample has a mean (median) of 0.733 (0.722), suggesting that many firms demonstrate effective resource utilization to generate income. Regarding the reported values for ROA and Tobin's Q (Q), the average (median) values for small listed firms during the 2016-2021 period were 3.84% (3.30%) and 1.275 (1.066) times, respectively.

In terms of control variables, the natural logarithm of lagged total assets (LnSIZE) is 18.497. The sample firms exhibit a mean (median) firm leverage (LEV) of 0.809 (0.644), indicating a high level of debt for small companies in Thailand. The mean (median) sales growth (SG) is 2.63% (0.73%), with some small listed companies experiencing low growth, as evidenced by the lowest mean growth value of -38.89%.

Findings and discussion

Robustness checks

As an alternative approach, moderation was examined using multiple regression analysis. To ensure the robustness of the findings, a robustness check was conducted by recalculating the moderation using multiple regression analysis. The results of the test yielded similar findings regarding the moderation effect of managerial efficiency on the relationship between ESG and financial performance.

Results of moderation through Andrew Hayes process

Table 5 shows the results of moderated PROCESS regression analysis, and the results of the interaction of ESG and Managerial efficiency (M_Score) with beta coefficients, t-statistics, and p-values

Table 5 Model summary of moderated PROCESS regression

Variables	Model 1 ROA					
	B	SE β	*t value*	*p-value*	LLCI	ULCI
constant	-0.025	0.031	-0.825	0.409	-0.085	0.035
ESG	-0.075	0.017	-4.417	0.000***	-0.108	-0.042
M_Score	0.021	0.012	1.771	0.077	-0.002	0.043
Int_1	0.139	0.019	7.286	0.000***	0.102	0.176
LnFS	0.004	0.002	2.078	0.038**	0.000	0.008
LEV	-0.035	0.003	-11.652	0.000***	-0.041	-0.030
GR	0.067	0.007	9.308	0.000***	0.053	0.081
*N = 1,391, R Square= 40.13%, R Square Change = 4.8%, F 54.136****						
Variables	**Model 2 Q**					
	B	SE β	*t value*	*p-value*	LLCI	ULCI
constant	3.805	0.263	14.475	0.000	3.289	4.320
ESG	-0.270	0.146	-1.848	0.065	-0.556	0.017
M_Score	0.347	0.100	3.484	0.001***	0.152	0.543
Int_1	0.754	0.164	4.600	0.000***	0.433	1.076
LnFS	-0.184	0.017	-10.633	0.000***	-0.218	-0.150
LEV	0.041	0.026	1.551	0.121	-0.011	0.092
GR	0.120	0.062	1.937	0.053	-0.002	0.241
*N = 1,391, R Square= 40.55%, R Square Change = 4.86% F 55.084****						

Upon analyzing the relationship between ESG and financial performance in small listed companies with a market capitalization below 10,000 million baht, the findings reveal that in Model 1 (ROA), the coefficient value is -0.025 with a p-value of 0.000 ($p < 0.01$). This indicates a significant negative relationship between ESG and ROA, while the relationship with Tobin's Q in Model 2 is insignificant (coefficient value of -0.270 and p-value of 0.065).

These results are consistent with the findings of previous studies conducted by Duque-Grisales and Aguilera-Caracuel (2021, pp. 315-320) and Tampakoudis, et al. (2021, pp. 1117–1141), who observed a negative correlation between ESG and ROA. These studies explained that ESG does not play a significant role in enhancing firm efficiency and its impact on corporate performance is less prominent in smaller firms. The analysis also reveals that the instigator variable (Int_1) in Model 1 demonstrates the interaction effect of ESG and M_Score on ROA. The interaction effect accounts for R square of 40.13% and exhibits a positive and statistically significant coefficient of 0.139 ($p < 0.01$). These additional data analysis results indicate that managerial efficiency

acts as a moderating variable, influencing the relationship between ESG and financial performance. In Model 2 (Q), the coefficient value is -0.270 and the p-value is 0.065 ($p > 0.05$), suggesting that ESG has no significant relationship with Tobin's Q. Consequently, hypothesis H1a/1b is not supported. However, upon examining the influence of the instigator (Int_1), it is evident that managerial efficiency has a positive and significant impact on the relationship between ESG and performance. In Model 2, the coefficient value is 0.754 and the p-value is 0.000 ($p < 0.01$). The interaction effect explains R square of 40.55%.

Table 6 Conditional effect of ESG on financial performance via M_Score

ROA					
M_Score	Effect	BootSE	*t-value*	*p-value*	95% CI
0.411	-0.018	0.010	-1.713	0.087	-0.0384 to 0.003
0.733	0.027	0.007	3.625	0.000	0.012 to 0.041
1.055	0.072	0.009	8.216	0.000	0.055 to 0.089
Tobin's Q					
M_Score	Effect	BootSE	*t-value*	*p-value*	95% CI
0.411	0.040	0.090	0.447	0.655	-0.136 to 0.217
0.733	0.283	0.064	4.446	0.000	0.158 to 0.408
1.055	0.526	0.075	7.021	0.000	0.379 to 0.673

Based on the results obtained from bootstrapping (Table 6), the relationship between ESG and financial performance is found to be significant only for individuals with high scores on managerial efficiency (M_Score). Specifically, for ROA, the coefficient (b) is 0.027 with a confidence interval (CI) ranging from 0.012 to 0.041, and a p-value of less than 0.001. Similarly, for Q, the coefficient (b) is 0.283 with a confidence interval (CI) ranging from 0.158 to 0.408, and a p-value of less than 0.001. These findings indicate that M_Score positively moderates the indirect relationship between ESG and financial performance (ROA and Q), providing support for hypothesis H2a/2b.

To gain further insight into the nature of these interactions, plots were created to illustrate the effects of ESG on financial performance at different levels of M_Score. These plots, depicted in Figure 2, align with hypothesis H2a/2b and demonstrate that at low levels of M_Score, ESG has no discernible impact on financial performance. However, at higher levels of M_Score, the influence of ESG on financial performance becomes significantly positive.

Figure 2 Effect of managerial efficiency (M_Score) on ESG and financial performance relationship

Conclusion

The results show that ESG performance has a significant negative impact on the account performance (ROA) of small firms. whereas ESG performance has no significant effect on the market performance (Tobin's Q). When firm efficiency factors are taken into account, managerial efficiency (M_Score) is found to positively and significantly moderate the relationship between ESG performance and firm performance (ROA and Tobin's Q).

The empirical findings of this study support the incorporation of stakeholder theory, which suggests that managerial efficiency is a critical determinant of the relationship between ESG and financial performance. This research contributes significantly to the existing literature by investigating the moderating effect of managerial efficiency on the ESG-financial performance relationship. The results highlight the crucial role of managerial efficiency in shaping the impact of ESG on financial performance and future firm value (Yung and Chen, 2018, pp. 1005-1032; Salehi, Bazrafshan and Hosseinkamal, 2021, pp. 150-173; Zhang, 2023, pp. 219-243).

These findings underscore the importance of prioritizing both managerial efficiency and ESG performance, offering valuable insights for researchers, regulators, and companies. The results indicate that adopting ESG practices is insufficient to enhance performance, as companies cannot solely rely on ESG disclosures to establish trust among stakeholders. Instead, high levels of managerial efficiency are necessary to fully realize the potential benefits of ESG, improving management effectiveness and mitigating business risks, thereby enhancing competitive advantage and promoting sustainable development (Lee, Kim and Kim, 2023, pp. 685-695). Furthermore, this study highlights the need for effective ESG regulations in Thailand to foster sustainable development. The inclusion of stakeholder theory provides a plausible explanation for why listed companies are mandated to report ESG data, even beyond voluntary disclosure (Velte, 2020, pp. 497-520; Lee, Kim and Kim, 2023, pp. 685-695).

In addition, the findings of this study underline the relevance of regulators considering the ESG performance of small firms when looking to develop single global standards for ESG disclosure. Other than, the top manager and regulators need to weigh both the costs and benefits of developing a common global standard for it to be successful and accepted.

Research Contribution

Theoretical implications

The findings of this study provide support for the connection between stakeholder theory and agency theory in the implementation of ESG practices. These findings suggest that ESG considerations must be accompanied by an examination of managerial efficiency to fully understand their impact. Interestingly, the results reveal that larger companies do not experience any performance improvement as a result of ESG practices. On the other hand, in smaller firms, the adoption of ESG practices has been found to have a negative impact on performance. This finding contradicts the predictions of both stakeholder theory and agency theory. However, when ESG practices are combined with managerial efficiency, the study reveals that the performance impact of ESG operations is higher for both large and small companies. This finding highlights the importance of considering both ESG practices and managerial efficiency together. The implementation of ESG practices can lead to higher performance, aligning with the principles of stakeholder theory, while managerial efficiency, as emphasized by agency theory, also plays a vital role in achieving such performance improvements.

Practical implication

Shareholders and the board of directors should prioritize managerial efficiency when evaluating management performance. This factor holds significant importance in ensuring the effective operation of the company and should be given careful consideration throughout the management process. Managerial efficiency serves as a crucial indicator of how well the corporate operations align with effective management practices, including strategies to address any shortcomings in low managerial efficiency. In fact, high managerial efficiency has a substantial impact on firm performance, particularly in terms of strategic decision-making.

This research provides recommendations for companies with less efficient executives compared to others in the same industry. Firstly, if a company has low managerial efficiency, it is recommended to implement policies aimed at enhancing managerial efficiency. These policies may involve providing training, certification programs, or organizing seminars for managers to enhance their skills, knowledge, and expertise. This approach allows the company to leverage ESG performance as a competitive advantage, thereby enhancing its position in the market.

Secondly, shareholders can adopt strategies to hire additional personnel, such as consultants or specialized executives, who possess expertise in specific fields. Companies with more efficient executives can improve their performance by embracing innovative approaches to production, adopting new technologies, and exploring new markets. These measures aim to enhance cost management and revenue generation efficiency within the organization.

Limitations and future research

This study has two limitations. The first limitation is that companies with corporate governance scores below 70 points (less than 3 stars) as assessed by the Thai Institute of Directors Association (IOD) were excluded from the

study. As a result, their data was not included in the analysis.

The second limitation is related to the sample size, which is limited to small listed operating firms for which information is available on SET. There are additional small enterprises that disclose ESG information in the market for alternative investment (MAI). If these companies were included in the sample, more significant results could have been obtained. Therefore, future research could benefit from enlarging the sample size.

To address these limitations, future research could adopt a mixed-methods approach, incorporating both qualitative and quantitative methodologies. For companies with a CG rating below 70 points where disclosure is not available, supplementing the analysis of secondary data with primary sources such as interviews with firm managers could provide a better understanding of the motivations behind ESG practices. Additionally, to obtain a comprehensive understanding of the relationship between ESG and financial performance in small listed firms, future research could include MAI-listed companies and conduct similar tests.

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