

ESG Ratings and Firm Performance with Moderating Role of Corporate Governance Mechanism: Evidence from Thai Settings

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Abstract

This paper aims to add empirical evidence to the existing literature in the arena of Environmental, Social, and Governance (ESG) information, firm performance, and stock market participation within a Thai context. Based on the dynamic analysis with the two-step system generalized method of moments, the instruments consist of the corporate governance mechanism. Results have indicated that the association between ESG scores and firm performance is statistically significant, with the moderating role of corporate governance. ESG-driven firms tend to have higher firm performance relative to non-ESG-driven firms. The overall result suggests that firm performance is more pronounced when the firm implements ESG policy. However, I argue that results should be interpreted with caution because 1) firm-specific factors may influence the outcome of ESG investment and 2) the outcome of ESG strategies may require a longer time to be identified. This paper also examines whether and how the stock market incorporates ESG information for its decisions. There is a negative association between excess returns and ESG performance. The result suggests that the stock market views ESG information as being able to mitigate information asymmetry. Two different ESG measures based on the Stock Exchange of Thailand and the third-party criteria are employed for the analysis, and I posit that the results based on those measures are qualitatively similar. This will endorse the usefulness of ESG information.

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1. Introduction

Conducting environmental, social, and governance (ESG) activities in business operations has long been promoted by regulators around the world. The impact of ESG in operations has received increasing attention, not only from investors and regulators but also from researchers. Building on prior research suggesting that firm- and country-specific conditions are important factors (Long, Chiah, Cakici, Zaremba, & Bilgin, 2024), this paper investigates the impact of ESG on stock market participation. Samples from Thailand – an emerging market country – and its setting have been used to determine the association between ESG and firm performance, as well as stock market participation.

Since 2015, the Stock Exchange of Thailand (SET) has consistently endorsed ESG for businesses in Thailand. As a result, SET has been able to successfully establish ESG eligibility criteria for firms and announce the ESG performance of Thai listed firms. SET's ESG regulations and actions should bring the stock market's attention to the ESG performance of firms. However, SET not only announces a firm's ESG performance as evaluated by SET (hereafter ESG_S) but also officially releases ESG performances and risks as evaluated by Morningstar (hereafter ESG_M) – a global investment research organization. This provides stock market participants with an additional source of ESG information in their decision-making process.

A large number of research studies have investigated the association between ESG performance and firm performance (i.e., Malik & Kashiramka, 2024; Narula, Rao, Kumar, & Matta, 2024; Velte, 2017). However,

empirical results have not been conclusive. Among others, an existing study finds both positive and negative relationships between ESG and firm performance for firms in the UK, France, Italy, Germany, and Denmark (Elamer & Boulhaga, 2024). By using firms in India, Narula et al. (2024) have found both positive and negative relationships between ESG and firm performance, but Malik and Kashiramka (2024) have found positive relationships between them. Thus, I maintain that the relationship between ESG and firm performance is still in doubt. These wavering issues are the motivation for exploring the relationship between ESG and firm performance in Thai settings, based on the fact that firm- and country-specific conditions can influence ESG and firm performances (Long et al., 2024). In addition, I explore the informativeness of ESG information to determine if stock market participants respond to it. Therefore, the focus of this study is two-fold: the first is to investigate the relationship between ESG and firm performance, and the second is to study ESG informativeness.

The first hypothesis of this research study responds to the first research question: investigating the extent of a firm's ESG performance in impacting its corporate performance. The motivation for this comes from prior research studies that have shown that the association between ESG and firm performance is inconclusive, and firm-specific conditions are significant factors. I use unique sample data from a Thai context to explore this unsettled area. Other than analyzing a firm's performance, I examine whether stock market participants incorporate ESG information into their investment decisions. This analysis aims to respond to the second research question and is derived within the second hypothesis. The analysis would assist in gaining an in-depth understanding of the usefulness of ESG information.

As evidenced by prior research studies, ESG performance analysis has raised potential endogeneity issues. I therefore glean the primary outcome from the dynamic panel data analysis with a two-step generalized method of moments (GMM) to indicate a significant effect of ESG information on firm performance. By using different measures of ESG performance – ESG_M vs. ESG_S – this study aims to offer nuanced insights into the impact of different ESG performance measures on firm performance and the pertinence of different measures of ESG information.

My results reveal that various levels of informativeness of ESG information exist, and the informativeness of ESG information is incremental to earnings and book value information. I also find that investors incorporate ESG information into their investment decisions. My results show that there is a negative association between excess returns and ESG performance, suggesting that the stock market is more likely to use ESG information to reduce information asymmetry. Additionally, by using two different ESG measures based on local and global criteria for the analysis, the results based on those measures are qualitatively similar. These results should endorse the usefulness of ESG information.

This research study contributes to the field by examining a unique notion that has not been investigated before within a Thai context. This study connects to three main strands of academic research. First, I explore global (ESG_M) and local ESG (ESG_S) performance measures in an emerging economy, which allows for the comparison of diverse effects from those different measures on firm performance and stock market participation. Second, my investigation responds from a broader perspective to the usefulness of ESG information and underlying accounting information—earnings and book value information captured by stock market participants. Third, this research study joins the growing list of academic research in this area that aims to produce empirical evidence of the impact of ESG performance on firms and the stock market in a developing nation. Insights and findings gleaned from this research paper may be applicable to other developing countries.

2. Prior Studies and Hypotheses

This section looks at the prior studies that relate to important theories that have been employed in developing the research conceptual framework and hypotheses in the study. The stakeholder framework by Freeman (1984) has its roots in a number of corporate social responsibilities, in particular sustainability reporting and ESG (Veeravel, Murugesan, & Narayanamurthy, 2024; Velte, 2017). The objective of the stakeholder approach is to formulate methods to manage the numerous groups and relationships that result in a strategic technique. Stakeholders can be any group or individual who is affected by, or can affect the accomplishment of an organization's objectives (Freeman & McVea, 2001). Additionally, legitimacy theory (Dowling & Pfeffer, 1975) deals with the interaction between a firm and society. As part of society, firms should respond to the norms applied in social communities. The social contract between firms and communities is vital, especially with respect to firms' consumption or corrosion of economic resources. According to the stakeholder approach and legitimacy theory, I argue that the rights of any group or individual in society, in particular firms and society, are equal. Thus, all parties' interests should be maximized. To bridge the gap between those theories and practices, I argue that ESG is one of the potential strategic tools that firms can use to balance the interests of different stakeholders. Besides, the application of the ESG strategy is possibly used as a signal for a firm to convey important information to the public, as suggested by the signalling theory. As a result, ESG performance is essential for firms and society.

2.1. ESG in Thailand

SET has promoted Thai listed firms to adopt sustainability measures since 2015. Like other stock exchanges, the sustainability measures outlined by SET include environmental, social, and governance – also known as ESG. SET has formed a portfolio for its sustainability SET index, which includes Thai listed firms that have long-term sustainable returns.

In 2013, SET made its first announcement of ESG ratings for firms that it had officially assessed. The core objective of its ESG rating is to support investment decisions. Participation in ESG rating is voluntary for Thai listed firms. An ESG rating is assigned to a firm that passes the eligibility criteria, which include long-run returns, investment volumes, and firm-specific attributes. An annual review and assessment are conducted to revise a firm's ESG rating. ESG_S has a five-level scoring system, with total scores ranging from zero to 100. The score for Level 1 – the lowest level – starts from 50. Another ESG rating that is also posted on SET's official website is the Morningstar Sustainability Rating – a global sustainability rating that evaluates a firm's ESG performance based on company risk and country risk (hereafter ESG_M). There are five risk levels that range from negligible risk, low risk, medium risk, high risk, and severe risk. Even though ESG_S and ESG_M use different criteria to evaluate firms, the final sum scores from ESG_S and ESG_M are presented within five levels to reduce confusion and make it easier for the public to understand and interpret a firm's ESG rating.

With more than one ESG rating for Thai listed firms released to the public, stock market participants are provided with additional information in their decision-making process. This study uses both ESG_M and ESG_S for its analysis, due to their similarity and comparability according to a five-level measurement system.

2.2 ESG and Firm Performance

Several prior studies have not been able to conclude the relationship between ESG and firm performance. The prior research have employed either aggregated or disaggregated ESG scores at firm level for their studies, and used either firm-based or market-based firm performance measures for their analysis. [Malik and Kashiramka \(2024\)](#) have highlighted a positive relationship between firm performances measured by return on assets, the firm-based performance, and Tobin's Q, which is market-based performance and aggregated ESG scores. However, they find mixed results when using disaggregated ESG scores. This is consistent with the study performed by [Narula et al. \(2024\)](#), which also finds diverse results. According to [Taddeo, Agnese, and Busato \(2024\)](#), the authors find varied results from the relationship between both aggregated and disaggregated ESG scores and the firm-based performance measure. Meanwhile, [Elamer and Boulhaga \(2024\)](#) have found mixed results of the relationship between ESG score and Tobin's Q. [Ho, Nguyen, and Dang \(2024\)](#) have found a positive relationship between ESG and the market-based performance (Q). However, [Veeravel, Sadharma, and Kamaiah \(2024\)](#) find a negative relation between ESG and return on asset, but a positive relation between ESG and Tobin's Q. [Veeravel, Murugesan, et al. \(2024\)](#) have found a positive relation between ESG and both return on asset and Tobin's Q and [Fu, Ren, Tian, Narayan, and Weber \(2024\)](#) have found a positive relation between return on asset and 1-year lag variable of ESG. In addition to these found relationships, results from [Agarwala, Jana, and Sahu \(2024\)](#) reveal no significant relationship between ESG and the firm-based performance, but a negative relationship between ESG and the market-based performance. [Elamer and Boulhaga \(2024\)](#) have found that various firm attributes, i.e., large vs. small firms and poor vs. strong performance firms, have different impacts of ESG on firm performance. [Moffitt, Patin, and Watson \(2024\)](#) have also found that there is a negative relationship between firm performance and ESG when firms have weak internal controls.

Based on the existing literature, I find that 1) ESG data is based on country-specific characteristics, which reduces the likelihood of sharing similarities; 2) ESG proxies used in the existing studies are different, i.e., aggregated vs. disaggregated values or ESG ratings vs. ESG scores. These may cause inaccurate results; 3) ESG strategy is not a direct tool that accelerates a firm's performance, but it may influence a firm's performance indirectly. Thus, ESG information is complex; 4) the existing research employs different research tools to estimate the relationship between ESG and firm performance. For these reasons, I argue that the relationship between ESG and firm performance remains inconclusive. To my knowledge, the literature and studies that focus on the relationship between ESG and firm performance in Thai settings remain scarce—more research is still required. As such, I posit my hypothesis as follows.

H₁: ESG performance is related to firm performance.

2.3. ESG and Stock Market Participations

Regulators choose to promote ESG in order to encourage long-run performances, returns, and possible benefits to be brought to stakeholders such as firms, investors, and social communities. ESG information may therefore attract investors to invest in a firm that is actively participating in ESG activities, because it is expected to be more sustainable compared to a firm that is not participating in ESG activities. Prior research studies have attempted to investigate whether stock market participation is related to ESG information. However, research findings are mixed. [Sahlian, Popa, Banța, Răpan, and Chiriac \(2024\)](#) and [Al-Hiyari and Kolsi \(2024\)](#) have found

a positive relationship between stock price and ESG information; however [Migliavacca \(2024\)](#) and [Nicolas, Desroziers, Caccioli, and Aste \(2024\)](#) have found that ESG information is less value-relevant to stock market participants, such that the relationship between ESG information and stock returns is negative. [Maccarrone, Illuzzi, and Inguanta \(2024\)](#) have revealed that the stock market does not respond to ESG information. [Blomqvist and Stradi \(2024\)](#) have found a negative relation between excess return and ESG, but [Desai \(2023\)](#) has revealed a positive relation between excess return and ESG, when mandatory ESG has been applied.

Prior research studies have tried to provide more insights about the factors influencing the relationship between ESG information and stock returns. For example, [Di Martino, Miglietta, and Poti \(2024\)](#) have studied the relation between ESG information and stock market participation in the banking industry and have found that the relation is negative. [Rahman, Bintoro, Dewi, and Kholilah \(2024\)](#) have broken down the impact of ESG on earnings and book value information. They have found that the presence of ESG has a negative impact on the earnings information value-relevant, but has a positive impact on the book value information value-relevant. However, for the firms with different earnings quality, the impact of ESG on earnings information is positive, and the impact of ESG on book value information is negative, suggesting that firm attributes are important to investors' decision-making. [Pandey, Kumari, Palma, and Goodell \(2024\)](#) suggest that firm governance is a significant factor inducing the stock market's participation with regards to ESG information. The positive relation between ESG and stock returns is more pronounced for a firm with a strong ESG reputation. Consistent with the study by [Pandey et al. \(2024\)](#) and [Wu, Zhu, and Tao \(2024\)](#) also suggest that a stronger ESG performance of listed companies significantly reduces volatility of excess stock returns, implying that ESG reputation reduces abnormal return volatility. However, [Sun, Luo, Yiu, Yu, and Ding \(2024\)](#) have stated that a strong ESG reputation may possibly have both positive and negative consequences for firms. [Yang, Bao, and Zhang \(2024\)](#) have provided insights that ESG performance and the presence of an abnormally positive tone in annual reports have a positive relationship. Managers in firms with a strong ESG performance are more likely to use an overly positive tone and tend to inflate that tone within annual reports. [Chen, Kang, Koedijk, Gao, and Gu \(2024\)](#) have found that the ESG reputation relates to stock market participation. Like [Chen et al. \(2024\)](#) and [Long et al. \(2024\)](#) have revealed that the different ESG scores have no different impact on abnormal returns in thriving or failing economies. In addition, [Long et al. \(2024\)](#) suggest that country-, firm-, and period-specific conditions are important factors within the study of the impact of ESG information on investors' decisions.

Based on these existing studies, I argue that the stock market is more likely to capture ESG information. However, since ESG information is complex, stock market participants are likely to respond to ESG information differently, leading to inconsistent results. In addition, each country's stock market has its own characteristics, which may cause different results. Drawing from prior findings, I argue that the relation between ESG information and stock market participation is inconclusive. Thus, I posit my hypothesis as follows.

H₂: Stock market participants incorporate ESG information as a factor for their investment decisions.

3. Data and Methodology

I have applied descriptive and inferential statistical techniques on data samples of listed firms in the SET from 2018 to 2023. Data has been retrieved from the SET Market Analysis and Reporting Tool (SETSMART) offered by SET. A series of analyses, including a correlation matrix and dynamic panel data analysis with two-step system GMM, has been used to pull out important insights. [Table 1](#) presents a definition of variables employed in this study.

Table 1. Variable definition.

Variable	Definition
ESG	ESG score: ESG_M or ESG_S
FP	Net profit scaled by total assets
FP _{t-1}	One-year lag variable of net profit scaled by total assets
ESG_M	ESG risk measured by Morningstar
ESG_S	ESG risk measured by the Securities Exchange of Thailand (SET)
DE	Debt-to-equity ratio
GRW	Price per book value per share scaled by stock price
DY	Dividend yield
MV	Natural logarithm of market capitalization
CG	Corporate governance score
AGM	Annual general meeting score
SCAN	Indicator variable if the firm's committee is reported on scandal issues
RT	12-month stock returns from stock price at 5-month after year-ended
AAR	Average 12-month annual returns
CAR	Cumulative 12-month annual returns
TA	Natural logarithm of total asset
EPS_ESG	Interaction of earnings per share and ESG risk
BV_ESG	Interaction of book value per share and ESG risk

3.1. Empirical Model Specification

The model to explore the first research question and test H1 in this study is as follows:

$$FP_{it} = \mathcal{F}(FP_{it-1}, ESG_M_{it}, DE_{it}, GRW_{it}, Controls) + \varepsilon_{it} \quad (1)$$

$$FP_{it} = \mathcal{F}(FP_{it-1}, ESG_S_{it}, DE_{it}, DY_{it}, Controls) + \varepsilon_{it} \quad (2)$$

FP is a firm performance measure. The coefficients of ESG_M and ESG_S are our primary interest. However, the expected sign of the coefficient is not predetermined. I employ two types of ESG measures as aforementioned. I add firm size (MV) and year indicator as control variables. Sample selection bias is a possible major factor of endogeneity. I regress firm performance on ESG risk by using ordinary least squares (OLS) estimation, and compare coefficients obtained from fixed effect and random effect models by using the Hausman test. The results suggest employing a fixed effect. Prior studies, Saleh, Latif, Bakar, and Maigoshi (2020) and Ullah, Akhtar, and Zaefarian (2018) suggest that fixed effect estimation partly reduces the issue of endogeneity, implying that the endogeneity may mislead the result interpretation and conclusion. To overcome the potential endogeneity problem, I employ the dynamic panel data analysis with two-step system GMM, as we use lag variables as instruments. Besides, I added CG, AGM, and SCAN as additional instruments. Based on Roodman (2009), I use the two-step system GMM because firm-year observations are large, while the number of time periods in this study is small. GMM allows the inclusion of both the past values of dependent variables, known as internal instruments and external instruments. In addition, bias and standard errors tend to be lowered by using the two-step GMM.

To confirm results, I also employ propensity score matching analysis, another method to mitigate the endogeneity problem. I perform a two-step analysis. I use a logit model for the first step, and the treatment effects estimation as the next step. The logit model is operationalized as follows.

$$ESG_{it} = \mathcal{F}(DE_{it}, GRW_{it}, CG_{it}, AGM_{it}, SCAN_{it}) + \varepsilon_{it} \quad (3)$$

3.2. Stock Market Participation

Given the increasing interest in ESG risk in a firm, and responding to the second research question in this study, I employ the stock return-specification model (Ohlson, 1995) to explain if ESG risk provides shareholders with value-relevant information. In these settings, the empirical study expects to address whether market participants incorporate ESG risk when assessing firm performance. I operationalize the model to test our H2 as follows.

$$R_{it} = \mathcal{F}(BV^*ESG_{it}, EPS^*ESG_{it}, TA_{it}) + \varepsilon_{it} \quad (4)$$

Coefficients of EPS*ESG_{it} and BV*ESG_{it} are of interest. However, the sign of those coefficients is not anticipated.

I complement the stock return-specification model by using the firm's abnormal returns over 12-month period. The abnormal return is obtained from the market model for each i firm, estimated by OLS and using

monthly data in the estimation period. Monthly abnormal returns (AR_i) for security i are obtained from the difference between the actual and expected returns as follows:

$$AR_{it} = R_{it} - E[R_{it}|X] = R_{it} - a_i - b_i R_{mt} \quad (5)$$

Average abnormal returns (AAR) and cumulative abnormal returns (CAR) are calculated as follows.

$$AAR_{it} = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (6)$$

$$CAR_{it} = \sum_{i=t1}^{t12} AR_{it} \quad (7)$$

To determine the assessment of market participants towards firms with different ESG risks and their stock returns, the following model specification is operationalized:

$$Y_{it} = f(ESG_{it}, Controls) + \varepsilon_{it} \quad (8)$$

Where Y is average abnormal returns (AAR) or cumulative abnormal returns (CAR). *Controls* include year indicators.

4. Results

4.1. Descriptive Statistics

Table 2 presents summary statistics for the variables used in our empirical models. Based on this study's main interests, firm performance (FP) measured by the ratio of net profit to total assets is varied among sample firms. The medians of ESG risk assessed by Morningstar (ESG_M) and SET (ESG_S) are 0, suggesting that the large group of samples firms do not participate in ESG risk assessment by the third-party assessors or SET.

Table 2. Descriptive statistics.

Variable	Mean	Median	SD	Min.	Max.	N
FP	0.037	0.033	0.075	-0.790	0.852	2470
FP _{t-1}	0.043	0.038	0.069	-0.668	0.465	1598
ESG_S	0.834	0	1.338	0	4	2470
ESG_M	1.019	0	1.520	0	5	2015
DE	1.134	0.81	1.323	0	23.6	2470
GRW	0.714	0.223	5.658	0.001	220.971	2470
DY	4.353	3.55	4.138	0.01	54	1223
MV	22.511	22.170	1.685	18.743	27.862	2015
CG	2.550	3	0.733	1	3	2015
AGM	4.280	4	0.807	0	5	2015
SCAN	0.979	1	0.145	0	1	2015

Table 3. Correlation: Spearman (Pearson) correlation is presented in above (Below) diagonal.

	FP	ESG_M	ESG_S	DE	GRW	DY	MV	CG	AGM	SCAN
FP		0.134**	0.030	-0.364**	0.009		0.324**	0.175**	0.084**	0.003
ESG_M	0.121**			0.175**	-0.189**		0.715**	0.307**	0.294**	-0.082**
ESG_S	0.018			0.240***		-0.025	0.587***	0.493***	0.341***	0.047*
DE	-0.285**	0.153**	0.147***		0.102**		0.135**	0.037	0.012	-0.067**
GRW	-0.019	0.009		0.012			-0.240**	-0.192**	-0.118**	-0.049*
DY			-0.023							
MV	0.257**	0.694**	0.609***	0.093**	0.008			0.442**	0.336**	-0.108**
CG	0.136**	0.274**	0.446***	0.011	-0.044*		0.400**		0.410**	-0.004
AGM	0.108**	0.236**	0.305***	-0.023	-0.009		0.291**	0.377**		-0.040
SCAN	0.009	-0.093**	0.040	-0.101**	-0.001		-0.120**	-0.006	-0.042	

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

4.2. Correlation Analysis

Table 3 tabulates two measures of correlation matrix for our variables. Both Spearman and Pearson correlation results are qualitatively similar. The correlations for main analyses are relatively low in their coefficients, and I would expect a low possibility of multi-collinearity in the regression model (Gujarati, 2004). However, prior studies (i.e. (Aziz, Alshdaifat, Latiff, & Osman, 2024; Cabaleiro-Cerviño & Mendi, 2024; Elamer & Boulhaga, 2024; Fu, Yu, Guo, & Zhang, 2024; Veeravel, Murugesan, et al., 2024)) suggest that endogeneity are potential issues for the ESG analysis. I use lag variable of FP and ESG as instrument variables. In addition, I adopt the view that the ESG score should contain relevant information complementary to the information contained in measures, including corporate governance (CG), quality of annual general shareholders' meeting (AGM), and the scandal of firm's executive management (SCAN). I therefore include those orthogonalized variables as additional instrument variables.

4.3. Regression Analysis

Table 4 depicts the baseline regression results of the impact of ESG on firm performance. I use OLS to estimate those baseline regressions by using two different ESG score estimates, control variables, and year indicators with the industry cluster-robust standard error estimation. The particular attention is to obtain the estimated coefficients of the core explanatory variables: *ESG_M* and *ESG_S*. As presented in the table, the results from both regressions suggest that firm performance is statistically significantly negatively related to both types of ESG score, implying that ESG may not be a potential factor to improve firm performance.

The study's baseline results are inconsistent with the results of prior studies that find a positive association between ESG and firm performance. It should be noted that this study's ESG proxy is based on a 5-rating scale measure, which is different from those employed within existing literature. For instance, Malik and Kashiramka (2024) and Veeravel, Sadharma, et al. (2024) have found a positive relation when using ESG scores as proxies. Velte (2017) uses a binary ESG between 0 and 1, and finds a positive association. Nevertheless, my baseline results suggest that the ESG ratings evaluated by different standard setters are in line with each other, in terms of the effect on corporate operating performance.

Table 4. OLS regression with industry-cluster robust standard error.

$FP_{it} = f(ESG_{it}, DE_{it}, GRW_{it}, DY_{it}, MV_{it}, Control) + \varepsilon_{it}$				
Dependent variable: FP	ESG_M		ESG_S	
Cont.	-0.206	(-4.7) ***	-0.222	(-4.45) ***
ESG	-0.002	(-1.70) *	-0.003	(-2.37) **
DE	-0.021	(-6.36) ***	-0.021	(-6.57) ***
GRW	0.016	(5.08) ***	0.015	(5.10) ***
DY	0.002	(2.20) **	0.002	(2.21) **
MV	0.012	(9.10) ***	0.012	(8.73) ***
Year indicator and control variables included				
Adj. R ²	0.19		0.192	
N	1,553		1,553	
F	14.52***		15.35***	

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

To respond to H₁, Table 5 shows the main results from the dynamic analysis with two-step system GMM estimation. The obtained results are mixed and are consistent with a few prior studies (Taddeo et al., 2024; Veeravel, Murugesan, et al., 2024; Veeravel, Sadharma, et al., 2024). The main interest is the coefficient of ESG. The coefficient estimates of both ESG score measures are statistically significant. However, they show the opposite sign. The tests of the model's overidentifying based on the Sargan test and the Hansen test are not rejected, suggesting that the model specification is not overidentified. Untabulated difference-in-Hansen tests of exogeneity of instrument subsets are not statistically significant, suggesting that endogeneity issues are observed.

I perform a robustness test to confirm the main result by using the propensity-score matching (PSM) analysis method. By using PSM, I am able to compare between ESG-driven and non-ESG-driven firms. PSM will reduce selection bias. For the comparison analysis, PSM generates a new control sample group through the

selection of control samples who have a similar propensity for treatment as the treated samples (Benedetto, Head, Angelini, & Blackstone, 2018). In this study, PSM is the probability that a firm engages or does not engage in ESG policy (dependent variable), based on characteristics of the firm and other variables (predictors). Such probabilities are estimated by using the logit model.

I construct ESG in two groups - where 1 represents firms participating in the ESG assessment process, and 0 otherwise - for both ESG measures. The first step is estimated by using the logit model as presented in Table 6. The core curiosity is the estimate of FP. The result indicates the statistical significance with a positive sign for the coefficients of FP for both ESG score measures, suggesting that ESG-driven firms are more likely to have better firm performance relative to non-ESG-driven firms. My robustness result is consistent with the prior study, evidenced by Velte (2017), which finds a positive association between ESG and firm performance when using an ESG proxy that is measured between 0 and 1. Additionally, the results based on ESG_M and ESG_S are in a similar manner, suggesting that both ESG_M and ESG_S are related to firm performance in the same direction.

According to my main findings and robustness tests, the positive association of ESG and firm performance is observed when mitigating some endogenous issues. As documented by prior studies, the influence of ESG on firm performance is volatile. With a six-year time span in this analysis, it may not be sufficient. I take the view that the varying results are due to the outcomes from ESG implementations that possibly require a longer time to be identified. I also view that ESG strategic projects are more likely a long-term investment. For a long-term investment, I argue that other firm-specific factors may possibly influence the outcomes of ESG investments, i.e., changes in firm strategic policy. Thus, I am more likely to argue that the interpretation of any finding should be performed with caution. Overall, this study's results imply that corporate performance is more likely to be pronounced if firms employ ESG strategies, especially in the long run.

Table 5. Dynamic analysis with two-step system generalized method of moments.

GMM	ESG_M		ESG_S	
Cont.	-0.754	(-2.61) ***	0.301	(1.78) *
FP _{t-1}	0.340	(4.31) ***	0.764	(4.33) ***
ESG	-0.038	(-2.09) **	0.016	(2.19) **
DE	-0.022	(-2.27) **	-0.012	(-1.3)
GRW	0.000	(-0.03)		
DY			-0.012	(-4.29) ***
MV	0.038	(2.76) ***	-0.011	(-1.39)
	Year included		Year included	
N	1598		1223	
Wald χ^2	82.16***		51.84***	
Sargan test	0.470		0.677	
Hansen test	0.545		0.360	
AR (1)	(-3.77) ***		(-2.58) **	
AR (2)	-1.550		-0.920	

Note: *p < 0.1, **p<0.05, and *** p<0.01.

Table 6. Propensity-score matching analysis.

Logit model - First step	ESG_M		ESG_S	
Cont.	-6.186	(-10.97) ***	-7.559	(-12.13) ***
DE	0.265	(-5.41)	0.068	(1.60)
GRW	0.004	(0.46)	-0.008	(-0.82)
CG	0.955	(9.19) ***		
AGM	0.750	(8.19) ***	1.220	(14.00) ***
SCAN	-0.601	(-1.85) *	1.696	(3.76) ***
Treatment effects on the treated				
FP	0.031	(7.02) ***	0.034	(10.47) ***
N	2015		2470	
χ^2	330.38***		265.19***	
Pseudo R ²	0.128		0.099	

Note: *p < 0.1, and *** p<0.01.

To respond to H₂, I proceed further by estimating the stock market participation and ESG information which results are presented in Table 7. In Panel A, the primary interests are the coefficients of *EPS_ESG* and *BV_ESG*. The results suggest that the information of book value interacted with ESG information (*BV_ESG*) is value-relevant to stock market participants, for both ESG score measures. Their coefficients have a positive sign (0.165 for *ESG_M* and 0.246 for *ESG_S*) with statistical significance. It suggests that the stock market participant perceive book value information in ESG-driven firms as an essential factor in the determination of firm value. The high stock market participation corresponds to book value information of the firm with higher ESG scores relative to lower ESG scores. The coefficient of *EPS_ESG* is statistically significant with positive sign for only ESG scores assessed by SET (0.715). The stock market participants perceive earnings information higher in the firm with high ESG scores relative to low ESG scores assessed by SET. The explanatory power from 2 estimates – *ESG_M* and *ESG_S* are 0.367 and .0002, respectively. The result suggests that the interaction of earnings and book value information with ESG scores measured by Morningstar can be used to explain stock market participation better than that with ESG scores measured by SET. Panel B presents the regression of average abnormal return and cumulative abnormal return on ESG scores. A similar pattern arises for all cases, where statistical significance and a negative relation is retained. This suggests that ESG disclosure is more likely to reduce information asymmetry. Thus, an abnormal return is less likely to be observed in ESG-driven firms relative to non-ESG-driven firms.

My findings suggest that the stock market participants incorporate ESG information for their investment decisions. The result also suggests that ESG information can be used to reduce information asymmetry. The results based on *ESG_M* and *ESG_S* are in the same strand, suggesting that both are value-relevant to stock market participants and can be employed to mitigate information asymmetry. Overall, my results are consistent with prior studies in concluding that the stock market captures ESG information for their decision-making (Pandey et al., 2024; Sun et al., 2024).

Table 7. Stock market participations.

Panel A simple return model with fixed effects				
	ESG_M		ESG_S	
Cont.	-4.193	(-1.67) *	-3.380	(-1.16)
BV_ESG	0.165	(69.6) ***	0.246	(6.79) ***
EPS_ESG	0.855	(1.47)	0.715	(3.47) ***
TA	0.264	(1.66) *	0.212	(1.14)
N	2470		2470	
R ²	0.3667		0.0024	
Panel B1 abnormal return model with fixed effect				
	ESG_M			
	AAR		CAR	
Cont.	-0.986	(-6.06) ***	-11.788	(-6.04) ***
ESG	-0.066	(-2.70) ***	-0.797	(-2.72) ***
	Year included			
N	2216		2216	
Adj. R ²	0.021		0.021	
Panel B2 abnormal return model with fixed effect				
	ESG_S			
	AAR		CAR	
Cont.	-1.007	(-5.34) ***	12.04	(-5.33) ***
ESG	-0.046	(-2.27) ***	-0.56	(-2.28) ***
	Year included			
N	2216		2216	
Adj. R ²	0.019		0.019	

Note: * $p < 0.1$, and *** $p < 0.01$.

5. Conclusions

This study looks at the growing list of research on ESG information, firm performance, and their market impact. It has focused on data within a Thai context. To extend the existing studies, my findings reveal the

positive association between ESG activities and firm performance. However, ESG is a complex operation that is more likely related to many factors. My baseline results show a negative relation between ESG and firm performance. After mitigating endogeneity problems by incorporating factors including corporate governance, annual general meeting quality, and firm executives' scandals, the association between ESG and firm performance becomes positive. Therefore, I argue that first, the caveat is about the analysis method applied to the study and the interpretation of the findings. Second, varying results may be caused by firm-specific conditions, such as obscure vs. clear financial reporting, or different firm business strategies that could be a major factor influencing the role of ESG on firm performance, as suggested by Long et al. (2024). Third, because of different ESG performance information released to the public, investors may use different ESG information for their decisions, leading to unpredictable outcomes.

My findings confirm that stock market participants incorporate ESG information into their investment decisions. The value relevance of ESG information is pronounced. The relationship between ESG and excess returns is negative, suggesting that a firm with strong ESG performance tends to reduce excess returns. This implies that ESG information may be a possible tool to mitigate information asymmetry for investors.

My findings contribute to existing studies, and I highlight the need to understand the impact of ESG information on firm performance and stock market participations. In line with Feng, Wang, and Huang (2015) and Fu et al. (2024) I would suggest that policymakers and firm managers should consider with caution how to implement ESG, and what ESG strategy should be included in business, because ESG varies substantially by industry (Malik & Kashiramka, 2024).

To bridge the gap between theory and practice, this study offers two important contributions. First, it adds to the ongoing concern over firms engaging in ESG investment. The findings reveal that ESG investment is more likely to improve firm performance. I contend that when firms contribute to ESG investment to highlight stakeholder interests, they are able to enhance their financial performance. This supports the viewpoint of stakeholder theory. Second, stock market participants respond to ESG information. I contend that ESG strategy supports legitimacy theory on the notion that ESG strategic policy is likely to encourage social impact and can be used to connect social communities by inducing information and knowledge sharing among participants. These should aid in building a firm's competitive advantage.

For a firm's management and policy implications, the findings imply that firms are more likely to gain advantages from their ESG strategies. The enhancement of firm performance is more pronounced for ESG-driven firms. I take the view that when the cost of ESG initiatives is to form strong relationships among stakeholders, it will become a firm's robust competitive advantage over its competitors, especially for its long-run objectives. Policymakers should consider the development of ESG guidelines that are appropriate for firms in different industries. However, it should be noted that some firms may be involved in ESG and go beyond standard compliance.

This study has some limitations. I have employed a six-year data sample for this analysis, which may not be sufficient to examine the role of ESG. Instrumental variables used in this study may not be sufficient to produce an in-depth analysis. I have left out extensions to other factors that might provide more insights, such as the firm's business policy, future investment in a firm, or firm incentives, which should be duly acknowledged and taken into account for future research.

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