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ESG PERFORMANCE IMPACTING ON SYSTEMATIC RISK OF THE LISTED COMPANIES ON THE STOCK EXCHANGE OF THAILAND

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ABSTRACT

Purpose – The research aims to examine the effect of the performance of environmental, social, and corporate governance (ESG) on the systematic risk of the listed companies on the Stock Exchange of Thailand (SET).

Methodology – The sample data included 158 listed companies on the SET in 2022. Collected annual data were retrieved from financial statements and the stock exchange database system (SETSMART). The statistics used for analysis were descriptive statistics and inference statistics. Descriptive statistics included mean, standard deviation, maximum, and minimum, while inference statistics included correlation analysis and multiple regression analysis.

Results – The research results found that the mean of ESG performance in terms of ESG book and Refinitiv were quite equal at 54.25 and 53.49, respectively. The ESG performance in terms of the ESG book provided a negative relationship with systematic risks at the statistically significant.05 level, while the ESG performance in terms of Refinitiv showed no significant relationship with systematic risks. Interestingly, only the listed companies in the technology sector showed a positive relationship with systematic risks at a.01 statistically significant level.

Implications – The critical role of corporate ESG information is to assess a company's long-term performance for sustainable growth. Therefore, the stock exchange of Thailand must provide knowledge about ESG indices to listed companies and investors to achieve sustainability for both business organizations and investors.

Originality/Value – This empirical study contributes as a specification model to explain how ESG performance impacts systematic risk. Additionally, the different ESG indices provide different results. This implies that a deep understanding of the ESG indices is necessary for listed companies and investors.

Keywords: Environmental, Social and governance: ESG, Systematic risk, ESG performance

Paper Type: Research Article

INTRODUCTION

Presently, the concept of sustainable organizational development is very popular among the global business sector due to the recognition of business sustainability. Numerous companies have conducted their business operations by paying attention to their responsibilities, focusing on three key areas, including the environment, society, and governance, known as ESG. These three areas—environment, social, and governance—are key factors representing the concept of sustainable organizational development. The ESG performance concept has become globally

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embraced not only by business firms but also by investors to evaluate investment choices. The meaning of each key factor starts with “Environment” focusing on a company's environmental responsibility, “Social” measuring its relationships with stakeholders, and “Governance” assessing its management and decision-making processes. The ESG concept is a principle that evaluates how a company handles its governance relationships, aiming for effective, transparent, and auditable management while considering its stakeholders. This approach helps to establish credibility for the business by reflecting on its role and responsibilities towards stakeholders and by presenting operating results to promote sustainable growth.

In Thailand, the Stock Exchange of Thailand (SET) establishes criteria for selecting sustainable stocks. These criteria are based on voluntary participation by listed companies in a sustainability assessment, which covers corporate governance, economics, environmental, and social dimensions. The committee of the SET always reviews and updates the assessment form annually to ensure it aligns with current sustainability trends both internationally and nationally. The listed companies on the SET Sustainable Stocks (THIS) have high potential to incorporate sustainability concepts into their business processes by taking account of risk management, preparing for emerging risks, and dealing with changes in social and environmental factors. Additionally, these companies aim to increase competitive potential and pay attention to all stakeholders. This leads to the increase of several companies in the sustainable stock group annually. This is evidence indicating that the business sector and investors are increasingly attentive to conducting business in line with the ESG sustainability concept. Over time, this trend may lead to a more steady and sustainable growth of the economy (Stock Exchange of Thailand (SET), 2023).

Phokchai (2021) stated that companies that prioritize environmental, social, and corporate governance issues, also known as ESG, play a crucial role in mitigating business risks. Several studies have shown that companies with strong ESG performance are associated with lower risks, such as a low chance of being sued and a low corruption problem. In addition, the costs of capital of the ESG firms may be lower and gain more advantages in accessing capital sources than those of the other companies, which do not apply to the ESG concept. Even though the stock prices of sustainability companies may fluctuate according to capital market conditions, their ESG stock prices will be less volatile than those of others in the long term. Hence, it can be inferred that ESG performance is interconnected in terms of risk management, competitive potential, and stakeholder acceptance. All of which are directly linked to the long-term survival and sustainable growth of the business.

Most prior research has focused on studying the relationship between business performance and environmental, social, and governance (ESG) considerations and financial performance. Jaisard (2022) studied the relationship between financial performance and conducting business with consideration of the environment, society, and corporate governance (ESG) by using the listed companies on the SET from 2015 to 2021 for 516 companies. The research results showed that there is no statistically significant correlation between environmental, social, and corporate governance responsibility activities and financial performance. However, the ESG performance was positively related to Tobin's Q of sustainable stocks (THSI). Rakpanichmanee et al. (2019) examined the connection between social responsibility performance and the financial performance of publicly traded companies in Thailand. Social responsibility awards were used to measure performance in social responsibility, corporate governance, sustainable development, and sustainable stocks. The firm’s performance was gauged by return on assets (ROA), return on equity (ROE), sales and income growth, and abnormal returns. The research results found that social responsibility performance was positively related to ROA. However, no statistically significant relationship was found between corporate social responsibility performance and abnormal returns, despite investing in award-winning companies.

Despite over 100 empirical studies on the correlation between ESG performance and company performance, there has been limited research on the connection between ESG performance and risk (Suttipun, 2023); however, the studies of the impact of ESG performance on firm risks employed various risk measurement methods. Almeyda and Darmansyah (2019)

pointed out that nowadays, numerous investors consider non-monetary aspects when making investment decisions, such as using ESG performance as a risk measurement tool. Their research was about real estate companies in the seven strongest economies in the world (G7), whose long-term nature of investments aligns with their long-term ESG goals. Research results indicated that there was a statistically significant positive relationship between disclosing ESG information and a company's ROA and ROC. However, there is no strong connection between the stock price and the price-earnings ratio. A company with a higher ESG performance signaled to lenders that it had a strong management system. The signaling theory can be used to illustrate how ESG improvements can lower firm risk, which directly impacts lenders' choices to approve loans or lower interest rates. However, improving ESG efficiency can also raise a company's risk profile.

Due to the aforementioned factors, a few prior studies focused on the impact of ESG performance on the systematic risk of firms. Therefore, the researchers decided to close the research gap by investigating the correlation between environmental, social, and corporate governance (ESG) responsibility scores and the systematic risks of the listed companies on the SET. Accordingly, the objective of the research was to study the relationship between the environment, society, and corporate governance (ESG) performance with the systematic risk of the listed companies on the stock exchange of Thailand. This involved analyzing and assessing the results in order to offer valuable insights to firms and potential investors in terms of long-term investment. The study will contribute to many parties. For the firms, the result can help improve their long-term business according to the sustainability concept. For investors, this study can provide good investment decisions for long-term investments. Also, for the commission of the stock exchange of Thailand, the study can provide insights in many aspects, such as the suitable ESG criteria for Thai companies, stimulating the listed companies to participate in the SET Sustainable Stocks (THIS), educating more companies and investors, etc. The paper is organized in a proper manner. The next section included a literature review, then the methodology and data, empirical results and discussion, and finally conclusions and discussion from the study.

LITERATURE REVIEW

Relevant theory

The study involves two major theories: the stakeholder theory and the capital asset pricing theory. The details of each theory are explained below.

The stakeholder theory

In this study, the aim of the research can be explained through the Stakeholder Theory, which states that executives must pay attention to and consider the satisfaction of stakeholders. This will lead to an increase in the value of the business" (Freeman, 1984). Freeman and McVea (2001) stated that the concept of stakeholder management, or strategic management, was to advise executives to create and execute procedures to respond to stakeholder needs. The main objective of this approach is to oversee and harmonize the connections and concerns of shareholders, employees, customers, suppliers, communities, and other groups in a way that guarantees the company's long-term prosperity. The stakeholder approach prioritizes managing the business environment, relationships, and fostering mutual advantages. The stakeholder theory explains the relationship between stakeholders and the financial management of firms. The company's operations will have an impact on the stakeholders in terms of both firm operation profits and various company liabilities. If a company can make a profit, stakeholders will also receive benefits from the firm. In this regard, the company should have disclosed information to stakeholders, such as general information and especially financial information, in a transparent and auditable manner. This will reduce the problem of information asymmetry; concurrently, it will make the company more reliable, affecting the level of confidence and decision-making of investors.

The capital assets pricing theory

In fact, the birth of the capital asset pricing model (CAPM) started with two major researchers: William Sharpe in 1964 and John Lintner in 1965 (resulting in a Nobel Prize for Sharpe in 1990) (Fama & French, 2004). The attraction of the CAPM is that it offers powerful and

intuitively pleasing predictions about how to measure risk and the relationship between expected return and risk. The expected return of an investment equals the risk-free return plus the market risk premium, according to the following formula:

$$E(R)=R_f+\beta(R_m-R_f)$$

where: $E(R)$ = the expected return
R_f = the risk-free rate
B = the risk of the security
(R_m-R_f) = the market premium

According to Lee and Su (2014), according to the CAPM theory, risk is divided into systematic and unsystematic risk. Systematic risk means that the market cannot be eliminated, or undiversifiable risk. On the other hand, unsystematic risk means that the risk is related to a specific company, industry, or unique risk. Thus, systematic risk is the uncertainty inherent to the entire market or entire market segment. The major sources of systematic risk, such as interest rates, recessions, and exchange rates, affect the entire market and cannot be avoided through diversification. As a result, systematic risk can be known as “market risk." Systematic risk underlies all other investment risks. Based on the capital assets pricing theory (CAPM), the beta coefficient is a measure of the systematic risk of a security, or a portfolio compared with the market as a whole, and it is also used to compare a stock's market risk to that of other stocks. The calculation for Beta is as follows:

$$\text{Beta coefficient } (\beta) = \frac{\text{Covariance } (R_{e,}R_m)}{\text{Variance } (R_m)}$$

where: R_e = the return on an individual stock
R_m = the return on the overall market

Related concepts

The concept of corporate social responsibility

In a capitalist economy, there are companies that aim to maximize profits through production or services, which is the primary driver of a country's growth and development. However, the production sector also brings about social and environmental issues, such as the exploitation of workers and customers, as well as the destruction of ecosystems. As a result, the idea of sustainable development has become a commonly debated topic in the realm of business practices. Engaging in social responsibility activities will have a positive impact on society and the environment, while also enhancing the company's reputation and value. The concept of corporate social responsibility (CSR) has emerged from the expectations and pressures of society, urging businesses to take responsibility for their impact on all stakeholders in their operations (Noknoi, 2015).

CSR, another meaning of the World Business Council for Sustainable Development, or WBCSD, states that it is an ongoing commitment by an enterprise or business to operate based on good morals and to achieve economic development and increase the quality of life of its employees, including benefiting the community and society.

The concept of environmental, social, and corporate governance (ESG) responsibility

The concept is built upon the principles of CSR and is increasingly gaining attention worldwide, particularly among investors. It emphasizes conducting business with consideration for three key areas of responsibility: the environment, society, and corporate governance. It emphasizes the significance of the organization's activities being beneficial to the environment or society, rather than solely focusing on the financial performance of the firm. The sustainability risk relates to the ESG issues, encompassing the environment, society, and corporate governance, or ESG risk. The ESG risk challenges business organizations to effectively manage to create opportunities and minimize potential negative impacts. It has a direct impact on a company's ability to generate operating profits, business competition, business image and reputation, and ultimately firm survival. Therefore, firms must consider this issue by integrating sustainability risk management into the creation of the organization's mission and strategies. In addition, firms must analyze

sustainability risk and materiality to incorporate risk management at various levels to build confidence among stakeholders (Noknoi, 2015).

Some companies may view ESG as causing higher costs and expenses. However, the ESG issues promote business image, resulting in generating company income or developing operating processes to increase production efficiency and reduce costs, such as employing solar energy projects in factories, changing waste into fuel, and processing waste into value-added products. This is evidence that companies can reduce production costs while also protecting the environment. In the case of inventing products and services that are environmentally friendly, For instance, the development of building materials to minimize heat and conserve energy, as well as the production of electric cars, are evidence to enhance product value, expand into new products, and generate revenue from environmentally conscious customers. In today's world, a number of green consumers who are concerned about global environmental conservation are increasingly aiming to support businesses that demonstrate social and environmental responsibility in their operation of products and services. In summary, it is evident that ESG is a pertinent issue that has an impact on everyday life and plays a role in the financial success and longevity of a business. This will ultimately affect the long-term returns of investors investing in the business. Therefore, it is not surprising that global investors are concerned and consider the ESG concept before making investment decisions. Many institutional investors, such as Investment Partners, BlackRock, and BNP Paribas, have reported that ESG scores have a consistent relationship with long-term investment returns. Currently, there are more than 1,500 stock funds that invest in firms compliant with the ESG framework. Many listed companies in Thailand have high ESG scores on the global stage, leading to high satisfaction and a high opportunity to raise funds (Kongsakul, 2019).

Concepts about firm characteristics

Much research employs firm characteristics such as profitability, firm risk, capital structure, and liquidity as a dependent variable, independent variable, or control variable because the firm characteristics are major factors impacting firm goals. The proxies of firm characteristics are always employed from financial statements or financial ratios, as shown in the papers of Suttipun (2023), Chueathong, and Bunworachot (2023).

One of the popular firm characteristics is firm size because large-scale companies have a higher level of competitiveness than small companies, implying that they have a large fund for business operations and a great opportunity to obtain large profits. The total value of a company's assets determines its size. Firm size is calculated as follows:

$$\text{Firm size} = \ln(\text{Total assets})$$

Firm size was a variable found in many researchers' papers, such as Jaimuk et al. (2020) as a control variable for studying the impact of a mediator on corporate governance characteristics and real earning management of Thai listed companies, Meiryani et al. (2020) as an independent variable for investigating the effect of a firm's size on corporate performance, and Nilapornkul (2019) as a control variable for examining the impact of information communication technology and cash conversion cycle on a firm's profitability.

Prior research

Many research papers aim to examine the effect of the ESG approach on many aspects, such as risk, firm performance, and cost of capital. Examples of prior research are presented below.

Sudcharoen (2021) found that an increase in environmental, social, and good governance or ESG performance can reduce risks. that can be systematic risk.

Amattayakul et al. (2021) found that the information factor affecting the sustainable growth of listed companies with a positive statistical significance level of.05 was profitability (ROA). Meanwhile, the debt-to-equity ratio (D/E) had a negative correlation with sustainable growth.

Velte (2017) examined the listed companies listed on the German Prime Standard during 2010–2014. The research results showed that ESGP has a positive impact on ROA but no impact on Tobin's Q. Corporate governance performance has the strongest impact on financial performance, or ROA, in comparison to environmental and social performance.

Broadstock et al. (2021) found that high-ESG portfolios generally outperform low-ESG portfolios, ESG performance mitigates financial risk during financial crises, and the role of ESG performance is attenuated in 'normal' times, confirming its incremental importance during crises.

METHODOLOGY

This study investigated the effect of environmental, social, and corporate governance (ESG) performance on the systematic risk of the listed companies on the stock exchange of Thailand (SET). The research methodology consisted of three subsections: 1) scope of the research, population, and sample size; 2) data collection and variable selection; and 3) data analysis. The details of each subsection are explained below.

Scope of the research, population, and sample

The study focused on Thai listed companies on the Stock Exchange of Thailand (SET), consisting of eight industrial sectors: the agro-food sector, resources sector, technology sector, financials sector, services sector, industrial products sector, consumer products sector, and property and construction sector. Importantly, the researcher employed listed companies with SET ESG scores in 2022. Furthermore, researchers used two major ESG scores: SET ESG scores and Refinitiv scores. The study excluded unlisted and delisted companies and companies with unavailable data. Finally, the study included 158 companies for the research period of 2022, as shown in Table 1 below.

Table 1. Listed companies in each industry sector

Industry sector	A number of companies	Stock Code* (Coded by SET)
Agro & Food Industry	20	ASIAN, CBG, CFRESH, CPF, GFPT, HTC, MINT, NRF, OSP, PM, RBF, SNP, STA, TFMAMA, TIPCO, TKN, TU, TVO, TWPC, and ZEN
Consumer	4	SABINA, STGT, TNL, and TOG
Financials	20	AEONTS, BAM, BAY, BBL, CIMBT, KBANK, KKP, KTB, KTC, LHFG, MTC, SAK, SAWAD, TCAP, THANI, THREL, TIDLOR, TISCO, TQM, and TTB,
Industrials	16	AH, BGC, CSC, IRC, IVL, PCSGH, PTTGC, SAT, SCGP, SNC, THIP, TMT, TPCS, TSC, TSTH, and UAC,
Property & Construction	28	AMATA, AMATAV, AP, AWC, CK, CPN, DRT, EPG, FPT, LH, LPN, NVD, ORI, PPP, PSH, QH, S, SC, SCC, SCCC, SIRI, SPALI, STEC, SYNTEC, TASCO, TOA, TTCL, and WHA
Resources	28	ACE, BAFS, BANPU, BCP, BCPG, BGRIM, BPP, CKP, EA, EASTW, EGCO, ESSO, GPSC, GULF, GUNKUL, IRPC, OR, PTG, PTT, PTTEP, RATCH, SCG, SPRC, SUPER, TOP, TPIPP, TTW, and WHAUP
Services	31	AAV, AOT, BCH, BDMS, BEC, BEM, BH, BJC, BTS, BWG, CENTEL, CHG, COM7, CPALL, DOHOME, ERW, GLOBAL, HMPRO, KEX, MAJOR, MAKRO, MEGA, NYT, PLANB, PR9, PRM, RS, SINGER, SJWD, TTA, and VGI
Technology	11	ADVANC, DELTA, HANA, ILINK, INTUCH, ITEL, KCE, MSC, PT, SYNEX, and THCOM
Total	**158**	

Data collection and variables usage

In their research, researchers employed systematic risk as a dependent variable. While the independent variable was environmental, social, and corporate governance (ESG) performance from two third parties as ESG book scores and Refinitiv scores, The control variable was the firm's size. All data was secondary data, which was obtained from the SETTRADE website database and

the annual financial statements of each company. The definitions of variables, their mnemonics, and sources of data are shown in Table 2 below.

Table 2. Definitions, mnemonic, and sources of data of each variable

Variables	Mnemonic	Definitions	Sources of data
Dependent variable			
Beta Coefficient	*Beta*	Systematic Risk	the SETTRADE website database
Explanatory variables			
1. ESG performance	*ESG*	ESG Ratings by ESG book	the SETTRADE website database
2. ESG performance	*Ref*	ESG Ratings by Refinitiv	the SETTRADE website database
Control Variable			
Firms' size	*Size*	Size = ln(Total assets)	Firms' Financial Statement 2022 and own calculation
Dummy variables			
Industry sector	D_i	D_1 = 1 for consumer, otherwise 0; D_2 =1 for Financials, otherwise 0; D_3 = 1 for Industrial, otherwise 0; D_4 = 1 for Property&Construction, otherwise 0; D_5 = 1 for Resource, otherwise 0; D_6 = 1 for Service, otherwise 0; D_7 = 1 for Technology, otherwise 0;	

Data analysis

This research employed statistical analysis below.

• Descriptive statistics were used for describing the characteristics of data in terms of mean, maximum, minimum and standard deviation.

• Pearson correlation and Variance Inflation Factor (VIF) were used to study the relationship of those variables for checking Multicollinearity.

• For inferential statistics, researchers employed both univariate and multivariate regression in terms of Ordinary Lease Square (OLS) regression analysis.

Model Specification

This researcher aimed to study the effect of ESG performance on the systematic risk of the listed companies on the SET. Additionally, a comparison study of the effect of the ESG book and Refinitiv on systematic risk was conducted. Finally, researchers investigated the effect of ESG performance on the systematic risk of listed companies in each industry sector as well. All specification models were below.

$$Beta_i = \beta_0 + \beta_1 ESG_i + \varepsilon_i \quad (1)$$

$$Beta_i = \beta_0 + \beta_1 ESG_i + \beta_2 SIZE_i + \beta_3 D_1 + \beta_4 D_2 + \beta_5 D_3 + \beta_6 D_4 + \beta_7 D_5 + \beta_8 D_6 + \beta_9 D_7 + \varepsilon_i \quad (2)$$

$$Beta_i = \beta_0 + \beta_1 Ref_i + \varepsilon_i \quad (3)$$

$$Beta_i = \beta_0 + \beta_1 Ref_i + \beta_2 SIZE_i + \beta_3 D_1 + \beta_4 D_2 + \beta_5 D_3 + \beta_6 D_4 + \beta_7 D_5 + \beta_8 D_6 + \beta_9 D_7 + \varepsilon_i \quad (4)$$

in which $Beta_i$ is systematic risk for individual i, ESG_i is the ESG scores from ESG book, $SIZE_i$ is individual firm's size, D_i is industry dummy variables, Ref_i is the ESG scores from Refinitive and ε_i is a random error term.

RESULTS

The study analyzes the connection between environmental, social, and governance performance and its impact on the systematic risk of listed companies on the Stock Exchange of Thailand. The

descriptive statistics for each variable are shown in Table 3 to address the research questions or hypotheses and be presented without interpretation or discussion.

Table 3. Descriptive statistics of each variable

Variables	Mean	Maximum	Minimum	Standard deviation
Dependent variable				
Beta	0.9804	3.1100	-0.0900	0.4649
Explanatory variables				
ESG	54.2538	70.1100	30.8200	7.5581
Ref	53.4856	91.4800	10.0400	16.7928
Control variable				
Size	10.6650	15.3021	7.2334	1.7553

Table 3 presents the descriptive analysis of each variable used in the study in terms of mean, maximum, and minimum standard deviation. The mean of systematic risk, measured by Beta, is 0.9804, and its standard deviation is 0.4649. The mean of Beta is slightly lower than 1.00, implying that the systematic risk of listed companies is slightly lower than the market. The mean of the ESG scores by ESG book is 54.2538 out of 100, while the mean of the ESG scores by Refinitiv is 53.4856 out of 100. This shows that the means of both are quite equal and slightly above 50.00. However, the standard deviation of the ESG scores by Refinitiv is quite higher than that of the ESG scores by ESG Book. The mean of the firm's size is 10.6650, and its standard deviation is 1.7553.

Multicollinearity Analysis

To examine the relationship in pairs for each variable, researchers employed the Pearson correlation matrix and the variance inflation factor (VIF). Certainly, these methods also detect a multicollinearity problem before formulating regression models. The correlation and VIF are presented in Table 4 below.

Table 4. The results of correlation and VIFs

VIF		***Beta***	***ESG***	***Ref***	***Size***
	Beta	1.000			
1.11	*ESG*	-0.1503	1.000		
		*0.02**			
1.35	*Ref*	0.0280	0.3130	1.000	
		0.73	*0.00***		
1.68	*Size*	0.0209	-0.1308	0.4248	1.000
		0.79	*0.10*	*0.00***	

The **, and * denote statistically significant at 1%, and 5% levels respectively; whereas P-value expresses in italic format.

As shown in Table 4, the VIFs for all variables range from 1.11 to 1.68, which are lower than 10. Moreover, the magnitude of correlations among explanatory variables is in the range of 0.0209–0.4248, which is lower than 0.80. The criteria for a possible multicollinearity problem are a correlation between explanatory variables above 0.80 or VIFs above 10.0 (Hair et al., 2006). Thus, the results imply that there is no multicollinearity problem.

The correlation analysis showed several noteworthy results. Starting with Beta, ESG had a negative relationship at the statistically significant 5% level. This meant that they had a reverse relationship; if ESG performance was higher, the systematic risk would decline. Surprisingly, the relationship between Beta and Ref had no statistical significance. Then, the relationship between the ESG and Ref had a positive direction at the statistically significant 1% level. This may be because both were the index for measuring the ESG efforts of firms to achieve sustainability.

Finally, the Ref and size had a positive relationship at the statistically significant 1% level. This implies that firms' size may be a major factor impacting their ESG score, according to Refinitiv.

Regression Analysis

From the data analysis section, this study employed four specification models, both univariate and multivariate regression. The results from the regression models are presented in Table 5 below.

Table 5. The results of regression analysis

Variable	Expected sign	Model 1	Model 2	Model 3	Model 4
Constant		1.582	1.485	0.939	0.818
		*0.00****	*0.00****	*0.00****	*0.00***
ESG	-	-0.011	-0.011		
		*0.02**	*0.01**		
Ref	-			0.001	0.000
				0.72	*0.87*
Size			0.004		0.003
			0.87		*0.91*
D_1			0.079		0.021
			0.74		*0.92*
D_2			0.120		0.203
			0.42		*0.18*
D_3			-0.110		-0.087
			0.44		*0.55*
D_4			-0.024		0.024
			0.85		*0.85*
D_5			-0.001		0.016
			0.99		*0.90*
D_6			0.149		0.184
			0.23		*0.15*
D_7			0.717		0.724
			*0.00***		*0.00***
R^2		0.0325	0.2040		0.1727
F-statistic		5.24*	4.21**	0.12	3.43**

Note: Italic Figures are P-value. ** and * denote significance at 1%, and 5% levels respectively.

Table 5 reports the results of four regression models, consisting of univariate and multivariate regression. The details of each model's results are explained below.

Model 1, a univariate regression model, focused on the impact of the ESG score from the ESG book on the beta. The empirical model provides an F-test at the 5% statistical significance level, reflecting the significance of group effects within the model. The model R square is 0.025, implying that the ESG performance can explain systematic risk as the Beta is 3.25%. The ESG performance provides a negative relationship with Beta at the statistically significant 5% level.

Model 2, a multiple regression model, expands from Model 1 by adding the firm's size as a control variable and industrial dummy variables. This model aims to investigate the effect of the industrial sector on the beta. The empirical model provides an F-test at the 1% statistical significance level, reflecting the significance of group effects within the model. The model R square is 0.2040, implying that the ESG performance, size, and industrial dummy variables can explain systematic risk as the Beta 20.40%. The same as in Model 1, the ESG performance provides a negative relationship with Beta at the statistically significant 5% level. Interestingly, listed companies in the technology sector had a coefficient of 2.202 (from 1.485+0.717) at the 1% statistically significant level. This means that technology companies have a positive relationship between ESG scores and systematic risk with statistical significance.

Model 3, a univariate regression model like Model 1, focused on the ESG score from Refinitiv instead of the ESG book. However, the empirical model provides an F-test with no statistical significance, reflecting that the only ESG performance from Refinitiv is not able to explain systematic risk.

Model 4, a multiple regression model like Model 2, expands on Model 3 by adding the firm's size and industrial dummy variables. This model aims to investigate the effect of the industrial sector on the beta. The empirical model provides an F-test at the 1% statistical significance level, reflecting the significance of group effects within the model. The model R square is 0.1727, implying that the ESG performance, size, and industrial dummy variables can explain systematic risk as the beta is 17.27%. The Refinitiv scores have no statistically significant relationship with systematic risk. Interestingly, listed companies in the technology sector had a coefficient of 1.542 (from 0.818 to 0.724) at a 1% statistically significant level, like in Model 2.

DISCUSSION AND IMPLICATIONS

Obviously, the listed companies on the Stock Exchange of Thailand are approximately 700, but the SETESG scores reported only 158 companies, which concern three major areas for a firm's sustainability, including environment, society, and corporate governance. (ESG). For this research, researchers focused the ESG score on only two third parties: the ESG book and Refinitiv. The results showed major findings, which were summarized and followed by suggestions below.

1. The listed companies that are concerned with sustainability concepts and rely on the SET have quite small numbers, being less than 50% of the listed companies on the SET. Thus, the Securities and Exchange Commission of Thailand should pay more attention to encouraging the listed companies to participate in ESG investment.

2. In the comparison between the ESG score from the ESG book and the definition, major findings found that the ESG book score provided a negative relationship with systematic risk at the statistically significant 5% level. This was aligned with the findings of Suttipun (2023) and Velte (2017). This may help to clarify the stakeholder theory, indicating that ESG enhancements can reduce risk and stimulate investors and creditors to provide financial support to firms. Additionally, higher ESG performance will reduce information asymmetry between firms and stakeholders.

3. Unfortunately, the ESG scores from Refinitiv did not impact systematic risk, implying that the different sources of ESG scores provided different results.

4. This is because ESG scores are provided by multiple third-party providers, such as Bloomberg ESG Data, Fitch Ratings, Moody's, Refinitiv, and S&P Global Corporate Sustainability Assessment, etc. They provided their own criteria, although they had the same concepts. In Thailand, the SET reported the ESC scores of the ESG investment for seven criteria. Too many criteria from third-party providers make it more complicated for the listed companies. Therefore, the Securities and Exchange Commission of Thailand should educate related parties about ESG investment and the criteria of each provider, as shown in the contribution section of this research. Some parties cannot impact systematic risk.

5. An ESG score can help identify areas of potential concern and risk from an ESG perspective. It will be beneficial for investors and the listed companies; however, the research found that if the ESG score of the listed companies in the technology sector increases, the systematic risk will increase. This might be a rapid change in technology in the digital era, leading to a huge technology risk in the future.

In addition, the critical role corporate ESG information will play in assessing a company's long-term performance. Notwithstanding, companies must be concerned not only with providing more information but also with their relevance and high quality. (Arvidsson & Dumay, 2022).

LIMITATIONS AND FUTURE RESEARCH POSSIBILITIES

***Limitations of this study are below*.**

1. A number of samples are quite small comparing with the whole number of the listed companies on the SET.

2. In Thailand, there are only two third parties' providers, providing numeric ESG scores. Thus, the research was able to compare only two criteria.

3. For Thailand, ESG investment has just began for a few years and the results will be shown in annual report. Thus, it must take a long time for data collection to employ in terms of panel data analysis.

Further research suggestions are below.

1. Due to several impacts of ESG investment, further research should employ the rate of return as a dependent variable. This will investigate the firm's performance relying on the sustainability concept.

2. Further research should employ other ESG performance methods and investigate in comparison aspects.

CONCLUSION

The study aims to examine the ESG score of only two third parties: ESG Book and Refinitiv, impacting the systematic risk of the listed companies on the stock exchange of Thailand. The major findings found that the companies concerned with the ESG concept in Thailand were quite low, whereas this sustainability concept is interesting issue among international and multinational companies in the globe. In addition, the results showed that the ESG book score provided a negative relationship with systematic risk at the statistically significant 5% level. This confirmed that the higher ESG performance will reduce information asymmetry. Unfortunately, the ESG indices provided a different impact on systematic risk.

Therefore, the commission of the stock exchange of Thailand should provide knowledge and create awareness of the importance of the sustainable growth concept for both business organizations and investors. It is undeniable that the environment, society, and good governance are the result of the sustainable coexistence of mankind for a better quality of life in the future.

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CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest found in this research.

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