Do ESG Scores Conditional on Family-Owned Business and Information Credibility Matter to the Market Reaction?

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ABSTRACT

This study examines the effects of the environmental, social and governance (ESG) scores on the market reaction (measured by risk-adjusted returns, a month-length of the window of returns). Specifically, this study examines whether family-owned firms will affect the investors' perception of credibility of information and the information usefulness when making stock-investment decision accordingly. This study further investigates whether the verification of ESG reports moderates the effect of the ESG scores on the market reaction through the credibility signal. We employed multiple regressions to analyze panel data coving 2017 – 2023 obtained from Thai listed companies. This study reports that there is a positive relationship between ESG scores and the market reactions implying that companies with higher ESG scores tend to receive more favorable responses from the stock market. This suggests that investors perceive strong ESG performance as a signal of good practices for a corporate long-term value creation. In the light of family-owned business, we find no significant effect on the relationship of ESG scores and market reaction. Unexpectedly, we find that ESG scores taken form the ESG report that is verified by external agencies negatively affect market reactions. Our study enriches the evidence on ESG scores are informative to investors when making investment decision. However, the credibility signal on ESG information can worsen market reactions when the ESG rating agency scandals are controversial. We, therefore, encourage companies to focus on the quality of ESG information and invest in trustworthy ESG rating agency to improve reliable ESG scores leading better market reaction to those ESG scores.

Keywords: ESG score, market reaction, family-owned business, creditability signal.

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1. INTRODUCTION

Public companies have increasingly disclosed information on environmental, social, and governance (ESG) issues over the past decade because stakeholders are satisfied when companies consider ESG issues. To ensure ESG data is of high quality and reliable, companies continuously strives to improve the ESG data collection (Hartzmark & Sussman, 2019). Nevertheless, the problem lies with the quality and reliability of ESG disclosures. It is imperative that stakeholders analyze or differentiate between companies that are engaging

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in legitimate ESG activities. Is the report merely designed to meet the needs of stakeholders? It is therefore increasingly likely that companies reporting on ESG will have indicators that will enhance the credibility of their reporting, such as external certifications. The third-party verification indicates that the report has been independently verified to ensure that it has been presented correctly (Gipper et al., 2023). Although ESG scores and verification of ESG affecting market reaction is important, the empirical evidence on this matter is still an open-ended research venue. Hence, it has become our motivation to conduct this study.

In so doing, we employed environmental, social, and governance reporting, this research utilizes the formulas provided in the Refinitive database as our variable of interest, following Carnini Pulino et al., (2022) and Harasheh and Provasi (2022) and Izcan and Bektas (2022). As for stock market reactions – dependent variable, we used Risk Adjusted Returns (RETs). Risk-adjusted rates of return are generally used by investors to measure the level of abnormal profits and losses from investments (de Vincentis, 2023) and to analyze their interaction with market information. We further used ESG reporting that verified by external agencies (Assurance) to moderate the relationship between ESG scores and market reactions. As Thai stock market is reported to be family business oriented (Pwc, 2023), we also investigate whether the family owned company moderate the effect of ESG scores on market reactions.

This study reports that there is a positive relationship between ESG Scores and stock market performance. This implies that a higher ESG Score leads to a higher RET. The interaction of ESG Scores with Assurance was found to have a negative impact on RET, which indicates that ESG Scores that are verified by external agencies result in the perception of overestimation of ESG Score and hence investor penalize stock price leading to smaller returns. (Del & Rigamonti, 2020; Sinha & Goel, 2023). We do not find evidence that family-owned structure moderates the relationship between ESG scores and market reactions. This could be because of the fact that Thai stock market is dominated by family-run companies.

This study contributes to the literature on the informativeness of ESG scores on investment decision making in multiple ways. First, our findings provided additional evidence that higher ESG scores is perceived by investors and reflected in the share prices and therefore stock returns. Hence, this study suggests it is worthwhile for companies to invest in ESG information disclosure that could improve ESG scores. Second, we also show higher ESG scores that are not verified by quality ESG rating agencies could penalize share prices. Therefore, we call for more future research to explore whether quality audit firms could reduce investors' concerns over the creditability of ESG information creditability. Third, we report that the informativeness of ESG scores do not dimmest in a market dominated by family-run business.

2. LITERATURE REVIEW AND HYPOTHESIS GENERATION

Spence's Signaling Theory (1973) is based on the asymmetry of information (Asymmetric Information). The asymmetry of information has a direct impact on the capital structure of the company. In other words, if the firm is experiencing a good business trend, it is also possible that there are new projects that will yield high returns. By doing so, investors receive a positive message which increases the value of their common shares. On the other hand, if the business has a rather poor future, such as needing to upgrade production technology to maintain competitiveness, investing in marketing, etc., investors will consider

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this as a negative indicator causing the value of common shares to decrease. Additionally, signaling theory has been studied in terms of how companies or major shareholders send signals to groups of smaller shareholders to communicate the likelihood of future stock price increases or decreases. The purpose of ESG reporting is to reduce or eliminate information asymmetry between companies and investors. Investors will be able to make more informed investment decisions if they have sufficient financial information both financially (from financial reports) and non-financially (from ESG reports) (Suttipun & Yordudom, 2022).

In previous studies, it has been shown that senior executives possess more information than investors. Decisions made by top management can have a significant impact on investment decisions made by investors in the future. In case a company is boycotted by its customers, an investor may be concerned about its competitive advantage. Consequently, this study uses signaling theory to explain stock market reactions to ESG disclosures. By communicating non-financial information through ESG reporting to investors, the company sends a positive signal to investors (Spence, 1978; Lo & Kwan, 2017; Phung et al., 2023; Rahman et al., 2023).

The certification of ESG reporting by external agencies is intended to increase the credibility and accuracy of the disclosed information (Del Giudice, 2020). An improvement in the quality of information disclosure is achieved through certification of reporting. Organizations and their stakeholders, including investors, will have access to more reliable and useful data. An external auditor reviewed the report and determined that the information was accurate, reliable, and complete. Information contained in the report can be relied upon by shareholders and investors, and the organization has managed its operations in accordance with the report and has focused on supervising its management in accordance with the information contained in the report. By reducing information asymmetry, independent certification serves as a bridge between corporate and investor interests, with certified ESG reports having a positive impact on investors. Investors can use reliable information to evaluate a company's sustainability performance, which leads to higher quality investment decisions (Reimsbach et al., 2018). A literature review indicates that reporting social, environmental, and governance practices is an effective method of conveying information to stakeholders. Contribute to the understanding of social and environmental practices and issues, as well as the credibility of the company, so that stakeholders can make informed decisions. In addition to word counting, most ESG reporting evaluation research utilizes the content analysis method (Suttipun, 2023). Investment decisions have not yet been made based on score counting. Consequently, to measure scores in this study as a criterion, a score matrix has been developed. This study was conducted on the basis of the following assumptions:

H1a: There is a positive relationship between ESG scores and a company’s stock market reaction.

H1b: The relationship between a company's stock market reaction and ESG scores is affected by information creditability – verification of a company’s ESG report.

H2: The relationship between a company's stock market reaction and ESG scores is affected by family-owned business structure.

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3. METHODOLOGY

3.1 Data collection

As of January 5, 2023, 873 companies are listed on the Stock Exchange of Thailand. Due to the fact that in 2015, the Stock Exchange of Thailand developed and supported ESG-related information regarding the disclosure of business information regarding environmental, social, and governance issues, the researcher began collecting data during the period 2017-2023. To obtain sufficient ESG disclosure data for analysis, the study began collecting data between 2017 and 2023. To provide sufficient ESG disclosure data for analysis, a data set of 6,111 units (Firm-Year Observations) is derived and then 196 companies are eliminated from "the Market for Alternative Investment" (MAI). Due to its different capital structure and stock price movements from larger companies. The sustainability reporting of companies within the MAI group is insufficient for analysis. In comparison with companies in the SET which have sufficient sustainability reporting data for analysis and are also a sample group for which investors are quite interested in using the information to make investment decisions (Bruder et al., 2019; Chantabutr et al., 2020). Additionally, 69 financial companies were excluded from this study's sample. The reason is that these companies have capital structures and financial reporting regulations that differ from those of other businesses (Namkhan et al., 2022). As the last group eliminated from the study was 61 companies belonging to various funds, their business operations were not similar to that of general listed companies (Dahiya & Singh, 2021), leaving a sample group consisting of 547 companies, or 3,829 firm-years in total Data. As a result, some 509 incomplete or inaccurate data were eliminated by the researcher. This resulted in a sample group of 3,320 data being used for testing the research assumptions, as shown in Table 1.

Table 1. Indicate how the sample group was selected for the research.

	Research sample size
Thai Stock Exchange companies; 873 companies total	6,111
Study criteria excluded these items:	
- MAI (196 companies)	1,372
- Financial (69 companies)	483
- Funds (61companies)	427
- Under-reported companies (509 companies)	509
The remaining sample group can be used for the study:	**3,320**

3.2 Variable and model measurement

The independent variables are the ESG scores obtained by using formulas from the Refinitive database and research conducted by Carnini Pulino et al., (2022); Harasheh & Provasi, (2023) and Izcan & Bektas ,(2022).

Dependent Variable is the Risk Adjusted Return (RET) calculated from the formula:

$$RET = \text{Rate of return} - \text{Expected rate of return}$$

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The following variables were used as control variables in this study:

- A measure of financial risk (Leverage) is calculated based on the debt-to-equity ratio (Albitar et al., 2020), calculated by dividing total debt by shareholders' equity (Debt/Equity Ratio).
- Using the logarithm of market capitalization, Scale of the company (SIZE) is measured (Aouadi & Marsat, 2018; Bernardi & Stark, 2018).
- A company's age (AGE) is the number of years that the company has been listed on the Stock Exchange of Thailand. Based on the logarithm of the number of years since the company was listed on the stock exchange, it is calculated (Nollet et al., 2016).
- The Price-to-Book Value Ratio (P/BV Ratio: PBV) is calculated by dividing the market price of the stock by its book value per share (Arkan, 2016).
- P/E Ratio: PE is calculated by dividing a company's market value by its earnings per share (Arkan, 2016).
- An investor's desired rate of return can be determined by the rate of account value to market value ratio (Book-to-Market: BTM) (Bae et al., 2021).
- A measure of the proportion of retail shareholders (Free float) is the number of shares owned by retail investors.
- An organization's cash flow from operations (CFO) is measured by analyzing the cash flow generated by its main activities that generate income and expenditures.
- If a company is audited by the Big4, it is set to 1. It is set to 0 if it has been audited by another agency.
- The report verification (Assurance) is determined by whether the company has received verification from *external agencies for its sustainability report*. In the absence of vertification, it is set to zero.
- If the company has the characteristics of a family owned business, it is set to 1. If it does not have the characteristics of a family owned business, it is set to 0.
- The year used in the research (Year) is studied from 2017 – 2023.

4. DATA ANALYSIS

4.1 Descriptive Statistics

This study uses descriptive statistics to summarize the preliminary data of the sample, consisting of Data's mean (Mean), standard deviation (Standard Deviation), maximum value (Maximum), and minimum value (Minimum).

4.2 Inference Statistics

The correlation analysis of the sample group is performed before analyzing the relationship between various variables in line with the hypothesis using Multiple Regression Analysis. Using the following equation, you can test the hypothesis and find relationships between independent variables moderator variables, controlled variables.

$$RET_{i,t} = \beta_0 + \beta_1 ESG_{i,t-1} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 AGE_{i,t} + \beta_7 PBV_{i,t} + \beta_8 PE_{i,t} + \beta_9 BTM_{i,t} + \beta_{10} Freefloat_{i,t} + \beta_{11} CFO_{i,t} + \beta_{12} BIG4_{i,t} + \beta_{13} Year + \beta_{14} Industry + \varepsilon_{i,t} \quad (1)$$

$$RET_{i,t} = \beta_0 + \beta_1 ESG_{i,t-1} + \beta_2 Assurance_{i,t} + \beta_3 (ESG*Assurance)_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 AGE_{i,t} + \beta_7 PBV_{i,t} + \beta_8 PE_{i,t} + \beta_9 BTM_{i,t} + \beta_{10} Freefloat_{i,t} + \beta_{11} CFO_{i,t} + \beta_{12} BIG4_{i,t} + \beta_{13} Year + \beta_{14} Industry + \varepsilon_{i,t} \quad (2)$$

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$$RET_{i,t} = \beta_0 + \beta_1 ESG_{i,t-1} + \beta_2 FamilyOwn_{i,t} + \beta_3 (ESG*FamilyOwn)_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 AGE_{i,t} + \beta_7 PBV_{i,t} + \beta_8 PE_{i,t} + \beta_9 BTM_{i,t} + \beta_{10} Freefloat_{i,t} + \beta_{11} CFO_{i,t} + \beta_{12} BIG4_{i,t} + \beta_{13} Year + \beta_{14} Industry + \varepsilon_{i,t} \quad (3)$$

5. RESULT

5.1 Descriptive statistics

According to Table 2, the companies on the Stock Exchange of Thailand used as samples in this study have an average risk-adjusted return rate (RET) of 7.827 percent and an average ESG score of 7.827 percent 26.191. It was revealed that the average cash flow from operations (CFO) was 1.820 billion baht, and the average company age (AGE) was 18 years old. Company size (SIZE) was determined by average market capitalization of 4.158 billion baht, and cash flow from operations (CFO) was determined based on average cash flow from operations (CFO). In terms of important financial ratios for investment such as the average share price to book value (PBV) ratio is 2.200, the market price to earnings per share (PE) ratio and the book to market capitalization (BTM) ratio are on average 19.986 and 0.872, respectively. Large companies have their accounts audited by Big4 accounting firms 65.390% of the time. A majority of companies do not have assurance reports from external agencies, up to 84.940%.

5.2 Inferential Statistics

The correlation analysis of each pair of variables is presented in Table 3. There was a positive correlation between ESG scores and RET, however, no relationship was found between the independent variables and the dependent variables with a correlation value of 0.009. A statistically significant relationship was found between some of the independent variables when considering their interaction with each other. In general, it was not found that the level of relationship between the independent variables was so high that there was a problem of self-correlation. (Multicollinearity).

5.3 Multiple Regression Analysis

Table 4 reports the main results regarding H1a, H1b, and H1c. H1a which predict that ESG scores is positively associated with stock market reaction. According to our analysis, we report that a higher ESG scores lead to higher the adjusted market returns (coefficient = 0.040, p-value <0.05). *This result supports our H1a.* As we interested in investigation of the moderating effect of family-owned structure on ESG scores and stock market reactions (H1b), we analyzed our data and find insignificant results. This perhaps because family –run business becomes country level norms and hence investors do not value that structure on ESG information when making decision. *That is, our H1b is not supported.* For H1c that questioned about the ESG information creditability we find a significant negative relationship between ESG*Assurance and the adjusted market returns (coefficient = -0.103, p-value < 0.01). The finding indicates that ESG scores taken from the verified ESG report does not increase the value of ESG scores when equity investors making decision, rather the verification of ESG information leads to smaller returns. This could be inconsistent with the notion that “Firms whose reports are audited by third parties did not exhibit significant changes in their scores after a scandal” (Del et. Al., 2020). ESG agencies’ scandal could affect the investor’s perception of overestimated ESG scores and subsequently penalize a

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company's share prices and returns accordingly. Therefore, *H1c seems to be partially supported.*

Table 2. Descriptive statistics were used to analyze the results.

	Min	25 percentiles	50 percentiles	75 percentiles	Max	Std. Dev	N
Panel A: Continuous Variables							
RET (%)	-51.441	-2.650	7.287	13.836	133.416	19.716	3320
ESG (%)	4.329	13.889	26.191	34.559	93.303	17.937	3320
LEV (Ratio)	7.997	12.798	13.502	14.278	16.041	1.064	3320
SIZE (Billion)	0.303	0.535	4.158	14.685	136.862	34.281	3320
AGE (Year)	1.000	9.000	18.000	28.000	48.000	11.217	3320
PBV (Ratio)	0.287	0.870	2.200	2.531	12.437	2.424	3320
PE (Ratio)	5.889	8.431	19.986	25.456	67.477	16.602	3320
BTM (Ratio)	0.144	0.399	0.872	1.168	2.399	0.612	3320
Free float (%)	0.947	23.177	36.568	48.259	97.961	18.400	3320
CFO (Billion)	-0.231	0.166	1.820	2.310	9.455	2.642	3320
			0 (Percent: %)		1 (Percent: %)		N
Panel B: Dichotomous Variables (dummy variables 0,1)							
Big4			34.610		65.390		3320
Assurance			84.940		15.060		3320
Family			60.570		39.430		3320

Note: Skewness values and Kurtosis values are checked for normal distribution (Orcan, 2020). In the event that the value exceeds the normal average, an adjustment will be made by cutting off the head and tail in a proportion of 5% and replacing the value with the per centile. (*Winsorization Techniques).* (Dixon & Yuen, 2020)

Table 3. This table displays Pearson's correlation coefficients for all variables.

Variables	RET	ESG	LEV	SIZE	AGE	PBV	PE	BTM	Free float	CFO	Big4	Assurance	Family	VIF
RET	1.000													
ESG	0.009	1.000												1.280
LEV	0.027	0.064***	1.000											1.080
SIZE	-0.060***	0.517***	0.162***	1.000										2.110
GE	-0.004	0.103*	-0.008	0.002	1.000									1.090
PBV	-0.063***	0.125*	0.120***	0.357***	-0.203***	1.000								1.330
PE	-0.023	0.012	-0.019	0.036	-0.023	0.074***	1.000							1.010
BTM	0.065***	-0.116***	-0.090***	-0.207***	0.148***	-0.338***	-0.037	1.000						1.180
Free float	-0.042	0.127***	0.178***	0.153***	0.064***	-0.024	-0.007	-0.002	1.000					1.070
CFO	-0.035	0.303***	0.173***	0.534***	0.092***	0.103***	0.002	-0.058***	0.110***	1.000				1.490
Big4	-0.032	0.178***	0.109***	0.218***	-0.082***	0.141***	-0.007	-0.181***	-0.024	0.231***	1.000			1.120
Assurance	-0.017	0.454***	0.138***	0.526***	-0.008	0.104***	-0.013	-0.114***	0.105***	0.357***	0.306***	1.000		7.710
Family	0.019	-0.046***	-0.024	-0.146***	-0.082***	-0.016	0.012	0.033***	-0.148***	-0.119***	-0.140***	-0.104***	1.000	2.400

Note: Statistical significance is indicated by p>0.01, p>0.05, and p>0.1 at 1%, 5%, and 10% levels respectively.

Table 4. Analyzes the results of multiple regression.

	Dependent Variable: Risk Adjusted Return (RET)		
	H1a	H1b	H1c
Variables			
ESG	0.040**	0.067***	0.023
	[2.010]	[2.840]	[1.000]
FamilyOwn	-	-	-0.930
			[-0.910]
*ESG*FamilyOwn*	-	-	0.050
			[1.510]
Assurance	-	4.426***	-
		[2.680]	
*ESG*Assurance*	-	-0.103***	-

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		[-2.710]	
Control variable			
LEV	0.004	0.004*	0.003
	[1.500]	[1.710]	[1.470]
SIZE	-0.030**	-0.026**	-0.027**
	[-2.570]	[-2.100]	[-2.310]
AGE	-0.030	-0.026	-0.031
	[-1.160]	[-1.020]	[-1.180]
PBV	-0.011	-0.032	-0.034
	[-0.080]	[-0.240]	[-0.250]
PE	-0.002	-0.002	-0.018
	[-0.590]	[-0.630]	[-0.130]
BTM	0.262	0.294	0.263
	[1.030]	[1.150]	[1.103]
Free float	0.019	0.021	0.022
	[1.220]	[1.330]	[1.380]
CFO	-0.298	-0.296	-0.306
	[-1.560]	[-1.550]	[-1.600]
BIG4	-0.869	-1.001	-0.880
	[-1.430]	[-1.620]	[-1.440]
Year-2561	4.484***	4.493***	4.496***
	[4.270]	[4.280]	[4.280]
Year-2562	6.507***	6.526***	6.534***
	[6.170]	[6.190]	[6.200]
Year-2563	1.872*	1.930*	1.891*
	[1.760]	[1.820]	[1.780]
Year-2564	36.176***	36.243***	36.187***
	[34.140]	[34.200]	[34.140]
Year-2565	-1.169	-1.082	-1.183
	[-1.120]	[-1.030]	[-1.130]
Year-2566	3.466***	3.549***	3.458***
	[3.300]	[3.370]	[3.290]
Industry 2	-0.611	-0.334	-0.310
	[-0.470]	[-0.260]	[-0.230]
Industry 4	1.086	1.541	1.388
	[1.010]	[1.420]	[1.270]
Industry 5	0.401	0.685	0.657
	[0.380]	[0.640]	[0.610]
Industry 6	-0.406	-0.057	-0.032
	[-0.340]	[-0.050]	[0.030]
Industry 7	0.728	1.056	0.933
	[0.730]	[1.050]	[0.920]
Industry 8	0.613	0.906	0.866
	[0.470]	[0.690]	[0.660]
Constant	4.807	3.597	4.955
	[1.210]	[4.014]	[1.230]
Observations	3,320	3,320	3,320
Adj. R-squared	0.386	0.387	0.386
VIF	1.73	2.140	1.940

**p< 0.1, ** p< 0.05, *** p< 0.01. T values are reported in brackets*

6. DISCUSSION AND CONCLUSION

The informativeness of ESG and its creditability and their effects on stock market reactions are still inconclusive and understudied especially in emerging countries due to insufficient data. We therefore studied whether the ESG scores enhance adjusted-market returns. Also, whether the external agency can improve the creditability of ESG scores and subsequently increase investor's confidence affecting stock market returns (Del Giudice & Rigamonti, 2020, Garcia et al., 2019 and Maroun, 2019). We hypothesize that a company's ESG report will have greater credibility if it is verified by external agencies (Vander Bauwhede & Van Cauwenberge, 2022). We further investigate whether family-owned structure can moderate the effect of ESG scores on stock market returns. Findings from our analysis point out that higher ESG scores contributes to larger adjusted-market returns. However, family-run business could not affect the relationship. Interestingly, the result sheds light that the verification of ESG scores leads to a significantly negative relationship between ESG scores

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and adjusted-market returns. This perhaps is because of the increase in the controversy of ESG agencies scandals.

Findings of this research does not only enrich the evidence on the informativeness of ESG scores on investors' investment decision making but also leads to the questions to be intensively investigated. Although ESG reports are verified by external organization, ESG agency scandals can lead to the overestimation of ESG scores resulting in investors' penalty on a company' share price leading to smaller returns. In the light of ESG scores' creditability we would suggest future research to analyze whether quality audit firms could enhance ESG scores creditability. As Thai stock market still have insufficient data on this matter we could not provide supreme evidence on this matter. Also, ESG scores may be conditional on the family-owned business especially on governance dimension. In another words, ESG information creditability and business structure could be significant conditions when testing in different stock market where ESG information quantity and quality endorsements are significantly different (Obalade & Tita, 2024).

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