FIRM OWNERSHIP AND ESG PRACTICES: A STUDY OF INDEXED VS. NON-INDEXED THAI COMPANIES

Ruitao SHUAI[1]
1 Faculty of Commerce and Accountancy, Chulalongkorn University, Thailand; 6684059026@student.chula.ac.th

ARTICLE HISTORY
Received: 7 November 2025 **Revised:** 21 November 2025 **Published:** 9 December 2025

ABSTRACT
This study explores the relationship between firm ownership (index membership as a proxy for ownership) and environmental sustainability practices (measured by greenhouse gas emission reduction target-setting) among Thai SET listed companies from 2019 to 2024. This study uses Probit and ordered Logit regression models to test hypothesis. The results indicate that index inclusion driver for firms to adopt of environmental practices, and indexed companies are 16.25% more likely to set emission reduction targets than non-index companies. However, the identity of index companies does not necessarily improve the quality of targets, as industry characteristics are more decisive. All hypothesized moderating effects (institutional ownership, European institutional pressure, and ownership concentration) are insignificant. Among them, European institutional pressure acts as an independent driving factor but fails to show a synergistic effect. The Thai market characteristic dominated by family business to explain why ownership concentration fails to promote environmental practices. This study enriches the literature on sustainability in emerging markets and offers implications for regulators to improve index criteria, firms to avoid symbolic compliance, and investors to assess actual environmental performance.
Keywords: Firm Ownership, Environmental Sustainability, ESG Practices, Indexed Firms, Corporate Governance

CITATION INFORMATION: Shuai, R. (2025). Firm Ownership and ESG Practices: A Study Of Indexed vs. Non-Indexed Thai Companies. *Procedia of Multidisciplinary Research, 3*(12), 47.

INTRODUCTION

The intensification of global environmental issues has aroused great concern all over the world, making sustainable development a common goal. Environmental, Social, and Governance (ESG) has rapidly become popular globally as essential tools for measuring corporate sustainability and social responsibility. The environmental dimension of ESG pays attention to how firms address environmental risks and contribute to climate change mitigation.

As an export-oriented economy, exports accounted for 65.8% of Thailand's GDP in 2022. It making the country highly vulnerable to international trade policies and consumer preferences related to environmental protection(*Thailand Trade*). Despite the implementation of some environmental policies, Thailand continues to grapple with serious environmental challenges.

The companies in the index are usually the core force of the Thai securities market and play a key role in Thailand's economic growth and financial stability. With increasing global attention to ESG factors, investors pay more and more attention to the environmental performance of index firms. Failure to meet these expectations may lead to a loss of investor confidence and potential divestment.

Existing literature has confirmed a positive correlation between index membership and environmental practices, but most evidence mainly comes from markets with robust institutional frameworks. Whether this relationship holds in emerging economies with unique institutional structures, like Thailand, remains an unresolved issue. The purpose of this study is to explore the relationship between firm ownership and environmental sustainability practices (taking the setting of greenhouse gas emission reduction targets as an example) of Thai listed companies, index membership as a proxy for ownership. It further analyzes the role of institutional investors, European institutions, and the concentration of ownership as moderating factors. This key exploration will deepen our understanding of the key factors affecting the practice of environmental sustainability of enterprises in the Thai market and help to formulate more effective environmental strategies and regulatory policies.

LITERATURE REVIEWS AND HYPOTHESIS DEVELOPMENT

Theoretical Foundation

At the theoretical level, the study also draws on several main perspectives, such as Signaling Theory, Principal - Agent Theory, Large Shareholder Control Theory, etc. Together, these theories form a cohesive framework to analyze the mechanisms driving environmental practices in Thailand’s distinct market context. Signaling Theory posits that firms use observable actions to reduce information asymmetry and convey unobservable qualities to stakeholders(Fombrun & Van Riel, 1997). Those that are included in the index system face increased scrutiny from investors and regulators. In order to maintain their "quality signal" status and stay within the index system, they adopt environmental measures such as setting greenhouse gas emission reduction targets.

The Principal - Agent Theory (Ross, 1973) posits that there are conflicts between principals and agents, especially when short - term profit motives overshadow long - term sustainable development goals. Stakeholder Theory (Freeman, 2010) emphasizes that companies need to balance the interests of multiple different stakeholders. As influential stakeholders and stockholders, institutional investors exert pressure on companies’ managers to prompt them to adopt sustainable development strategies for long time benefit.

Reputation Theory posits that firms invest in reputation - building behaviors to signal reliability and quality to stakeholders (Kreps & Wilson, 1982). Meanwhile, Institutional Theory (DiMaggio & Powell, 1983) offers a more comprehensive perspective for analyzing the interactive relationship between organizations and their external environment, highlighting the shaping effect of the institutional environment on the behaviors of organizations and individuals. Thai companies engaged with the EU market face mandatory institutional pressures (such as REACH compliance), which compel them to adopt more stringent EU standards to maintain market access.

Large Shareholder Control Theory (Shleifer & Vishny, 1997), within the framework of Ownership Structure Theory, examines how ownership concentration shapes environmental strategy through governance mechanisms. When ownership is concentrated among a few major shareholders, their enhanced control enables direct intervention in strategic decisions to promote long-term environmental initiatives.

GHG Reduction Targets as a Core Metric of Environmental Practices derive their theoretical validity from three aspects: First, GHG management constitutes the strategic nucleus of corporate climate risk response. Second, science-based targets require firms to specify baselines, emission scopes, and dynamic reduction pathways enhancing disclosure credibility. Third, the global proliferation of Net Zero commitments intensifies the imperative for GHG reduction.

Review of Relevant Empirical Studies

Prior research has consistently confirmed that the impact of index constituent identity on firm ownership: Chen et al. (2019) studied the MSCI Standard Index of 38 countries and indicated that the number of institutional investors increased when stocks were added to the index and decreased when they were removed. Ahluwalia et al. (2020) discovered that foreign institutional investors responded faster to index rebalancing than other domestic funds and institutions. In summary, whether a company is included in the indexed consistent will have an impact on the company's ownership structure and ownership concentration. In terms of environmental practices, empirical evidence supports the positive impact of index membership. Some research findings that can provide evidence for significant differences in environmental practices between indexed constituents and non-indexed constituents. Li et al. (2023) demonstrated that companies included in the indexed constituents will increase their environmental impact index. Zhao et al. (2024) found that companies listed on the Chinese A-share market that were included in the MSCI index had significantly improved ESG performance. Current research on index membership and environmental practices focuses on developed markets and large emerging economies like China, while neglecting emerging markets like Thailand. The unique institutional characteristics of Thailand may change this relationship. The regulatory role of ownership structure remains understudied in this context.

The Influence of Institutional Investor on Environmental Practices: a series of research findings provide key evidence in exploring the impact of institutional investors on environmental practices. Cohen et al. (2023) pointed out that when institutional investors demand climate - related information from enterprises, it will prompt companies to disclose more relevant content, and further lead enterprises to make decisions to reduce carbon emissions. Jiang et al. (2022) indicate that institutional investors will improve the ESG level of enterprises through various means such as improving the quality of accounting information, increasing environmental investment, and attracting media attention. The above research results mainly come from regions with robust institutional frameworks and active investors. However, institutional investors are passive, and regulatory efforts are weak in emerging markets in developing countries. Whether these mechanisms (such as Thailand) play a similar role remains

an issue that needs empirical research. Therefore, it is necessary to examine whether institutional ownership can still have a positive impact on the relationship between index membership and environmental practices in different environments.

The Influence of Cross-Border Operations on Environmental Practices: To comply with international norms and meet the requirements of international clients, firms will enhance their environmental governance standards and performance. Wang et al. (2022) conducted data analysis on overseas investment companies using Chinese A-share listed companies and found that the environmental protection levels of enterprises with overseas investments were significantly higher than those of other enterprises. Despite these insights, the mechanisms of this influence remain less clear for firms in other emerging markets. Further research is needed to examine how cross-border operations, particularly with key regions like the EU, shape corporate environmental behavior in this distinct institutional setting.

The Impact of Corporate Governance on Environmental Performance: The effect of ownership concentration on environmental practices remains inconclusive in the academic literature. Utomo et al. (2019), taking listed companies in the mining, manufacturing, and agricultural sectors in Indonesia as samples, pointed out that ownership concentration has a positive and non - linear impact on environmental performance. Arora (2021) pointed out that the relationship between ownership concentration and Corporate Environmental Irresponsibility (CEI) varies under different institutional environments or external regulatory qualities. Calza et al. (2016) provide further insights into the relationship between ownership structures and firms' environmental proactivity.

Hypothesis Development

Synthesizing the aforementioned theoretical perspectives and identified research gaps, this study established four hypotheses and expectations.

H1: Indexed Firm are more likely than Non-Indexed Firm to adopt environmental sustainability practices for managing environmental risks and addressing climate change. We expect indexed firms to exhibit significantly higher levels of environmental sustainability practices than non-indexed firms. Hypothesis 1 is primarily grounded in Signaling Theory and Reputation Theory. Becoming an index membership serves as a powerful signal of quality and legitimacy to the market. To maintain this status and manage heightened scrutiny from investors and regulators (i.e. institutional pressure). Setting greenhouse gas emission reduction targets is concrete action that strengthens their "quality signal" and indicates compliance with regulatory requirements.

H2a: Institutional ownership positively moderates the adoption of environmental sustainability practices among both Indexed and Non-Indexed firms, with a significantly stronger positive effect for Indexed firms. We expect the positive relationship between index membership and environmental practices to be more pronounced when institutional ownership is higher.

H2b: European institutions positively moderate the adoption of environmental sustainability practices among both Indexed and Non-Indexed firms, with a significantly stronger positive effect for Indexed firms. We expect European institutions to have a significantly stronger positive impact on the environmental sustainability practices of index companies.

These two hypotheses (H2a and H2b) are jointly supported by Stakeholder Theory, Principal-Agent Theory, and Institutional Theory. Institutional investors(H2a), as influential stakeholders, have the resources and incentive to supervisory management (address agency issues) and drive long-term value creation (includes managing environmental risks). Therefore, higher institutional ownership will increase the pressure on indexed firms to fulfill the environmental expectations associated with index membership. European institutions(H2b) represent a special and powerful institutional pressure that comes from external sources. For

Thai companies, entering the European market means exposure to the stringent EU environmental standards. This significantly enhances regulatory and mandatory pressure. This significantly enhances regulatory and mandatory pressure, thereby encouraging businesses to comply with environmental regulations.

H3: Concentrated ownership positively moderates the adoption of environmental sustainability practices among both Indexed and Non-Indexed firms, with a significantly stronger positive effect for Indexed firms. We expect concentrated ownership will have a more significant positive effect on the environmental sustainability practices of index companies. This hypothesis is directly drawn from Large Shareholder Control Theory. When ownership is concentrated, major shareholders have both the power (control) and a significant financial interest to affect firm strategy directly. For an indexed firm, large shareholders are likely to perceive the firm's index membership status as a valuable asset. To protect this reputation and ensure long-term value, they can use their control power to guide the company towards long-term beneficial action.

RESEARCH METHODOLOGY

Sample and Data

This study analyzes a sample of publicly listed firms in SET in Thailand from 2019-2023, excluding financial firms, Property Fund & REITs, and those with incomplete data, resulting more than 450 firms (or more than 2,100 observations). We use the list of Bloomberg ASEAN Large & Mid Price Return Index, STOXX Emerging Markets 1500 Index, and Dow Jones Emerging ASEAN Titans 100 Index for the year 2024 has been adopted as the benchmark. The dataset was compiled from Bloomberg, Refinitiv Eikon, SETSMART, and corporate disclosures available on company websites.

Dependent Variable Measurement

The core dependent variable, Environmental_Practice, captures a firm's commitment to climate-related targets. We use two complementary ways to define the dependent variable. Binary measurement (primary): In primary regression models, the dependent variable is defined as a binary variable. Our core research is whether the indexed membership drives firms to change from a 'not adopted environmental practices' state to a' adopted environmental practices' state, and how other factors will strengthen or weaken this relationship. The adoption of environmental practices is proxied by whether a firm sets a greenhouse gas (GHG) emission reduction target. If a firm sets a greenhouse gas (GHG) emission reduction target in a given year, it is 1; and 0 otherwise. Ordinal Measure (Extended): While the baseline Probit model captures the binary outcome of dependent variable (i.e., whether a company sets GHG target or not), it does not account for potential variations in the intensity of the outcome. To address this limitation and explore heterogeneous effects across different levels of dependent variable, the study extends the analysis by redefining Environmental_Practice as an ordered categorical variable with three distinct levels: 1=no target; 2=vague target; 3=specific target.

Models

We chose a dynamic panel Probit model because dependent variable is binary variable, and it measures the adoption decision (set the GHG target) as a discrete "yes" or "no". We don't use the Linear Probability Model (LPM) because it is prone to producing predicted probabilities outside the [0,1] logical range and suffers from heteroskedasticity. We also lagged all independent and control variables by one period (t-1). First, it helps alleviate the problem of reverse causality and ensures that explanatory factors are ahead of decisions to adopt

environmental practices in terms of time. Second, it acknowledges the realistic time lag between changes in corporate governance (or ownership) and the implementation of new strategic like setting GHG targets.

Compared to static models, this method can more effectively handle unobserved heterogeneity. The dynamic model captures a substantial portion of time-invariant unobserved factors by controlling for the lagged values of independent variables and incorporating industry and year fixed effects, thereby enhancing the causal interpretability of our research findings.

To test these hypotheses, a dynamic panel Probit model is employed, specified as follows:

H1: $$P(Environmental\_Practice_{it}=1)=F(\beta_0+\beta_1 Index\_firm_{it-1}+\gamma Controls_{it-1}+e_{it})$$

H2a: $$P(EnvironmentalPractice_{it}=1)=F(\beta_0+\beta_1 Index\_firm_{it-1}+\beta_2 Inst\_Own_{it-1}+\beta_3 Index\_firm_{it-1}*Inst\_Own_{it-1}+\gamma Controls_{it-1}+e_{it})$$

H2b: $$P(EnvironmentalPractice_{it}=1)=F(\beta_0+\beta_1 Index\_firm_{it-1}+\beta_2 EU\_Exposure_{it-1}+\beta_3 Index\_firm_{it-1}*Inst\_Own_{it-1}+\gamma Controls_{it-1}+e_{it})$$

H3: $$P(EnvironmentalPractice_{it}=1)=F(ß_0+ ß_1 Index\_firm_{it-1}+ß_2 Concen\_Own_{it-1}+ß_3 Index\_firm_{it-1}*Concen\_Own_{it-1}+\gamma Controls_{it-1}+e_{it})$$

Extended Ordered Logit Model: To explore heterogeneous effects across different levels of dependent variable, the study extends the analysis by redefining Environmental_Practice as an ordered categorical variable with three distinct levels.

Robustness Checks: Jaccard similarity tests for index constituent variability; Difference-in-Differences (DID) with Linear Probability Model (LPM), treating index entry/exit as a "treatment" to verify causal effects, following:

$$Environmental\_Practice_{it}=\beta_0+\beta_1*Treated_{it}+\beta_2*Post_t+\beta_3*DID+\gamma Controls_{it-1}+\varepsilon_{it}$$

Variables

Dependent: Environmental_Practice (1=has emission reduction target, 0=not). Extended model, it is redefined as (1=no target; 2=vague target; 3=specific target).

Independent: Index_firm (1=indexed, 0=non-indexed); Inst_Own (institutional ownership %); EU_Exposure (1=firm engages with EU via exports(Trade Linkages), Establishment of branches, subsidiaries, or direct investment projects(Physical Presence), Participation in key EU regulatory schemes or possession of mandatory EU certifications(Regulatory Compliance), Engagement in specific EU-led initiatives(Market Integration).); Concen_Own (ownership concentration measured by HHI of top 10 shareholders).

Controls: All control variables are measured in year "t-1" to mitigate reverse causality concerns. Profitability (EBIT/Sales) controls for firms' financial capacity to invest in environmental initiatives, which often require significant upfront investment; Leverage (Debt/Total Capital) limits firms' financial flexibility and management autonomy. Heavily indebted firms might prioritize short-term financial obligations; Firm Size (Natural Log of Total Assets) exposes companies to varying degrees of attention and scrutiny from regulators, investors, and the public ; Controls variable also includes industry and year fixed effects for unobserved time-invariant industry heterogeneity and common temporal shocks, respectively.

Variable in robustness: Treated (1=firm is included in index in time t); Post (1=the year t -1 is the year after the event was processed); DID (Treatedi*Postt)

Table 1: Variable Name Mapping Between Paper Terminology and Regression Code

Variable names in the paper	Variable names in regression
$EnvironmentalPractice_{it-1}$	GHG_Target ("Target_level" in Extended Model)
$Index\_Firm_{it-1}$	Index_firm_3list_lag
$Inst\_Own_{it-1}$	Inst_Own_lag
$EU\_Exposure_{it-1}$	EU_Exposure_lag
$Concen\_Own_{it-1}$	Concen_Own_lag
$EBIT/Sales_{it-1}$	EBIT_Sale_lag
$Debt/TotalCapital_{it-1}$	Debt_capital_lag
$ln\ (Size)_{it-1}$	Ln_Asset_lag

RESEARCH RESULTS

Descriptive Statistics

Table 2 presents the final sample comprises 2,177 annual firm-year observations from Thai listed companies. The average value of "GHG Target" (dependent variable) is 0.2485, indicating that 24.85% of the firm-year observations in the sample had adopted greenhouse gas emission reduction targets. The core independent variable 'Index_firm' accounts for 9.78% of the total sample. Among moderating variables, the mean of institutional ownership (Inst_Own_lag) is 7.79%, and Std Dev. is 9.16%. The means of ownership concentration (Concen_Own_lag) is 21.17% and Std Dev. of 16.35%. There are 32.89% of the sample companies have business in Europe or have entered the European market. Reasonable distribution of control variables in the samples.

Table 2: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
GHG_Target	2177	0.249	0.432	0	1
Target_level	2177	1.332	0.624	1	3
Index_firm_3list_lag	2177	0.098	0.297	0	1
Inst_Own_lag	2177	0.078	0.092	0.000	0.782
EU_Exposure_lag	2177	0.329	0.470	0	1
Concen_Own_lag	2177	0.212	0.163	0.011	0.715
EBIT_Sale_lag	2177	0.088	0.224	-0.870	0.920
Debt_capital_lag	2177	0.351	0.224	0.000	0.980
Ln_Asset_lag	2177	8.924	1.579	2.149	14.938

Results for the Main Effect: Indexed Membership (H1 & Extended H1)

The Probit Model result shows that the coefficient of the core independent variable is significantly positive at the 1% significance level ($\beta = 0.5794$, $z = 2.818$, $p = 0.005$) (Table 3), and support H1. The marginal effect of Index_firmit-1 is 0.1625 ($z = 4.634$, $p < 0.001$) (Table 3), implying that index firms have an average 16.25% higher probability of adopting GHG targets.

We use an Ordered Logit model to conduct an extended analysis of H1. When included in the industry fixed effects, the coefficient of Index_firmit-1 is not statistically significant (Table 3). After removing industry fixed effects, the coefficient is positive and highly significant ($p = 0.006$). This preliminary finding suggests that index membership may not have a significant

additional effect on the maturity level of environmental practices. The industry characteristics are more decisive in determining the quality of environmental commitments than their existence.

Table 3: Key Results of Hypothesis 1(H1)

Variable	Probit Model	Marginal Effect	Ordered Logit Model	Ordered Logit Model (without Industry FE)
Intercept	-2.2303			
	(0.570)			
Index_firm_3list_lag	0.5794***	0.1625***	0.3708	0.7841***
	(0.206)	(0.035)	(0.348)	(0.286)
EBIT_Sale_lag	0.3748	0.1051	0.0999	0.1926
	(0.209)	(0.042)	(0.274)	(0.296)
Debt_capital_lag	-0.2465	-0.0691	-0.0759	-0.6817*
	(0.237)	(0.044)	(0.358)	(0.353)
Ln_Asset_lag	0.0503	0.0141	0.1653***	0.2405
	(0.047)	(0.008)	(0.075)	(0.071)
Controls	Yes	Yes	Yes	Yes
Industry & Year FE	Yes	Yes	Yes	No

Notes: This table synthesizes key results of Hypothesis 1 across Probit, Marginal effects, and Ordered Probit models (with/without industry fixed effects). Dependent variables: GHG Target for Probit Model, Marginal Effect; Target level for Ordered Logit Model. P-values are derived from the reported coefficients and standard errors, with significant levels: *** p<0.01, ** p<0.05., * p<0.1.

Results for the Moderation Effect

Institutional Ownership (H2a): The result of the Probit regression analysis shows the coefficient of the interaction term is positive, but it is statistically insignificant ($p = 0.390$) (Table 4). The main effect of institutional ownership (Inst_Ownit-1) is negative and is not significant ($p = 0.860$) in the model. The results of the H2a extended model are shown in Table 4. The coefficient of the interaction term is negative and statistically insignificant ($p = 0.943$). The consistent lack of statistical significance across both model specifications suggests that the hypothesized moderating effect of institutional ownership is not supported by our data.

European Institutional Pressure (H2b): This study used a Probit model with interaction terms. It was found that index membership (Index_firmit-1) remains a strong predictor ($p = 0.005$), and the main effect of exposure to European institutional pressure (EU_Exposureit-1) is also significantly positive ($p < 0.031$) (Table 4). However, the coefficient of the interaction term is negative and statistically insignificant ($\beta = –0.2467$, $p = 0.379$) (Table 4). In the Logit extended model results of H2b, the interaction term is also negative and insignificant ($p = 0.935$) (Table 4). Both index membership and European institutional pressure are independent and significant driving factors for environmental practices, but there is a lack of synergistic enhancement effects between the two.

Table 4: Key Results of Hypothesis 2a(H2a) & Hypothesis 2b(H2b)

Variable	Probit Model(H2a)	Ordered Probit Model(H2a)	Probit Model(H2b)	Ordered Probit Model(H2b)
Intercept	-2.2558		-2.2058	
	(0.571)		(0.585)	
Index_firm_3list_lag	0.284	0.016	0.6976***	-0.0063
	(0.373)	(0.534)	(0.246)	(0.414)
Inst_Own_lag	-0.1102	-0.0097		
	(1.928)	(0.963)		
EU_Exposure_lag			0.2863**	0.002
			(0.133)	(0.196)
Interaction term	1.6565	0.0658	-0.2467	0.0471
	(1.928)	(2.471)	(0.280)	(0.540)
EBIT_Sale_lag	0.3825*	-0.008	0.4009*	0.0058
	(0.210)	(0.258)	(0.206)	(0.260)
Debt_capital_lag	-0.2391	0.0107	-0.2339	0.0142
	(0.239)	(0.351)	(0.237)	(0.354)
Ln_Asset_lag	0.05	0.1017	0.0332	0.1066
	(0.048)	(0.072)	(0.048)	(0.072)
Controls	Yes	Yes	Yes	Yes
Industry & Year FE	Yes	Yes	Yes	Yes

Notes: This table synthesizes key results of Hypothesis 2a and Hypothesis 2b across Probit and Ordered Probit models. Dependent variables: GHG Target for Probit Model; Target level for Ordered Logit Model. The interaction term of H2a is "Index_firm_3list_lag*Inst_Own_lag" and H2b is "Index_firm_3list_lag*EU_Exposure_lag" . P-values are derived from the reported coefficients and standard errors, with significance levels: *** p<0.01, ** p<0.05., * p<0.1.

Ownership Concentration (H3): This study established a Probit model containing the interaction term, and we found that the interaction term was not statistically significant (β=0.1900, p=0.872) (Table 5). The results of the H3 extended model are shown in Table 5. The interaction term is negative and is not significant (p = 0.981) (Table 5), which is insufficient evidence to reject the null hypothesis of the original H3 Probit model. The results

of the basic model and the extended model are highly consistent, both clearly indicating that the moderating effect of ownership concentration does not exist.

Table 5: Key Results of Hypothesis 3(H3)

Variable	Probit Model(H3)	Ordered Probit Model(H3)
Intercept	-2.2164	
	(0.574)	
Index_firm_3list_lag	0.5441	0.0383
	(0.298)	(0.580)
Concen_Own_lag	-0.035	-0.0689
	(0.322)	(0.497)
Interaction term	0.19	0.0047
	(1.175)	(2.497)
EBIT_Sale_lag	0.3775	-0.0029
	(0.209)	(0.270)
Debt_capital_lag	-0.2499	0.0754
	(0.239)	(0.072)
Ln_Asset_lag	0.0504	0.0754
	(0.047)	(0.072)
Controls	Yes	Yes
Industry & Year FE	Yes	Yes

Notes: This table synthesizes key results of Hypothesis 3 across Probit and Ordered Probit models. Dependent variables: GHG Target for Probit Model; Target level for Ordered Logit Model. The interaction term of H3 is "Index_firm_3list_lag*Concen_Own_lag". P-values are derived from the reported coefficients and standard errors, with significant levels: *** $p<0.01$, ** $p<0.05$., * $p<0.1$.

Robustness Checks

We use the Jaccard Similarity Analysis to test whether core variable (Indexed membership) has sufficient variability in the fixed effect model. The results shown in Figure 1 provide sufficient and robust evidence to refute the issue of absorption effect. The threat of our key variables being absorbed by fixed effects is low.

The Difference-in-Differences (DID) analysis provides a critical test for causality. Table 6 shows the regression results of the DID model. The coefficient of the core variable DID is not significant and negative at the 5% level (β=-0.031, p=0.655). We have not found statistically significant evidence showing that companies newly added to the index exhibit a trend of increase or decrease in the likelihood of firms' environmental practices. Alternatively, we cannot establish a definitive causal effect between a firm's entry into the index and its

subsequent environmental practices, thereby challenging the direct causal interpretation of Hypothesis 1.

Figure 1: Jaccard Similarity Analysis of Consecutive-Year List Overlaps (2018–2024)

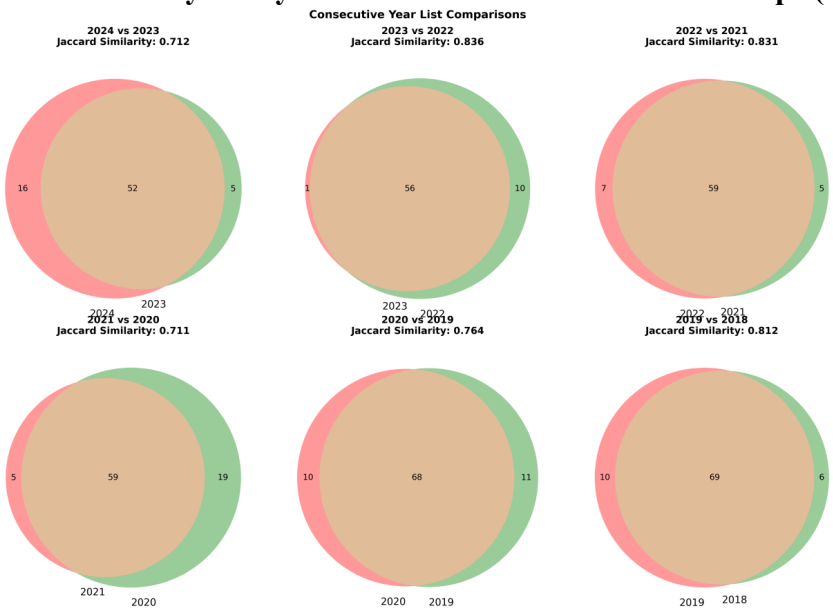

Table 6: Key Results of DID - Linear Probability Model

Variable	**DID Model**
Intercept	-0.0565
	(0.158)
Treated	0.2144
	(0.064)
Post	-0.207
	(0.016)
DID	-0.031
	(0.069)
EBIT_Sale_lag	-0.0962
	(0.055)
Debt_capital_lag	-0.0677
	(0.067)
Ln_Asset_lag	0.0113
	(0.013)
Controls	Yes
Industry & Year FE	Yes

Notes: Treated =1 if firm is in treatment group (index-included). Post =1 if in post-treatment period. DID = Treated×Post (captures group-time differential effect). P-values are derived from the reported coefficients and standard errors, with significant levels: *** p<0.01, ** p<0.05., * p<0.1.

DISCUSSION

This study confirms that index membership is a key driving force for companies to implement environmental practices (support H1). The probability of indexed firms adopting GHG targets is significantly 16.25% higher than non-indexed firms. The average marginal effect of 16.25% further indicates that index identity is not only a statistically significant predictor, but also an environmental practice driving factor with significant economic influence in the Thai market. Additionally, time trends, profitability, and firm size also exhibit significant positive predictive effects.

However, extended analysis of the Ordered Logit model (Extended H1) revealed that the impact of index membership on GHG target quality is not significant after controlling for industry fixed effects, and the industry characteristics play a more important role, such as degrees of policy pressure, industry competition, marginal costs. Firstly, Different industries operate in distinctly different regulatory environments and face varying degrees of policy pressure related to climate change. del Valle y Rivera and Vilar da Costa (2023) conducted a survey and study of 1200 companies worldwide and found that companies in downstream industries set more environmental indicators than companies in upstream industries. Enterprises in industries with strict regulations will set more specific environmental practice goals, regardless of whether they are included in the index list or not. Second, the competition within the industry affects the strategic choices of enterprises. Some companies face more intense competition in showcasing their environmental qualifications in order to attract environmentally conscious customers. Guntuka (2022) conducted an in-depth analysis on how industry competition drives companies to implement sustainability initiatives and found that a positive correlation between the sustainable development performance of competitors and focus companies. Thirdly, the feasibility of emission reduction technologies and marginal costs are not consistent across different industries. Existing literature has demonstrated through quantitative analysis that the marginal emission reduction cost of heavy industry is 3-5 times higher than that of service industry due to process complexity and technological pathways(Stern, 2007). The difference in emission reduction technology and cost determined by industry characteristics is not related to whether the firm is an indexed member.

All three hypotheses regarding moderating effects are not supported. The hypothesized moderating effect of institutional ownership (H2a) is not supported by our data. This could result from the heterogeneity of institutional investors, there are significant differences in investment maturity and ESG preferences among different types of institutional investors (Dyck et al., 2019). Secondly, Thailand's specific system and cultural background may also have an impact. The limit role of Thai institutional investors in external governance mechanisms because Thai institutional investors may generally be more passive in terms of corporate governance and shareholder activism (Bunkanwanicha & Wiwattanakantang, 2008). Finally, there may be a 'threshold effect'. Descriptive data shows that the institutional shareholding ratio of index companies is much higher than that of non-index companies. Once a company is included in the index and external supervision is sufficient to form strong constraints, the incremental impact of institutional ownership may no longer be significant.

Index membership and European institutional pressure (H2b) are significant independent predictive factors adopted by environmental practices, but no synergistic enhancement effect. The interaction term is not significant, it indicates that the additional European institutional pressure has not brought further marginal impact on index firms. This indicates that the

disconnect between policy and practice is a classic response of organizations to institutional pressures (Meyer & Rowan, 1977). Companies only meet the minimum requirements to maintain market access and legitimacy. These results also highlight the profound shaping effect of Thailand's unique institutional environment on corporate ESG practices. Rooted in relational capitalism and family networks (Witt & Redding, 2012), Thailand's business environment affects firms' ESG practices. Although global pressures have successfully pushed ESG onto corporate agendas, localized implementation exhibits a clear "decoupling" feature - formal ESG policies remain separate from actual practices(Meyer & Rowan, 1977). This can also explain why the regulatory mechanism based on Western theoretical expectations has not been presented in the Thai context. It is worth noting that the marginal effect included in the index (19.45%) is higher than the European institutional pressure (7.98%). This indicates the index mechanism is currently playing a leading role in promoting corporate environmental behavior in the Thai market.

The moderating effect of ownership concentration (H3) does not exist. This finding is unlikely to be accidental but reflects the specific corporate governance environment in Thailand. This is consistent with the "entrenchment effect" commonly documented in the corporate governance literature (Claessens et al., 2003). Family businesses account for approximately 67% of listed companies in the Thai market and large family shareholders may view environmental practices as non-essential and even conflict with profit maximization goals. Therefore, concentrated ownership not only fails to promote environmental response, but may also inhibit corporate environmental commitments. This reflects an inherent tension between controlling shareholders' desire to maintain autonomy and the growing external expectations for corporate responsibility and sustainability. They need to respond to increasing external pressure from international investors and rating agencies, while being constrained by internal governance structures that often resist change.

DID robustness test further indicates the result does not support a clear causal effect of changes in index membership, and this is contrary to the results of the baseline model supporting the positive correlation of hypothesis 1. The simplest explanation for this difference is the selection effect: major index is methodically curated to include large, stable, and strategically forward-looking firms. These firms are inherently more likely to have existing environmental initiatives or stronger environmental tendencies. However, the negative coefficient of the core variable ("DID") may suggest the potential reputation substitution effect, although not statistically significant. As Kitzmueller and Shimshack (2012)noted, the "reputational capital" acquired by firms may become a substitute for actual environmental investment, thereby reducing their motivation to pursue further emissions. Our findings collectively indicate that the observed positive correlation is most likely driven not by the index membership, but rather by the index's successful identification and selection of firms that are already environmental leaders or are poised to become so.

CONCLUSION

Research Summary

This study takes Thai listed companies as the research sample and focuses on the relationship between corporate ownership structure (measured by stock index membership) and environmental sustainability practices (with the establishment of greenhouse gas emission reduction targets as an example), and analyzes the moderating effects of institutional investors, European institutional pressure, and ownership concentration. Based on empirical analysis of panel data from 2019 to 2023.

This study strongly supports hypothesis H1 and finds that the probability of index constituent firms adopting emission reduction targets is approximately 16.25% higher than that of non-index firms. This result confirms that in the Thai market, firm ownership represented by index

membership is a key factor driving corporate environmental management. However, the extended analysis (Ordered Logit model) reveals an important detail: The positive effect of index membership is only reflected in promoting companies to "include in emission reduction targets" and cannot promote them to set "higher quality targets", and this effect becomes insignificant due to industry differences. The index membership only drives basic compliance, it hardly promotes high-quality targets and is affected by industries.

Regarding the moderating effects, none of the three hypotheses (H2a, H2b, H3) in this study received statistical support. The moderating effect of Institutional ownership (H2a) is not significant. This may be attributed to the heterogeneity of institutional investors (in terms of long-term versus short-term orientations) and the fact that local institutional investors in Thailand mostly remain in a state of passive participation. Both European institutional pressure (H2b) and ownership concentration (H3) function as independent driving factors, but they do not generate a synergistic enhancement effect with index membership. The impact of European market pressure on index and non-index companies is not different, reflecting the possible "decoupling" phenomenon between global environmental regulations and local business practices in Thailand. The moderating effect of ownership concentration (H3) is not significant, which is consistent with the "entrenchment effect" theory in corporate governance literature. In the Thai market dominated by family businesses, ownership concentration is more inclined to prioritize safeguarding the private interests of controlling shareholders rather than responding to environmental responsibilities, which undermines its governance function.

Finally, the robustness test found that the causal relationship between index membership and environmental practices is more complex. Companies newly included in the index exhibited a weakening in their motivation to conduct environmental practices. But it is not statistically significant, this finding can only be seen as a weak signal.

Theoretical Contributions and Practical Implications

In terms of theoretical contributions, this study reveals the phenomenon of "ineffective regulation" resulting from the lack of synergy between internal and external governance mechanisms. It deepens our understanding of the complex interaction between corporate governance and environmental practices under different institutional contexts. It indicates that the effectiveness of standard governance mechanisms premised on Western theories (e.g., institutional investor oversight, equity incentives) may be compromised or reshaped by Thailand's relational capitalist system. The practical inspiration is as follows:

For regulatory agencies and index compilation agencies: They should refine the index inclusion criteria by shifting the focus from encouraging the mere adoption of practices to incentivizing the quality of implementation. It is crucial to recognize the fundamental impact of industrial differences and to formulate more sector-specific environmental policies and guidelines.

For enterprise managers: They should translate environmental commitments from report narratives into concrete actions and management practices. Non-index companies should consider the strict market access requirements in Europe or other regions as an important external driving force to enhance their environmental management capabilities.

For investors: In assessing the environmental risks of Thai firms, investors should carefully differentiate between corporate environmental commitments and the actual quality of firms' practices. Investors also pay attention to the company's equity structure and the long-term direction of major shareholders on environmental issues.

Limitations

This study has several limitations, which also point to directions for future research. First, the study's primary focus on Thailand means that the generalizability of its findings to other emerging markets requires further examination. Secondly, the measurement of environmental practices is narrowly focused on "greenhouse gas emission reduction targets," thereby failing to capture a more comprehensive set of environmental performance indicators. Thirdly,

regarding the heterogeneity of institutional investors, and the study fails to account for the differential impacts of institutions with distinct investment orientations. Future research should distinguish between different categories of institutional investors and extend the scope to other emerging markets.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my supervisor Associate Professor KANIS SAENGCHOTE, Ph.D., of Department of Banking and Finance, Chulalongkorn Business School, for his invaluable guidance, rigorous academic supervision, and constant encouragement. From the conception of the research framework to improvement of paper, his profound insights and suggestions have greatly contributed to the completion of this study.

I also would like to express my sincere gratitude to Chulalongkron University for its generous support. I am a student under the scholarship program for ASESN or Non-ASEAN countries supported by Chulalongkron University. As a student under this scholarship, I have received crucial financial support.

REFERENCES

Ahluwalia, E., Mishra, A. K., & Tripathy, T. (2020). Institutional ownership, investor recognition and stock performance around index rebalancing: Evidence from Indian market. *Journal of Multinational Financial Management*, *55(1)*, 100615. https://doi.org/10.1016/j.mulfin.2020.100615

Arora, P. (2021). Ownership and Environmental Irresponsibility: A Contingency Model of Corporate Governance. *Academy of Management Proceedings*, *2021*(1), 11236. https://doi.org/10.5465/AMBPP.2021.11236

Bunkanwanicha, P., & Wiwattanakantang, Y. (2008). Big Business Owners in Politics. *The Review of Financial Studies*, 22(6), 2133–2168. https://doi.org/10.1093/rfs/hhn083

Calza, F., Profumo, G., & Tutore, I. (2016). Corporate Ownership and Environmental Proactivity. *Business Strategy and the Environment*, *25*(6), 369–389. https://doi.org/10.1002/bse.1873

Chen, H.-L., Shiu, C.-Y., & Wei, H.-S. (2019). Price effect and investor awareness: Evidence from MSCI Standard Index reconstitutions. *Journal of Empirical Finance*, *50(1)*, 93–112. https://doi.org/10.1016/j.jempfin.2019.01.002

Claessens, S., Dobos, G., Klingebiel, D., & Laeven, L. (2003). The growing importance of networks in finance and its effects on competition. In *Innovations in Financial and Economic Networks, Edward Elgar Publishers: Northampton, MA, USA*, *110*–135. https://ideas.repec.org/h/elg/eechap/3116_6.html

Cohen, S., Kadach, I., & Ormazabal, G. (2023). Institutional investors, climate disclosure, and carbon emissions. *Journal of Accounting and Economics*, *76*(2), 101640. https://doi.org/10.1016/j.jacceco.2023.101640

del Valle y Rivera, J. F., & Vilar da Costa, S. (2023). DO COMPANIES' ENVIRONMENTAL COMMITMENTS DIFFER ACCORDING TO THEIR SUPPLY CHAIN POSITION?

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147–160. https://doi.org/10.2307/2095101

Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics*, *131*(3), 693–714. https://doi.org/10.1016/j.jfineco.2018.08.013

Fombrun, C., & Van Riel, C. (1997). The reputational landscape. In *Revealing the Corporation: Perspectives on identity, image, reputation, corporate branding, and*

corporate-level marketing, pp. 1–16. https://repub.eur.nl/pub/12136/TheReputationalLandscape_1997.pdf

Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge University Press. https://doi.org/10.1017/CBO9781139192675

Guntuka, L. (2022). Inter-Firm ESG Rivalry: A Competitive Dynamics View. *Sustainability*, *14*(20), 13665. https://doi.org/10.3390/su142013665

Jiang, Y., Wang, C., Li, S., & Wan, J. (2022). Do institutional investors' corporate site visits improve ESG performance? Evidence from China. *Pacific-Basin Finance Journal*, *76(1)*, 101884. https://doi.org/10.1016/j.pacfin.2022.101884

Kitzmueller, M., & Shimshack, J. (2012). Economic Perspectives on Corporate Social Responsibility. *Journal of Economic Literature*, *50*(1), 51–84. https://www.jstor.org/stable/23269969

Kreps, D. M., & Wilson, R. (1982). Reputation and imperfect information. *Journal of Economic Theory*, *27*(2), 253–279. https://doi.org/10.1016/0022-0531(82)90030-8

Li, Q., Wang, S., He, Z., Li, H., & Xiang, E. (2023). Does stock market index adjustment affect environmental information disclosure? Evidence from China. *International Review of Financial Analysis*, *87(1)*, 102628. https://doi.org/10.1016/j.irfa.2023.102628

Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, *83*(2), 340–363. https://www.jstor.org/stable/2778293

Ross, S. A. (1973). The economic theory of agency: The principal's problem. *The American Economic Review*, *63*(2), 134–139. https://www.jstor.org/stable/1817064

Shleifer, A., & Vishny, R. W. (1997). A Survey of Corporate Governance. *The Journal of Finance*, *52*(2), 737–783. https://doi.org/10.2307/2329497

Stern, N. (2007). *The Economics of Climate Change: The Stern Review*. Cambridge University Press. https://doi.org/10.1017/CBO9780511817434

Thailand Trade. WITS - World. https://wits.worldbank.org/CountrySnapshot/en/THA/textview

Utomo, M. N., Wahyudi, S., Muharam, H., & Helmina, M. R. A. (2019). Linking Ownership Concentration to Firm Value: Mediation Role of Environmental Performance. *Journal of Environmental Management and Tourism*, 10(1), 182-194. https://doi.org/10.14505/jemt.10.1(33).18

Wang, Q.-J., Shen, Q., Geng, Y., & Li, D.-Y. (2022). Does Overseas Investment Raise Corporate Environmental Protection? Evidence from Chinese A-List Companies. *International Journal of Environmental Research and Public Health*, *19(2)*, 837. https://doi.org/10.3390/ijerph19020837

Witt, M., & Redding, G. (2012). Asian Business Systems: Institutional Comparison, Clusters, and Implications for Varieties of Capitalism and Business Systems Theory. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2104088

Zhao, P., Yao, X., & Shen, R. (2024). Capital market internationalization and firms' ESG performance: Evidence from the inclusion of China A-shares in the MSCI Emerging Market Index. *Energy Economics*, *133(1)*, 107415. https://doi.org/10.1016/j.eneco.2024.107415

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.