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Does Environmental Responsibility Pay Off? The Conditional Roles of Firm Size and Sustainability Board Governance

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ABSTRACT

Public attention to environmental responsibility has been heightened alongside the increasingly evident impacts of climate change. In response, corporations must continue to operate their businesses optimally while considering their environmental impact. This paper examines the impact of environmental responsibility on firm performance using unbalanced data from 681 companies across ASEAN-5 countries (Indonesia, Malaysia, Singapore, Thailand, and the Philippines). Our empirical investigation suggests that environmental responsibility is negatively associated with performance, both profitability and value. Further, in this paper, we documented that firm size can mitigate the adverse effect of environmental responsibility. This evidence may occur because large firms have better resources to benefit from their environmentally related investments and to create a reputation, especially in terms of firm value. We also find that the presence of a sustainability committee board in a firm can alter the negative impact of environmental responsibility on its campaign. Overall, this paper suggests that the size and sustainability of governance structures matter for firms' environmental responsibility in developing economies. Therefore, policymakers should implement different policies for firms of different sizes. Policymakers should also encourage companies to enhance their governance structures by considering the establishment of a sustainability committee.

JEL Classification: M14, Q52, Q56
Keywords: Environmental responsibility; Resource use; Emission; Innovation; Firm size; Sustainability board

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INTRODUCTION

Over the last decade, global business strategy has increasingly emphasized environmental responsibility as a crucial aspect of sustainability. This urgency is reinforced by the global policy outlined in the 2015 Paris Agreement, which binds countries to reduce carbon emissions and adopt more environmentally friendly practices. The agreement committed to limiting temperature rise by 1.5-2 °C until 2030 (Greenwalt et al., 2018). At the same time, cases of natural disasters arising from business activities also urge various parties, including companies, to take environmental responsibility more seriously. Xu et al. (2016) explain that land burning, land clearing, and continuous exploitation of coal mines without reclamation have increased environmental damage, potentially leading to ecological disasters. Some ecological disasters include storms, extreme weather events, droughts, wildfires, and floods that can last for days, weeks, or, in extreme cases, months (Morganstein and Ursano, 2020). According to Huang et al. (2024), environmental responsibility is a crucial element of Corporate Social Responsibility (CSR), reflecting a company's commitment to and implementation of responsible measures that protect and improve the natural environment within its business operations. In turn, stakeholders begin to recognize environmental responsibility as a factor that encourages companies to achieve good performance (Prayanthi and Budiarso, 2022), especially consumers who pay special attention to ecological issues (Yusoff et al., 2019). A shift in consumption patterns is underway, in which brands that have made environmental campaigns are replacing products that ignore their promises to the planet and its people (Reichheld et al., 2023). In addition, corporate environmental responsibility is growing amid increasing government pressure stemming from environmental pollution incidents (Li et al., 2020). They were sued for paying pollution costs and investing in environmental governance (Wang et al., 2021). Here, increased corporate environmental responsibility aims to retain current customers, gain new market share, and respond to policy and regulatory demand (Gangi et al., 2019).

Several previous studies have investigated the impact of environmental responsibility on firm performance. Research conducted in the United States and Australia by Bagh et al. (2024) finds that environmental responsibility positively impacts company profitability. A prior study by Choi et al. (2010) also identified similar results in the Asian region. Although the numbers are still limited, research on environmental responsibility has begun to expand in developing countries. As documented by Tseng et al. (2013), which takes the contexts of Indonesia and Vietnam into account, environmental responsibility increases sustainable performance. In contrast, research by Khurram et al. (2024) in the Chinese context found that environmental responsibility would erode the company's profitability. The direct financial benefits of environmental responsibility are lower than the costs associated with the transition (Zhao and Murrell, 2016), which aligns with the "cost-burden view" regarding environmental initiatives.

In assessing environmental responsibility alongside firm performance, we also observed that other factors, such as size and governance, shape both relations. According to Hart (2017) and Heubeck and Ahrens (2025), the natural resource-based view (NRBV) and slack resources theory, respectively, indicate that the competencies and resources that companies possess determine their ability to gain a competitive advantage from environmental campaign initiatives. Large companies are more favorable than small companies, which are more vulnerable to the risks and costs associated with environmental responsibility transformation. Meanwhile, environmental responsibility that is not balanced with oversight from the company board only triggers managers to act opportunistically, including engaging in greenwashing (Li et al., 2023; Zhou et al., 2024). Greenwashing behavior is detrimental to a company's sustainability because its manipulative actions can suppress market value (Xu et al., 2025). From here, the existence of a CSR committee or sustainability board governance is necessary to prevent and ensure that environmental responsibility is properly realized.

Our research focuses on the Association of Southeast Asian Nations (ASEAN) landscape, specifically the ASEAN-5 countries. ASEAN-5 comprises five major powers in Southeast Asia, classified by economic and geopolitical scale: Malaysia, Singapore, Indonesia, Thailand, and the Philippines (Syahfitri and Risfandy, 2023). ASEAN-5 has also placed sustainability goals among its main agendas (Saktiawan et al., 2026), although the regulations governing them remain diverse. For example, Singapore, Thailand, and Malaysia have long started implementing mandatory sustainability reporting on their stock exchanges, while Indonesia and the Philippines have not yet introduced it (Asian Development Bank Institute, 2020). Second, apart from differences in regional contexts, our research focused more on environmental aspects and the three pillars (resource use, emission score, and environmental innovation technology), whereas previous research examined all aspects of ESG (Aydoğmuş

et al., 2022; Narula et al., 2024). A more detailed investigation into environmental aspects alone would shift the research focus deeper into these responsibilities. According to Jin (2025), among other ESG pillars, environmental factors are the main determinants of company performance. Third, this research also investigates whether firm size and board sustainability governance moderate environmental responsibility and firm performance, as another main contribution. Although research on the role of size in sustainability and performance has been widely used, the determinants of board sustainability governance remain less explored. A prior study that motivated our investigation is Tran et al. (2021), who suggest that one key to encouraging corporate sustainability is the presence of a committee focused on this issue. Our research is potentially the first to apply the sustainability committee interaction in an ASEAN study regarding environmental responsibility and performance.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The Debate of Environmental Responsibility and Firm Performance Among Scholars

Several conflicting views exist regarding the relationship between environmental responsibility and firm performance. On the supporting side, stakeholder theory states a positive relationship between environmental responsibility and firm performance (Aggarwal and Padhan, 2017; Brouwers et al., 2014). Stakeholder theory assumes that increasing environmental responsibility is a response to stakeholders' pressure. If they fail to comply, they are feared to face boycotts and lawsuits in the future (Chi et al., 2022). Furthermore, consumers are becoming aware of environmental issues and prefer products from companies that are highly committed to sustainability. Friede et al. (2015) conducted a meta-analysis of more than 2,000 empirical studies that documented a positive relationship between environmental, social, and governance performance and company financial performance. The opposite view comes from neoclassical agency theory, which explains the negative relationship between environmental responsibility and firm performance (Brouwers et al., 2014). They believed that environmental responsibility investments would only increase company costs and expenses, consequently suppressing profits, resources, and business value. The relationship between CSR and financial performance tends to be negative, contrary to what most people believe (Li and Li, 2024). Chen et al. (2023) argue that the company's core activity resources were diverted due to environmental initiatives, accordingly suppressing financial performance and operational efficiency.

Hypothesis Development

While the majority of studies indicate a positive relationship between environmental responsibility and firm performance, growing evidence suggests that environmental responsibility can also reduce firm performance. From a cost-benefit perspective, several scholars argue that firm performance and ESG, including environmental responsibility, are unrelated or even negatively correlated (Mishra et al., 2024). Environmental initiatives often require significant technological investments, process redesign, and compliance measures. Neoclassical agency theory expresses that the costs incurred are not commensurate with the profits obtained (Friedman, 2017). Suggests that the costs associated with environmental initiatives exceed their economic benefits. Consequently, the company's performance became negative because the initial environmental responsibility costs were significant (Costa and Opare, 2024). At the same time, companies require more effective organizational practices and resource configurations to cope with the multi-dimensional character and broad scope of environmental innovation (Cloquell-Ballester et al., 2008). Allocating resources to environmental initiatives may divert funds from other potentially more profitable investments, especially if the company is experiencing limited financial constraints. Chen et al. (2024) demonstrated that firms facing financial constraints experience a more negative relationship between environmental responsibility and financial performance. Supports the idea that environmental investments may strain limited resources. Futri et al. (2025) supports our argument by finding that companies with better environmental responsibility scores are likely to face financial constraints. Based on these considerations, we hypothesize:

H1: Environmental responsibility lowering firm performance

As we mentioned earlier, firm size will affect the relationship between environmental responsibility and performance, depending on the resources available to the firm. Firms' capabilities have an important influence on gaining benefits from environmental initiatives (Miroshnychenko et al., 2021). Environmentally responsible investments in large companies are favored because they maximize economies of scale and existing resources. The benefits of environmental initiative practices are more pronounced in large companies with extensive resources, enabling them to effectively reduce costs and secure a superior position in achieving these benefits (Tanggamani et al., 2022). Companies with greater financial resources will have opportunities for environmental investment returns (Broadstock et al., 2020). This argument follows the natural resource-based view (NRBV) and slack resources theory, which posit that an organization's competence and resources influence its competitive advantage in environmental initiatives (Hart, 2017; Heubeck and Ahrens, 2025). In line with Saktiawan et al. (2025), environmental responsibility performance tends to increase with company size. Therefore, we build the hypothesis as follows:

H2: The relationship between environmental responsibility and performance is positively moderated by firm size.

Second, managers' opportunistic actions, exploiting control loopholes and a lack of transparency, allow them to project a sense of sustainability commitment without taking substantial action (Li et al., 2017). Recent studies by Xu et al. (2025) have revealed that market reactions turn negative when such manipulation is uncovered. As a preventive measure, companies establish sustainability councils or board committees responsible for ensuring environmental responsibility. The existence of a board sustainability committee is also consistent with stakeholder expectations in agency theory, ensuring manager accountability and avoiding opportunistic behavior (Ho and Shun Wong, 2001). Tran et al. (2021) demonstrated in their empirical study that the presence of a sustainability committee significantly enhances corporate sustainability disclosure. They are tasked with implementing, developing, and updating environmental policies to evaluate the company's resource allocation decisions (Bolourian et al., 2023). With sustainability board governance, the benefits of environmental responsibility will be better supported by maintaining stakeholders' trust, ultimately enhancing company performance. Hence, we propose the following hypothesis:

H3: The relationship between environmental responsibility and firm performance is positively moderated by sustainability committee board.

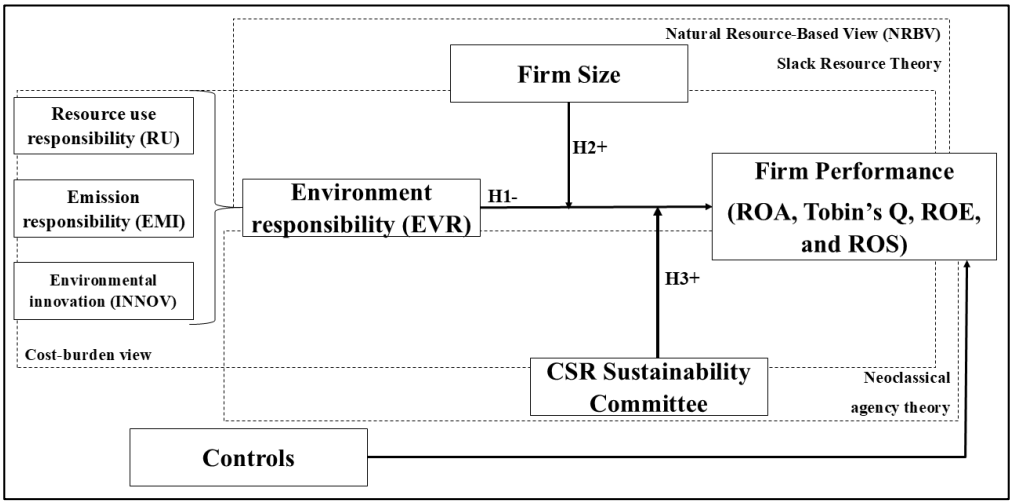

Figure 1 Theoretical framework

METHODS

Data

This research utilizes environmental responsibility, financial, and governance reports from firms in ASEAN-5 countries across all sectors. Firm-level data collected from Refinitiv or the London Stock Exchange Group (LSEG). 681 firms were obtained for the period 2014-2022. We also collect country-level data on inflation rates, gross domestic product (GDP), and regulatory quality from the World Development Indicators (WDI) by the World Bank. Details on all research variables, including 2839 observations for firm profitability (ROA) and 2834 observations for firm value (TQ), are shown in Table 1 after eliminating extreme values (using winsorize at the 1% and 99% levels).

Table 1 Variable of research

Variables and Abbreviation	Formula/Description	Reference(s)
Dependent variable		
Return on assets (ROA)	Net income after tax/total assets	Aydoğmuş et al. (2022), Narula et al. (2024)
Tobin's Q (TQ)	(Market value of equity + total assets – book value of equity) /total assets	Valencia (2025)
Return on equity (ROE)	Net income after tax/total equity	Valencia (2025)
Return on sales (ROS)	Net income after tax/total revenue	Kwak and Kim (2020)
Independent variable		
Environmental responsibility (EVR)	Refinitiv/LSEG score (0-100)/100 (See Table 2 for more details)	Saktiawan et al. (2025), Schoonjans (2024)
Resource use responsibility (RUR)	Refinitiv/LSEG score (0-100)/100 (See Table 2 for more details)	Saktiawan et al. (2025), Schoonjans (2024)
Emission use responsibility (EMR)	Refinitiv/LSEG score (0-100)/100 (See Table 2 for more details)	Saktiawan et al. (2025), Schoonjans (2024)
Environmental innovation (EVI)	Refinitiv/LSEG score (0-100)/100 (See Table 2 for more details)	Saktiawan et al. (2025), Schoonjans (2024)
Moderating variable		
Firm size (FS)	Natural logarithm of total revenue	Dang et al. (2018)
Sustainability board governance (SBG)	Dummy variable for companies that have a CSR committee or an ESG committee	Fathoni et al. (2025), Pratama et al. (2025)
Control variable		
Sustainability compensation incentives board (SCIB)	Dummy variable for companies that provide sustainability performance incentives to their committee	Amara and Ahmadi (2024)
Board gender diversity (GenderD)	Number of female directors on the company board	Saktiawan et al. (2026)
Independent Board (IndependB)	Number of independent boards to board size in percentage	Amara and Ahmadi (2024)
Board sturcture type (BST)	1 for companies that implement one-tier, 2 for two-tier, and 3 for companies with mixed on their board	Fathoni et al. (2025)
GDP growth (GDPG)	Growth of GDP	Saktiawan et al. (2025)
Inflation rate (IR)	Inflation rate	Saktiawan et al. (2025)
Regulatory quality (RQ)	The quality of a country's regulations ranges from a worst-case score of -2.5 to 2.5	Fathoni et al. (2025)

Dependent, Independent, Moderating, and Control Variables

Firm performance is the dependent variable of this study, and it uses the proxies return on assets (ROA) for firm profitability and Tobin's Q (TQ) for firm value. We also use alternative firm performance proxies, return on equity (ROE) and return on sales (ROS), for the robustness test. These proxies usually measure company performance in terms of profitability, value, and operations (Aydoğmuş et al., 2022; Kwak and Kim, 2020; Narula et al., 2024; Valencia, 2025). For the independent variable, environmental responsibility, we apply four proxies (ENV, RU, EMI, and INNOV), which are described in more detail in Table 2. The four variables have also been used previously as environmental responsibility variables, for example, in research (Boubakri et al., 2021; Schoonjans, 2024). Schoonjans (2024) explains that the environmental pillar is a company assessment that focuses on how a company acts to minimize damage and protect the environment, including resource consumption and carbon emissions. In short, the environmental pillar is a composite of resource use, emission, and environmental innovation scores (LSEG, 2024). At the decomposition level, resource use is calculated from energy and water consumption, supply chains, and sustainable packaging. Emissions encompass environmental management systems, waste management, and related standards, such as ISO 14000. Innovation is assessed based on green revenue, product innovation, and related research and expenditure. We also divided the four environmental responsibility proxies by 100 to maintain their magnitude relative to other variables, as suggested by Xue et al. (2023).

Table 2 Environmental responsibility (ER) proxy explanation

Environmental responsibility proxies	Indicator
Environment responsibility (EVR)	How companies apply best management practices to minimize the impact of environmental risks and obtain long-term value for shareholders through optimizing environmental opportunities
Resource use responsibility (RUR)	Reflects how the company's performance and capacity reduce the use of energy, materials, or water, and promote more environmentally friendly alternatives by improving supply chain management
Emission responsibility (EMR)	How the company is committed to reducing environmental emissions in production and operational processes
Environmental innovation (EVI)	Creation of new market opportunities through environmentally friendly products or related innovative technologies, and the company's capacity to reduce environmental burdens and costs borne by consumers

Source: LSEG (2024)

Firm size and the sustainability committee board are used as moderating variables. We use the natural logarithm of total revenue as a proxy for firm size and a dummy variable for the sustainability board governance, following the widespread literature that has employed them (Dang et al., 2018; Kubo and Sasaki, 2024; Pratama et al., 2025). The remaining variables are sustainability compensation incentives board (SCIB), gender (GenderD), independent (IndependB), structure type (BST), growth of gross domestic product (GDPG), inflation rate (IR), and regulatory quality (RQ), following research from Amara and Ahmadi (2024), Fathoni et al. (2025), and many others. We summarize these variables in Tables 1 and 2.

Methodology

To investigate the influence of environmental responsibility on firm performance, we use the following econometric specification.

$$FP_{i,t} = \alpha_0 + \beta_1 ER_{i,t} + \beta_2 FS_{i,t} + \beta_3 SCB_{i,t} + \varphi X_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$FP_{i,t} = \alpha_0 + \beta_1 ER_{i,t} + \beta_2 FS_{i,t} + \beta_3 SCB_{i,t} + \beta_4 ER_{i,t} * FS_{i,t}/SCB_{i,t} + \varphi X_{i,t} + \varepsilon_{i,t} \quad (2)$$

The subscript i indicates the individual firm, and t indicates year t. FP is the dependent variable for firm performance, measured by ROA and TQ. ER is environmental responsibility, an independent variable with ENV, RU, EMI, and INNOV as its proxies. Meanwhile, FS represents the company's size using a logarithmic scale based on total revenue. SCB itself is a dummy of the sustainability board governance. Next, the symbol X is the control variable, including SCIB, GenderD, IndependB, BST, GDPG, IR, and RQ. We also test the interaction effect between ER and FS/SCB in Equation 2. We estimate both equations using fixed effects with robust clustered standard errors to prevent autocorrelation and heteroscedasticity (Petersen, 2009). Previous research also concerns the issue of endogeneity, which is feared not to be adequately mitigated, and reverse causality in it (Lee et al., 2016). Lee et al. (2016) explain that environmental responsibility is not limited to its influence on company performance. Instead, the company's profitability can also influence its environmental responsibility. We then conducted a robustness test using the two-step generalized method of moments (GMM) proposed by Blundell and Bond (1998) to address endogeneity. The GMM has been believed to be one of the solutions for the endogeneity issue (Stock and Watson, 2020). Using GMM in our case will reformat equation (1) into the following equation (3):

$$FP_{i,t} = \alpha_0 + \beta_1 FP_{i,t-1} + \beta_2 ER_{i,t} + \beta_3 FS_{i,t} + \beta_4 SCB_{i,t} + \varphi X_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where FP in the right-hand side is lagged 1 period to emphasize the "dynamic" nature of the equation, the performance, FP (in the left-hand side), is also affected by itself in the previous period. According to Arellano and Bond (1991), the GMM will transform the dynamic model into first differences to eliminate country-specific effects. However, this will lead to problems such as autocorrelation and simultaneity between the independent variables. To overcome this issue, Arellano and Bond (1991) proposed that the lagged levels of the regressors (explanatory variables) are used as instruments under two strict conditions: (1) the error term is not serially correlated, and (2) the lag of the explanatory variables is weakly exogenous.

RESULTS, ANALYSIS, AND DISCUSSION

Descriptive Statistics and Correlation Matrix

Based on Table 3, return on assets (ROA) has a total number of observations (2,839) and a mean (0.053), indicating that, on average, the companies in this sample have a profit of around 5.3% of their total assets. For Tobin's Q (TQ), the minimum value is 0.556, the maximum is 8.704, and the standard deviation is 1.536. This standard deviation indicates that some companies' market values exceed the value of their physical assets. However, TQ has only 2,835 observations, fewer than those of the profitability proxy. Return on Equity (ROE) also has the same number of observations as ROA. It has a mean (0.113) and a standard deviation (0.132), indicating that companies profit around 11.3% on their equity. The last dependent variable, firm performance, is the return on sales (ROS), with a mean of 0.146 and a standard deviation of 0.123. The company has profitable performance, though it is heterogeneous.

Table 3 Description statistics and correlation matrix

Variable	Obs	Mean	Std. Dev.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)
(1) ROA	2,839	0.053	0.072	-0.226	0.351	1					
(2) TQ	2,834	1.749	1.536	0.556	8.704	0.605	1				
(3) ROE	2,839	0.113	0.132	-0.253	0.548	0.812	0.528	1			
(4) ROS	2,839	0.146	0.123	-0.023	0.360	0.352	0.097	0.396	1		
(5) EVR	2,839	0.393	0.245	0.000	0.973	-0.031	-0.031	0.013	0.018	1	
(6) RUR	2,839	0.449	0.275	0.000	0.995	-0.017	-0.004	-0.006	-0.028	0.852	1
(7) EMR	2,839	0.436	0.295	0.000	0.999	-0.017	-0.021	0.030	-0.027	0.849	0.726
(8) EVI	2,839	0.214	0.283	0.000	0.980	-0.047	-0.068	-0.011	0.091	0.586	0.347
(9) FS	2,839	20.424	1.317	17.348	21.869	0.037	-0.039	0.142	-0.055	0.390	0.285
(10) SBG	2,839	0.689	0.463	0.000	1.000	0.017	0.011	0.005	-0.042	0.393	0.415
(11) SCIB	2,839	0.142	0.349	0.000	1.000	-0.081	-0.083	-0.049	0.044	0.215	0.233
(12) GenderD	2,839	1.577	1.339	0.000	10.000	-0.013	0.043	-0.003	0.034	0.073	0.100
(13) IndependB	2,839	48.578	14.974	0.000	100.000	-0.078	-0.060	-0.087	0.070	0.112	0.144
(14) BST	2,839	1.168	0.452	1.000	3.000	0.124	0.091	0.108	0.048	-0.052	-0.089
(15) GDPG	2,839	3.539	3.859	-9.518	8.882	0.052	-0.031	0.049	0.048	-0.117	-0.138
(16) IR	2,839	2.395	2.024	-1.138	6.412	0.067	0.003	0.050	0.018	-0.063	-0.073
(17) RQ	2,839	0.610	0.746	-0.158	2.252	-0.096	-0.138	-0.130	0.051	0.043	0.090

Table 3 Cont.

Variable	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) ROA											
(2) TQ											
(3) ROE											
(4) ROS											
(5) EVR											
(6) RUR											
(7) EMR	1										
(8) EVI	0.337	1									
(9) FS	0.392	0.220	1								
(10) SBG	0.395	0.141	0.015	1							
(11) SCIB	0.208	0.124	0.055	0.179	1						
(12) GenderD	0.055	0.086	-0.086	0.113	0.128	1					
(13) IndependB	0.050	0.121	-0.031	0.149	0.130	0.041	1				
(14) BST	-0.043	-0.020	0.150	-0.175	-0.107	-0.254	-0.110	1			
(15) GDPG	-0.105	-0.089	-0.035	-0.016	-0.036	-0.110	0.020	0.072	1		
(16) IR	-0.027	-0.048	-0.050	-0.029	0.045	-0.079	-0.114	0.257	0.498	1	
(17) RQ	-0.052	0.039	-0.053	0.117	0.158	-0.038	0.478	-0.254	0.043	-0.183	1

Next, the environmental responsibility variable was measured by four proxies, which are the environment (EVR), renewable energy resource use (RUR), emissions (EMR), and environmental innovation (EVI), each having a total of 2,839 observations. EVR has a mean of 0.393 with a standard deviation of 0.245, suggesting a significant variation in companies' environmental scores. RUR has a mean of 0.449 with a standard deviation of 0.275, also showing wide variation in resource use. EMR has a mean (0.436) and a standard deviation (0.295), with a minimum value (0.0000) and a maximum value (0.999), signalling that some companies produce no emissions score. Last, EVI has a maximum value (0.980), a standard deviation (0.283), and a mean (0.214).

In Table 3, we also present a correlation matrix showing the strength of the relationship between proxies. Overall, the correlation between the study proxies is low, avoiding multicollinearity. However, several proxies with relatively high correlations, such as ROA, TQ, and ROE, or EVR, RUR, EMR, and EVI, are not

problematic because they are proxies for firm performance and environmental responsibility variables, respectively, and are included in separate regression models.

Baseline Regression

Table 4 shows the baseline regression results investigating the effect of environmental responsibility on firm performance. The results present that the four environmental responsibility proxies, EVR, RUR, EMR, and EVI, negatively influence firm performance as measured by ROA and TQ at the 1% to 5% significance level. Our results indicate that greater environmental responsibility will lead to reduced firm performance, as measured by profitability and value. This finding aligns with several previous studies from (Duque-Grisales and Aguilera-Caracuel, 2021; Lioui and Sharma, 2012).

Table 4 Baseline regression

	FE	FE	FE	FE	FE	FE	FE	FE
	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) TQ	(6) TQ	(7) TQ	(8) TQ
EVR	-0.0495***				-0.940***			
	(-4.64)				(-4.91)			
RUR		-0.0354***				-0.624***		
		(-4.43)				(-4.21)		
EMR			-0.0311***				-0.639***	
			(-3.59)				(-4.70)	
EVI				-0.0155**				-0.244**
				(-2.25)				(-1.97)
FS	0.0437***	0.0442***	0.0436***	0.0413***	0.0367	0.0433	0.0389	-0.00893
	(3.90)	(3.91)	(3.84)	(3.64)	(0.40)	(0.46)	(0.42)	(-0.09)
SBG	0.00313	0.00268	0.00134	-0.00331	-0.0498	-0.0684	-0.0744	-0.176***
	(0.90)	(0.75)	(0.38)	(-0.97)	(-0.78)	(-1.01)	(-1.23)	(-2.60)
SCIB	-0.00375	-0.00386	-0.00373	-0.00555	-0.0282	-0.0335	-0.0239	-0.0646
	(-0.84)	(-0.85)	(-0.82)	(-1.18)	(-0.38)	(-0.44)	(-0.32)	(-0.89)
GenderD	-0.00566***	-0.00599***	-0.00580***	-0.00683***	-0.0545	-0.0622*	-0.0551	-0.0785**
	(-3.11)	(-3.37)	(-3.04)	(-3.76)	(-1.62)	(-1.85)	(-1.59)	(-2.39)
IndependB	0.000100	0.0000984	0.0000914	0.0000571	-0.00320	-0.00332	-0.00327	-0.00407
	(0.60)	(0.58)	(0.54)	(0.33)	(-1.19)	(-1.23)	(-1.19)	(-1.44)
BST	0.000720	0.000826	0.00151	0.00179	0.114	0.118	0.128	0.136
	(0.12)	(0.14)	(0.25)	(0.29)	(1.20)	(1.24)	(1.30)	(1.36)
GDPG	0.00131***	0.00127***	0.00130***	0.00136***	-0.0136***	-0.0141***	-0.0139***	-0.0125**
	(5.38)	(5.20)	(5.27)	(5.54)	(-2.69)	(-2.77)	(-2.70)	(-2.47)
IR	-0.000132	-0.000159	-0.000101	-0.000204	0.0144	0.0138	0.0152	0.0130
	(-0.24)	(-0.29)	(-0.19)	(-0.38)	(1.20)	(1.14)	(1.25)	(1.07)
RQ	-0.0172	-0.0207	-0.0206	-0.0228	-0.644*	-0.717**	-0.703**	-0.757**
	(-1.02)	(-1.20)	(-1.23)	(-1.30)	(-1.85)	(-2.01)	(-2.02)	(-2.07)
Constant	-0.811***	-0.823***	-0.812***	-0.768***	1.922	1.772	1.826	2.752
	(-3.55)	(-3.56)	(-3.50)	(-3.32)	(1.00)	(0.90)	(0.94)	(1.39)
Firm effects	YES	YES	YES	YES	YES	YES	YES	YES
N. obs.	2839	2839	2839	2839	2834	2834	2834	2834
N. firms	681	681	681	681	681	681	681	681
R-sq. Within	0.136	0.132	0.129	0.119	0.0686	0.0609	0.0633	0.0472

Note: This table shows the main regression results with equation (1). Columns (1)-(4) are the results of the regression effects of ER on firm profitability with return on assets (ROA). Meanwhile, columns (5)-(8) are the results of the regression effects of ER on firm value with Tobin's Q. Please see Table 1 for the explanation of each variable. Robust t-statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01 depict the significance level.

Environmental responsibility is often associated with a decrease in ROA due to additional process costs (Zaiane and Ellouze, 2023). According to Akben-Selcuk (2019), the diversion of profitable investment funds and additional cost burdens reveal a negative relationship between environmental responsibility and corporate performance. Furthermore, high upfront costs associated with environmental responsibility will negatively impact company performance (Costa and Opare, 2024), and the company's efforts to maximize environmental commitment will ultimately compromise its overall outcomes. Our findings also strengthen the neoclassical agency theory, which explains the negative relationship between environmental responsibility and firm performance (Brouwers et al., 2014). Environmental initiatives will divert resources from the company's core activities, resulting in operational inefficiencies and reducing financial capability (Chen et al., 2023). ESG investment, including environmental responsibility, will consume part of the business capital and does not convey a positive signal for the firm's value (Brammer and Pavelin, 2006). Besides, these ASEAN-5 countries generally still lack an ESG-conscious market, which hinders the development of a sufficient environment for sustainable development (Saktiawan et al., 2026). One is that consumers remain reluctant to spend more on environmentally friendly products. The combination of high transformation costs, resource diversion, and poor

market appreciation makes environmental responsibility less profitable for companies. Therefore, hypothesis 1 in our study is supported.

For the control variable results, company size, proxied by the FS variable, positively affects profitability only. Large companies possess internal operational advantages such as economies of scale, bargaining power, and access to affordable funding, which directly impact profitability and efficiency. However, the effect of size has disappeared from market valuations, as Cheema et al. (2021) investigated in the US and other international markets. In contrast, gender diversity (GenderD) actually has a depressing impact on firm performance, especially profitability. As boards become more diverse, various perspectives emerge, including values and communication styles that tend to trigger conflict, as supported by the findings of Ahmad et al. (2020) study. Interestingly, GDP growth has distinct impacts on firm profitability and value. GDP growth reflects the vibrancy of real economic activity and demand, driving profitability (Demirgüç-Kunt and Huizinga, 1999). However, rising GDP often leads to excessive expectations or overvaluation, especially in emerging markets (Bekaert et al., 2007). Our results also found that regulatory quality does not always bring a positive impact on firm value, as the regulatory burden effect view (Levie and Autio, 2011).

Further Analysis: Interaction Effect

We found an interesting result in Table 5, where the interaction between environmental responsibility and size positively affects performance (both firm profitability and value). Large companies are more likely to benefit from environmentally responsible measures because of their capabilities (Miroshnychenko et al., 2021). These capabilities include extensive endowments to reduce costs and gain a competitive advantage (Tanggamani et al., 2022), including the maximization of economies of scale. Besides that, large companies have strong financial capabilities. Broadstock et al. (2020) argue that those with substantial financial capital will benefit from environmental investment. The NRBV and slack theory also reinforce this view that competencies and resources are key to gaining a competitive advantage in sustainability initiatives (Hart, 2017; Heubeck and Ahrens, 2025). The moderating effect of firm size will be more significant, especially on the firm value model (Table 5, columns 5-8). Following the initial goal, large companies want to build positive values regarding environmental commitment. Dzage and Szabados (2024) explain that large companies are attempting to establish their brand image and fulfill stakeholder demands for environmental stewardship. Our results suggest that increased environmental responsibility will enhance reputation, prestige, and brand image, which translates to driving financial outcomes (Brouwers et al., 2014). These results support hypothesis 2.

In other interaction findings, we also demonstrated positive results for environmental responsibility when the company has a sustainability committee, as shown in Table 6, columns 1-8. Sustainability committee boards are responsible for critically evaluating business practices that address environmental issues. They are mandated to align sustainable development with financial returns (Faleye et al., 2011; Velte and Stawinoga, 2020). The presence of the sustainability committee board can balance the costs incurred and the benefits optimized. The sustainability committee board can also help convince stakeholders to counteract the potential greenwashing rumors (Pratama et al., 2025). As we know, regulations and oversight in the ASEAN-5 region are still developing compared to those in other regions, such as Europe or North America (Khunkaew et al., 2023; Saktiawan et al., 2026). This condition creates a loophole for companies to make sustainability claims without actual implementation (Pratama et al., 2025), thereby further eroding credibility and reducing performance (Birindelli et al., 2024). In this regard, the sustainability committee board ensures a credible environmental stewardship campaign. When they can maintain stakeholders' trust, the company's value will increase, as our results are stronger in the Tobin's Q model (Table 6, columns 5-8). Our third hypothesis was also supported.

Table 5 Environmental responsibility, firm size, and performance

	FE	FE	FE	FE	FE	FE	FE	FE
	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) TQ	(6) TQ	(7) TQ	(8) TQ
EVR	-0.297**				-8.414***			
	(-2.41)				(-3.84)			
RUR		-0.268***				-4.413**		
		(-2.68)				(-2.48)		
EMR			-0.210**				-5.745***	
			(-2.24)				(-3.45)	
EVI				-0.194*				-7.176***
				(-1.85)				(-3.85)
FS	0.0390***	0.0393***	0.0396***	0.0404***	-0.105	-0.0369	-0.0740	-0.0437
	(10.10)	(10.51)	(10.66)	(12.95)	(-1.54)	(-0.55)	(-1.12)	(-0.79)
EVR x FS	0.0118**				0.358***			
	(2.01)				(3.41)			
RUR x FS		0.0111**				0.182**		
		(2.33)				(2.13)		
EMR x FS			0.00857*				0.245***	
			(1.91)				(3.07)	
EVI x FS				0.00848*				0.330***
				(1.70)				(3.73)
Constant	-0.715***	-0.723***	-0.732***	-0.749***	4.822***	3.412**	4.127***	3.484***
	(-9.02)	(-9.39)	(-9.57)	(-11.61)	(3.42)	(2.48)	(3.04)	(3.03)
Control	YES	YES	YES	YES	YES	YES	YES	YES
Firm effects	YES	YES	YES	YES	YES	YES	YES	YES
N. Obs.	2839	2839	2839	2839	2834	2834	2834	2834
N. Firms.	681	681	681	681	681	681	681	681
R-sq. Within	0.137	0.134	0.131	0.121	0.0736	0.0629	0.0674	0.0534
Marginal tests:								
P.10 (Low)	-0.178***	-0.156***	-0.124**	-0.109**	-4.836***	-2.595***	-3.294***	-3.875***
	(-2.76)	(-3.00)	(-2.53)	(-1.98)	(-4.21)	(-2.79)	(-3.78)	(-3.96)
P.50 (Medium)	0.295*	0.289**	0.219*	0.230	9.477***	4.674*	6.510***	9.325***
	(1.72)	(2.07)	(1.67)	(1.60)	(3.10)	(1.88)	(2.79)	(3.63)
P.90 (High)	0.769*	0.734**	0.561*	0.570*	23.791***	11.944**	16.315**	22.526***
	(1.89)	(2.22)	(1.81)	(1.66)	(3.28)	(2.02)	(2.95)	(3.69)

Note: This table shows the regression results with equation (2). Columns (1)-(4) are the results of the regression interaction effect of ER and FS on firm profitability with return on assets (ROA). Meanwhile, columns (5)-(8) are the results of the regression interaction effect of ER and FS on firm value with Tobin's Q. All these results include control variables. Please see Table 1 for the explanation of each variable. Robust t-statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01 depict the significance level.

Table 6 Environmental responsibility, sustainability board governance, and firm performance

	FE	FE	FE	FE	FE	FE	FE	FE
	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) TQ	(6) TQ	(7) TQ	(8) TQ
EVR	-0.0648***				-1.266***			
	(-6.93)				(-7.60)			
RUR		-0.0522***				-0.885***		
		(-6.55)				(-6.22)		
EMR			-0.0392***				-0.812***	
			(-5.42)				(-6.29)	
EVI				-0.0265***				-0.516***
				(-3.32)				(-3.63)
SBG	-0.00497	-0.00677	-0.00380	-0.00612*	-0.222***	-0.216***	-0.183**	-0.246***
	(-1.13)	(-1.55)	(-0.90)	(-1.91)	(-2.83)	(-2.78)	(-2.44)	(-4.30)
EVR x SBG	0.0376**				0.801***			
	(2.50)				(2.98)			
RUR x SBG		0.0407***				0.634***		
		(3.01)				(2.63)		
EMR x SBG			0.0213*				0.454**	
			(1.70)				(2.04)	
EVI x SBG				0.0246*				0.610***
				(1.88)				(2.61)
Constant	-0.804***	-0.811***	-0.805***	-0.767***	2.064*	1.961*	1.970*	2.772**
	(-12.70)	(-12.69)	(-12.60)	(-12.07)	(1.83)	(1.72)	(1.73)	(2.45)
Control	YES	YES	YES	YES	YES	YES	YES	YES
Firm effects	YES	YES	YES	YES	YES	YES	YES	YES
N. Obs.	2839	2839	2839	2839	2834	2834	2834	2834
N. Firms.	681	681	681	681	681	681	681	681
R-sq. Within	0.138	0.135	0.130	0.121	0.0725	0.0639	0.0651	0.0503
Marginal tests:								
P.10 (Low)	0.295*	0.341**	0.202*	0.245*	5.592**	4.152*	3.847*	4.622**
	(1.91)	(2.47)	(1.67)	(1.95)	(2.03)	(1.69)	(1.75)	(2.05)
P.50 (Medium)	1.736**	1.913***	1.115*	1.310**	33.013**	24.235*	22.145*	25.071**
	(2.17)	(2.69)	(1.78)	(2.01)	(2.32)	(1.90)	(1.95)	(2.14)
P.90 (High)	3.177**	3.486***	2.028*	2.376**	60.435**	44.318*	40.442**	45.520**
	(2.20)	(2.71)	(1.80)	(2.02)	(2.35)	(1.93)	(1.97)	(2.15)

Note: This table shows the regression results with equation (2). Columns (1)-(4) are the results of the regression interaction effect of ER and SBG on firm profitability with return on assets (ROA). Meanwhile, columns (5)-(8) are the results of the regression interaction effect of ER and SBG on firm value with Tobin's Q. All these results include control variables. Please see Table 1 for the explanation of each variable. Robust t-statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01 depict the significance level.

Robustness Checks and GMM Testing

We use several robustness tests to confirm that our findings are consistent with the main results. The first robustness test involves replacing the firm performance variable with return on equity (ROE) and return on sales (ROS) as alternative measures (Table 7). The results are mostly unchanged, and the significance levels are high, except for column 8, which is insignificant.

Lastly, to demonstrate that our research results are exempt from endogeneity issues as explained previously, we employ the two-step generalized method of moments (GMM). This robustness is present in Table 8. The results remain consistent with our initial findings. The GMM diagnostic test also indicates that the research model is valid and that there is no residual autocorrelation in the second-order (AR2) process, ensuring reliable estimation.

Table 7 Robustness using return on equity (ROE) and return on sales (ROS)

	FE	FE	FE	FE	FE	FE	FE	FE
	(1) ROE	(2) ROE	(3) ROE	(4) ROE	(5) ROS	(6) ROS	(7) ROS	(8) ROS
EVR	-0.0827***				-0.0350***			
	(-5.89)				(-3.19)			
RUR		-0.0711***				-0.0360***		
		(-6.31)				(-4.08)		
EMR			-0.0595***				-0.0317***	
			(-5.51)				(-3.76)	
EVI				-0.0189*				-0.00462
				(-1.76)				(-0.55)
FS	0.0496***	0.0516***	0.0501***	0.0455***	0.0188***	0.0202***	0.0195***	0.0170***
	(8.13)	(8.42)	(8.18)	(7.47)	(3.94)	(4.21)	(4.08)	(3.58)
SBG	-0.00685	-0.00519	-0.00843	-0.0181***	-0.00306	-0.00117	-0.00252	-0.00808*
	(-1.15)	(-0.87)	(-1.43)	(-3.22)	(-0.66)	(-0.25)	(-0.55)	(-1.85)
SCIB	0.00466	0.00528	0.00531	0.00135	0.000236	0.000891	0.00103	-0.00131
	(0.77)	(0.87)	(0.88)	(0.22)	(0.05)	(0.19)	(0.22)	(-0.28)
GenderD	-0.00984***	-0.00995***	-0.00971***	-0.0120***	-0.0106***	-0.0105***	-0.0103***	-0.0116***
	(-3.82)	(-3.88)	(-3.75)	(-4.66)	(-5.27)	(-5.21)	(-5.07)	(-5.81)
IndependB	-0.000129	-0.000110	-0.000129	-0.000211	-0.0000718	-0.0000530	-0.0000598	-0.000112
	(-0.57)	(-0.48)	(-0.57)	(-0.93)	(-0.41)	(-0.30)	(-0.34)	(-0.63)
BST	-0.0121*	-0.0125*	-0.0110	-0.0100	-0.00541	-0.00584	-0.00515	-0.00439
	(-1.70)	(-1.75)	(-1.55)	(-1.40)	(-0.97)	(-1.05)	(-0.93)	(-0.79)
GDPG	0.00265***	0.00255***	0.00261***	0.00275***	0.00328***	0.00322***	0.00325***	0.00333***
	(5.15)	(4.96)	(5.06)	(5.29)	(8.15)	(8.00)	(8.06)	(8.25)
IR	0.000204	0.000174	0.000282	0.0000809	-0.000000115	-0.00000453	0.0000557	-0.0000531
	(0.21)	(0.18)	(0.29)	(0.08)	(-0.00)	(-0.01)	(0.07)	(-0.07)
RQ	-0.0450**	-0.0496**	-0.0499**	-0.0551***	-0.0288*	-0.0302*	-0.0301*	-0.0334**
	(-2.17)	(-2.40)	(-2.41)	(-2.65)	(-1.78)	(-1.87)	(-1.86)	(-2.06)
Constant	-0.810***	-0.850***	-0.824***	-0.736***	-0.188*	-0.215**	-0.204**	-0.156
	(-6.44)	(-6.73)	(-6.52)	(-5.84)	(-1.91)	(-2.18)	(-2.07)	(-1.59)
Firm effects	YES	YES	YES	YES	YES	YES	YES	YES
N. obs.	2839	2839	2839	2839	2839	2839	2839	2839
N. firms	681	681	681	681	681	681	681	681
R-sq. Within	0.0873	0.0895	0.0855	0.0739	0.0809	0.0837	0.0826	0.0767

Note: This table shows robustness regression results with equation (1). Columns (1)-(4) are the results of the regression effects of ER on firm profitability with return on equity (ROE). Meanwhile, columns (5)-(8) present the regression results for the effects of ER on firm profitability, as measured by return on sales (ROS). Please see Table 1 for the explanation of each variable. Robust t-statistics in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ depict the significance level.

Table 8 Two-step GMM

	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM
	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) TQ	(6) TQ	(7) TQ	(8) TQ
ROA_{t-1}	0.460***	0.454***	0.453***	0.451***				
	(14.27)	(6.15)	(6.43)	(14.02)				
TQ_{t-1}					0.532***	0.565***	0.545***	0.526***
					(20.33)	(25.61)	(24.12)	(20.63)
EVR	-0.0512***				-0.466***			
	(-5.24)				(-3.73)			
RUR		-0.0367***				-0.219**		
		(-3.45)				(-2.54)		
EMR			-0.0314***				-0.398***	
			(-3.18)				(-5.07)	
EVI				-0.0214***				-0.371***
				(-3.12)				(-3.83)
FS	0.00634***	0.00448*	0.00462*	0.00289*	0.0546**	0.0280*	0.0670***	0.0394**
	(3.28)	(1.69)	(1.65)	(1.65)	(2.45)	(1.67)	(3.51)	(2.02)
SBG	0.00459	0.00553	0.00627	-0.000414	-0.0716	-0.0826*	-0.0367	-0.106**
	(1.37)	(1.20)	(1.29)	(-0.14)	(-1.51)	(-1.85)	(-0.87)	(-2.34)
SCIB	-0.00137	-0.000341	-0.000637	-0.00291	0.00699	0.0377	0.0434	0.0360
	(-0.39)	(-0.07)	(-0.13)	(-0.87)	(0.16)	(0.94)	(1.14)	(0.91)
GenderD	0.00352**	0.00323	0.00223	0.00134	-0.00719	-0.00242	0.00907	-0.0327*
	(2.05)	(1.43)	(1.00)	(0.80)	(-0.35)	(-0.12)	(0.48)	(-1.68)
IndependB	-0.000395**	-0.000347	-0.000480*	-0.000252	-0.00386**	-0.00366**	-0.00379**	-0.00188
	(-2.22)	(-1.25)	(-1.74)	(-1.48)	(-2.33)	(-2.38)	(-2.46)	(-1.20)
BST	-0.00180	-0.00178	-0.00230	0.000690	0.311***	0.273***	0.349***	0.294***
	(-0.38)	(-0.25)	(-0.31)	(0.16)	(6.82)	(6.57)	(7.92)	(5.82)
GDPG	0.00105***	0.000998***	0.00101***	0.00104***	-0.00789***	-0.00772***	-0.00865***	-0.00670***
	(6.33)	(4.38)	(4.33)	(6.37)	(-4.70)	(-4.52)	(-5.25)	(-4.10)
IR	0.000334	0.000318	0.000295	0.000401	-0.00555	-0.00650*	-0.00994***	-0.00648*
	(0.98)	(0.68)	(0.62)	(1.21)	(-1.64)	(-1.92)	(-3.14)	(-1.95)
RQ	-0.0164**	-0.0218**	-0.0229**	-0.0180**	0.416***	0.296***	0.370***	0.406***
	(-2.18)	(-2.11)	(-2.13)	(-2.52)	(4.76)	(3.94)	(4.77)	(4.87)
Constant	-0.0631	-0.0276	-0.0257	-0.00966	-0.613	-0.111	-0.943**	-0.389
	(-1.64)	(-0.53)	(-0.48)	(-0.26)	(-1.37)	(-0.31)	(-2.43)	(-0.98)
Firm effects	YES	YES	YES	YES	YES	YES	YES	YES
N obs.	2647	2647	2647	2647	2620	2620	2620	2620
N firms	670	670	670	670	665	665	665	665
AR (1) Test	0.000	0.000	0.000	0.000	0.040	0.038	0.040	0.043
AR (2) Test	0.224	0.245	0.251	0.243	0.425	0.421	0.428	0.411
Hansen Test	0.080	0.154	0.055	0.112	0.063	0.056	0.054	0.053

Note: This table shows the generalized method of moments (GMM) testing using equation (3). Columns (1)-(4) are the results of ER on firm profitability with return on assets (ROA). Meanwhile, columns (5)-(8) are the results of the regression effects of ER on firm value with Tobin's Q. Please see Table 1 for the explanation of each variable. Robust t-statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01 depict the significance level.

CONCLUSION AND POLICY RECOMMENDATIONS

This research generally shows that environmental responsibility reduces firm performance, possibly because of the substantial costs and resources required. However, we also find that firm size and the sustainability committee board can moderate environmental responsibility to improve firm performance. The capabilities and resources of large companies enable them to obtain the benefits of environmental responsibility more effectively than small companies. Additionally, the sustainability committee board is to ensure and enhance stakeholders' trust in maintaining sustainability initiatives. Our findings provide important considerations for companies to reassess their ability in environmental responsibility and its contribution to performance outcomes. These findings are particularly useful for stakeholders and managers in the ASEAN-5 region and may also be applicable in other ASEAN countries. Although environmental responsibility is crucial for achieving sustainable development, its impact on company performance needs to be recalculated. Assistance is needed through policies or incentives regarding companies' environmental commitment. Policymakers should adopt different environmental responsibility policies based on firm capability. Therefore, companies with limited assets can overcome the initial challenges of implementing environmentally responsible practices. For large companies, environmental commitment can be a competitive advantage in operations and a long-term benefit. Policies are also needed to encourage the establishment of sustainabilitycommittees or similar boards, such as offering tax incentives to attract companies.

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REFERENCES

Aggarwal, D., & Padhan, P. C. (2017). Impact of capital structure on firm value: Evidence from Indian hospitality industry. *Theoretical Economics Letters*, *7*(4), 982–1000. https://doi.org/10.4236/tel.2017.74067

Ahmad, M., Raja Kamaruzaman, R. N. S., Hamdan, H., & Annuar, H. A. (2020). Women directors and firm performance: Malaysian evidence post policy announcement. *Journal of Economic and Administrative Sciences*, *36*(2), 97–110. https://doi.org/10.1108/JEAS-04-2017-0022

Akben-Selcuk, E. (2019). Corporate social responsibility and financial performance: The moderating role of ownership concentration in Turkey. *Sustainability*, *11*(13), Article 3643. https://doi.org/10.3390/su11133643

Amara, T., & Ahmadi, A. (2024). The ESG performance in relation to the board of directors' characteristics and sustainability incentives: A cross-national study. *Montenegrin Journal of Economics*, *20*(4), 27–37. https://doi.org/10.14254/1800-5845/2024.20-4.3

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277–297. https://doi.org/10.2307/2297968

Asian Development Bank Institute. (2020). *Environmental, social, and governance investment: Opportunities and risks for Asia*. https://www.adb.org/publications/environmental-social-governance-investment-opportunities-risks-asia

Aydoğmuş, M., Gülay, G., & Ergun, K. (2022). Impact of ESG performance on firm value and profitability. *Borsa Istanbul Review*, *22*, S119–S127. https://doi.org/10.1016/j.bir.2022. 11.006

Bagh, T., Zhou, B., Mahmoud, S., & Azam, R. I. (2024). ESG resilience: Exploring the non-linear effects of ESG performance on firms' sustainable growth. *Research in International Business and Finance*, *70*, Article 102305. https://doi.org/10.1016/j.ribaf.2024.102305

Bekaert, G., Harvey, C. R., & Lundblad, C. (2007). Liquidity and expected returns: Lessons from emerging markets. *The Review of Financial Studies*, *20*(6), 1783–1831. https://doi.org/10.1093/rfs/hhm030

Birindelli, G., Chiappini, H., & Jalal, R. N. U. D. (2024). Greenwashing, bank financial performance and the moderating role of gender diversity. *Research in International Business and Finance*, *69*, Article 102235. https://doi.org/10.1016/j.ribaf.2024.102235

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Bolourian, S., Alinaghian, L., & Angus, A. (2023). Exploring the role of board-level corporate social responsibility committees in corporate social responsibility performance: A configurational approach. *Journal of Business Research*, *169*, Article 114280. https://doi.org/10.1016/j.jbusres.2023.114280

Boubakri, N., El Ghoul, S., Guedhami, O., & Wang, H. (2021). Corporate social responsibility in emerging market economies: Determinants, consequences, and future research directions. *Emerging Markets Review*, *46*, Article 100758. https://doi.org/10.1016/ j.ememar.2020.100758

Brammer, S., & Pavelin, S. (2006). Voluntary environmental disclosures by large UK companies. *Journal of Business Finance and Accounting*, *33*(7–8), 1168–1188. https://doi.org/10.1111/j.1468-5957.2006.00598.x

Broadstock, D. C., Matousek, R., Meyer, M., & Tzeremes, N. G. (2020). Does corporate social responsibility impact firms' innovation capacity? The indirect link between environmental and social governance implementation and innovation performance. *Journal of Business Research*, *119*, 99–110. https://doi.org/10.1016/j.jbusres.2019.07.014

Brouwers, R., Schoubben, F., Van Hulle, C., Van Uytbergen, S., & Leuven, K. (2014). The link between corporate environmental performance and corporate value: A literature review. *Review of Business and Economic Literature*, *58*, 343–374.

Cheema, M. A., Chiah, M., & Zhong, A. (2021). Resurrecting the size effect in Japan: Firm size, profitability shocks, and expected stock returns. *Pacific-Basin Finance Journal*, *69*, Article 101641. https://doi.org/10.1016/j.pacfin.2021.101641

Chen, F., Liu, Y.-H., & Chen, X.-Z. (2024). ESG performance and business risk—Empirical evidence from China's listed companies. *Innovation and Green Development*, *3*(3), Article 100142. https://doi.org/10.1016/j.igd.2024.100142

Chen, S., Song, Y., & Gao, P. (2023). Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance. *Journal of Environmental Management, 345*, Article 118829. https://doi.org/10.1016/j.jenvman.2023.118829

Chi, L. H. D., Hac, L. D., Nhat, N. Q., & Hang, B. T. T. (2022). Corporate environmental responsibility and financial performance: The moderating role of ownership structure and listing status of Vietnam banks. *Cogent Economics and Finance*, *10*(1), Article 2087286. https://doi.org/10.1080/23322039.2022.2087286

Choi, J. S., Kwak, Y. M., & Choe, C. (2010). Corporate social responsibility and corporate financial performance: Evidence from Korea. *Australian Journal of Management*, *35*(3), 291–311. https://doi.org/10.1177/0312896210384681

Cloquell-Ballester, V. A., Monterde-Díaz, R., Cloquell-Ballester, V. A., & Torres-Sibille, A. del C. (2008). Environmental education for small- and medium-sized enterprises: Methodology and e-learning experience in the Valencian region. *Journal of Environmental Management*, *87*(3), 507–520. https://doi.org/10.1016/j.jenvman.2007.01.041

Costa, M. D., & Opare, S. (2025). Impact of corporate culture on environmental performance. *Journal of Business Ethics*, *196*, 61–92. https://doi.org/10.1007/s10551-024-05674-3

Dang, C., Li, Z., & Yang, C. (2018). Measuring firm size in empirical corporate finance. *Journal of Banking and Finance*, *86*, 159–176. https://doi.org/10.1016/j.jbankfin.2017. 09.006

Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. *The World Bank Economic Review*, *13*(2), 379–408. https://doi.org/10.1093/wber/13.2.379

Duque-Grisales, E., & Aguilera-Caracuel, J. (2021). Environmental, social and governance (ESG) scores and financial performance of multilatinas: Moderating effects of geographic international diversification and financial slack. *Journal of Business Ethics*, *168*(2), 315–334. https://doi.org/10.1007/s10551-019-04177-w

Dzage, E. J., & Szabados, G. N. (2024). The relationship of corporate social responsibility with business performance—A bibliometric literature review. *Sustainability*, *16*(7), 1–25. https://doi.org/10.3390/su16072637

Faleye, O., Hoitash, R., & Hoitash, U. (2011). The costs of intense board monitoring. *Journal of Financial Economics*, *101*(1), 160–181. https://doi.org/10.1016/j.jfineco.2011.02.010

Fathoni, A. F., Hanafi, M. M., & Tandelilin, E. (2025). The effects of ESG controversies and women on boards on ESG-washing behavior: Global evidence from the banking industry. *Banks and Bank Systems*, *20*(2), 1–14. https://doi.org/10.21511/bbs.20(2).2025.01

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance and Investment*, *5*(4), 210–233. https://doi.org/10.1080/20430795.2015.1118917

Friedman, M. (2007). The social responsibility of business is to increase its profits. In W. Ch. Zimmerli, M. Holzinger, and K. Richter (Eds.), *Corporate ethics and corporate governance* (pp. 173–178). Springer. https://doi.org/10.1007/978-3-540-70818-6_14

Futri, I. N., Pratiwi, D. I., Saktiawan, B., & Risfandy, T. (2025). The relationship between environmental sustainability and financial constraints: Evidence from Indonesian firms. *IOP Conference Series: Earth and Environmental Science*, *1438*(1), Article 012040. https://doi.org/10.1088/1755-1315/1438/1/012040

Gangi, F., Meles, A., D'Angelo, E., & Daniele, L. M. (2019). Sustainable development and corporate governance in the financial system: Are environmentally friendly banks less risky? *Corporate Social Responsibility and Environmental Management*, *26*(3), 529–547. https://doi.org/10.1002/csr.1699

Greenwalt, J., Raasakka, N., & Alverson, K. (2018). Building urban resilience to address urbanization and climate change. In *Resilience: The science of adaptation to climate change* (pp. 151–164). https://doi.org/10.1016/B978-0-12-811891-7.00012-8

Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, *20*(4), 986–1014. https://doi.org/10.5465/amr.1995.9512280033

Heubeck, T., & Ahrens, A. (2025). Governing the responsible investment of slack resources in environmental, social, and governance (ESG) performance: How beneficial are CSR committees? *Journal of Business Ethics*, *198*, 365–385. https://doi.org/10.1007/s10551-024-05798-6

Ho, S. S. M., & Shun Wong, K. (2001). A study of the relationship between corporate governance structures and the extent of voluntary disclosure. *Journal of International Accounting, Auditing and Taxation*, *10*(2), 139–156. https://doi.org/10.1016/S1061-9518(01)00041-6

Huang, J., Li, Y., & Han, F. (2024). Walk well and talk well: Impact of the consistency of ESG performance and disclosure on firms' stock price crash risk. *International Review of Economics and Finance*, *93*, 1154–1174. https://doi.org/10.1016/j.iref.2024.03.067

Jin, Y. (2025). Distinctive impacts of ESG pillars on corporate financial performance: A random forest analysis of Korean listed firms. *Finance Research Letters*, *71*, Article 106395. https://doi.org/10.1016/j.frl.2024.106395

Khunkaew, R., Wichianrak, J., & Suttipun, M. (2023). Sustainability reporting, gender diversity, firm value and corporate performance in ASEAN region. *Cogent Business and Management*, *10*(1), 1–24. https://doi.org/10.1080/23311975.2023.2200608

Khurram, M. U., Abbassi, W., Chen, Y., & Chen, L. (2024). Outward foreign investment performance, digital transformation, and ESG performance: Evidence from China. *Global Finance Journal*, *60*, Article 100963. https://doi.org/10.1016/j.gfj.2024.100963

Kubo, K., & Sasaki, R. (2024). The impact of a CSR committee on CSR performance. *Japan and the World Economy*, *71*, Article 101269. https://doi.org/10.1016/j.japwor.2024. 101269

Kwak, K., & Kim, N. (2020). Concentrate or disperse? The relationship between major customer concentration and supplier profitability and the moderating role of insider ownership. *Journal of Business Research*, *109*, 648–658. https://doi.org/10.1016/j.jbusres. 2019.09.033

Lee, K. H., Cin, B. C., & Lee, E. Y. (2016). Environmental responsibility and firm performance: The application of an environmental, social and governance model. *Business Strategy and the Environment*, *25*(1), 40–53. https://doi.org/10.1002/bse.1855

Levie, J., & Autio, E. (2011). Regulatory burden, rule of law, and entry of strategic entrepreneurs: An international panel study. *Journal of Management Studies*, *48*(6), 1392–1419. https://doi.org/10.1111/j.1467-6486.2010.01006.x

Li, D., Cao, C., Zhang, L., Chen, X., Ren, S., & Zhao, Y. (2017). Effects of corporate environmental responsibility on financial performance: The moderating role of government regulation and organizational slack. *Journal of Cleaner Production*, *166*, 1323–1334. https://doi.org/10.1016/j.jclepro.2017.08.129

Li, W., Li, W., Seppänen, V., & Koivumäki, T. (2023). Effects of greenwashing on financial performance: Moderation through local environmental regulation and media coverage. *Business Strategy and the Environment*, *32*(1), 820–841. https://doi.org/10.1002/bse.3177

Li, Y., & Li, S. (2024). ESG performance and innovation quality. *International Review of Economics and Finance*, *92*, 1361–1373. https://doi.org/10.1016/j.iref.2024.02.063

Li, Z., Liao, G., & Albitar, K. (2020). Does corporate environmental responsibility engagement affect firm value? The mediating role of corporate innovation. *Business Strategy and the Environment*, *29*(3), 1045–1055. https://doi.org/10.1002/bse.2416

Lioui, A., & Sharma, Z. (2012). Environmental corporate social responsibility and financial performance: Disentangling direct and indirect effects. *Ecological Economics*, *78*, 100–111. https://doi.org/10.1016/j.ecolecon.2012.04.004

LSEG. (2024). *Environmental, social and governance scores from LSEG*. LSEG Data and Analytics.

Miroshnychenko, I., Strobl, A., Matzler, K., & De Massis, A. (2021). Absorptive capacity, strategic flexibility, and business model innovation: Empirical evidence from Italian SMEs. *Journal of Business Research*, *130*, 670–682. https://doi.org/10.1016/j.jbusres. 2020.02.015

Mishra, G., Patro, A., & Tiwari, A. K. (2024). Does climate governance moderate the relationship between ESG reporting and firm value? Empirical evidence from India. *International Review of Economics and Finance*, *91*, 920–941. https://doi.org/10.1016/j.iref. 2024.01.059

Morganstein, J. C., & Ursano, R. J. (2020). Ecological disasters and mental health: Causes, consequences, and interventions. *Frontiers in Psychiatry*, *11*, Article 1. https://doi.org/10.3389/fpsyt.2020.00001

Narula, R., Rao, P., Kumar, S., & Matta, R. (2024). ESG scores and firm performance: Evidence from emerging market. *International Review of Economics and Finance*, *89*, 1170–1184. https://doi.org/10.1016/j.iref.2023.08.024

Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies*, *22*(1), 435–480. https://doi.org/10.1093/rfs/ hhn053

Pratama, A., Yusoff, H., Yadiati, W., & Jaenudin, E. (2025). Sustainability-related corporate governance and greenwashing practices: Preliminary evidence from Southeast Asian companies. *Meditari Accountancy Research*, *33*(3), 853–885. https://doi.org/10.1108/ MEDAR-07-2024-2579

Prayanthi, I., & Budiarso, N. S. (2022). The effect of social responsibility disclosure on financial performance in the COVID-19 pandemic era. *Cogent Business and Management*, *9*(1), 1–15. https://doi.org/10.1080/23311975.2022.2147412

Reichheld, A., Peto, J., & Ritthaler, C. (2023, September 18). Research: Consumers' sustainability demands are rising. *Harvard Business Review*.

Saktiawan, B., Risfandy, T., & Toro, J. S. (2025). Firm characteristics and environmental performance: Evidence from ASEAN-5 countries. *IOP Conference Series: Earth and Environmental Science*, *1438*(1), Article 012069. https://doi.org/10.1088/1755-1315/1438/1/012069

Saktiawan, B., Setiyono, B., & Rachmadi, E. (2026). Diversity and sustainability: How can gender diversity on boards impact ESG performance? Evidence from ASEAN-5 countries. *Innovation and Green Development*, *5*(2), Article 100347. https://doi.org/10.1016/j.igd. 2026.100347

Schoonjans, E. (2024). From diversity to sustainability: Environmental and social spillover effects of board gender quotas. *Journal of Economic Behavior and Organization*, *222*, 314–331. https://doi.org/10.1016/j.jebo.2024.04.026

Stock, J. H., & Watson, M. W. (2020). *Introduction to econometrics* (4th ed.). Pearson.

Syahfitri, A. R., & Risfandy, T. (2023). Female directors, the institutional environment and dividend policy: Evidence from ASEAN-5 commercial banks. *Studies in Economics and Finance*, *40*(4), 591–605. https://doi.org/10.1108/SEF-12-2022-0568

Tanggamani, V., Amran, A., & Ramayah, T. (2022). CSR practices disclosure's impact on corporate financial performance and market performance: Evidence of Malaysian public listed companies. *International Journal of Business and Society*, *23*(1), 604–613. https://doi.org/10.33736/ijbs.4632.2022

Tran, M., Beddewela, E., & Ntim, C. G. (2021). Governance and sustainability in Southeast Asia. *Accounting Research Journal*, *34*(6), 516–545. https://doi.org/10.1108/ARJ-05-2019-0095

Tseng, M. L., Chiu, A. S. F., Tan, R. R., & Siriban-Manalang, A. B. (2013). Sustainable consumption and production for Asia: Sustainability through green design and practice. *Journal of Cleaner Production*, *40*, 1–5. https://doi.org/10.1016/j.jclepro.2012.07.015

Velte, P., & Stawinoga, M. (2020). Do chief sustainability officers and CSR committees influence CSR-related outcomes? A structured literature review based on empirical-quantitative research findings. *Journal of Management Control*, *31*(4), 333–377. https://doi.org/10.1007/s00187-020-00308-x

Wang, Y., Yang, Y., Fu, C., Fan, Z., & Zhou, X. (2021). Environmental regulation, environmental responsibility, and green technology innovation: Empirical research from China. *PLoS ONE*, *16*(9), Article e0257670. https://doi.org/10.1371/journal.pone.0257670

Xu, M., Tse, Y. K., Geng, R., Liu, Z., & Potter, A. (2025). Greenwashing and market value of firms: An empirical study. *International Journal of Production Economics*, *284*, Article 109606. https://doi.org/10.1016/j.ijpe.2025.109606

Xu, X. D., Zeng, S. X., Zou, H. L., & Shi, J. J. (2016). The impact of corporate environmental violation on shareholders' wealth: A perspective taken from media coverage. *Business Strategy and the Environment*, *25*(2), 73–91. https://doi.org/10.1002/bse.1858

Xue, L., Dong, J., & Zha, Y. (2023). How does digital finance affect firm environmental, social and governance (ESG) performance? Evidence from Chinese listed firms. *Heliyon*, *9*(10), Article e20800. https://doi.org/10.1016/j.heliyon.2023.e20800

Yusoff, Y. M., Omar, M. K., Kamarul Zaman, M. D., & Samad, S. (2019). Do all elements of green intellectual capital contribute toward business sustainability? Evidence from the Malaysian context using the partial least squares method. *Journal of Cleaner Production*, *234*, 626–637. https://doi.org/10.1016/j.jclepro.2019.06.153

Zaiane, S., & Ellouze, D. (2023). Corporate social responsibility and firm financial performance: The moderating effects of size and industry sensitivity. *Journal of Management and Governance*, *27*(4), 1147–1187. https://doi.org/10.1007/s10997-022-09636-7

Zhao, X., & Murrell, A. J. (2016). Revisiting the corporate social performance-financial performance link: A replication of Waddock and Graves. *Strategic Management Journal*, *37*(11), 2378–2388. https://doi.org/10.1002/smj.2579

Zhou, Y., Chen, L., Zhang, Y., & Li, W. (2024). "Environmental disclosure greenwashing" and corporate value: The premium effect and premium devalue of environmental information. *Corporate Social Responsibility and Environmental Management*, *31*(3), 2424–2438. https://doi.org/10.1002/csr.2698