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Posted Date: 22 July 2025

doi: 10.20944/preprints202507.1701.v1

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Article

# Unlocking the Power of ESG: How ESG Scores Drive Firm Performance (ROE) with Firm Size as a Key Moderator: Evidence from Southeast Asia

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## Abstract

This study examines the impact of Environmental, Social, and Governance (ESG) scores on firm performance in Southeast Asia, with a focus on the moderating role of firm size. Using data from companies in Indonesia, Malaysia, and Singapore from 2012 to 2023, the research empirically investigates how ESG scores influence profitability and whether firm size strengthens or weakens this relationship. The study employs robust econometric models to analyze panel data, controlling for industry effects and other firm-specific characteristics. The results show that higher ESG scores are positively correlated with better firm performance, as reflected in higher Return on Equity (ROE). Additionally, firm size is found to significantly moderate the relationship between ESG performance and profitability, with larger firms exhibiting a stronger positive relationship between ESG scores and financial performance. These findings highlight the importance of adopting ESG practices for companies in Southeast Asia and provide critical insights for policymakers, investors, and company managers seeking to improve profitability through sustainable business practices. This research contributes to the literature on ESG and financial performance in emerging markets, providing valuable empirical evidence for research and policy development in the region.

**Keywords:** ESG scores; firm performance; Return on Equity (ROE); firm size; moderating effect; Southeast Asia; corporate governance; sustainable finance; financial performance; emerging markets

**JEL Classification:** G32; G34; M14; Q56

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## 1. Introduction

### 1.1. Background

In recent decades, sustainability has become a central pillar in global business strategy, driven by growing environmental concerns, social accountability, and the demand for sound corporate governance [1]. Firms worldwide are increasingly required to adopt Environmental, Social, and Governance (ESG) practices, which extend beyond corporate social responsibility and are now recognized as strategic imperatives for achieving long-term financial performance and risk mitigation[2]. Empirical studies have shown that companies with higher ESG scores tend to exhibit stronger profitability, enhanced stakeholder trust, and greater resilience amid global economic disruptions (Kim & Li, 2021; Friede et al., 2015).

While substantial evidence exists in developed economies, emerging markets especially in Southeast Asia, have received less attention in ESG-performance research. Indonesia, Malaysia, and Singapore represent a strategically important yet diverse group of countries in the region [3]. Although these countries are actively embracing sustainability principles through regulations, corporate disclosures, and investment guidelines, the integration and impact of ESG practices remain inconsistent across firms and sectors as state on ASEAN CSR Network, 2023 [4]. This heterogeneity

provides a compelling context to explore how ESG strategies translate into financial outcomes in varying institutional environments[5].

Furthermore, the role of firm size may critically influence the ESG–performance nexus. Larger firms generally have more resources, public scrutiny, and formalized governance structures, which can lead to better ESG performance and potentially greater financial returns [6][7]. Smaller firms, on the other hand, may face capital and capability constraints but could benefit from agility in ESG innovation. Despite its theoretical importance, the moderating role of firm size in ESG research has been underexplored, particularly in the Southeast Asian context[8].

With increasing investor demand for ESG integration, evolving sustainability frameworks such as Indonesia’s OJK ESG roadmap, Singapore’s SGX mandatory ESG disclosures, and Bursa Malaysia’s sustainability reporting guidelines, there is a pressing need for empirical insights tailored to the region[9] [10]. Understanding how ESG practices affect firm performance across different firm sizes can support more effective policy-making and corporate strategy development[11].

This study aims to investigate the effect of ESG scores on firm performance, measured by Return on Equity (ROE), with firm size as a moderating variable. Using a panel dataset of listed companies from Indonesia, Malaysia, and Singapore, this study contributes to the literature by (i) providing cross-country comparative evidence from Southeast Asia, (ii) integrating firm size as a key moderating factor, and (iii) offering policy-relevant insights into the ESG-finance interface in emerging markets

### *1.2. Research Problem and Objectives*

Despite the growing attention ESG has received among investors and policymakers, there remains a significant gap in research that directly explores the relationship between ESG scores and firm performance, particularly in relation to firm size, in developing countries [12]. Southeast Asia, as a rapidly growing economic region, presents unique challenges and opportunities for the effective implementation of ESG practices. Although countries in this region share similar cultural and historical characteristics, they display considerable differences in economic policies, infrastructure, and sustainability practices. Countries such as Indonesia, Malaysia, and Singapore offer a compelling context for analyzing how ESG policies and implementations influence firm performance, particularly given the varying levels of economic development and acceptance of sustainability principles [13].

In this context, firm performance is commonly measured using various financial metrics, one of the most widely recognized being Return on Equity (ROE), which reflects a company’s ability to generate profit from its shareholders’ equity. As the ESG concept continues to evolve, several studies have identified a positive correlation between high ESG scores and improved ROE. This suggests that companies that prioritize ESG factors not only contribute to social and environmental sustainability but may also achieve better financial outcomes [14]. While many studies support this positive relationship, there is a lack of research that investigates how external factors, such as firm size, may moderate the link between ESG scores and financial performance. Firm size can be a crucial factor, as larger companies typically possess more resources to implement comprehensive ESG policies, while smaller firms may face constraints in terms of budget, human resources, and technological capabilities to fully implement such policies (Lam et al., 2025). Therefore, a deeper understanding of the role firm size plays in moderating the impact of ESG on firm performance is essential.

This study aims to address this gap by focusing its analysis on three Southeast Asian countries: Indonesia, Malaysia, and Singapore. While these countries share cultural and historical similarities, they exhibit different economic dynamics. Indonesia, the largest country in the region by population, faces challenges in broadly implementing ESG policies, but offers a substantial market potential and high growth opportunities. Malaysia, which has begun to develop more formal and structured ESG policies, provides insight into how government policies can influence ESG adoption in the private sector. Meanwhile, Singapore, a long-standing financial hub in Asia, has become a global example of integrating ESG principles into corporate governance and economic policies (Hassan et al., 2021).

These three countries not only have unique ESG policy implementations but also provide a rich context to assess whether firm size can influence the impact of ESG on financial performance.

By examining these three countries, this study seeks to provide a more holistic understanding of how policies and firm size influence the relationship between ESG scores and firm performance in Southeast Asia. The research will utilize data from 2012 to 2023, offering a broader perspective on the dynamics of ESG implementation and firm performance in the region over the past decade. Additionally, the empirical analysis is expected to uncover previously unseen patterns in the relationship between ESG, firm size, and financial performance in developing countries. The findings from this research are expected to not only enrich the academic literature on ESG and firm performance but also provide practical insights for policymakers, investors, and business leaders in formulating more effective sustainability strategies to enhance firm performance and support sustainable economic growth in Southeast Asia.

Thus, this research has the potential to contribute to bridging sustainability theory with business practices in Southeast Asia, an increasingly focal point in the global context. Furthermore, the study is expected to serve as a reference for other developing countries aiming to strengthen ESG implementation to foster sustainable economic progress

### *1.3. Significance of the Study*

This study is significant both for theoretical development and business practice. Given the importance of ESG in modern business, the research can make a valuable contribution to the academic literature on the relationship between ESG and firm performance in developing countries, particularly in Southeast Asia. The findings of this study will also provide insights for policymakers, investors, and company managers in formulating sustainability policies that can enhance firm performance and support sustainable economic growth in the region.

### *1.4. Literature Review*

#### *1.4.1. Definition and Concept of ESG*

Environmental, Social, and Governance (ESG) refers to the three main dimensions in corporate management that focus on sustainability [15]. The environmental dimension encompasses the management of a company's impact on natural resources and the reduction of carbon emissions [16]. The social dimension relates to the company's relationships with employees, consumers, and communities. Governance involves transparent and ethical managerial policies, as well as effective corporate management practices. ESG has increasingly become a key element used to assess corporate sustainability and social responsibility, and is considered an indicator that influences investment decisions (Eccles et al., 2014).

#### *1.4.2. The Impact of ESG on Firm Performance*

Numerous studies have demonstrated a positive relationship between high ESG scores and company financial performance, particularly in terms of Return on Equity (ROE). Research by Vongpatchim & Chainirun, 2025 indicates that companies excelling in ESG practices tend to exhibit higher profitability, which is reflected in stronger financial performance [17]. This can be attributed to better risk management, improved operational efficiency, and stronger relationships with stakeholders. ESG not only impacts social and environmental sustainability but also contributes to a company's financial gains (Friede et al., 2015).

**Hypothesis 1 (H1):** ESG Score positively influences firm performance

#### *1.4.3. The Role of Firm Size as a Moderator*

Firm size plays a significant moderating role in the relationship between ESG and financial performance. Larger companies typically have more resources to implement more comprehensive

ESG policies compared to smaller firms, which may face budgetary and human resource constraints. Li et al. (2021) demonstrate that larger firms possess the capacity to better integrate ESG practices, allowing them to maximize the benefits from sustainability investments. In contrast, smaller firms may encounter greater challenges in executing these initiatives due to limited resources and their lower influence in the market.

**Hypothesis 2 (H2):** Firm size moderates the relationship between ESG Score and firm performance, such that the positive effect of ESG on performance is stronger for larger firms.

#### 1.4.4. Control Variables: Profitability, Liquidity, and Growth

Several control variables need to be considered in this study to assess the impact of ESG on firm performance. Profitability is a key indicator, as profitable companies can more easily fund ESG initiatives without disrupting their operations. Liquidity also plays an important role, as firms with strong liquidity are better positioned to invest in sustainability policies. Firm growth, which reflects future development potential, can also influence the effect of ESG implementation, as growing companies may be more inclined to prioritize sustainability to strengthen their market position (Cheng et al., 2014).

**Hypothesis 3 (H3):** Profitability positively influences firm performance.

**Hypothesis 4 (H4):** Liquidity influences firm performance.

**Hypothesis 5 (H5):** Firm growth positively influences firm performance.

## 2. Materials and Methods

This study utilizes panel data encompassing companies listed in Indonesia, Malaysia, and Singapore for the period from 2013 to 2024. The variables used in this research include ESG scores, which reflect the environmental, social, and governance performance of the companies, Return on Equity (ROE) as a measure of financial performance, and several control variables such as profitability (ROA), liquidity (Current Ratio), and firm growth (Growth in Total Assets). Additionally, firm size is measured using the logarithm of total assets ( $\ln$  total assets) and is used as a moderating variable. The data is sourced from Bloomberg.

### 2.1. Analysis Process

The analysis process begins with descriptive statistics to illustrate the basic characteristics of the data, such as the mean, standard deviation, and minimum and maximum values. Next, a combined correlation analysis is conducted to explore the relationships between ESG scores, ROE, firm size, profitability, liquidity, and growth across the country sample. Subsequently, country dummy variables will be introduced (Singapore = 3, Malaysia = 2, Indonesia = 1). If the results indicate that the country dummy coefficients are significant, the next step will involve conducting separate analyses for each country to gain a deeper understanding of the impact of ESG scores and firm size within the different economic and policy contexts of each nation.

### 2.2. Econometric Model

The model to be used in testing whether firm size moderates the relationship between ESG scores and firm performance is outlined below, where the interaction variable between ESG and firm size will be included to examine the moderating effect.

$$ROE_{it} = \alpha_i + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 (ESG_{it} \times Size_{it}) + \beta_4 Profitability_{it} + \beta_5 Liquidity_{it} + \beta_6 Growth_{it} + \epsilon_{it}$$

### 2.3. Selection of the Best Model

In this study, four econometric approaches are employed to analyze the relationship between ESG scores and firm performance: Common Effects Model (CEM), Fixed Effects Model (FEM), First Difference GMM (FD-GMM), and System GMM (SYS-GMM). CEM and FEM are used as baseline models to test the relationship between variables with and without considering individual heterogeneity [18]. FD-GMM and SYS-GMM are applied to address potential endogeneity issues and capture the dynamics of the relationships between variables in panel data [19]. After comparing estimation results and performing validity tests through the Sargan and Hansen tests, as well as the Arellano-Bond autocorrelation test, SYS-GMM is chosen as the best model due to its ability to provide the most valid and robust estimates against endogeneity problems and panel data dynamics [20]. Therefore, the final results and interpretations in this study focus on the estimates from the SYS-GMM model.

### 2.4. Matrix and Result Interpretation

The estimation results of the models will be presented in matrix form, which will include the estimated coefficients, significance values, and confidence intervals. This matrix will be used to interpret the effect of ESG scores on firm performance, as well as to explore the moderating role of firm size and the differences between countries. The results will provide insights into how ESG scores influence financial outcomes and whether firm size moderates this relationship, with a particular focus on the variations across the different countries in the sample.

## 3. Results

### 3.1. Descriptive Analysis

In the first stage, a descriptive analysis is conducted to describe the basic characteristics of the data used. Table 1 presents a summary of the statistics for the variables included in this study, namely ESG scores, ROE, firm size, profitability, liquidity, and growth, for each of the countries in the sample (Indonesia, Malaysia, and Singapore).

**Table 1.** Descriptive Statistics.

	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Profitability	17040	8.119057	12.12173	-22.0188	50.02084
Liquidity	17040	2.436236	1.121201	0.000289	5.007999
FirmSize	17040	25.10145	3.652645	17.6262	32.16572
Growth	17040	4.350189	6.501672	-8.27202	22.05887
ROE	17040	6.717101	9.486964	-14.5206	28.39698
ESG_Score	17040	65.3669	6.515468	46	86
gdp_usd	17040	7.89E+11	3.63E+11	2.95E+11	1.37E+12
Inflationrate	17040	3.243839	1.888805	-0.53227	6.412513
dummy_country	17040	1.530282	0.744815	1	

The descriptive analysis reveals significant variation among the observed variables. The average profitability of the companies is 8.12, but with a large standard deviation of 12.12, indicating considerable differences between companies, with some experiencing substantial losses. The liquidity of the companies, with an average of 2.44, also shows significant variation, reflecting differences in the companies' ability to meet short-term obligations. Firm size, with an average of 25.10 and a standard deviation of 3.65, highlights the variation between large and small companies. On the other hand, the average firm growth is 4.35%, but with a high standard deviation of 6.50%, indicating instability in growth among the companies. The average Return on Equity (ROE) is 6.72%, with significant variation, reflecting differences in the efficiency of equity returns across companies. The average ESG score is 65.37, suggesting a relatively high awareness of environmental, social, and governance issues. Macro-economic variables such as GDP (7.89E+11) and inflation rate (average

3.24%) indicate substantial differences between countries in terms of economic size and price stability. The country dummy variable shows that the majority of the sample comes from the country coded as 1, with limited variation. This analysis provides an overview of the complexity and diversity of companies, as well as the macroeconomic conditions that influence firm performance across different countries.

### 3.2. Combined Regression Analysis

Table 2 shows the regression test results for the model examining the impact of various factors on the dependent variable. Based on the F-test results, which show  $F(8, 17031) = 1504.96$  with  $\text{Prob} > F = 0$ , the regression model as a whole is significant. The R-squared value of 0.4142 indicates that approximately 41.42% of the variation in the dependent variable can be explained by the independent variables in this model. The adjusted R-squared value, which is nearly the same at 0.4139, also indicates that the model is quite effective in explaining the relationships between the variables.

**Table 2.** Regression Results.

Source	SS	df	MS	Number of obs	=	17040
Model	1036891	8	129611	F(8, 17031)	=	1504.96
Residual	1466757	17031	86.1228	Prob > F	=	0
Total	2503648	17039	146.936	R-squared	=	0.4142
				Adj R-squared	=	0.4139
				Root MSE	=	9.2802
Profitability	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Liquidity	1.861806	0.0660153	28.2	0	1.732409	1.991203
FirmSize	1.120565	0.034021	32.94	0	1.05388	1.187249
Growth	0.6092022	0.0136849	44.52	0	0.5823783	0.6360261
ROE	0.3596902	0.0090268	39.85	0	0.3419968	0.3773836
ESG_Score	-0.0110932	0.0113422	-0.98	0.328	-0.0333251	0.0111388
gdp_usd	-1.24E-12	4.14E-13	-2.99	0.003	-2.05E-12	-4.26E-13
Inflationrate	0.0994114	0.044723	2.22	0.026	0.0117497	0.1870731
dummy_country	7.421969	0.2158558	34.38	0	6.99887	7.845069
_cons	-39.59021	1.188308	-33.32	0	-41.91942	-37.26101

Source: Stata Result.

Individually, the variables Liquidity, FirmSize, Growth, and ROE exhibit significant positive coefficients with p-values  $< 0.01$ , meaning they have a significant positive influence on the dependent variable. The variable ESG\_Score, however, does not show a significant effect (p-value = 0.328), suggesting that ESG scores do not significantly influence the dependent variable in this model. Meanwhile, gdp\_usd shows a significant negative effect (p-value = 0.003), indicating that GDP has a negative influence on the dependent variable, with a coefficient of  $-1.24E-12$ . The Inflationrate variable also shows a significant positive effect (p-value = 0.026), with a coefficient of 0.0994114, suggesting that inflation has a positive impact on the dependent variable.

Finally, the dummy\_country variable shows a significant effect with a positive coefficient of 7.421969, indicating a significant difference between the countries involved in this study. The negative \_cons coefficient ( $-39.59021$ ) suggests that the dependent variable will be very low when all independent variables are zero.

Based on the results of the Descriptive Analysis and Combined Regression, it is clear that each country has relatively different characteristics. Therefore, it would be more appropriate to perform separate analyses for each country to avoid bias in the results.

### 3.3. Country-Based Analysis

Based on the results of the country dummy test, the analysis is conducted separately for each country: Indonesia, Malaysia, and Singapore.

### 3.3.1. Results for Indonesia

From Table 3, it can be explained that the SYS-GMM (System Generalized Method of Moments) model provides the best results in this analysis, with an  $R^2$  of 0.8212 and an Adjusted  $R^2$  of 0.8211, indicating that this model is able to explain approximately 82.12% of the variation in the dependent variable. The regression results reveal that ROE (Return on Equity) and profitability have a significant positive effect on the dependent variable, with coefficients of 0.2938 and 0.3301 ( $p < 0.001$ ), respectively. Additionally, the ESG Score shows a significant positive effect on firm performance with a coefficient of 0.1313 ( $p < 0.001$ ).

**Table 3.** Regression Results for Indonesia (CEM, FEM, FD-GMM, SYS-GMM).

Variable	fem	fdgmm	sysgmm	cem
roe				
L1.	.27245525***	.19480338***	.29382053***	.60122475***
esg_score	.15882824***	.1805708***	.13130194***	.09646962***
esg_score ~e	.2715375***	.28593734***	.30481194***	.20483148***
profitabil~y	.2684405***	.32244701***	.33011794***	.23472247***
liquidity	-0.00656325	-0.00048529	-.0235961*	-.02327734***
firmsize	.13318311***	0.02389248	.26635027***	.15854493***
growth	0.02901977	0.02444847	0.01329698	.01810658**
_cons	.00173474**	-.04402283***	-0.00106954	.01324025**
N	9724	8840	9724	9724
r2	0.49334579			0.82121564
r2_a	0.49298076			0.82108683

legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

On the other hand, ESG Score ~e, the interaction between ESG Score and FirmSize, demonstrates an even larger positive effect with a coefficient of 0.3048 ( $p < 0.001$ ), indicating that companies with larger sizes and greater attention to ESG issues tend to perform better. FirmSize has a significant positive effect with a coefficient of 0.2664 ( $p < 0.001$ ), suggesting that larger companies generally exhibit better performance. Meanwhile, Liquidity has a small negative impact on performance with a coefficient of -0.0236 ( $p < 0.05$ ), and Growth shows a small but significant positive effect ( $p < 0.05$ ) with a coefficient of 0.0133.

Overall, this model provides a robust picture of the factors influencing firm performance, with profitability, ESG Score, firm size, and the interaction between ESG Score and firm size being the most significant contributors.

### 3.3.2. Results for Malaysia

From Table 4, it can be explained that the SYS-GMM (System Generalized Method of Moments) model is the best model, showing significant results with an  $R^2$  of 0.8801, indicating that the model can explain approximately 88% of the variation in the dependent variable. The regression results reveal that ROE, ESG Score, and FirmSize have a significant positive effect on firm performance, with coefficients of 0.2205, 0.1165, and 0.4934 ( $p < 0.001$ ), respectively. Additionally, the interaction between ESG Score and FirmSize (ESG Score ~e) also demonstrates a significant positive effect with a coefficient of 0.2536 ( $p < 0.001$ ), suggesting that larger companies with attention to ESG issues tend to perform better.

**Table 4.** Regression Results for Malaysia (CEM, FEM, FD-GMM, SYS-GMM).

Variable	fem	fdgmm	sysgmm	cem
roe				
L1.	.08796276***	.07545746***	.22054562*	.29764768***
esg_score	.12455718***	.13927087***	.11653109***	.10710024***
esg_score ~e	.2762592***	.28278383***	.25362034***	.24116347***
profitabil ~y	.28064843***	.27987745***	.27676814***	.26394307***

liquidity	-0.00326245	0.00101908	0.0230416	.01721759***
firmsize	.41203671***	.34306005***	.49336009***	.45388497***
growth	.27142724***	.27224363***	.26799316***	.26846336***
_cons	-.01574064***	-.08229011***	-0.01451956	-0.01070431
N	3509	3190	3509	3509
r2	0.72094067			0.88007734
r2_a	0.72038271			0.87983756

legend: \* p<0.05; \*\* p<0.01; \*\*\* p<0.001.

Profitability and Growth have a significant positive impact, while Liquidity shows a small but significant positive effect.

### 3.3.3. Results for Singapore

From Table 5, it can be explained that the SYS-GMM model is the best model, showing significant results with an R<sup>2</sup> of 0.7659 and an Adjusted R<sup>2</sup> of 0.7652, indicating that the model can explain approximately 76.59% of the variation in the dependent variable. The regression results reveal that ROE, ESG Score, and its interaction with FirmSize (ESG Score ~e) have a significant positive effect on firm performance, with coefficients of 0.7508, 0.1266, and 0.1756 (p<0.001), respectively. Profitability also has a positive effect with a coefficient of 0.0989 (p<0.001), while FirmSize has a significant positive impact with a coefficient of 0.1087 (p<0.001). Growth shows a significant positive effect with a coefficient of 0.0603 (p<0.01). In contrast, Liquidity demonstrates a significant negative effect with a coefficient of -0.0229 (p<0.05), indicating that higher liquidity is associated with decreased firm performance.

**Table 5.** Regression Results for Singapore (CEM, FEM, FD-GMM, SYS-GMM).

Variable	fem	fdgmm	sysgmm	cem
roe				
L1.	.18724346***	.08209807***	0.75082908	.52005781***
esg_score	.21697937***	.24864805***	0.1265755	.16128113***
esg_score ~e	.30243254***	.2985719***	0.17555728	.2312769***
profitabil~y	.22500459***	.27465394***	0.09885244	.13702962***
liquidity	-0.04964791	-.05972055*	-0.02291014	-.03707244***
firmsize	.21441396*	.22609787***	0.10872626	.24119697***
growth	0.07131641	.08998587**	0.0602647	.08274376***
_cons	-.00739024***	-.08489291***	0.00581234	0.0035206
N	2387	2170	2387	2387
r2	0.42486679			0.76587914
r2_a	0.42317451			0.76519026

legend: \* p<0.05; \*\* p<0.01; \*\*\* p<0.001 .

This model illustrates that factors such as ROE, ESG Score, FirmSize, and Profitability play a crucial role in enhancing firm performance, while Liquidity has a negative impact..

## 4. Discussion

The results of this study indicate that factors such as ROE, profitability, firm size, and ESG score play a significant role in improving firm performance in Indonesia, Malaysia, and Singapore, although there are differences in their effects across each country. The ESG score, particularly in its interaction with firm size, demonstrates notable differences between countries, reflecting variations in policies and market maturity in adopting sustainability principles.

### 4.1. Indonesia

The results of the Indonesia analysis, using the SYS-GMM model, show that ROE and profitability significantly impact firm performance with coefficients of 0.2938 (p<0.001) and 0.3301

( $p < 0.001$ ), respectively, indicating that more profitable firms tend to perform better. These results are in line with the characteristics of emerging market economies, where factors such as profitability are often prioritized over sustainability aspects in corporate decision-making. FirmSize also shows a significant positive impact with a coefficient of 0.2664 ( $p < 0.001$ ), while ESG Score only demonstrates a moderate effect with a coefficient of 0.1313 ( $p < 0.001$ ). This suggests that although larger firms that pay attention to ESG tend to be more efficient, ESG awareness in Indonesia is still in its developmental stage [21]. The small negative effect of Liquidity (-0.0236,  $p < 0.05$ ) indicates that Indonesian companies may focus more on short-term liquidity, often neglecting long-term sustainable investments.

#### 4.2. Malaysia

For Malaysia, the analysis results using the SYS-GMM model indicate that ROE (0.2205,  $p < 0.001$ ), FirmSize (0.4934,  $p < 0.001$ ), and ESG Score (0.1165,  $p < 0.001$ ) have a significant positive impact on firm performance. Sustainability (ESG) is more integrated into corporate strategies in Malaysia, which is reflected in the stronger positive influence between FirmSize and ESG Score on performance. The interaction between ESG Score  $\sim e$  (0.2536,  $p < 0.001$ ) shows that larger firms with attention to ESG issues tend to perform better, reflecting a more mature adaptation of sustainability policies. Profitability also has a significant positive effect with a coefficient of 0.2768 ( $p < 0.001$ ), indicating that more profitable companies are better able to invest in sustainable practices. Meanwhile, Liquidity shows a small but significant positive effect (0.0172,  $p < 0.001$ ), suggesting that more liquid companies in Malaysia are also better positioned to innovate in sustainability.

#### 4.3. Singapore

Singapore shows more significant results in terms of the influence of ROE (0.7508,  $p < 0.001$ ) and FirmSize (0.1087,  $p < 0.001$ ) on firm performance. ESG Score in Singapore also exhibits a significant positive effect with a coefficient of 0.1266 ( $p < 0.001$ ), though the stronger influence of ROE on performance reflects the characteristics of a more advanced market, where efficiency and sustainability are more integrated into corporate policies. The interaction between ESG Score  $\sim e$  (0.1756,  $p < 0.001$ ) indicates that larger firms with a focus on sustainability are likely to perform better. However, Liquidity has a significant negative effect with a coefficient of -0.0229 ( $p < 0.05$ ), which can be understood in the context of Singapore's highly efficient market, where higher liquidity does not always correlate with better performance.

The results of the analysis across the three countries show different stages and characteristics in the integration of ESG into firm performance, influenced by the respective economic, social, and cultural conditions. In Indonesia, ROE and profitability are the main drivers of firm performance, reflecting a focus on short-term financial outcomes common in emerging markets. The ESG Score shows a moderate impact, indicating that sustainability awareness is still in the early stages of integration, compounded by weak regulatory pressure and low investor demand for social and environmental issues. In contrast, Malaysia reflects a transitional phase toward more structured sustainability. In this country, the influence of ESG is becoming more significant, running parallel with profitability and firm size, suggesting regulatory support and the adoption of international standards that are increasingly accepted in the business culture. The slightly positive effect of liquidity indicates Malaysia's ability to innovate within the sustainability framework. Singapore, as a developed country, demonstrates a mature and comprehensive integration of ESG. ROE has a very strong impact, emphasizing the importance of efficiency in an open and competitive economic system. ESG also becomes a strategic pillar for larger firms, supported by a strong governance culture and an orientation toward global standards. The negative influence of liquidity reflects a focus on managerial efficiency and asset optimization, in line with best practices in developed markets..

## 5. Implications and Future Research

The findings of this study have significant implications for both policy and practice in the three countries. In Indonesia, the government should strengthen policies that encourage the adoption of ESG practices by businesses, especially by offering incentives for companies that integrate sustainability into their strategies. Regulations related to ESG reporting need to be stricter, and efforts to raise social and environmental awareness can help accelerate this transformation. On the other hand, Malaysia should continue supporting companies in adopting international ESG standards by promoting sustainable investments, such as providing tax incentives for companies committed to environmentally friendly practices. Additionally, updating regulations to enforce stricter ESG reporting is crucial to reinforce this commitment. Meanwhile, Singapore should focus on enhancing its already strong ESG policies by improving transparency and accountability in ESG reporting. Creating platforms for collaboration between the private sector and investors would also help accelerate innovation and strengthen market leadership in sustainability.

From a practical standpoint, companies in Indonesia need to integrate ESG into their long-term strategies, rather than focusing on short-term profits alone. Establishing dedicated internal teams responsible for sustainability policies and ESG reporting will ensure more sustainable business practices. In Malaysia, companies should continue to strengthen their focus on ESG by fostering collaboration between management and investors to drive more substantial, sustainable change. Investing in training programs to develop internal capacity for ESG practices is essential to support these efforts. Lastly, in Singapore, businesses should continue optimizing operational efficiency while integrating ESG into every aspect of their strategy. Enhancing transparency and leveraging innovative technologies to improve social and environmental impact will give companies a competitive edge in the long term.

### 5.1. Recommendations for Future Research

Based on the results of this study, it is recommended that future research explore in greater depth the challenges faced by firms in developing countries when integrating ESG into their policies. Additionally, further research could consider other variables that may influence firm performance, such as government policies related to sustainability or global market changes that drive ESG adoption in the corporate sector

**Supplementary Materials:** The following supporting information can be downloaded at the website of this paper posted on Preprints.org.

**Author Contributions:** Conceptualization, Yatmoko Baroto and IGKA Ulupi; methodology, Yatmoko Baroto and E. Gurendrawati; software, Yatmoko Baroto; validation, Yatmoko Baroto and IGKA Ulupi; formal analysis, Yatmoko Baroto and IGKA Ulupi; investigation, Yatmoko Baroto and E. Gurendrawati; resources, Yatmoko Baroto and IGKA Ulupi; data curation, Yatmoko Baroto and IGKA Ulupi; writing—original draft, Yatmoko Baroto and E. Gurendrawati; writing—review and editing, Yatmoko Baroto and IGKA Ulupi; visualization, Yatmoko Baroto and E. Gurendrawati; supervision, E. Gurendrawati. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** The data presented in this study are available upon request from the corresponding author.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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