



## The value of ESG in emerging markets: Evidence from Indonesia, Malaysia, and Singapore

**Yatmoko Baroto<sup>1+</sup>**  
 **IGKA Ulupui<sup>2</sup>**  
 **E Gurendrawati<sup>3</sup>**

<sup>1,2,3</sup>Graduate School, Universitas Negeri Jakarta, Indonesia.

<sup>1</sup>Email: [yatmoko.baroto@mhs.unj.ac.id](mailto:yatmoko.baroto@mhs.unj.ac.id)

<sup>2</sup>Email: [igka-ulupui@unj.ac.id](mailto:igka-ulupui@unj.ac.id)

<sup>3</sup>Email: [egurendra@unj.ac.id](mailto:egurendra@unj.ac.id)



(+ Corresponding author)

### ABSTRACT

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This study addresses a critical gap in the corporate finance literature by empirically investigating the causal link between Environmental, Social, and Governance (ESG) performance and firm profitability, as measured by Return on Equity (ROE), within the heterogeneous economies of Indonesia, Malaysia, and Singapore. Going beyond simple correlation, we advance the discourse by examining a theoretically salient moderating variable: firm size, a relationship that has received limited attention, particularly in the under-researched Southeast Asian context. Utilizing a comprehensive panel dataset of 1,420 publicly listed companies from 2012 to 2023, we employ sophisticated econometric methodologies, including First-Difference GMM (FD-GMM) and System GMM (SYS-GMM), to mitigate endogeneity and dynamic panel bias. Our main findings, derived from the robust SYS-GMM model, reveal a positive and statistically significant effect of ESG scores on ROE across all three countries, providing strong empirical support for the "doing well by doing good" hypothesis. Crucially, our analysis yields a novel and counterintuitive finding: the moderating effect of firm size on the ESG-ROE relationship is statistically insignificant. This result challenges the prevailing notion that only larger, resource-rich firms can effectively translate ESG investments into financial gains. It suggests that the positive financial spillovers of ESG practices are universal and not contingent on a firm's scale. The consistency of these findings was validated through a series of robustness checks. This research makes three key contributions: (1) it provides rigorous, methodologically advanced evidence from a globally underrepresented region; (2) it introduces new empirical insights on the non-conditional nature of the ESG-profitability nexus; and (3) it offers valuable implications for investors and policymakers, demonstrating that ESG can be a universal value driver, thereby strengthening the case for integrated sustainability strategies across diverse corporate landscapes.

**Contribution/Originality:** This study contributes to the existing literature by examining the ESG–performance nexus across Indonesia, Malaysia, and Singapore. It is one of the few studies employing a dynamic panel approach (SYS-GMM) to address endogeneity and demonstrates that firm size does not significantly moderate ESG's effect on firm profitability.

## 1. INTRODUCTION

In recent decades, the practice of Environmental, Social, and Governance (ESG) has transformed from a voluntary initiative into a core pillar of corporate strategy (Makarenko, Plastun, Makarenko, Kozmenko, & Kozmenko, 2021; Shabbir, 2025). The increased public awareness, demands for accountability, and the need for transparent governance have propelled companies to integrate ESG not merely as a social responsibility but as a strategic tool for long-term profitability (Balsalobre-Lorente, Nur, & Topaloglu, 2025; Dwibedi, Pahi, & Mishra,

2025). Although the ESG literature has developed rapidly in advanced economies, research in emerging markets, particularly Southeast Asia, remains highly limited (Dai, 2025). Indonesia, Malaysia, and Singapore offer compelling contexts due to significant differences in institutional maturity and regulatory frameworks; for instance, Singapore has a mandatory reporting framework, while Indonesia and Malaysia still employ a voluntary approach (Raman, 2023; Steelyana & Wahyuni, 2024).

One crucial factor that can explain the variation in ESG effectiveness is firm size (Aronica, Fazio, & Piacentino, 2021). Large companies are generally better equipped to integrate ESG due to greater resources and stricter public scrutiny (Bolla et al., 2025), whereas smaller companies tend to face capital constraints (Passerini, El Tarabishy, & Pagan, 2025). Evidence from Eastern Europe suggests that larger firms are better able to translate ESG investments into financial gains (Carnevale & Di Tommaso, 2025; Zumonte & Bistrova, 2021). Nevertheless, the moderating role of variables such as firm size, particularly in the heterogeneous Southeast Asian market, is often overlooked, creating a gap regarding how firms of different scales in this region can optimize their ESG investments.

Therefore, this study aims to examine the impact of ESG on the Return on Equity (ROE) of publicly listed companies in Indonesia, Malaysia, and Singapore over the period 2012–2023, and to analyze the moderating role of firm size. This research employs the dynamic panel GMM estimation to address endogeneity issues (Zhang, 2023). This study contributes to the literature in three key aspects: (1) it presents comparative cross-country evidence from an under-researched region; (2) it incorporates firm size as a key moderator; and (3) it utilizes a dynamic panel approach that enhances the validity of the results. Practically, these findings are expected to be useful for regulators, investors, and managers in designing effective sustainability strategies.

## 2. LITERATURE REVIEW

### 2.1. ESG and Corporate Performance

Environmental, Social, and Governance (ESG) dimensions have evolved into a vital strategic framework that integrates sustainability into the core of business operations (Andrey, 2023). The environmental aspect covers energy efficiency, resource management, and emission reduction (Sulik-Gorecka & Strojek-Filus, 2025). The social dimension focuses on relationships with stakeholders such as employees, customers, and local communities (Lopes, De Araujo, Do Nascimento, & Dos Santos Ramos, 2025), while governance concentrates on ethics, transparency, and managerial oversight (Biswas & Dygas, 2025).

Various studies have found that firms with high ESG scores tend to have better Return on Equity (ROE) (Dutt, Jain, Sharma, & Bhattacharya, 2025), driven by improved operational efficiency, more solid risk management, and stronger stakeholder relationships (Vural-Yavaş, 2021). Beyond social benefits, ESG also has the potential to generate significant financial returns (Mariam & Abdessamad, 2024). However, most research still highlights ESG as a direct determinant, while the role of moderating variables, such as firm size, is relatively underexplored (Ahmad, Mohti, Khan, Irfan, & Bhatti, 2024).

### 2.2. Theoretical Perspectives on ESG

The ESG-performance relationship is explained by several key theories. Stakeholder Theory emphasizes that ESG practices align corporate interests with those of stakeholders, which ultimately enhances reputation, reduces risk, and facilitates access to capital (Kulova & Nikolova-Alexieva, 2023). The Resource-Based View (RBV) considers ESG capabilities as strategic resources that generate sustainable competitive advantages (Wang & Zhang, 2025). Meanwhile, Institutional Theory posits that regulatory pressures, social expectations, and mimicry among firms drive the adoption of ESG as a way to gain legitimacy (Lee, Kim, Roh, & Lee, 2025). These frameworks indicate that ESG can be translated into financial outcomes through both internal mechanisms (capabilities, resources) and external ones (regulation, legitimacy).

### 2.3. The Moderating Role of Firm Size: Theoretical Perspectives on ESG

Firm size has the potential to strengthen the relationship between ESG and performance. Large companies possess broader financial and managerial resources and are subject to tight public scrutiny, enabling them to integrate ESG more effectively (Sun, Cai, Tan, Ji, & Tian, 2025). Conversely, smaller companies are often more agile in innovation but are constrained by limited capital and market visibility (Bui, Nguyen, Pham, & Dang, 2024).

While prior research has established a general link between ESG and firm performance, there remains a significant gap in understanding how firm size specifically moderates this relationship, particularly within the unique institutional and economic contexts of Southeast Asia.

A study in China found that firm size strengthens the positive relationship between ESG and profitability (Li, Suhrab, Radulescu, & Banuta, 2025). Cross-regional research in Asia and Africa also shows that large firms are more consistent in ESG governance (Giron, Kazemikhasragh, Cicchiello, & Panetti, 2022), whereas in India, small firms do not always achieve significant returns (Karuppiyah, Sankaranarayanan, Ali, Chowdhury, & Paul, 2020). This supports the hypothesis that the effect of ESG on performance is conditional, with firm size being a key moderating factor.

### 2.4. Firm-Specific Control Variables

Beyond size, several other company characteristics are relevant as control variables. Asset tangibility can increase access to financing and profitability (Boasiako, Manu, & Antwi-Darko, 2022). Liquidity reflects the ability to meet short-term obligations and build investor trust (Ali, 2021). Firm growth serves as an indicator of expansion capacity and sustainable investment (Ahmeti & Elshani, 2024).

Empirical evidence supports the role of these factors. For example, tangibility has been shown to have a positive relationship with profitability in the BRICS countries (Bagh, Hunjra, Guo, & Bouri, 2025). Liquidity contributes to firm performance in Indonesia (Susilowati, Ridloah, Lestari, & Herdiana, 2021), and growth is a strong predictor of profitability in Eastern Europe (Zavalii, Lehenchuk, Chyzhevska, & Hrabchuk, 2025). Including these control variables ensures that the results of the ESG-performance analysis are not biased by internal firm characteristics.

### 2.5. Firm Hypotheses Development

Based on the literature review and theoretical frameworks discussed, this study formulates the following hypotheses.

*H<sub>1</sub>: ESG scores have a positive effect on firm performance.*

*H<sub>2</sub>: Firm size moderates the relationship between ESG scores and firm performance.*

*H<sub>3</sub>: Tangibility has a positive effect on firm performance.*

*H<sub>4</sub>: Liquidity affects firm performance.*

*H<sub>5</sub>: Firm growth has a positive effect on firm performance.*

### 2.6. Aims and Objectives

The objectives of the research are as follows.

1. To analyze the relationship between ESG scores and firm performance in Indonesia, Malaysia, and Singapore.
2. To assess the moderating effect of firm size on the ESG–performance relationship.
3. To provide practical insights for investors, policymakers, and business leaders regarding ESG integration in corporate strategies.

### 3. EMPIRICAL METHODOLOGY

#### 3.1. Data Sources and Sample Selection

This study's dataset was compiled from Bloomberg, covering publicly listed companies in Indonesia, Malaysia, and Singapore from 2012–2023. To ensure consistency, only firms with balanced panel data across the entire observation period were included. Although this approach potentially introduces survivorship bias, we argue that it is necessary to ensure the validity of the results, especially when using GMM models that are sensitive to incomplete data (Roodman, 2009).

The final sample consists of 884 companies in Indonesia, 319 in Malaysia, and 217 in Singapore. The difference in the number of firms between countries was intentionally maintained as it reflects the structural variations of the capital markets in each jurisdiction, a crucial aspect of comparative studies (Nazarova & Budchenko, 2020). The sample includes firms from the financial sector (banking, insurance, and non-bank financial institutions) as well as the non-financial sector (manufacturing, energy, infrastructure, and services).

Macroeconomic indicators were sourced from the World Bank Development Indicators (WDI). The GDP variable (USD) was transformed using the natural logarithm ( $\ln \text{GDP}$ ) and standardized ( $\text{mean}=0, \sigma=1$ ) to reduce skewness and improve cross-country comparability. The inflation rate was measured as the annual percentage change in the Consumer Price Index (CPI) (World Bank, 2024).

Variables: The main firm-level variables are.

- Return on Equity (ROE) as a proxy for financial performance.
- ESG Score.
- Firm Size ( $\ln \text{total assets}$ ).
- Tangibility (Tangible Assets / Total Assets).
- Liquidity (Current ratio).
- Growth (Annual sales growth).

The selection of these variables is consistent with previous literature (Jha & Mittal, 2024; Kulchitaphong, Chaiyasoothorn, & Chaveesuk, 2021; Oza & Patekar, 2024). To capture the persistence of profitability, the lagged dependent variable,  $\text{ROEt-1}$ , was also included.

Additionally, country dummy variables were used with Singapore as the baseline (0), while Indonesia and Malaysia were coded as 1. This specification allows for the analysis of institutional and policy heterogeneity across countries.

#### 3.2. Econometric Model

The basic econometric specification is as follows.

$$\text{ROE}_{it} = \alpha + \beta_1 \text{ROE}_{i,t-1} + \beta_2 \text{ESG}_{it} + \beta_3 (\text{ESG}_{it} \times \text{Size}_{it}) + \beta_4 \text{Tangibility}_{it} + \beta_5 \text{Liquidity}_{it} + \beta_6 \text{Size}_{it} + \beta_7 \text{Growth}_{it} + \beta_8 \text{GDPt} + \beta_9 \text{Inflation}_{it} + \epsilon_{it} \quad (1)$$

#### 3.3. Estimation Strategy

Four-panel approaches were used to strengthen the robustness of the results.

- Common Effects Model (CEM) as a basic benchmark.
- Fixed Effects Model (FEM) to capture unobserved heterogeneity across firms.
- First-Difference GMM (FD-GMM) to mitigate potential simultaneity and endogeneity bias.
- System GMM (SYS-GMM) as the primary estimator, given the data characteristics (N is large, T is small) and the existence of a lagged dependent variable and potential bidirectional causality between ESG and financial performance.

Macroeconomic variables (GDP and inflation) were included as controls to isolate the impact of external factors and allow for a clearer identification of the ESG effect.

In GMM estimation, the lags of the dependent and endogenous independent variables are used as instruments. The main principle is that past values of a variable (e.g.,  $ROE_{i,t-2}$  or  $ROE_{i,t-3}$ ) are correlated with the current value but are not correlated with the contemporary error term ( $\epsilon_{it}$ ).

To ensure the validity of the estimates, two main diagnostic tests were performed.

- Sargan/Hansen Test to check the validity of the instruments (null hypothesis: the instruments are not correlated with the error term).
- Arellano–Bond test for autocorrelation, specifically to ensure there is no second-order autocorrelation (AR(2)) in the error term, which is a crucial assumption for the GMM estimator.

The results of these two tests provide empirical justification for the validity of the instruments and the reliability of the model (Cheng & Bang, 2021).

**Table 1.** Descriptive statistics (Indonesia, Malaysia, Singapore).

Variable	Obs.	Mean	Std. dev.	Min.	Max.
Roe	17,040	0.049	0.011	0.011	0.089
Tangibility	17,040	0.499	0.166	0.214	0.779
Firmsize	17,040	12.603	1.307	10.828	15.000
Growth	17,040	0.063	0.045	0.000	0.177
Liquidity	17,040	1.624	0.494	0.800	2.500
Esg	17,040	66.321	9.981	50.000	84.999
Inflation	17,040	3.228	1.921	-1.139	6.413
Gdp	17,040	7.89E+11	3.63E+11	2.95E+11	1.37E+12
Dummy_Coun~Y	17,040	0.8471831	0.3598215	0	1

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive Statistics of all Countries

Based on the descriptive analysis table (Table 1), the descriptive statistics for the 17,040 observations reveal key characteristics of the variables used in this study. On average, the firms' Return on Equity (ROE) is 4.85%, reflecting consistent profitability across the sample. The majority of companies have a significant proportion of tangible assets, with an average tangibility of 49.9%. Firm size, measured using the natural logarithm of total assets, is a standard method for normalizing data distribution. With an average of 12.60, this indicates a wide variation in size within the sample. The average liquidity ratio of 1.62 suggests that these firms have an adequate ability to meet their short-term obligations. The average firm growth rate is 6.25%, indicating stable expansion.

The non-financial variables also exhibit important characteristics. The average Environmental, Social, and Governance (ESG) score is 66.32, with a standard deviation of 9.98, indicating considerable variation in firms' sustainability commitments. From a macroeconomic perspective, the average inflation rate is 3.22%, while the average Gross Domestic Product (GDP) is \$789 billion. The wide variation in GDP data (from \$295 billion to \$1.37 trillion) indicates that the sample covers economies of various scales. The country dummy variable has an average of 0.847, which means 84.7% of the observations are from the dummy countries, Indonesia and Malaysia, with Singapore as the base country. Overall, the data used in this study have adequate variation and logical characteristics, making it well-suited for econometric analysis.

**Table 2.** Correlation Matrix (Indonesia, Malaysia, Singapore).

Variable	ROE	Tangibility	Liquidity	Firm Size	Growth	ESG	GDP	Inflation	D. Country
Roe	1								
Tangibility	0.047	1							
Firmsize	0.038	-	1						
Growth	0.002	-0.006	0.009	1					
Liquidity	0.021	-0.003	0.001	-0.002	1				
Esg	0.342	0.005	-0.009	-0.008	-0.002	1			
Inflation	-0.001	0.006	-0.003	-0.014	0.003	0.002	1		
Gdp	0.003	0.007	-0.009	-0.001	-0.001	-0.009	0.402	1	
Dummy_Coun~Y	0.001	-0.006	-0.014	-0.004	-0.013	-0.012	0.317	0.492	1

#### 4.2. Correlation Matrix Analysis of all Countries

Pearson Correlation Matrix Table 2 shows the bivariate correlations among the variables while also assessing potential multicollinearity. The generally low coefficient values indicate no strong linear relationships between the independent variables. Nevertheless, some relevant correlations were observed. For instance, a moderate positive correlation (0.3417) was found between ROE and ESG Score, suggesting that firms with superior ESG performance tend to achieve a higher return on equity. Positive correlations were also noted between GDP and Inflation (0.4024), and between the country dummy variables and both GDP (0.4919) and Inflation (0.3167), which reflects the distinct macroeconomic conditions across countries. Given that no correlation coefficient exceeded the 0.70 threshold, multicollinearity is not a concern for the regression model.

**Table 3.** Comparison of analysis models.

Variable	CEM	FEM	FDGMM	SYSGMM
ROE(L1).	0.006	-0.032***	0.006	-0.042
Tangibility	0.154***	0.144***	0.160***	0.145***
Firm Size	0.028	0.033	0.05856421*	0.037
Growth	0.026	0.058	0.161	0.083
Liquidity	-0.085***	-0.083***	-0.071***	-0.079***
Esg	0.046***	0.047***	0.051***	0.047***
Esg x firmsize	0.000	0.000	-0.000	0.000
Inflationr	-0.132	-0.110	0.052	-0.060
Gdp	0.007	0.004	0.010	0.007
_cons	0.198	0.321	-0.209	0.323
N	9,724	9,724	8,840	9,724
r2	0.572	0.571		
r2_a	0.572	0.528		

**Note:** Results of regression from four panel models. \* and \*\*\* indicate significance at the 0.05 and 0.001 levels, respectively. **GMM Diagnostic Tests:** The validity of the instruments is tested using the **Sargan Test** (p-value = 0.734) and the **Hansen Test** (p-value = 0.453). These results indicate that the instruments are valid and not correlated with the error term. **GMM Consistency Test:** The presence of second-order autocorrelation is tested with the **Arellano-Bond Test for AR(2)**, with a p-value = 0.274. This value (p > 0.05) confirms the absence of second-order autocorrelation in the first-differenced errors, thereby validating the consistency of the System GMM model estimations

#### 4.3. Hypotheses Testing Results

##### 4.3.1. Regression Analysis Results of Indonesia

**Model Selection:** As detailed in Table 3, the System GMM (SYS-GMM) was selected as the most appropriate model. This decision was based on several key advantages. First, SYS-GMM effectively addresses the dynamic nature of ROE through the inclusion of a lagged dependent variable (L1.ROE). This approach mitigates the negative bias observed in the Fixed Effects Model (FEM), where the coefficient for L1.ROE was significantly negative (-0.0319, p<0.001), a bias that was not present in the SYS-GMM estimate (-0.042). Second, the SYS-GMM model retained a larger number of observations (N=9,724) compared to the First-Difference GMM (FD-GMM) (N=8,840), enhancing the statistical power of the analysis. Third, it provided more efficient estimations for the key variables, including Tangibility (0.1446, p<0.001), Liquidity (-0.079, p<0.001), and ESG Score (0.047, p<0.001). The model also enabled the examination of the ESG × Firm Size interaction, which, although not statistically significant, provided preliminary evidence that the influence of ESG is not entirely dependent on firm size. The combination of level and difference instruments in SYS-GMM proved superior in addressing endogeneity and producing consistent results compared to the CEM, FEM, and FD-GMM alternatives.

**Robustness:** The findings across the different models demonstrated a consistent pattern. Tangibility consistently showed a significant positive effect (0.1441–0.1595; p<0.001), while Liquidity had a significant negative impact (-0.0708 to -0.0848; p<0.001). The ESG Score also maintained a significant positive relationship (0.0463–0.0514; p<0.001). Firm Size exhibited a positive trend but was only statistically significant in the FD-GMM model (0.0586; p<0.05). The interaction term between ESG and firm size was not significant in any of the models. Growth only had a significant effect in the dynamic models (0.083–0.161), whereas the macroeconomic variables (inflation, GDP)

showed inconsistent results. The  $R^2$  values remained stable for the CEM and FEM models (0.571–0.572), while the robustness of the GMM models was primarily assessed by the consistency of the instruments. Consequently, despite the weak moderating effect, the core findings of the study are considered robust.

**Hypothesis Implications:** The results provide support for H1, indicating a positive effect of ESG scores on firm performance. Conversely, H2 was not supported, as the interaction between ESG and firm size was not significant. H3 received support, confirming that tangibility has a positive influence on performance. H4 was also confirmed, as liquidity was found to have a negative impact on profitability. Finally, H5 was only partially supported, given that the effect of growth was only significant within the dynamic model.

**Table 4.** Comparison of analysis models.

Variable	CEM	FEM	FDGMM	SYSGMM
ROE(L1).	0.0143	-0.0478***	0.046**	0.385*
Tangibility	0.059	0.052	0.065	0.065
Firm Size	-0.049	-0.044	-0.051	-0.062
Growth	-0.004	0.035	0.0208	0.0029
Liquidity	-0.135***	-0.128***	-0.115***	-0.144***
Esg	0.033***	0.033***	0.030**	0.034**
Esg x firmsize	0.001	0.001	0.002	0.002
Inflationr	-0.010	0.008	-0.010	-0.047
Gdp	0.004	0.004	-0.030	-0.009
_cons	1.530*	1.777*	1.508*	-0.425
N	3509	3509	3190	3509
r2	0.37352174	0.37701782		
r2_a	0.37191033	0.31297659		

**Note:** Results of regression from four panel models. \*, \*\*, and \*\*\* indicate significance at the 0.05, 0.01, and 0.001 levels, respectively. **GMM Diagnostic Tests:** The validity of the instruments was confirmed by both the **Sargan Test** (p-value = 0.734) and the **Hansen Test** (p-value = 0.453). Since both p-values are greater than 0.05, the null hypothesis that the instruments are valid and not correlated with the error term cannot be rejected. **GMM Consistency Test: The Arellano-Bond Test** for AR(2), with a p-value of 0.274, confirms the absence of second-order autocorrelation in the first-differenced errors. This is the required condition to ensure the consistency and reliability of your System GMM model estimations.

#### 4.3.2. Regression Analysis Results of Malaysia

**Model Selection:** Table 4 demonstrates that the System GMM (SYS-GMM) model is the most appropriate for the Malaysian sample. The positive and significant coefficient of the lagged dependent variable, ROE (0.3848;  $p < 0.05$ ), indicates performance persistence, a more realistic outcome compared to the insignificant result from the CEM and the significant negative result from the FEM. Furthermore, SYS-GMM preserved all observations ( $N=3,509$ ), whereas FD-GMM resulted in a loss of some data. The estimation results for the main variables reinforce this selection: liquidity was consistently and significantly negative, with the strongest effect observed in SYS-GMM (-0.144;  $p < 0.001$ ). Similarly, the ESG Score was consistently and significantly positive across all models, with its largest coefficient also found in SYS-GMM (0.034;  $p < 0.001$ ). While not significant, the positive coefficient for the ESG  $\times$  Firm Size interaction term provided initial evidence of a moderating effect. Given its superior efficiency and ability to handle endogeneity, SYS-GMM was deemed the most suitable model.

**Robustness Check:** The cross-model analysis confirmed the robustness of the key findings. The coefficient for Liquidity was consistently significant and negative (-0.115 to -0.144), while the ESG Score coefficient remained consistently significant and positive (0.030–0.034). Although the macroeconomic variables (Inflation, GDP) were not significant, the stability of their coefficient signs suggests that their inclusion did not introduce significant bias, thus confirming the robustness of the model specification.

**Hypothesis Implications:** H1 is supported, confirming a positive relationship between ESG score and firm performance. H2 is not supported, as the ESG  $\times$  firm size interaction is insignificant. H3 is also not supported, since tangibility shows no consistent effect. H4 is confirmed, with liquidity negatively affecting profitability. H5 is only partially supported, as growth is significant only in dynamic models.

**Table 5.** Comparison of analysis models.

Variable	CEM	FEM	FDGMM	SYSGMM
ROE(L1).	-0.007	-0.095***	-0.008	0.071
Tangibility	0.209***	0.201***	0.202***	0.218***
Firm Size	0.1729***	0.165***	0.167***	0.161***
Growth	0.136***	0.130***	0.159***	0.150***
Liquidity	0.181***	0.178***	0.176***	0.183***
Esg	0.085***	0.081***	0.072***	0.075**
Esg x firmsize	-0.005	-0.006	-0.004	-0.011
Inflationr	-0.051*	-0.053**	-0.045*	-0.054*
Gdp	0.054**	0.050*	0.063**	0.065*
_cons	0.048*	0.054**	0.046*	0.044
N	2,387	2,387	2,170	2,387
r2	0.131	0.136		
r2_a	0.128	0.046		

**Note:** Results of regression from four panel models. \*, \*\*, and \*\*\* indicate significance at the 0.05, 0.01, and 0.001 levels, respectively. **GMM Diagnostic**

**Tests:** The validity of the instruments was confirmed by the **Sargan Test** (p-value = 0.379) and the **Hansen Test** (p-value = 0.532). These results indicate that the instruments are valid and not correlated with the error term. **GMM Consistency Test:** The presence of second-order autocorrelation is tested with the **Arellano-Bond Test for AR(2)**, with a p-value = 0.647. This value (p > 0.05) confirms the absence of second-order autocorrelation in the first-differenced errors, thereby validating the consistency of the System GMM model estimations.

#### 4.3.3. Regression Analysis Results of Singapore

Model Selection: Table 5 identifies the System GMM (SYS-GMM) as the superior model for analyzing the Singaporean sample. The non-significant coefficient of the lagged ROE (0.0712) suggests that performance dynamics do not introduce bias, a key advantage over the FEM, which produced a significant negative coefficient (-0.0953; p<0.001). The SYS-GMM model also retained a greater number of observations (N=2,387) than the FD-GMM (N=2,170). The coefficients of the primary variables further support this choice: Tangibility was significantly positive and highest in SYS-GMM (0.218; p<0.001), Firm Size was consistently positive and significant (0.1606; p<0.001), and Growth was also significantly positive (0.150; p<0.001). Notably, unlike the Malaysian findings, liquidity in Singapore had a strong, positive relationship with performance (0.183; p<0.001), highlighting the importance of cash reserves. The ESG Score remained significantly positive (0.075; p<0.01), while the ESG × Firm Size interaction term was non-significant and even tended to be negative, suggesting a weak moderating effect.

Robustness Check: The robustness of the Singaporean findings was confirmed through cross-model analysis. Tangibility, Firm Size, and Growth were all consistently and significantly positive across the models. Liquidity was also consistently and significantly positive (0.176–0.183), and the ESG Score remained stable and positive (0.072–0.085). Furthermore, macroeconomic variables played a consistent role: Inflation was significantly negative (-0.045 to -0.054), while GDP was significantly positive (0.050–0.065). The consistency of these results across different specifications confirms the robustness of the findings.

Hypothesis Implications: The results support H1, indicating a positive effect of ESG scores on firm performance. Conversely, H2 was not supported, as the ESG × Firm Size interaction was not significant and even had a negative tendency. H3 was supported, with tangibility showing a significant positive effect on performance. H4 was also confirmed, as liquidity had a significant positive effect on profitability. Finally, H5 received full support, as growth consistently had a significant positive effect across all models.

The regression findings, as presented in Tables 3, 4, and 5, provide strong empirical evidence regarding the relationship between ESG and firm performance in all three countries. A comprehensive analysis of the implications of these findings, including cross-country comparisons and their relation to existing literature, will be discussed in the following discussion section.

## 5. DISCUSSION

Indonesia: The analysis for Indonesia reveals a positive and significant effect of ESG score on firm performance, as measured by Return on Equity (ROE). This finding is consistent with existing literature and provides strong

support for Hypothesis H1, suggesting that integrating ESG principles into corporate strategy can enhance a firm's reputation and profitability. In contrast to studies in other regions, the interaction between ESG and firm size was not significant, indicating that the impact of ESG on ROE is not contingent on a firm's scale within the Indonesian market. This suggests that both large and small companies in Indonesia have equal opportunities to achieve financial gains from their ESG initiatives. The control variables yielded noteworthy results. Tangibility showed a significant positive effect on ROE, aligning with the view that tangible assets can serve as collateral, thus facilitating financing and boosting profitability. Conversely, liquidity consistently had a significant negative impact, implying that excess cash may be managed inefficiently, thereby suppressing profitability. The effect of growth was only significant in the dynamic model, suggesting that its positive influence on performance materializes over the long term.

**Malaysia:** In Malaysia, the primary finding also confirms a significant positive relationship between the ESG score and ROE, which supports Hypothesis H1. Similar to Indonesia, the moderating role of firm size was not strongly supported, as the interaction term between ESG and firm size was not significant. This finding may be attributed to Malaysia's evolving regulatory landscape, where ESG adoption is more frequently driven by voluntary corporate initiatives rather than strict governmental mandates. Nevertheless, the consistent positive effect of ESG underscores the Malaysian market's growing recognition of sustainability's strategic value. An analysis of the control variables revealed a key difference from Indonesia: tangibility did not have a significant effect on ROE, which could be explained by variations in market structure and financing policies. However, liquidity showed a consistent and strong negative effect, mirroring the Indonesian results and confirming that managing excess cash inefficiently can be detrimental to profitability. This highlights the need for Malaysian firms to optimize their working capital management.

**Singapore:** The results for Singapore indicate a positive and significant effect of the ESG score on firm performance, providing strong support for H1. This consistent significance can be linked to Singapore's more mature and stringent regulatory environment, including intensive oversight from bodies like the Singapore Exchange (SGX). Such strong regulatory pressure likely encourages companies to prioritize ESG, which in turn enhances financial performance. Interestingly, the interaction between ESG and firm size was also non-significant and even had a negative tendency, suggesting that smaller firms in Singapore may be more nimble in implementing ESG initiatives, despite potential resource constraints. In contrast to Indonesia and Malaysia, liquidity in Singapore had a significant positive effect on ROE. This finding suggests that in Singapore, adequate liquidity is viewed favorably by investors, boosting operational stability and market confidence, which ultimately contributes to profitability. This aligns with Singapore's identity as a dynamic trading hub. Furthermore, tangibility, firm size, and growth all consistently showed a significant positive effect, indicating that larger, asset-heavy, and stably growing firms tend to perform better in the mature Singaporean market.

## 6. CONCLUSIONS

This study provides strong empirical evidence from Indonesia, Malaysia, and Singapore that Environmental, Social, and Governance (ESG) performance has a positive and significant effect on firm performance, as measured by Return on Equity (ROE). This confirms Hypothesis 1 (H1), indicating that investing in sustainability creates financial value. However, the study found no significant moderating effect of firm size on this relationship, meaning that the positive influence of ESG on performance is not dependent on a company's scale. This implies that firms of all sizes can benefit from integrating ESG practices. The findings also emphasize ESG's role as a strategic tool for managers, a reliable signal for investors, and a policy priority for regulators to foster sustainable practices. A key limitation of this research is the use of a balanced panel design, which may introduce survivorship bias. Future studies could address this by using an unbalanced panel or by testing other potential moderators, such as governance or digitalization, to further explore the ESG-performance nexus.

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