DOES ESG INCREASE FIRM PERFORMANCE? EVIDENCE FROM ASEAN-5 BASED ON THE DYNAMIC THRESHOLD REGRESSION METHOD

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ABSTRACT

Guided by Shareholder Theory and Stakeholder Theory, this study examines the threshold influence of ESG on ASEAN-5 countries' firm performance using the Dynamic Threshold Regression Method. DTRM is a powerful tool that addresses the dynamic nature of firm performance and resolves endogeneity problems in the variables used. Our analysis shows that ASEAN-5 firms must achieve an ESG score above the threshold to reap the benefits of ESG investment. At the low regime, we observed a negative relationship between ESG and firm performance, while at the high regime, the relationship was positive. These results remained robust across different estimation methods. The significance of the threshold value can serve as a reference for ASEAN-5 firms and relevant stakeholders in allocating funding for ESG activities to achieve long-term sustainable performance.

Keywords: ESG Score, ASEAN-5, Dynamic Threshold Regression Method, Threshold value, Low Regime and High Regime

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1. INTRODUCTION

The shift from serving shareholders alone to addressing the interests of stakeholders (i.e., customers, employees, government, society, and environmental groups) has become the norm for corporations, yet remains controversial in relation to their sustainable performance. In this regard, environmental, social, and governance (ESG) practices have become a tool for balancing shareholder wealth maximization with strong stakeholder relationships. Although Jain and Tripathi's (2023) bibliometric analysis indicates a growing trend in ESG–performance research, past studies have not reached a consensus on the pros and cons of ESG implementation. Such inconclusive and conflicting empirical findings prompted us to explore whether a nonlinear relationship exists between ESG and firm performance.

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This investigation focuses on the ASEAN-5 countries—Malaysia, Singapore, Indonesia, Thailand, and the Philippines—for several reasons. First, the ESG frameworks in these countries have been modeled after mature international markets, where products are primarily export-driven and measured against carbon emissions. Despite this, ASEAN-5 countries face mounting sustainability issues due urbanization, including the degradation of their biodiversity, natural resources, and air and water quality. For example, Malaysia has reported problems with plastic and river pollution (The Star, 2024), while Indonesia faces persistent challenges surrounding gender inequality and corruption (Wongtrakool & Kim, 2019). This raises the question of whether international ESG standards translate into firm performance in the ASEAN-5 region. Second, statistics from Sustainalytics indicate that Singapore, Malaysia, the Philippines, and Indonesia face greater ESG risks than the global average (Pan, 2021). Failure to manage these risks is associated with weak strategic management of ESG and non-compliance with current environmental regulations (PricewaterhouseCoopers, 2021). This can erode the loyalty of environmentally conscious investors and customers, ultimately deterioriating firm performance (Cohen, 2023). Third, past ESG-performance findings in the ASEAN-5 context are inconclusive (Atan et al., 2018; Junius et al., 2020; Thomas et al., 2021; Lee & Isa, 2023; Raneses, 2023; Treepongkaruna & Suttipun, 2024), raising the possibility of a threshold effect. To address this gap and examine the suitability of international ESG frameworks for ASEAN-5, this study aims to investigate the interactive threshold effect of ESG on firm performance in the five countries. In doing so, we provide a means to quantify the impact of ESG investments as part of moving towards the United Nations Sustainable Development Goals (SDGs).

We applied linear and nonlinear functions to analyze a sample of 146 companies from the ASEAN-5. The fixed-effects linear model showed that a 10% increase in ESG decreases firm performance by 1.127%. However, these results did not remain under the nonlinear function. Using the dynamic panel threshold estimation method proposed by Seo and Shin (2016) and Seo et al. (2019), we established a threshold ESG score of 29.16, dividing sample firms into low and high regimes. At the low regime, a 10% increase in ESG reduces performance by 1.134%. At the high regime, once ESG exceeds the threshold value, the same 10% increase improves performance by 1.474%. These results were robust across different estimation methods and models. Overall, our findings align with our prediction of ESG's threshold effect, confirming a U-shaped relationship between ESG and firm performance in ASEAN-5 countries.

This paper makes three contributions to ESG research. First, it is the first to integrate both Shareholder Theory and Stakeholder Theory to explain the nonlinear impact of ESG on firm performance, distinct from the linear effect examined by Treepongkaruna and Suttipun (2024), Lee and Isa (2023), Raneses (2023), Thomas et al. (2021), Junius et al. (2020), and Atan et al. (2018). Linear models oversimplify the interpretation of empirical results to a single theory, as seen in most ESG studies on the ASEAN-5. Thus, our study adds to the ESG literature by demonstrating that both Shareholder Theory (for points below the threshold) and Stakeholder Theory (for points above the threshold) can concurrently explain the relationship between ESG and firm performance.

Second, unlike previous studies (Nollet et al., 2016; Shabbir et al., 2020; Pu, 2023; Dwibedi et al., 2024; Bagh et al., 2024) that used quadratic forms to reveal ESG's threshold effects, we employed the Dynamic Threshold Regression Method (DTRM) to explore ESG's threshold impact on

ASEAN-5 firm performance. The DTRM is more powerful because it identifies not only the threshold value but also the effects of other variables (e.g., firm size, leverage, economic growth, and inflation) across different regimes below and above the threshold. In contrast, the quadratic approach only detects the threshold point without detailing regimes. Additionally, the DTRM captures the dynamic effect of firm performance (i.e., how past performance influences current performance) and mitigates endogeneity issues among the variables (i.e., where high-performing firms tend to engage in ESG). This approach allowed us to quantify and interpret the threshold value more meaningfully and comprehensively.

Third, this study acknowledges that ASEAN-5 countries are undergoing continuous transitions to achieve resilience and sustainability for the well-being and livelihood of their present and future citizens. To this end, each country has introduced specific ESG standards and frameworks, as follows: Singapore's Sustainability Reporting Guide in 2016, Malaysia's i-ESG Framework in 2023, the Philippines' Sustainability Guideline in 2019, Thailand's Corporate Governance Code in 2017, and Indonesia's requirement for listed companies to publish sustainability reports as of 2020. However, these guidelines were largely adopted from developed international markets. By situating our research within ASEAN-5, our findings offer contextual evidence on whether existing frameworks effectively curb current ESG challenges in this region.

At the firm level, our results offer guidance in determining funding allocations for ESG to realize its benefits. Firms with ESG scores below the threshold should prioritize environmental protection and address social issues to enhance long-term value. On the other hand, firms with ESG scores above the threshold can expand into additional ESG activities to boost ESG quality and enjoy commensurate returns on their investment. Policymakers can also use our findings to strengthen ESG disclosure standards and support firms' acceptance of ESG responsibilities. For example, to help firms below the threshold reach sufficient ESG levels, suitable incentive mechanisms (e.g., tax-based incentives or financial assistance) can facilitate efficient resource allocation, ensure compliance, and prevent excessive investment and wastage. Lastly, this study assists shareholders, potential investors, and other stakeholders with sustainability literacy in differentiating between firms that have achieved true sustainable performance and firms that remain at the surface level. With this understanding, they can make more informed investment decisions.

2. LITERATURE REVIEW

2.1 Empirical Evidence on the Relationship between ESG and Firm Performance

ESG refers to a company's commitment to enhancing social welfare and creating sustainable, long-term wealth for all its stakeholders (Mohammad & Wasiuzzaman, 2021). Generally, two arguments are presented in the literature regarding the relationship between ESG and firm performance. The first argument focuses on the performance-enhancing role of ESG, purporting that it improves employee productivity, lowers operational risks, and ultimately maximizes firm value and shareholder wealth. This position is supported by the Stakeholder Theory (Freeman, 1984), which advocates for the importance of safeguarding stakeholders' interests to gain competitive advantages. Several studies in developed countries have adopted this view to support the positive ESG–performance relationship. For example, studies in the US (Nguyen et al., 2022; Cui et al., 2018) as well as Canada, France, and Germany (Cormier & Magnan, 2007) have shown that ESG

engagement attracts investors because of lower information asymmetry. ESG is also argued to lower firms' cost of capital, as demonstrated in Australia (Bhuiyan & Nguyen, 2020) and the European Union (Eliwa et al., 2021); this reflects risk reduction from better management of idiosyncratic and systematic risks (Sassen et al., 2016).

Other studies contend that ESG reduces bankruptcy risk, especially in developing markets (Kuen, 2023). Li et al. (2022) analyzed Chinese firms' data from 2015 to 2020 and found that default risk decreased when ESG commitments governed environmental conduct, labor practices, and corporate governance. During periods of financial turbulence, firms with higher ESG engagement also showed greater resilience in facing the adverse effects of COVID-19, minimizing their stock price vulnerability and financial risk (Broadstock et al., 2021). Collectively, these findings suggest that strong ESG practices contribute to firms' stability and long-term value. Accordingly, a linear, positive relationship between ESG and firm performance can be expected in ASEAN-5 firms.

The second argument, conversely, warns that although the benefits of ESG investment are evident, one should be cautious in attributing its positive impact. Based on the Shareholder Theory (Friedman, 1962), ESG is not always advantageous, but can be a value-destroying activity that wastes resources and prevents firms from optimally allocating resources to more profitable projects, thereby reducing competitiveness (Duque-Grisales & Aguilera-Caracuel, 2021; Ersoy et al., 2022). Agency Theory (Jensen & Meckling, 1976) also explains the negative effect of ESG, as it aggravates the agency conflict between the shareholder and manager. Specifically, managers may use ESG investments as a mechanism to advance their own reputation instead of shareholder wealth, which ultimately deteriorates firm performance (Barnea & Rubin, 2010; Nollet et al., 2016). Weak institutional frameworks further cause firms to prioritize capital accumulation over ESG benefits, exacerbating ESG's adverse effects (Duque-Grisales & Aguilera-Caracuel, 2021; Garcia & Orsato, 2020; Landi & Sciarelli, 2019).

Contrary to positive and negative effects, some studies have found an insignificant impact of ESG on firm performance. Higher ESG scores do not guarantee financial health, particularly during economic crises (Folger-Laronde et al., 2022). Rather, factors like governance quality and external crises may influence the ESG–performance relationship. Recognizing these contradictions, scholars have begun exploring ESG's nonlinear effect. Studies conducted in the US (Bagh et al., 2024) and China (Bagh et al., 2024; Pu, 2023) have proven an inverse U-shaped relationship, where ESG benefits firm performance up to a threshold point but damages performance beyond it. Conversely, Nollet et al. (2016), Shabbir et al. (2020), and Hakimi et al. (2023) revealed a U-shaped ESG-performance relationship, in which firms initially incur losses when engaging in ESG activities, but begin to reap its benefits after a certain threshold.

In the ASEAN context, empirical evidence is fragmented. Researchers have reported ESG's effect on performance to be positive (Thomas et al., 2021; Lee & Isa, 2023; Treepongkaruna & Suttipun, 2024), negative (Raneses, 2023), or insignificant (Atan et al., 2018; Junius et al., 2020; Raneses, 2023). These mixed findings, summarized in Table 1, indicate that most ASEAN-based studies have focused on a linear ESG-performance framework, neglecting nonlinear impacts. This study seeks to address this paucity. In line with past studies that highlighted potential threshold effects and rooted in Stakeholder Theory and Shareholder Theory, we postulate the following hypothesis:

Hypothesis: ESG has a significant threshold effect on firm performance in ASEAN-5.

Table 1: Relevant Literature on ESG-Performance Relationship within ASEAN-5

Author(s)	Year published	Sample	Period Investigation	Models & Methods	Results
Atan et al.	2018	54 firms in Malaysia	2010-2013	Static linear models & fixed effect method	Insignificant with ROE and Tobin's Q
Junius et al.	2020	271 firms in Indonesia, Malaysia, Singapore and Thailand	2013-2017	Static linear models & random effect method	Insignificant with ROA, ROE, Tobin's Q and Price Earnings ratio
Thomas et al.	2021	36 firms in Malaysia	2015-2019	Static linear models & Pooled Ordinary Least Square	Positive with ROE; Insignificant with Tobin's Q and ROA
Lee & Isa	2023	50 Shariah-compliant firms in Malaysia	2010-2017	Static and dynamic linear models & Pooled OLS and System Generalized Method of Moments	Positive with ROA, ROE and Tobin's Q
Raneses	2023	26 firms in the Philippines	2010 to 2018	Static linear models & pooled OLS	Negative with earnings per share and dividend per share; positive with earnings before interest, tax, depreciation and amortization; insignificant with ROA, ROE and return on capital employed.
Treepongkaruna & Suttipun	2024	147 firms in Thailand	2019 to 2021	Static linear models & fixed effect method	Positive with ROA and ROE

Source: Author's own work.

3. METHODOLOGY

3.1 Data

To fulfill the research objective, we retrieved ESG and financial data for ASEAN-5 firms from the Thomson Reuters database, while economic data was obtained from the World Bank. The period of investigation spanned 12 years from 2012 to 2022. We chose 2012 as the starting point because many firms began ESG reporting that year, while 2022 was the endpoint as it was the most recent year with available data. The 12-year period allowed us to control for the impact of ESG on firm performance across different economic life cycles[1]. To construct a dataset, we set two main criteria for sample firms: (i) only non-financial companies were included, as financial firms adhere to different reporting requirements, and (ii) firms were required to have at least five years of observations to ensure meaningful ESG measurement and to properly instrument the endogenous variables under the DTRM. Applying these criteria yielded a final sample of 146 firms: 43 from Malaysia, 25 from Singapore, 37 from Indonesia, 25 from Thailand, and 16 from the Philippines. fulfill the research objective, we retrieved ESG and financial data for ASEAN-5 firms from the Thomson Reuters database, while economic data was obtained from the World Bank. The period of investigation spanned 12 years from 2012 to 2022. We chose 2012 as the starting point because many firms began ESG reporting that year, while 2022 was the endpoint as it was the most recent year with available data. The 12-year period allowed us to control for the impact of ESG on firm performance across different economic life cycles[2]. To construct a dataset, we set two main criteria for sample firms: (i) only non-financial companies were included, as financial firms adhere to different reporting requirements, and (ii) firms were required to have at least five years of observations to ensure meaningful ESG measurement and to properly instrument the endogenous variables under the DTRM. Applying these criteria yielded a final sample of 146 firms: 43 from Malaysia, 25 from Singapore, 37 from Indonesia, 25 from Thailand, and 16 from the Philippines.

3.2 Baseline Equation

To assess how ESG affects firm performance, we first estimated an ordinary panel data regression without accounting for dynamic threshold effects. The baseline model is expressed in**Error! Not a valid bookmark self-reference.**). To mitigate potential heteroskedasticity and extreme observations, we took the natural logarithm of the dependent and independent variables.

$$TQ_{ijt} = \lambda_0 + \lambda_1 ESG_{ijt} + \lambda_2 SIZE_{ijt} + \lambda_3 LEV_{ijt} + \lambda_4 GDP_{ijt} + \lambda_5 INF_{ijt} + v_i + \theta_j + u_t + \varepsilon_{ijt} \quad (1)$$

Where, TQ or Tobin's Q represents firm performance, measured as the ratio of market value to total assets; $\lambda_1, \lambda_2, \ldots \lambda_5$ are the coefficients of the independent variables; i(i=1,2,…n), j(j=1,2,…n) and t (t=1,2,…n) represent firm, country, and year, respectively; and ESG denotes environmental, social, and governance performance measured by the natural logarithm of ESG scores (Chen et al.,

[1] An economic or business cycle period is approximately 7 to 11 years, comprising four different cycles: expansion, recession, crisis and recovery (Juglar, 1862).

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2023; Lee & Isa, 2023; Pu, 2023). The higher the score, the better the ESG performance (Chen et al., 2023). SIZE represents firm size, measured by the natural logarithm of total assets (Alareeni & Hamdan, 2020; Lee & Isa, 2023); LEV refers to firm leverage, measured by the ratio of total debt to equity (Alareeni & Hamdan, 2020); GDP reflects economic growth, measured by gross domestic product growth; and INF denotes inflation, measured by the inflation rate. v_i , θ_j, and u_t represent firm-invariant, time-invariant, and country-invariant individual effects, respectively. Lastly, λ_0 and ε_{ijt} are the constant and idiosyncratic disturbance terms, respectively. The definition of each variable is provided in Table 2.

Table 2: Definition of Variables

Abbreviation	Variable Name	Measurement
Dependent variable		
TQ	Tobin's Q	Natural logarithm of the fraction of market value of the corporate to total assets
Explanatory variables		
ESG	Environmental, social, and governance score	Natural logarithm of the aggregate score of the firm obtained from the Refinitiv Eikon ESG performance
SIZE	Firm Size	Natural logarithm of total assets of the firm
LEV	Firm Leverage	The ratio of total debt to total equity
GDP	Gross Domestic Product	Percentage of Annual GDP Growth
INF	Inflation	Percentage of Inflation measured by consumer prices index

Source: Author's own work.

3.3 DTRM Model

Substantial research indicates that firm performance is persistent and likely to correlate over time. To reflect this dynamism, our model included lagged Tobin's Q as an explanatory variable. Moreover, given contradictory findings in the literature, Pu (2023), Shabbir et al. (2020) and Nollet et al. (2016) indicated the presence of nonlinear ESG effects using the quadratic form. Enriching this line of research, we developed a dynamic threshold model by referring to Seo and Shin (2016) and Seo et al. (2019). Compared to quadratic models, the DTRM can better reveal ESG's nonlinear impact on firm performance, as it can delineate the heterogenous effects of main and control variables across different regimes (above and below the threshold). The DTRM also addresses potential endogeneity problems, as there may be two-way causality between ESG and performance (i.e., while ESG participation may increase performance, high-performing firms may also tend to engage in ESG).

The general DTRM model adopted in this study is expressed in (2):

$$TQ_{it} = (\beta_1 TQ_{t-1} + \beta_2 ESG_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 GDP_{it} + \beta_6 INF_{it})1 \cdot (ESG_{it} \leq \gamma) + (\lambda_1 TQ_{t-1} + \lambda_2 ESG_{it} + \lambda_3 SIZE_{it} + \lambda_4 LEV_{it} + \lambda_5 GDP_{it} + \lambda_6 INF_{it})1 \cdot (ESG_{it} > \gamma) + \varepsilon_{it} \quad (2)$$

Where TQ_{t-1}, an endogenous variable, represents the lagged term of TQ to account for the dynamic nature of firm performance. ESG_{it} refers to the threshold variable. $1 \cdot ()$ is a function that takes the value of 1 if an argument has value and zero otherwise. In this study, its value is 1 if $ESG_{it} \leq \gamma$, indicating the lower regime which uses β coefficients; if $ESG_{it} > \gamma$, its value is 0, indicating the upper regime which uses λ coefficients. ε_{it} represents the error term.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 1 details the descriptive statistics of the variables used in this study. On average, Tobin's Q has a mean value of 0.613, ranging from -0.881 to 3.049. As we took its natural logarithm, the minimum value of -0.881 is equivalent to 0.414, indicating that the minimum market value is positive but undervalued. At the maximum, the market value exceeds fair valuation at 21.094, suggesting firm overvaluation. The minimum and maximum ESG values are 0.658 and 4.523, respectively, demonstrating that the lowest ESG score is 1.93 and the highest is 92.01 for ASEAN-5 firms. On average, firm size is 19.072, ranging from 11.918 to 26.733. In terms of leverage, the average value is 0.212, with a range of zero to 1.737. The minimum value of zero indicates that some firms are debt-free, while the maximum value of 1.737 signifies that some firms utilize debt over equity to finance their assets. Regarding economic growth and inflation, the mean values are positive while the minimum values are negative, implying that the ASEAN-5 have experienced negative growth. This trend was particularly observed in 2020, when countries struggled to manage the COVID-19 pandemic and its impact on businesses.

Table 1: Descriptive Statistics

Variables	Mean	SD	Min	Max
TQ	0.613	0.619	-0.881	3.049
ESG	3.744	0.165	0.658	4.522
SIZE	19.072	3.559	11.918	26.733
LEV	0.212	0.164	0	1.737
GDP	3.94	3.271	-9.518	8.882
INF	2.434	1.972	-1.139	6.413

Source: Author's own work.

4.2 Baseline Regression Results

4.2.1 Baseline Models

Table 2 presents the regression results for the influence of ESG on firm performance using the baseline equation. After conducting the Breusch-Pagan LM and Hausman tests, we selected the fixed effects method as the most suitable estimation technique. Model 1 portrays the results without controlling for any variables. We then added firm fixed effects in Model 2; firm characteristics, macroeconomic variables, and firm fixed effects in Model 3; firm characteristics, macroeconomic variables, firm fixed effects, and time fixed effects in Model 4; and, finally, firm characteristics, macroeconomic variables, firm fixed effects, time fixed effects, and country effects in Model 5. Throughout the models, we observed a negative relationship between ESG and firm performance, as proxied by Tobin's Q.

Table 2: Regression Results of Equation (1) (Fixed Effect Model)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
	-0.0737***	-0.1852 ***	-0.1507***	-0.1027**	-0.1127**
ESG	(-2.66)	(-3.24)	(-3.73)	(-2.04)	(-2.55)
			-0.0842***	-0.0786***	-0.1766***
SIZE			(-7.59)	(-7.41)	(-9.56)
			-1.3760***	-1.3477***	-1.0655***
LEV			(-7.13)	(-7.08)	(-6.18)
			0.0048**	-0.0174**	-0.0026
GDP			(2.27)	(-2.35)	(-0.63)
			0.0018	-0.0080	0.0097
INF			(0.25)	(-0.87)	(1.52)
Firm fixed effects	No	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	Yes	Yes
Country effects	No	No	No	No	Yes
	7.10***	16.48***	34.37***	34.21***	41.14***
F-statistics	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
R^2	0.1262	0.5895	0.7595	0.7707	0.7892
N	1417	1417	1417	1417	1417

Notes: ***p < .01, **p < .05. Values in parentheses are t-statistics.

4.2.2 Relationship between ESG and Firm Performance

In Model 5, ESG's coefficient ($\boldsymbol{\lambda}_1$) of -0.1127 indicates that with a 10% increase in ESG, the performance of ASEAN-5 firms declines by 1.127%. The negative result is consistent with that of Barnea and Rubin (2010), Landi and Sciarelli (2019), Duque-Grisales and Aguilera-Caracuel (2021), Folger-Laronde et al. (2022), and Raneses (2023), all of whom reported decreased firm performance with greater ESG engagement. As supported by the Shareholder Theory (Friedman, 1962), funding ESG activities can waste resources that would otherwise be available to finance other investment or growth opportunities. This reduction of resources weakens firms' competitiveness, and thus, harms performance (Duque-Grisales & Aguilera-Caracuel, 2021; Lee & Isa, 2023; Ersoy et al., 2022). From the Agency Theory perspective, firms that engage in ESG incur higher agency costs, as managers may exploit ESG initiatives to enhance their personal

reputation at the expense of shareholders' interests (Jensen & Meckling, 1976; Barnea & Rubin, 2010; Nollet et al., 2016). Such behavior can decrease firms' performance.

4.2.3 Control Variables

Among the control variables, firm size shows a significant negative coefficient; as the size of the firm increases by 10%, its performance decreases by 1.766% for ASEAN-5 countries. This contradicts the conventional belief that larger firms have superior efficiency and performance. A likely reason is the diseconomies of scale experienced by ASEAN-5 firms as they grow, with larger firms facing additional issues with communication, coordination, management efficiency, worker motivation, and principal-agent problems (Samouel & Price, 2006).

Leverage has the most substantial impact of all the control variables, with a 10% increase in leverage reducing performance by 10.655%. Our result is in line with the Trade-Off Theory of capital structure, supporting that firms with more debt have lower market returns. A firm should employ just enough debt to balance off the marginal benefits of tax shields and marginal costs of financial distress from debt; beyond this optimal point, the firm's value will decrease (Myers, 1977; Fama & French, 2002).

Lastly, the coefficient of economic growth (GDP) is negative, while the coefficient of inflation is positive; however, both are not significant. This suggests that in ASEAN-5, firm characteristics play a more dominant role than macroeconomic factors in determining performance.

4.3 Dynamic Panel Threshold Regression Model

4.3.1 U-shaped Relationship between ESG and Firm Performance

Table 5 presents the DTRM results on how ESG affects ASEAN-5 firms' performance at various ESG scores, while Figure 1 depicts the results graphically. Using ESG as the threshold variable, the threshold value α was estimated at 3.7313 (equivalent to an ESG score of 29.16). To confirm the validity of this threshold, we applied the bootstrap linearity test. Its p-value of 0.0000 validates the existence of ESG as a threshold in the model. These results support our hypothesis of a significant threshold effect between ESG and firm performance, corroborating the findings of Pu (2023), Shabbir et al. (2020), and Nollet et al. (2016) across different institutional settings.

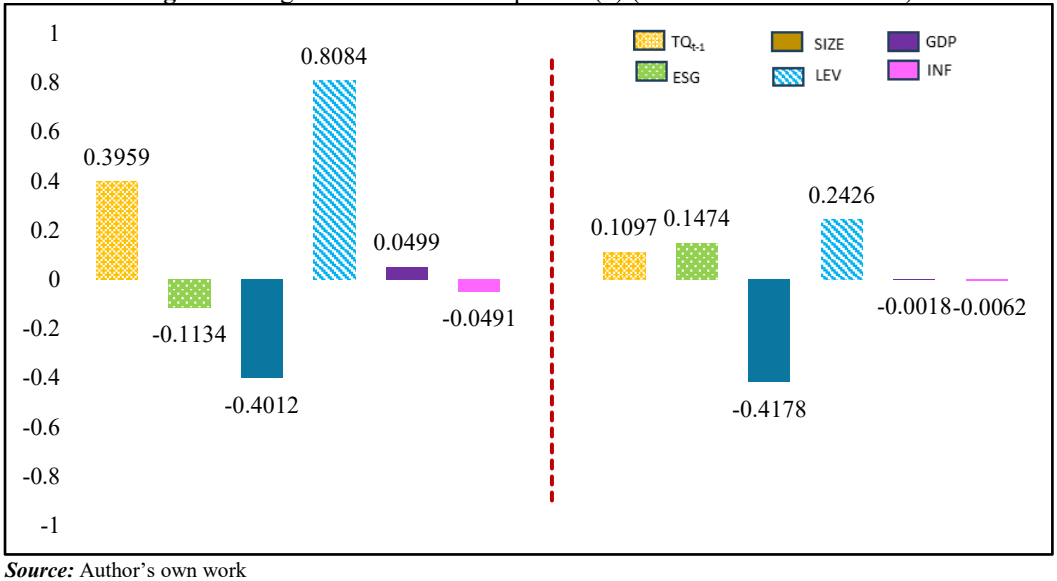
At the lower regime, there is a significant negative relationship between ESG and firm performance; in the upper regime, this relationship becomes positive. This signifies a U-shaped relationship between ESG and firm performance in ASEAN-5 firms. Of the sample observations, 38.8% fall in the lower regime whereas 61.2% are in the upper regime, indicating that the majority of firms are above the threshold. The estimated ESG coefficient in the lower regime is -0.1134, denoting that a 10% increase in ESG reduces firm performance by 1.134%. When ESG exceeds the threshold, the coefficient is 0.1474, indicating that a 10% increase in ESG leads to an improvement of 1.474% in firm performance.

Table 3: Regression Results of Equation (2) (Dynamic Panel Threshold Model – Main Result)

	Model 1	
	Lower Regime β	**Difference δ= λ-β**
TQ_{t-1}	0.3959*** (10.90)	-0.2862*** (-6.65)
ESG	-0.1134** (-2.28)	0.2608*** (3.74)
SIZE	-0.4012*** (-20.11)	-0.0166** (-2.40)
LEV	0.8084*** (5.28)	-0.5658** (-2.34)
GDP	0.0499*** (6.18)	-0.0517*** (-7.52)
INF	-0.0491*** (-5.80)	0.0429*** (4.91)
Constant		-0.4292** (-1.98)
Threshold value	3.7317*** [3.4255,4.0379]	
Percentage	550/1417 =38.8%	867/1417 = 61.2%
Bootstrap p-value for linearity	0.0000	
Number of Moment conditions	171	
Observations	1417	

Notes: ***p < .01, **p < .05. Values in parentheses are t-statistics. The model was estimated using the "xthenreg" command in Stata 17.

Figure 1: Regression Results of Equation (2) (Threshold variable: ESG)



Source: Author's own work

The negative impact of ESG on firm performance in the lower regime supports the Shareholder Theory's view that allocating funding to ESG activities wastes financial resources, which could otherwise be invested in profitable projects that benefit shareholder wealth. However, the positive impact of ESG on firm performance in the upper regime signifies that substantial investments in ESG ultimately pay off. Concerned stakeholders react positively to firms' commitment to solving ESG issues, thus contributing to overall performance. This is consistent with Freeman's (1984) argument that although investing in ESG reduces free cash flow in the short term, in the long term it minimizes risk and improves cash flow availability for investments.

From a practical perspective, the U-shaped trend observed from 2012 to 2022 can be attributed to increasing ESG levels. The average ESG score rose from 30.815 in 2012 to 60.440 in 2022, with a significant surge between 2019 and 2022. The upward pattern represents a growing awareness of ESG among ASEAN-5 firms, especially during and after the COVID-19 pandemic. Thus, low ESG investment is inadequate to generate a competitive advantage. Once it reaches the threshold, however, greater investments in ESG enhance firms' performance. It is also noteworthy that it takes time for a firm to build its reputation by restoring the environment, solving social issues, and strengthening governance structures. Since ESG implementation in ASEAN-5 countries is still in the early stages, performance benefits may not be immediately attainable.

4.3.2 Lagged firm performance

The coefficient of lagged Tobin's Q is significantly positive in both the low and high ESG regimes. Specifically, for every 10% increase in the previous period's performance, the current period's performance increases by 3.95% in the low ESG regime and 1.10% in the high ESG regime. This points to performance persistence, whereby firms that have performed well in the past maintain their performance in subsequent years. Moreover, the greater increment in the lower regime can be attributed to low-ESG firms relying more on past performance to sustain their current performance. Conversely, firms in the higher ESG regime depend less on past performance. Overall, declines in past performance hinder ASEAN-5 firms' current performance.

4.3.3 Control variables

Concerning the control variables, the coefficient of firm size is significantly negative in both ESG regimes. In particular, for every 10% increase in size, a firm's performance decreases by 4.01% in the lower regime and 4.18% in the higher regime. This is consistent with the baseline regression analysis, reinforcing the notion that larger firms tend to have lower performance.

The leverage coefficient is significantly positive in the lower and upper regimes: when the ESG score is below the threshold, a 10% increase in leverage improves firm performance by 8.0%, whereas when the ESG score is above the threshold, a 10% increase in leverage enhances firm performance by 2.43%. The stronger positive influence in the lower regime implies that leverage plays a greater role in improving performance among low-ESG firms; as firms' ESG score increases, this role weakens. These results support the Agency Theory's argument on the existence of shareholder–stakeholder agency conflict. Both ESG and leverage act as monitoring tools to alleviate such conflict (Jensen & Meckling, 1976; Faccio et al., 2001; Wu et al., 2022). Thus, as

ESG increases firm transparency, less debt is required to scrutinize firm-wide operations. Nevertheless, given the positive coefficients in both regimes, firms should still employ leverage to improve performance.

Interestingly, the GDP coefficient is significantly positive in the lower regime but significantly negative in the higher regime. For every 10% increase in economic development, firm performance increases by 4.99% for firms with ESG scores below the threshold, indicating that investing resources in ESG enhances firm performance when the economy expands. In this scenario, firms' initial ESG contributions are recognized by external parties (e.g., consumers) who value social and environmental welfare, which strengthens firm reputation and ultimately, performance. However, for firms above the threshold, every 10% increase in economic development diminishes firm performance by 0.018%. This signifies that investing in ESG beyond a certain threshold incurs a trade-off with other potential uses of funds (Pursiainen et al., 2023). As per the Shareholder Theory (Friedman, 1962), ESG activities are unprofitable because they deplete firm resources and competitiveness (Lee & Isa, 2023; Duque-Grisales & Aguilera-Caracuel, 2021; Ersoy et al., 2022). Although the economy continues to advance, firms that have surpassed the ESG threshold may struggle to compete with rivals due to limited funds, which can harm performance.

For inflation, the estimated coefficients are -0.0491 and -0.0062 in the lower and higher ESG regimes, respectively, implying that firm performance decreases by 0.5% at the lower regime and 0.62% at the upper regime when inflation grows by 10%. The negative coefficients suggest that growing inflation rates reduce consumer demand and raise borrowing costs (Broyles et al., 1983), hampering firm performance. Interestingly, inflation's negative effect is greater in the lower regime but diminishes as ESG moves into the higher regime. This is possibly because an increasing ESG score informs consumers that the firm is addressing ESG issues, which enhances its reputation among stakeholders and alleviates inflation's detrimental impact on performance.

Overall, our findings on the control variables are consistent with Faria and Mollick (2010), who examined US firms from 1953 to 2020, and Cheong and Hoang (2021), who studied Hong Kong and Singapore firms from 1998 to 2018.

4.4 Robustness Testing

4.4.1 Alternative Regression Methods

(a) DTRM with a kink (Seo & Shin, 2016)

As a robustness test, Model RT I in Table 4 shows the threshold estimation of ESG using the DTRM with a kink, developed by Seo and Shin (2016). In this specification, for a given $(1, x_{it}')\delta = k(q_{it} - \gamma)$, the model implies the potential existence of a kink (Seo et al., 2019). The predicted threshold value (α) is 3.7778, close to the 3.7317 threshold reported in the previous section. The ESG coefficients in the two regimes are -0.1702 and 0.0160, respectively, and their signs and significance are consistent with our earlier findings in Figure . This shows that even after accounting for the presence of a kink, the regression results remain robust. Furthermore, the signs and significance of most other variables align with the baseline results, confirming the validity of our empirical findings.

Table 4: Estimation Results for Alternative Regression Methods

	Model RT I	**Model RT II**	**Model RT III**	
			Low regime	**High Regime**
TQ_{t-1}	0.2202*** (15.07)	0.6791*** (16.47)	0.2191** (2.16)	0.7861*** (11.78)
ESG	-0.1702*** (-6.91)	-0.7507*** (2.85)	-0.3891* (-1.95)	0.1489*** (2.65)
ESG^2		0.1121*** (3.08)		
SIZE	-0.3943*** (-23.71)	-0.0012 (-0.61)	0.0150 (0.88)	-0.0009 (-0.39)
LEV	0.1103 (1.59)	-0.4170*** (-4.63)	-0.9730*** (-2.84)	-0.2802** (-2.15)
GDP	0.0080*** (14.53)	0.0106*** (6.76)	0.0460*** (3.17)	0.0126*** (3.75)
INF	-0.1092*** (-7.73)	-0.0148*** (-2.99)	-0.0971 (-1.38)	-0.0153 (-1.45)
Threshold value	3.7778*** [3.5416, 4.0139]			
Kink slope	0.1862*** (7.32)			
Bootstrap p-value for linearity	0.0000			
Number of Moment conditions	171			
F-statistics[P]		5891.40 [0.0000]	201.17 [0.0000]	5502.26 [0.0000]
AR(1) [P]		-2.15 [0.031]	-3.92 [0.0000]	-3.92 [0.0000]
AR(2) [P]		0.87 [0.387]	0.95 [0.345]	0.95 [0.345]
Hansen Test of overid			4.83 [0.681]	16.31 [0.233]
Obs	1417	1417	558	859

Notes: ***p < 0.01, **p < 0.05, *p < 0.10. Values in parentheses are t-statistics. Model RT I was estimated using DTRM with a kink (xthenreg). Model RT II was estimated using the two-step system GMM (xtabond2) of the dynamic regression model with a square term. Model RT III was estimated using the two-step system GMM (xtabond2) by categorizing the sample into upper and lower regimes.

(b) Quadratic form dynamic regression model (Arellano & Bover, 1995; Blundell & Bond, 1998; Roodman, 2009)

The second method we used to check for robustness was the two-step System Generalized Method of Moments (System GMM) technique described by Arellano and Bover (1995), Blundell and Bond (1998), and Roodman (2009), which is powerful in dealing with endogeneity. We used the Roodman (2009) *collapse* option with a command of xtabond2 in Stata 17 to obtain robust estimators to run the regression. To test the ESG threshold, we introduced a square term of ESG in the model, as below:

$$TQ_{ijt} = \Omega_0 + \alpha_1 TQ_{ijt-1} + \alpha_2 ESG_{ijt} + \alpha_3 ESG_{ijt}^2 + \alpha_4 SIZE_{ijt} + \alpha_5 LEV_{ijt} + \alpha_6 GDP_{ijt} + \alpha_7 INF_{ijt} + v_i + \theta_j + u_t + \varepsilon_{ijt}$$

Where, Ω represents the constant, $\alpha_1, \alpha_2, \ldots, \alpha_7$ signifies the regression coefficients to be estimated for the explanatory variables, and i(i=1,2,…n), j(j=1,2,…n) and t (t=1,2,…n) denote firm, country and year, respectively.

Based on the results for Model RT II in Table 4, the coefficient of ESG is significant and negative, indicating that higher ESG investment deteriorates firm performance. Meanwhile, the coefficient of ESG's square term is significant and positive, signifying that once ESG reaches the threshold, channeling more resources to it improves firm performance. Specifically, before the threshold, an increase of 10% in ESG drops firm performance by 7.51%. After ESG crosses the threshold, an increase of 10% drives up firm performance by 1.11%. These results confirm a U-shaped relationship between the two. The signs of ESG and ESG², as well as the significance of other variables, align with our initial results (Figure 1), reinforcing the robustness of our main conclusions.

4.4.2 Subsample test

Additional robustness test results were conducted via subsamples. First, two-step System GMM analysis was performed on subsamples split by the ESG regimes identified earlier. As shown in Model RT III in Table 4, the coefficients of ESG are negative in the low regime and positive in the high regime. Second, we winsorized the data by 1% to address potential inaccuracies in the results due to outliers. The outcomes remained reliable, with ESG coefficients of -0.1318 in the lower regime and 0.1136 in the upper regime (Model RT IV, Table 5), meaning no extreme outlier influenced the main results. Third, we applied an accounting-based measurement (return on equity, ROE) for firm performance, substituting Tobin's Q. The result (Model RT V, Table 5) is consistent with the main findings. Lastly, we re-ran the analysis by modifying the sample period from 2018 to 2022, when ESG reporting was more prevalent. The values under Model RT VI in Table 5 are similar to Figure 1, albeit with a slightly higher threshold value, reflecting greater ESG investment in recent years. Overall, the consistency of results across estimations of the subsample, performance measurement, and timeframe reinforces the robustness of our conclusions.

Table 5: Estimation Results of the Dynamic Panel Threshold Model by Resampling Data

	Model RT IV	**Model RT V**	**Model RT VI**	**Model RT IV**	**Model RT V**	**Model RT VI**
	Lower Regime β			**Difference δ= λ-β**		
TQ $_{t-1}$	0.1579*** (4.11)		0.3738*** (2.96)	0.2682*** (4.23)		-0.4892*** (-4.02)
ROE $_{t-1}$		0.8290*** (16.05)			-1.0950*** (-24.58)	
ESG	-0.1318*** (-2.73)	-0.0283*** (-3.81)	-0.6364*** (-3.06)	0.2454*** (3.08)	0.7484*** (5.62)	4.0558*** (2.85)
SIZE	-0.7307*** (-13.17)	-0.0882*** (10.81)	-0.5407*** (-6.44)	0.0430*** (3.91)	-0.0396*** (-7.46)	-0.0156 (-0.46)
LEV	0.9479*** (4.14)	-0.1077*** (-3.00)	1.7605*** (2.32)	0.7884*** (6.00)	0.6872*** (10.25)	-0.2588 (-0.45)
GDP	0.0201*** (3.93)	0.0062*** (7.35)	0.0238*** (3.53)	-0.0453** (-2.20)	-0.0126*** (-6.62)	-0.0265** (-2.18)
INF	-0.0165*** (-2.65)	-0.0058*** (-3.68)	-0.0761*** (-2.54)	0.0100 (1.18)	0.0164*** (3.66)	0.1258*** (4.69)
Constant	-0.3237 (-0.83)	3.7556*** (6.02)	-16.6460*** (-2.85)			
Threshold value	3.9115*** [3.4830, 4.3402]	4.1615*** [4.0631, 4.2600]	4.1546*** [3.9162, 4.3931]			
Bootstrap p-value for linearity	0.0000	0.0000	0.0000			
Number of Moment conditions	189	153	51			
Observation	1417	1417	656			

Notes: ***p < 0.01, **p < 0.05, *p < 0.10. Values in parentheses are t-statistics. All models were estimated using DTRM (xthenreg). Model RT IV was estimated after winsorizing the data by 1%. Model V was estimated using ROE as the dependent variable. Model VI was estimated by modifying the sample period from 2018 to 2022.

5. CONCLUSION

To investigate the threshold effect of ESG on firm performance, this study applied the DTRM to a panel dataset of 146 firms across ASEAN-5 (Malaysia, Singapore, Indonesia, Thailand, and the Philippines) from 2012 to 2022. First, a fixed effects model was used to establish the linear ESG–performance relationship. The inverse result indicates that investing more in ESG activities harms

firm performance. This finding is supported by Shareholder Theory, which argues that spending resources on non-profitable projects reduces competitiveness and removes opportunities for value generation.

Next, we applied dynamic panel threshold regression to test for the threshold effect. The findings confirm our prediction of a U-shaped ESGs–performance relationship, where ESG exerts an adverse influence below the threshold but becomes beneficial upon exceeding the threshold. These results underscore the need to examine nonlinear dynamics between ESG and performance, without which researchers may limit themselves to a single theoretical perspective. Our findings prove that Shareholder Theory explicates only the negative influence of ESG in the lower regime, while Stakeholder Theory and Agency Theory elucidate its positive influence in the upper regime.

From a practical standpoint, this study informs ASEAN-5 firms that although ESG investment is seen as a resource-intensive activity, it actually adds value beyond the threshold. In relation to the SDGs, our findings contribute to SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). The critical ESG thresholds demonstrated in this study highlight the role of strategic ESG engagement in achieving operational resilience and, consequently, long-term economic growth (SDG8). Moreover, the positive effect above the threshold underscores the importance of using financial resources wisely to support responsible corporate behavior, consistent with SDG 12. Finally, as ESG encompasses environmental responsibility, the findings provide empirical support for corporate contributions to climate-related goals, consistent with SDG 13. Collectively, the findings aid policymakers in ASEAN-5 nations who struggle to provide timely incentive mechanisms for ESG, expediting national efforts to achieve the SDGs.

Although our findings offer valuable implications for interested parties, they should be interpreted with caution. First, our dataset was limited to the ASEAN-5 region, so our results may be restricted to countries with similar backgrounds and settings. Future studies may consider other emerging markets that are concerned about sustainability performance. Second, we studied only the causal relationship between ESG and performance; thus, the findings do not explain how moderating factors (e.g., board characteristics and CEO characteristics) accelerate the ESG threshold to maximize firm performance. Third, although ESG is vulnerable to negative news or crises, we did not address the impact of such events on the time taken for firms to realize long-term value. Therefore, future studies should explore these perspectives.

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REFERENCES

Alareeni, B. A., & Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. *Corporate Governance*, *20*(7), 1409–1428. https://doi.org/10.1108/CG-06-2020-0258

Anbumozhi, V. (2017). Ensuring ASEAN's sustainable and resilient future. In Baviera, A. & Maramis, L. (Eds.), *Building ASEAN community: Political–security and socio-cultural reflections*(pp. 309-323). Economic Research Institute for ASEAN and East Asia.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29–51. https://doi.org/10.1016/ 0304-4076(94)01642-D

Atan, R., Alam, M. M., Said, J., & Zamri, M. (2018). The impacts of environmental, social, and governance factors on firm performance: Panel study of Malaysian companies. *Management of Environmental Quality: An International Journal*, *29*(2), 182–194. https://doi.org/10.1108/MEQ-03-2017-0033

Bagh, T., Zhou, B., Alawi, S. M., & 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*, 102305. https://doi.org/10.1016/j.ribaf.2024.102305

Barnea, A., & Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics, 97*, 71–86. https://doi.org/10.1007/s10551-010-0496-z

Bhuiyan, M. B. U., & Nguyen, T. H. N. (2020). Impact of CSR on cost of debt and cost of capital: Australian evidence. *Social Responsibility Journal, 16*(3), 419–430. https://doi.org/10.1108/SRJ-08-2018-0208

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

Broadstock, D. C., Chan, K., Cheng, L. T. W., & Wang, X. (2021). The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. *Finance Research Letters, 38*(August 2020), 101716. https://doi.org/10.1016/j.frl.2020.101716

Broyles, J. E., Cooper, I., & Archer, S. (1983). *Financial management handbook*. Gower; Brookfield, Vt.: Distributed by Gower Pub. Co.

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*(August), 118829. https://doi.org/10.1016/j.jenvman.2023.118829

Cheong, C., & Hoang, H. V. (2021). Macroeconomic factors or firm-specific factors? An examination of the impact on corporate profitability before, during and after the global financial crisis. *Cogent Economics and Finance, 9*(1). https://doi.org/10.1080/23322039.2021.1959703

Cochran, P. L., & Wood, R. A. (1984). Corporate social responsibility and financial Performance. *The Academy of Management Journal, 27*(1), 42–56.

Cohen, G. (2023). ESG risks and corporate survival. *Environment Systems and Decisions, 43*(1), 16–21. https://doi.org/10.1007/s10669-022-09886-8

Cormier, D., & Magnan, M. (2007). The revisited contribution of environmental reporting to investors' valuation of a firm's earnings: An international perspective. *Ecological Economics, 62*(3–4), 613–626. https://doi.org/10.1016/j.ecolecon.2006.07.030

Cui, J., Jo, H., & Na, H. (2018). Does corporate social responsibility affect information

asymmetry? *Journal of Business Ethics, 148*(3), 549–572. https://doi.org/10.1007/s10551-015-3003-8

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

Dwibedi, P., Pahi, D., & Sahu, A. (2024). Unveiling the relationship between ESG scores and firm performance in India: A System GMM approach. *Australasian Accounting, Business and Finance Journal*, *18*(3), 26–49. https://doi.org/10.14453/aabfj.v18i3.03

Eliwa, Y., Aboud, A., & Saleh, A. (2021). ESG practices and the cost of debt: Evidence from EU countries. *Critical Perspectives on Accounting, 79*, 102097. https://doi.org/10.1016/j.cpa.2019.102097

Ersoy, E., Swiecka, B., Grima, S., Özen, E., & Romanova, I. (2022). The impact of ESG scores on bank market value? Evidence from the U.S. banking industry. *Sustainability (Switzerland)*, *14*(15), 1–14. https://doi.org/10.3390/su14159527

Faccio, M., Lang, L. H. P., & Young, L. (2001). Dividends and expropriation. *American Economic Review*, *91*(1), 54–78. https://doi.org/10.1257/aer.91.1.54

Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies*, *15*(1), 1–33. https://doi.org/https://doi.org/10.1093/rfs/15.1.1

Faria, J. R., & Mollick, A. V. (2010). Tobin's Q and US inflation. *Journal of Economics and Business, 62*(5), 401–418. https://doi.org/10.1016/j.jeconbus.2010.04.001

Folger-Laronde, Z., Pashang, S., Feor, L., & ElAlfy, A. (2022). ESG ratings and financial performance of exchange-traded funds during the COVID-19 pandemic. *Journal of Sustainable Finance and Investment, 12*(2), 490–496. https://doi.org/10.1080/20430795.2020.1782814

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Cambridge university press.

Friedman, M. (1962). Capitalism and freedom. In Democracy: A reader (pp. 344-349). Columbia University Press

Garcia, A. S., & Orsato, R. J. (2020). Testing the institutional difference hypothesis: A study about environmental, social, governance, and financial performance. *Business Strategy and the Environment, 29*(8), 3261–3272. https://doi.org/10.1002/bse.2570

Hakimi, A., Boussaada, R., & Karmani, M. (2023). Corporate social responsibility and firm performance: a threshold analysis of European firms. *European Journal of Management and Business Economics.* https://doi.org/10.1108/EJMBE-07-2022-0224

Jain, K., & Tripathi, P. S. (2023). Mapping the environmental, social and governance literature: a bibliometric and content analysis. Journal of Strategy and Management, 16(3), 397–428. https://doi.org/10.1108/JSMA-05-2022-0092

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*, 305–360. https://doi.org/http://dx.doi.org/10.1016/0304-405X(76)90026-X

Juglar, C. (1862). *Des Crises Commerciales et de leur retour périodique en France, an Angleterre et aux États-Unis*. Paris: Guillaumin. https://doi.org/10.4000/books.enseditions.1396

Junius, D., Adisurjo, A., Rijanto, Y. A., & Adelina, Y. E. (2020). The impact of ESG performance to firm performance. *Jurnal Aplikasi Akuntansi*, *5*(1), 21–41.

Kuen, Y. L. (2023, June 30). Leveraging ESG metrics as a risk management tool. *The Star Online*. https://www.thestar.com.my/news/nation/2023/06/30/leveraging-esg-metrics-as-a-risk-management-tool

Landi, G., & Sciarelli, M. (2019). Towards a more ethical market: the impact of ESG rating on corporate financial performance. *Social Responsibility Journal, 15*(1), 11–27. https://doi.org/10.1108/SRJ-11-2017-0254

Lee, S. P., & Isa, M. (2023). Environmental, social and governance (ESG) practices and financial performance of Shariah-compliant companies in Malaysia. *Journal of Islamic Accounting and Business Research*, *14*(2), 295–314. https://doi.org/10.1108/JIABR-06-2020-0183

Li, H., Zhang, X., & Zhao, Y. (2022). ESG and firm's default risk. *Finance Research Letters, 47*, 102713. https://doi.org/10.1016/j.frl.2022.102713

Mohammad, W. M. W., & Wasiuzzaman, S. (2021). Environmental, social and governance (ESG) disclosure, competitive advantage and performance of firms in Malaysia. *Cleaner Environmental Systems*, *2*, 100015. https://doi.org/10.1016/j.cesys.2021.100015

Myers, C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*, 147–175.

Nguyen, D. T., Hoang, T. G., & Tran, H. G. (2022). Help or Hurt? The Impact of ESG on Firm Performance in S&P 500 Non-Financial Firms. Australasian Accounting, Business and Finance Journal, 16(2), 91–102. https://doi.org/10.14453/aabfj.v16i2.7

Nollet, J., Filis, G., & Mitrokostas, E. (2016). Corporate social responsibility and financial performance: A non-linear and disaggregated approach. *Economic Modelling*, *52*, 400–407. https://doi.org/10.1016/j.econmod.2015.09.019

Pan, F. (2021). ESG disclosure and performance in Southeast Asia. Sustainalystics, 2017–2020. https://www.sustainalytics.com/esg-research/resource/investors-esg-blog/esg-disclosure-and-performance-in-southeast-asia

Pu, G. (2023). A non-linear assessment of ESG and firm performance relationship: evidence from China. *Economic Research-Ekonomska Istrazivanja*, *36*(1), 2113336. https://doi.org/10.1080/1331677X.2022.2113336

Pursiainen, V., Sun, H., & Xiang, Y. (2023). Competitive pressure and ESG. In *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4546541

Raneses, A. (2023). Effect of ESG factors on the financial performance of philippine firms. *Journal of Applied Business and Economics*, *25*(1), 96–100. https://doi.org/10.33423/jabe.v25i1.5863

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*, *9*(1), 86–136. https://doi.org/10.1177/1536867x0900900106

Samouel, P., & Price, D. (2006). Do diseconomies of scale impact firm size and performance? *Journal of Managerial Economics*, *4*(1), 27–70.

Sassen, R., Hinze, A. K., & Hardeck, I. (2016). Impact of ESG factors on firm risk in Europe. *Journal of Business Economics, 86*(8), 867–904. https://doi.org/10.1007/s11573-016-0819-3

Seo, M. H., Kim, S., & Kim, Y. J. (2019). Estimation of dynamic panel threshold model using Stata. *Stata Journal*, *19*(3), 685–697. https://doi.org/10.1177/1536867X19874243

Seo, M. H., & Shin, Y. (2016). Dynamic panels with threshold effect and endogeneity. *Journal of Econometrics*, *195*(2), 169–186. https://doi.org/10.1016/j.jeconom.2016.03.005

Shabbir, M. S., Aslam, E., Irshad, A., Bilal, K., Aziz, S., Abbasi, B. A., & Zia, S. (2020). Nexus between corporate social responsibility and financial and non-financial sectors'

performance: a non-linear and disaggregated approach. *Environmental Science and Pollution Research*, *27*(31), 39164–39179. https://doi.org/10.1007/s11356-020-09972-x

The Star. (2024, March 14). *Tough for Malaysians to detect greenwashing, say experts. The Star.* https://www.thestar.com.my/news/nation/2024/03/14/tough-for-malaysians-to-detect-greenwashing-say-experts.

Thomas, C. J., Tuyon, J., Matahir, H., & Dixit, S. (2021). The impact of sustainability practices on firm financial performance: Evidence from Malaysia. *Management and Accounting Review*, *20*(3), 211–243. https://doi.org/10.24191/mar.v20i03-09

Treepongkaruna, S., & Suttipun, M. (2024). The impact of environmental, social and governance (ESG) reporting on corporate profitability: evidence from Thailand. *Journal of Financial Reporting and Accounting*. https://doi.org/10.1108/JFRA-09-2023-0555

Wongtrakool, B. M., & Kim, W. (2019). *Indonesia and ESG Investing: a Sovereign Case Study*. Western Asset. http://www.westernasset.com/us/en/pdfs/whitepapers/esg-indonesia-case-study-2019-02.pdf

Wu, S., Li, X., Du, X., & Li, Z. (2022). The Impact of ESG Performance on Firm Value: The Moderating Role of Ownership Structure. *Sustainability (Switzerland)*, *14*(21), 1–22. https://doi.org/10.3390/su142114507