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Impact of Environmental, Social, and Governance (ESG) Practices on the Stability and Profitability of Financial Institutions in Malaysia

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Abstract

This study examines how Environmental, Social, and Governance (ESG) activities affect the stability and profitability of Malaysian financial institutions, in light of the country's growing emphasis on sustainable finance. Using annual data from 2014 to 2024, the study focuses on three main objectives: assessing whether stronger ESG practices enhance financial stability, identifying the most influential ESG pillar among environmental, social, and governance components, and evaluating whether ESG performance affects profitability. This study employs random-effects panel regression with robust standard errors, yielding empirical evidence relevant to Malaysia's dual banking landscape. The results show that stronger ESG performance raises the stability of financial institutions. Environmental practice shows a strong positive relationship with financial institutions' stability. The social scores show a negative relationship, while governance shows a positive one, but neither is statistically significant. Conversely, ESG performance does not appear to significantly affect short-term profitability. This result highlights the importance of incorporating ESG considerations into firms' operations to ensure long-term resilience, offering valuable insights for both regulators and financial institutions, and helping firms align sustainability with financial stability.

Keywords: Stability of Financial Institutions, Environmental, Social, and Governance (ESG), Sustainable Finance, Panel Data Regression, Random Effects Model, Financial Performance.

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1.0 Introduction

Environmental, social, and governance (ESG) practices have become essential indicators for assessing how firms manage risks and opportunities to achieve long-term sustainability. In the financial sector, strong ESG commitment contributes to financial resilience, regulatory compliance, and stakeholder confidence. (Gonzalez-Ruiz et al., 2024). In Malaysia, interest in ESG integration continues to grow as investors and regulators increasingly consider non-financial performance in evaluating firm stability and long-term value creation (Nik Azhar, 2023). ESG practices enable firms to operate responsibly, balancing profitability with environmental protection, social responsibility, and governance transparency. The shifts reflect broader regional and global trends in sustainable finance, where these components play a critical role in evaluating firms' resilience to climate-related, reputational, and operational risks. In Malaysia, ESG interest is driven not only by investor preferences but also by evolving regulatory expectations. Over the past decade, domestic and international investors have increasingly favored institutions with a strong commitment to sustainability, while regulators have reinforced the integration of ESG into firms' operations as part of prudent risk management standards (Chaieb & Lu, 2024).

Recent studies have shown that organizations with strong ESG implementation are often recognized as firms that have a good, resilient, and low-risk profile, which can be a favorable long-term investment, while poorly disclosed ESG is considered riskier and could lead to poor investment due to mismanagement of ESG-related issues (Wan Masliza & Wasiuzzaman, 2021). Investors are becoming more aware that strong ESG practices are closely linked to long-term financial stability, while poor ESG disclosure signals hidden risks and a higher likelihood of unpredictable future firm performance. The most influential factor for a firm's stability, especially in European markets, is governance (G), which encompasses board structure, transparency, and regulatory compliance (Deda et al., 2025). The financial system becomes more efficient when regulatory governance, control, and management are effective, helping the firm achieve capital adequacy, reduce risk, and increase overall performance (Almulla et al., 2025). However, the relative importance of

each ESG pillar may differ across countries due to variations in institutional strength and regulatory enforcement.

Environmental (E) factors, such as carbon emissions and the adoption of renewable energy, are more strongly linked to firms' performance than social and governance factors, due to regulatory constraints and reliance on natural resources (Do et al., 2024). Malaysia's climate exposure and reliance on environmentally sensitive economic activities heighten the importance of environmental performance within the financial sector. In recent years, Bank Negara Malaysia (BNM) has introduced sustainability-driven initiatives, including the Climate Change and Principle-Based Taxonomy (CCPT) and the Value-Based Intermediation (VBI) framework. These initiatives clearly catalyze greater ESG integration in banks' risk management processes and disclosures (BNM, 2024; Jamil & Tri Wahyuni, 2025) and motivate this study. While Malaysian financial institutions are increasingly required to integrate ESG factors into their risk management and reporting (BNM, 2024; Jamil & Tri Wahyuni, 2025), the economic consequences of these practices remain unsettled, both theoretically and empirically, particularly regarding financial stability and profitability.

Although research on ESG has expanded, significant gaps remain in three key areas. The first concerns the stability-versus-profitability trade-off, where most existing studies focus on metrics such as return on assets (ROA), yet inconsistencies in findings persist. Prior studies by Jamil and Tri Wahyuni (2025) and Agnese et al. (2024) suggest a positive relationship; others have found that compliance with ESG standards increases costs and may diminish short-term profitability in developing economies. Additionally, a scarcity of sources evaluates financial stability, particularly as measured by the Z-Score, as well as profitability, leaving a gap in understanding the effects of ESG in mitigating systemic risk in the Malaysian banking sector, as reported by Fithria and Darma (2024). The mixed results leave room for further evaluation, as prior literature lacks consensus on whether ESG enhances or reduces firm performance. Secondly, the dual banking system in Malaysia is unique and is considered underexplored in ESG research, compared with the development of ESG models in mature, developed markets. Many findings on ESG from

developed markets are generalized to Malaysia without considering the actual differences in terms of governance structures and regulatory frameworks.

Thirdly, prior research often relies on aggregated ESG scores due to the limited availability of Malaysian ESG data, and little has been explored regarding the individual effects, which may differ in their impact on banks' risk profiles and stability (Md Aris et al., 2025). This aggregation masks the possibility that the ESG pillar may have somewhat different influences on financial outcomes; for instance, the environmental component may have short-term effects compared to the social and governance components. This study fills that gap by assessing the individual effects of environmental (E), social (S), and governance (G) pillars on financial stability and profitability. Additionally, the study is relevant for multiple stakeholders. Regulators could improve disclosure standards, investors could develop metrics to evaluate stability, and firms could optimize ESG investments by identifying which pillars are most relevant to supporting a more resilient financial sector and long-term financial stability. There are three objectives to this research:

1. To investigate the relationship between environmental, social, and governance performance and firm stability.
2. To identify the most influential environmental, social, and governance pillar affecting firm stability.
3. To analyze the effect of environmental, social, and governance performance on firm profitability (ROA)

2.0 Literature Review and Hypotheses Development

2.1 Theoretical Framework

Regarding ESG practices, financial stability, and profitability in the banking sector, two theories are used to explain their relationships. Stakeholder theory, which suggests that a firm's value depends on its connections to stakeholders and its ESG investment activities, will enable the firm to build capital and trust, which in turn reduces regulatory scrutiny and improves brand loyalty. Under this theory, ESG investments shall build trust, reduce

regulatory scrutiny, and enhance firm value (Liaqat et al., 2025). Another relevant theory is the signaling theory, which complements Stakeholder theory argues that strong ESG performance signals to the market sound risk management, operational integrity, and a long-term commitment to sustainability. This means that high ESG scores serve as a signal that a financial institution is resilient, thereby attracting long-term investors, reducing information asymmetry, and lowering costs. Specifically in Malaysia, where BNM emphasizes the Value-Based Intermediation (VBI) framework, strong ESG performance from attracting stable, long-term investors can lower the cost of capital and enhance stability, as reflected in the Z-score (Jamil & Tri Wahyuni, 2025). While both theories have been previously discussed in isolation, an integrated approach is more relevant for financial institutions. ESG practices can be understood through these theories as complementary explanatory lenses that clarify why ESG engagement may influence firm stability and long-term value creation. Stakeholder Theory explains how ESG engagement addresses stakeholder expectations and risk management needs, while Signaling Theory clarifies how ESG disclosures communicate firm resilience and quality to the market, together helping to explain potential effects on stability and long-term value creation.

2.2 ESG Performance and Financial Stability (Z-Score)

A popular measure to evaluate the stability of firms is the Z-score, most notably in the case of insolvency risk. This indicator, developed by Boyd and Graham (1986), lays the groundwork for using the Z-score to measure stability (Chiaramonte et al., 2016). It is used as an indicator due to its strong performance in capturing bankruptcy risk across various regulatory scenarios. It has also been confirmed by numerous empirical studies to be a reliable measure of firm stability (Li et al., 2017). Based on the Signaling Theory, higher ESG performance shall indicate lower risk, as it demonstrates responsible behavior, stronger regulatory compliance, and long-term planning. Stakeholder theory further argues that firms that manage environmental and social risks will build trust and reduce uncertainty, resulting in greater firm stability. Results from Do et al. (2024), which use data from ASEAN countries, show that firms achieving better ESG performance have higher Z-scores. It indicates that sustainable practice leads to financial resilience. As BNM places

great importance on risk management and capital sufficiency, significant metrics, such as the Z-score, are widely used in many studies. Recent literature provides evidence that sustainable practices in ASEAN markets reduce stock price volatility and increase resistance to insolvency, and, according to Tanaka (2025), banks that comply with ESG standards are found to be less exposed to risks in carbon-intensive industries. Furthermore, a study by Irsyad et al. (2025) has found that ESG-driven risk management enhances stability for Indonesian banks. In summary, these studies suggest that ESG performance contributes to stability through both enhanced stakeholder confidence and positive signaling effects.

H1: There is a significant positive relationship between the environmental, social, and governance score and firm stability in Malaysian financial institutions

2.2.1 Environmental, Social, and Governance Scores

ESG scores are based on three components: Environmental, Social, and Governance perspectives. Agencies assess a firm's performance in each area using data from public disclosures, company reports, third-party audits, and media sources (S&P Global, 2022). Each agency, such as Morgan Stanley Capital International (MSCI), Sustainalytics, and Refinitiv, has its own way of assessing how well a firm manages ESG risks and opportunities by assigning weights to a set of indicators (Berg et al., 2022). The final score is shown as a letter grade. The lowest is CCC. While the highest is AAA. The same result can also be shown on a 0-to-100 scale. Higher ESG scores, such as 70 and above, or ratings of A to AAA, represent strong ESG practices (Sayani & Kaplan, 2020). While lower scale and ratings indicate poor ESG practices, these are exposed to higher ESG risks. The ESG score has become an important independent variable in assessing firm stability, as investors, regulators, and scholars increasingly use these scores to evaluate sustainability performance and its impact on financial outcomes.

2.2.2 Environmental (E) Pillar

Environmental practices have drawn more attention as financial institutions recognize their importance in combating climate change and supporting sustainable development (Saif-Alyousfi & Alshammari, 2025). The operation could be affected by lending and investment activities as the economy shifts toward more sustainable technologies. Lending to high-emission industries is one example of exposure to regulatory risks, as firms involved in such activities may face legal action and incur financial losses (Tanaka, 2025). Environmental regulations in Malaysia are becoming stricter, especially as Bank Negara Malaysia introduces the Value-Based Intermediation (VBI) framework, prompting many firms to incorporate environmental considerations into their lending decisions and day-to-day operations (Shahrom & Kunhibava, 2023). The E-Score is used by many researchers to represent the environmental pillar and to measure how well firms perform in this area. The environment pillar is one of the important components in ESG, which focuses on an organization's effort to preserve the environment, including activities such as lowering carbon emissions, addressing climate change, and handling production-related environmental pollutants and waste material, making efficient use of energy and water, and protecting biodiversity while preventing deforestation (Radzi et al., 2023). Research by Bressan (2024) shows that firms could face legal action from regulators and reputational damage if they are involved in projects that harm the environment, which could, in turn, reduce their financial stability and reputation. In contrast, firms could be stable in the long term and reduce their climate-related financial risk if they are committed to environmental practices. Based on studies such as Bressan (2024), Tanaka (2025), and Do et al. (2024), environmental initiatives serve as both stakeholder-responsive actions and positive market signals that strengthen investor confidence and reduce long-term risk exposure.

H2a: The Environmental (E) score is positively related to firm stability.

2.2.3 Social (S) Pillar

Social practices in the financial sector encompass how they manage their employees, their relationships with customers, and their efforts in community development and financial inclusion (Gonzalez-Ruiz et al., 2024). This is enhanced by stakeholder theory, which holds that socially responsible firms build trust and legitimacy, which then translate into long-term stability. A firm will achieve long-term financial performance by prioritizing social responsibility (Do et al., 2024). Making social responsibility a top priority can also reduce a firm's financial risks by improving its credibility and gaining trust among stakeholders and the public (Radzi et al., 2023). The Social component, measured by the S-score, is used to analyze an institution's social practices. The firm's overall social performance, including product responsibility, community involvement, human rights, and workforce practices, is used to calculate the social score as the weighted means of self-reported data in these areas (Fithria & Darma, 2024). In Malaysia, for example, Islamic financial institutions must adhere to Shariah principles that prioritize social justice, fairness, and ethical finance, thereby establishing a strong connection between social practice and stability within Islamic financial institutions (Anis Idayu & Razali, 2022). In previous studies, such as Lins et al. (2017) and Albuquerque et al. (2020), firms with strong social responsibility, including social capital and trust, were among the factors associated with lower downside risk and survival during market downturns. Despite theoretical expectations, empirical evidence may remain inconsistent and require longer maturity periods before results are seen. Nevertheless, on theoretical grounds, enhancing social investments will ultimately affect firm stability and profitability.

H2b: The Social (S) Pillar is positively related to firm stability.

2.2.4 Governance (G) Pillars

The governance pillar of ESG concerns how well a company is governed and can be measured using the G-Score. The G-Scores are calculated based on factors such as board independence, executive compensation, shareholder rights, audit committee effectiveness, and operational transparency (Monteiro et al., 2021). The G-Score can be used to evaluate

a firm's overall corporate governance performance. Therefore, investors could make a reliable decision about which investment to choose, and stakeholders could develop a strategic plan for the firm's growth (Au et al., 2023). According to signaling theory, strong governance signals integrity and accountability, which in turn reduces information asymmetry. Stakeholder theory similarly argues that good governance aligns management decisions with stakeholder interests. Governance scores are important for identifying governance-related risks, such as fraud or misconduct, that could impact firm stability (Monteiro et al., 2021). How the firm manages risks and aligns them with stakeholder interests is influenced by good governance, which is fundamental to implementing sustainability in the firm's decision-making (Au et al., 2023).

Empirical studies have shown the positive effect of governance in enhancing firm stability. Research by Irsyad et al. (2025), in which data are collected from financial institutions in Malaysia and Indonesia, shows that higher G-Scores are associated with greater firm stability and help lower insolvency risk. A strong governance structure helps lower insolvency risk by ensuring efficient risk management, meeting regulatory standards, and promoting transparency in financial reporting (Idan et al., 2023). Therefore, the governance pillar is an important component of ESG and helps measure the firm's stability in areas related to management, especially in developing countries and emerging markets, where institutional frameworks may be weaker (Ararat et al., 2021). Older studies have also shown similar findings, including Claessens et al. (2013) and Erkens et al. (2012). These studies found that enhanced corporate governance in emerging markets improved firm resilience and reduced vulnerability to financial crises (Claessens et al., 2013). This was made more specific regarding board oversight and ownership structure, which significantly influenced firm stability during the global financial crisis (Erkens et al., 2012). Therefore, the governance component serves as a mechanism linking internal controls to market perceptions, although its effects may vary across institutional environments.

H2c: The Governance (G) Pillar is positively related to firm stability.

2.3 ESG Performance and Financial Profitability (ROA)

Financial profitability, typically measured by return on assets (ROA), reflects the efficient use of a firm's resources to generate earnings (Yuan et al., 2022). As the trade-off hypothesis suggests, costs of enhancing ESG compliance may affect short-term earnings (Pyka et al., 2025); however, from the standpoint of stakeholder theory, these costs are viewed as investments in long-term efficiency and reputation. Within the Malaysian setting, transitioning to sustainable finance and efforts to increase the involvement of environmental, social, and governance are expected to correlate with better performance. This is highlighted by Cantero-Saiz et al. (2024), who attribute the improved performance to better waste management and reduced future litigation risks. Several Asian studies have reported negative or insignificant relationships between ESG and ROA, particularly in emerging markets that exhibit high compliance costs. (Indrasuci & Rokhim, 2023; Firmansyah, 2023). However, the influence of ESG performance on profitability may take time and not take effect immediately during the transitioning process. The inconsistent abovementioned findings underscore the need to examine whether ESG practices translates to profitability in the Malaysian financial context, where sustainability reporting and regulatory compliance continue to evolve.

H3: There is a positive relationship between environmental, social, and governance scores and firm profitability (ROA) in Malaysian financial institutions.

3.0 Methodology

3.1 Data Collection

Table 1 presents the list of financial institutions included in this study. The analysis is based on secondary data from reliable sources, including the Department of Statistics Malaysia (DOSM), annual reports, and, primarily, the Refinitiv Eikon platform, which provides comprehensive ESG scores for Malaysian financial institutions. The final sample consists of eight firms observed over the period from 2014 to 2024. These firms were selected based on the availability of complete and consistent ESG data within the LSEG database.

Table 1: List of Financial Institutions Involved

No.	Company
1	AMMB Holdings Bhd
2	CIMB Group Holdings Bhd
3	RHB Bank Bhd
4	Alliance Bank Malaysia Bhd
5	Public Bank Bhd
6	Hong Leong Financial Group Bhd
7	Malayan Banking Bhd
8	Hong Leong Bank Bhd

ESG-related metrics that represent the firm's environmental, social, and governance performance are the primary independent variables. Various aspects of firm stability are measured using dependent variables that help assess how ESG performance affects financial resilience. To account for additional significant factors affecting firm stability, control variables are also included. Table 2 presents a summary of the variables used in this study to ensure clarity and transparency regarding the analysis, definitions, measurement techniques, and data sources.

Table 2: Variables Information

Variables	Abbreviation	Sources	Data Description
Dependent Variables			
Bank stability	ZSCORE	Annual reports	Calculated as: $Z - score = \frac{ROA + (\frac{Equity}{Asset})}{SD(ROA)}$
Profitability	ROA	Annual reports	$ROA = \frac{Net\ Income}{Total\ Assets}$
Independent Variables			
ESG performance	ESG	Refinitiv Eikon (LSEG)	Overall Environmental, Social, and Governance performance score
Environmental score (E)	ENV	Refinitiv Eikon (LSEG)	Environmental dimension score (ESG pillar)
Social score (S)	SOC	Refinitiv Eikon (LSEG)	Social dimension score (ESG pillar)
Governance score (G)	GOV	Refinitiv Eikon (LSEG)	Governance dimension score (ESG pillar)

Control Variables			
Inflation	CPI	Department of Statistics Malaysia (DOSM)	The overall rise in the pricing of goods and services within an economy.
Gross Domestic Product	GDP	Department of Statistics Malaysia (DOSM)	The overall economic growth of a country.

3.2 Methodology

3.2.1 Panel Data Regression Models

This study uses panel data regression analysis in a quantitative research design. Panel data is chosen because it combines time-series and cross-sectional elements, allowing the study to capture changes over time and across entities. Compared with time-series or pure cross-sectional models, this method reduces omitted-variable bias and improves estimation efficiency. Three regression models were implemented as follows:

Model 1: Main ESG - Stability Relationship

$$ZSCORE_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 GDPG_{it} + \beta_3 CPI_{it} + \epsilon_{it}$$

Where $ZSCORE_{it}$ represents the Z-score, which is a measure of the stability of the firm i at period t , ESG_{it} indicates the aggregate ESG score, $GDPG_{it}$ refers to the gross domestic product growth, CPI_{it} is the inflation rate, while ϵ_{it} is the error term.

Model 2: Pillar-Specific Models of ESG

$$ZSCORE_{it} = \beta_0 + \beta_1 ENV_{it} + \beta_2 SOC_{it} + \beta_3 GOV_{it} + \beta_4 GDPG_{it} + \beta_5 CPI_{it} + \epsilon_{it}$$

Where ENV_{it} , SOC_{it} , and GOV_{it} employ environmental, social, and governance scores, respectively. The separate components score analysis was to compare the individual influences of each ESG pillar on the stability of financial institutions.

Model 3: ESG - Profitability Relationship

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 GDPG_{it} + \beta_3 CPI_{it} + \epsilon_{it}$$

Where ROA_{it} denotes Return on Assets, which is the profitability of the firm i at period t , ESG_{it} is the aggregate ESG score, $GDPG_{it}$ is gross domestic product growth, CPI_{it} refers to the inflation rate and ϵ_{it} refers to the error term. By using separate models for aggregate ESG scores and individual pillar scores, the methodology captures both the holistic impact of ESG and the influence of each ESG component on financial outcomes. There are three types of panel data regression considered in this study. The first is the Pooled Ordinary Least Squares (OLS), where entities are assumed to be homogeneous, and the regression parameters are assumed to be the same over time and across entities. Secondly, the Fixed Effects (FE) Model controls unobserved time-invariant heterogeneity by allowing each entity to have its own intercept. Thirdly, the Random Effects (RE) Model, where effects that are specific to an entity are regarded as random and unrelated to the explanatory variables. Panel data often contains unobserved heterogeneity, making it important to select the most suitable model using formal statistical tests. The same processes are applied for the three objectives in this study.

3.2.2 Panel Data Model Selection Tests

To determine the most appropriate model in this study, three diagnostic tests were conducted, which include the Chow Test, the Hausman Test, and the Lagrange Multiplier (LM) Test. The Chow Test compares pooled OLS and fixed-effects models to assess whether individual firm-specific intercepts significantly improve model fit. The Hausman Test evaluates whether regressors are correlated with individual effects, which guides the process in choosing between the fixed and random effects models. Finally, the LM test determines whether random-effects estimation is preferred over pooled OLS through testing significance in the variance across firms. The outcome of choosing the best model for each objective consistently indicated that the random-effects model was the most suitable for this study, reflecting the nature of the dataset of ESG figures, which remain relatively stable and slowly change over time, particularly the governance dimension.

3.2.3 Diagnostic Tests

To check whether the results are reliable and robust, diagnostic tests, such as a multicollinearity test, were conducted using the Variance Inflation Factor (VIF). This was calculated to account for high correlations among the independent variables. After the "firm size" variable was removed, the VIF values indicated that no harmful multicollinearity remained.

4.0 Results and Discussion

4.1 Descriptive Statistics

Table 3: Descriptive Statistics

	ZSCORE	ROA	ESG	ENV	SOC	GOV	CPI	GDPG
Mean	78.0371	0.009599	61.5881	54.4380	61.7746	68.4285	1.9813	4.18246
Median	77.8139	0.009600	64.3047	58.9204	67.8864	72.820	2.1044	4.8430
Max	144.0331	0.01442	87.9219	92.1333	92.3438	96.2386	3.7994	8.8620
Min	6.8254	-0.02255	17.2887	5.4697	8.7426	17.4883	-1.1387	-5.4570
Std. Dev.	35.6851	0.004163	18.1068	24.6399	20.8461	19.6782	1.3443	3.3795
Skewness	-0.3856	-5.2395	-0.3961	-0.3313	-0.6824	-0.9512	-0.8809	-1.8732
Kurtosis	2.4446	41.6849	2.05296	1.7313	2.4857	3.2165	3.2896	6.5127
Jarque-Bera	3.3121	5889.893	5.5898	7.5121	7.7993	13.4413	11.6899	96.7070
Prob	0.1909	0.0000	0.06112	0.02338	0.02025	0.001206	0.0029	0.0000
Sum	6867.265	0.8447	5419.75	4790.54	5436.16	6021.71	174.3571	368.0560
Sum Sq. Dev.	110787.9	0.001508	28523.61	52819.68	37806.82	33689.13	157.2323	993.6572
Obs	88	88	88	88	88	88	88	88

The statistical summary of all variables used in this research is presented in Table 3. These results help to understand the nature of the available data, especially in describing the characteristics of firm stability and ESG values, before directly assessing the objectives. From Table 3, the mean values for ZSCORE and ESG (78.0371 and 61.5881, respectively) are relatively high, indicating that firms in the sample generally exhibit strong stability and

moderate ESG practices from 2014 to 2024. However, the wide ranges and moderately large deviations suggest considerable variation across firms, reflecting differences in risk appetite, governance structures, and ESG investment. In contrast, ROA has a low mean (0.009599) and a distinct negative skewness (-5.2395), suggesting that most firms operate at or near the break-even point, possibly due to the losses reported during the COVID-19 period. ROA also has high Jarque-Bera statistics relative to other variables, which are heavily influenced by extreme values, underscoring the importance of robust estimation in the subsequent regression models.

4.2 Correlation Matrix

Table 4 shows the correlation values between financial stability (Z-Score), profitability (ROA), ESG and its pillars (ENV, SOC, GOV), and macroeconomic factors (GDP growth and CPI). A direct relationship is shown by positive values, while an inverse relationship is shown by the negative ones. These indicate the direction and strength of the linear relationships between variables.

Table 4: Correlation Matrix

	ZSCORE	ROA	ESG	ENV	SOC	GOV	GDPG	CPI
ZSCORE	1							
ROA	0.2694	1						
ESG	-0.1680	-0.0970	1					
ENV	0.1055	0.0795	0.7361	1				
SOC	-0.3274	-0.0877	0.9001	0.6590	1			
GOV	-0.0177	-0.1275	0.7557	0.3843	0.4325	1		
GDPG	-0.0306	0.1838	-0.1134	-0.0368	-0.0949	-0.0685	1	
CPI	-0.0402	0.0968	-0.1138	-0.0359	-0.1159	-0.0459	0.8091	1

This correlation matrix examines the correlations among stability (Z-Score), profitability (ROA), ESG score (ESG), the ESG components (ENV, SOC, GOV), and macroeconomic variables (GDPG and CPI). ESG has a very high correlation with each of ENV, SOC, and GOV because it is the combination score of the three components. This

suggests that when a firm improves one ESG aspect, overall ESG performance usually improves too. From a profitability perspective, ROA is positively correlated with the Z-score. Most other variables, however, exhibit a negative association with the Z-score. The macroeconomic factors GDPG and CPI correlate more with each other than with either ESG or Z-Score. More importantly, the correlations between ESG variables and Z-Score are relatively weak, suggesting that ESG performance alone does not fully explain variations in firm stability. Fundamentally, it is also essential to note that correlation analysis does not imply causation. For instance, although ROA and Z-score show a positive correlation in Table 4, this does not mean profitability causes stability. Rather, it reflects that the more stable the firms are, the better it can financially perform. Thus, multivariate analysis is needed to understand the true impact.

4.3 Multicollinearity Test (VIF)

Table 5 lists the VIF values for the independent variables for each objective. VIF helps identify multicollinearity among predictor variables. In general, values greater than 10 indicate serious multicollinearity, while values above 5 may signal potential multicollinearity but are still acceptable.

Table 5: Variance Inflation Factor (VIF)

Independent Variable	Objective 1	Objective 2	Objective 3
ESG	1.0145	-	1.0145
ENV	-	1.8118	-
SOC	-	1.9214	-
GOV	-	1.2610	-
GDPG	2.8997	2.9059	2.8997
CPI	2.9000	2.92203	2.9000

Variance Inflation Factors (VIFs) were used to assess multicollinearity across all three objectives. All VIF values are below 5, indicating no significant correlation among the independent variables. For Objective 1 (ZSCORE model) and Objective 3 (ROA model), the ESG score showed a significantly low VIF of about 1.01. This confirms that it was statistically independent of the macroeconomic controls. GDP growth and CPI, which,

in turn, presented a moderate but acceptable VIF of about 2.9. The individual analysis of the ESG pillars for objective 2, which are ENV, SOC, and GOV, had low Variance Inflation Factors (VIFs) (1.26 to 1.92). From this result, multicollinearity is not present across all variables, further enhancing the accuracy of the regression estimates.

4.4 Model Selection Test

Three common tests were used to identify the best panel data model for each research objective: the Hausman test, the Breusch-Pagan Lagrange Multiplier (LM) test, and the Chow test. These tests help determine whether the fixed effects, random effects, or pooled OLS models are the best option for estimating the relationship between dependent and independent variables.

Table 6: Summary Table of Panel Model Selection Across Objectives

Objective	Chow Test (F-statistic, p-value)	Hausman Test (χ^2 -statistic, p-value)	LM Test (χ^2 -statistic, p-value)	Selected Model
1	F = 320.0091, p = 0.0000	$\chi^2 = 0.0000$, p = 1.0000	$\chi^2 = 359.2943$, p = 0.0000	Random Effects
2	F = 264.1314, p = 0.0000	$\chi^2 = 0.0000$, p = 1.0000	$\chi^2 = 212.3484$, p = 0.0000	Random Effects
3	F = 3.5274, p = 0.0025	$\chi^2 = 0.0000$, p = 1.0000	$\chi^2 = 11.6571$, p = 0.0006	Random Effects

Table 6 provides an overview of diagnostic tests performed to determine the best panel regression model for each of the three objectives. The random-effects model is chosen as the best model for all regression analyses in this study. This outcome is consistent with the nature of ESG metrics, such as the governance pillar, in which components like board structure change very slowly or remain constant over the study period. Random effects allow for time-invariant variables, whereas fixed effects drop them entirely. As a result, the Random Effects model was selected to achieve all three objectives, enabling efficient estimation and accommodating unobserved heterogeneity among firms. The model selection aligns with the characteristics of ESG data, which tend to exhibit a slower

change and minimal within-firm variation over time. The random effects model allows for the inclusion of time-invariant factors while capturing firm-specific heterogeneity.

4.5 Panel Data Regression Analysis

The random-effects panel regression was estimated using robust standard errors. This methodological choice was intended to address possible heteroskedasticity in the panel data underlying the reported significance levels. This also enables the analysis to account for cross-sectional dependence and unequal variance, which are common characteristics of financial datasets, thereby increasing the credibility of the results.

4.5.1 Objective 1: Impact of Overall ESG on the Stability (Z-score)

Table 7: Random Effects Panel Regression of ESG on Z-Score

Variable	Coefficient	Robust Std. Error	t-Statistic	Probability
C	65.52955**	19.49344	3.361620	0.0072
ESG	0.225970***	0.049364	4.577602	0.0010
GDPG	0.133846	0.346105	0.386722	0.7071
CPI	-0.993941	1.188622	-0.836213	0.4226
R ²	0.217009	F-statistic		7.760302
Adjusted R ²	0.189045	Prob(F-statistic)		0.000123

Notes: Random-effects panel EGLS with robust (clustered) standard errors.

** p-value < 0.10, ** p-value < 0.05, *** p-value < 0.01 (two-tailed).*

Table 7 presents the findings from objective 1, which determines the effect of ESG on the Z-score. As shown in the table, the coefficient on ESG scores is statistically significant and positively associated with financial institution stability. It is demonstrated by a coefficient of ($\beta = 0.2260$, $p\text{-value} < 0.01$). This finding aligned with the prior study, which found that high ESG performance contributes to greater resilience and a reduced likelihood of insolvency. For example, a study by Almula et al. (2025) found that ESG participation increases Z-scores in the MENA (Middle East and North Africa) region and is associated with greater financial strength and reduced default risk. Similarly, studies by Irsyad et al.

(2025) reveal that Islamic financial institutions in Malaysia and Indonesia with higher ESG scores tend to be more stable. Thus, based on H1, the null hypothesis is rejected, indicating a significant positive relationship between ESG score and firm stability. These findings are consistent with expectations from both stakeholder and signaling theories, which suggest that firms investing in ESG activities may reduce long-term operational risks and, through signaling, enhance investor awareness of their resilience. The relationship, however, remains an association between these variables and not a causal one. On the other hand, GDP growth and inflation do not show significant effects, implying that fluctuations in macroeconomic conditions have a limited influence on firm stability in the sample period of this study.

4.5.2 Objective 2: Impact of E, S, and G Pillar Score on Stability (Z-score)

Table 8: Random Effects Panel Regression of E, S, G Pillar Score on Z-Score

Variable	Coefficient	Robust Std. Error	t-Statistic	Probability
C	64.54378***	12.13622	5.318278	0.0003
ENV	0.235709**	0.085434	2.758955	0.0202
SOC	-0.055933	0.050926	-1.098301	0.2978
GOV	0.087487	0.052517	1.665865	0.1267
GDPG	0.142694	0.394805	0.361429	0.7253
CPI	-1.244803	1.213530	-1.025770	0.3292
R ²	0.299664	F-statistic		7.017322
Adjusted R ²	0.256960	Prob(F-statistic)		0.000017

Notes: Random-effects panel EGLS with robust (clustered) standard errors.

** p-value < 0.10, ** p-value < 0.05, *** p-value < 0.01 (two-tailed).*

Table 8 summarizes the results of the regression analysis for objective 2, in which the aggregate of ESG scores is analyzed separately (ENV, SOC, and GOV). As presented in the table, the environmental score (ENV) is the only variable that has a significant p-value at 5% level and has a positive effect on the stability of financial institutions ($\beta = 0.2357$, $p < 0.05$). It implies that financial institutions with good environmental performance are generally more financially stable. It also suggests that effective environmental risk

management, including eco-friendly practices and climate risk reduction, helps lower the risk of insolvency and, over time, increase stability in financial institutions. The results underscore the importance of environmental risk management in Malaysian financial institutions, particularly in climate-vulnerable markets, where environmental pressures can expose firms to higher credit and operational risks.

On the contrary, the Social (SOC) and governance (GOV) components do not have a significant relationship with the stability of financial institutions in this study. Even though the social component (SOC) has a negative coefficient, the impact is not statistically significant. This indicates that social initiatives, such as employee well-being, customer relationship management, and community involvement, do not directly lead to firm growth or have an immediate influence within the study's timeframe. Additionally, this may be attributed to the nature of social investments, which generally take longer to yield measurable impact. Similarly, the governance score shows a positive but insignificant influence ($\beta = 0.08749$, $p > 0.05$), which means that although theoretically good governance is linked to better risk management, its effect on firm stability could be indirect. The homogeneity of governance structures may also play a role, limiting the impact or significance across institutions in this study.

The analysis implies that the environmental efforts are the important components in the ESG framework that contribute the most to the resilience of Malaysian financial institutions. This is aligned with the prior study by Almulla et al. (2025), which shows that the stability of a financial institution is hugely boosted by environmental performance, while the social practices only play a minor role. Other than that, Irsyad et al. (2025) also concluded that environmental factors had a stronger influence on conventional financial institutions, whereas social practices were more vital for Islamic financial institutions. Given that the firms involved in this study are Conventional financial institutions, the importance of environmental activities aligns with Irsyad's findings. In summary, based on H2a, the null hypothesis is rejected, whereas for H2b and H2c it is not.

4.5.3 Objective 3: Effect of ESG on Profitability (ROA)

Table 9: Random Effects Panel Regression of ESG on Profitability

Variable	Coefficient	Robust Std. Error	t-Statistic	Probability
C	0.0108960 ***	0.0014210	7.668045	0.0000
ESG	-0.0000301	0.0000283	-1.065561	0.3116
GDPG	0.0003660 **	0.0001630	2.252228	0.0480
CPI	-0.0004910	0.0004740	-1.035228	0.3249
R ²	0.064496	F-statistic		1.930621
Adjusted R ²	0.031085	Prob(F-statistic)		0.130883

Notes: Random-effects panel EGLS with robust (clustered) standard errors.

** p-value < 0.10, ** p-value < 0.05, *** p-value < 0.01 (two-tailed).*

The ESG impact on the profitability of financial institutions, as presented by ROA, is summarized in Table 9. The panel regression findings indicate a negative relationship between firms' environmental, social, and governance (ESG) performance and profitability ($\beta = -0.0000301$, $p > 0.05$). However, although the relation was negative, it was not significant, implying that H3 is not accepted. The outcome aligns with prior research by Indrasuci and Rokhim (2023), which found statistically insignificant and negative relationships between ESG and ROA across various Asian datasets. In the short term, the study shows that meeting ESG standards costs more than they pay off, consistent with the trade-off theory. Likewise, Firmansyah (2023) found no significant negative relationship between ESG and ROA in a panel data regression analysis of Indonesian firms. This suggests that initial investments in ESG will incur higher implementation costs in emerging markets, which may require additional compliance expenses and therefore are not immediately translated into profitability, especially given that emerging markets are still in their maturation process.

For control variables, GDP growth and ROA showed a positive relationship and a statistically significant effect ($\beta = 0.0003660$, $p < 0.05$). It means macroeconomic growth increases firm profitability. On the other hand, the impact of CPI on ROA was negative but not statistically significant, indicating that inflation was not a problem in this setting. The adjusted R^2 value is 0.0311 is low. It is a common feature of profitability models due to

the influence of numerous unobserved firm-specific variables. These results show that while ESG activity can lead to stability, which is revealed in objective 1, its direct contribution to profitability is limited in the short run. It does not imply that ESG lacks financial value; rather, financial benefits may accrue over a longer period, consistent with the Stakeholder Theory's long-term value creation emphasis. This suggests that ESG strategies should support long-term value growth rather than focus on short-term financial results. Thus, these findings encourage both policymakers and firms to view the integration of ESG factors as a long-term investment strategy rather than a short-term profit strategy.

5.0 Conclusion and Future Research

The results of this study confirmed that ESG practices influence the stability of Malaysian financial institutions. When broken down into three components (environmental, social, and governance), the environmental pillar (ENV) is statistically significant and positively affects the stability of financial institutions, indicating that green initiatives and effective environmental risk management are important for increasing firm resilience. Conversely, while the governance (GOV) practice shows a positive association and social (SOC) has a negative one, neither appeared to be statistically significant. From a profitability perspective, the overall ESG measure negatively affects ROA, but the effect is not statistically significant. It implies that although ESG investments provide long-term stability, they carry short-term costs that could reduce profitability. However, due to the insignificant results, there is no strong evidence to support this.

Given the positive link between the environment (ENV) and firm stability, financial institutions should prioritize activities that enhance the environment component to remain resilient. Immediate effects of the governance and social components appear limited; long-term arrangements and alignment with BNM's sustainable finance roadmap should be considered. Additionally, refining the ESG reporting guidelines to include stability measures is a recommended step for regulators, while ESG scores should be treated as indicators of long-term financial resilience rather than reputational signals to investors. Academically, this study contributes to prior research on ESG factors in the Malaysian

context by filling a critical gap and shifting the focus from mere compliance to stability. The study has limitations in the sample of companies included however, it provides a foundation for future research exploring the interplay between ESG and other variables, such as firm-specific control variables and financial health variables, using available datasets.

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