
ESG AND FIRM VALUE: THE MODERATING ROLE OF LEVERAGE IN ASEAN NON-FINANCIAL FIRMS

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Abstract:

This study examines the effect of Environmental, Social, and Governance (ESG) performance on firm value and the moderating role of leverage in non-financial firms in the ASEAN region. The study employs secondary data obtained from Bloomberg ESG Data Services and firms' annual reports, comprising 820 firm-year observations from ASEAN-5 countries during the period 2018-2022. Panel data regression analysis is employed to test the direct effect of ESG on firm value and the moderating effect of leverage. Firm value is measured using Tobin's Q and price-to-book value (PBV), and robustness tests are conducted with lagged ESG variables and alternative firm-value proxies. The results indicate that ESG has a positive and statistically significant effect on firm value, suggesting that stronger ESG performance enhances market valuation and investor confidence in ASEAN firms. Furthermore, leverage weakens the positive effect of ESG on firm value, suggesting that high debt levels reduce ESG's ability to enhance market valuation. These findings suggest that the ESG-firm value relationship is conditional and influenced by firms' financial structure and risk profile. This study contributes to the literature by integrating ESG and capital structure perspectives within the context of emerging ASEAN markets.

Keywords: *ESG, Firm Value, Leverage, Sustainability, ASEAN*

1. Introduction

Awareness of social and environmental responsibility has become a central concern in modern business, as reflected by the increasing demands placed on companies to be more accountable to the environment and society (Arif et al., 2021). As investor attention to sustainability issues continues to grow, firms have begun adopting stakeholder-oriented strategies and striving to maximize social value by implementing Environmental, Social, and Governance (ESG) practices in their business activities (Alsayegh et al., 2020). ESG is increasingly viewed as a key indicator of a firm's long-term performance, particularly in assessing environmental risks, social responsibility, and corporate governance (Mahmood et al., 2025; Yuan et al., 2025).

In this context, ESG disclosure serves as an important mechanism for firms to communicate the social and environmental impacts of their economic activities to stakeholders, particularly investors (Prabawati & Rahmawati, 2022). Higher transparency is expected to enhance investor confidence and increase firm value in the capital market. ESG itself represents an evolution of the corporate social responsibility (CSR) concept, measured more structurally through indicators such as environmental, social, and governance scores provided by rating agencies such as Bloomberg, Thomson Reuters, and Sustainalytics (Ehsan et al., 2018).

In the ASEAN region, awareness and implementation of ESG have grown significantly. Various policy initiatives, regulatory frameworks, and efforts from both governments and the private sector have accelerated the adoption of sustainability practices in the region (Yu et al., 2024). The commitment to sustainable finance in Asia continues to grow and has become an increasingly strategic priority for governments, financial institutions, and corporations. This trend is driven by the growing recognition that ESG considerations are not only relevant for sustainability goals but also materially influence long-term market performance and investment decisions (OECD, 2023). In the ASEAN context, sustainable finance is increasingly recognized as a key mechanism for mobilizing capital toward environmentally sustainable activities and supporting the transition to a low-carbon economy. To support this objective, the ASEAN Taxonomy for Sustainable Finance provides a common framework to harmonize definitions, enhance transparency, and guide investment decisions across countries with different levels of economic development (ASEAN Taxonomy Board, 2023).

Nevertheless, the increasing awareness and implementation of ESG are not always accompanied by a consistent increase in firm value. In practice, there is still evidence that the market has not responded positively to ESG disclosure, particularly in developing countries. Firms with high levels of ESG disclosure do not always exhibit a significant increase in firm value; in some cases, they even experience a decline. This suggests that ESG has not yet become a primary consideration in investment decisions, or that there is skepticism about the credibility of ESG disclosures (Utami et al., 2025; Zhao et al., 2025).

In addition, the quality and consistency of ESG information remain a challenge. Differences in ESG ratings across rating agencies (ESG rating divergence) indicate that ESG information is not yet fully standardized, thereby creating uncertainty for investors in evaluating firm performance (Zhao et al., 2025). This condition may reduce the relevance of ESG in determining firm value, as investors struggle to interpret the available information consistently. ESG should serve as a mechanism that enhances firm value by improving transparency, strengthening risk management, and fostering stronger relationships with stakeholders. High-quality and consistent ESG disclosure is expected to reduce information asymmetry, increase investor confidence, and create long-term value for firms. However, various limitations in ESG implementation and disclosure quality suggest that these benefits have not been fully realized, particularly in emerging markets such as ASEAN.

Although ESG is increasingly promoted as a factor that can enhance firm value, empirical findings reveal key issues when it is implemented suboptimally. In many cases, high ESG disclosure is not necessarily associated with higher firm value and may even

trigger negative market reactions. This occurs when ESG is perceived as a symbolic activity (greenwashing) that does not reflect actual performance, or when the quality and consistency of ESG information are low, thereby increasing investor uncertainty (Zhao et al., 2025). Moreover, the relatively high cost of ESG implementation may reduce financial performance, especially for firms with limited resources, leading ESG to be perceived as a burden rather than a value driver (Rashwan et al., 2025; Utami et al., 2025). This issue is exacerbated by the lack of standardization in ESG ratings across agencies, leading to inconsistent interpretations and undermining the credibility of ESG information in investors' eyes. Consequently, the relationship between ESG and firm value becomes inconsistent and highly contextual, particularly in emerging markets. Therefore, this issue indicates that the effectiveness of ESG in enhancing firm value is not yet fully established and requires further investigation to identify the conditions under which ESG can create value.

Several studies have examined the relationship between ESG and firm value. However, the findings remain mixed and inconclusive. ESG is not only viewed as a sustainability reporting tool but also as a strategic mechanism that can enhance transparency, reduce information asymmetry, and strengthen investor confidence (Difalla, 2026; García-Sánchez et al., 2025; Mahmood et al., 2025; Monteiro et al., 2024; Yuan et al., 2025). Most studies suggest that ESG has a positive effect on firm value. ESG disclosure can enhance firm value in the long term through improved reputation, operational efficiency, better risk management, and broader access to financing (Anabtawi et al., 2025; Aprilina et al., 2025; Fang et al., 2025; Faure et al., 2025; Hassan et al., 2025; Huang et al., 2025; Lee & Nam, 2026; Wu et al., 2025). In addition, ESG plays a role in reducing asymmetric information between firms and investors, thereby increasing investor trust and strengthening firm valuation (Li & You, 2025; Mahmood et al., 2025; Nguyen & La, 2025).

However, the literature also shows that the relationship between ESG and firm value is not always consistent. Some studies find that ESG has no significant effect or even a negative impact on firm value, particularly in emerging markets (Rashwan et al., 2025; Salama et al., 2026; Singh & Kumar, 2025; Utami et al., 2025; Wijayanto & Supanto, 2025). In addition, inconsistencies in ESG information, such as ESG rating divergence, have been found to reduce firm value by increasing information uncertainty and agency costs (Zhao et al., 2025).

Furthermore, several studies indicate that the relationship between ESG and firm value is nonlinear. ESG may enhance firm value up to a point; however, excessive or inefficient implementation may reduce it (Cardillo & Basso, 2025; Lu et al., 2026; Ochoa-marquez & Gehrke, 2026; Sun & Zhang, 2026). In addition, under economic pressure or financial constraints, ESG investment may be perceived as an additional burden that reduces firm performance.

Beyond internal firm factors, the relationship between ESG and firm value is also influenced by external contexts. In developing countries, ESG disclosure may enhance firm value by increasing transparency and reducing opportunistic behavior such as tax avoidance (Surya et al., 2026; Tran & Nguyen, 2026; Yuan et al., 2025). However, limited disclosure quality and low investor attention to non-financial information make the impact of ESG inconsistent (Makhija et al., 2025; Patekar & Mahajan, 2025; Yanrou et al., 2025).

On the other hand, the literature on capital structure suggests that leverage is an important factor affecting firm value, although the findings are also inconsistent. Leverage may increase firm value through financing efficiency but may also reduce it by increasing risk and agency costs (Sari & Tjahjadi, 2026). Furthermore, leverage has been found to moderate the relationship between financial variables and firm value, including that between tax avoidance and firm value (Shubita, 2024).

Nevertheless, studies that integrate ESG and leverage it into a single model remain limited. Most prior studies treat ESG and capital structure separately, thus failing to provide a comprehensive understanding of how financial conditions influence the effectiveness of ESG in enhancing firm value. In addition, previous studies are generally conducted within a single-country context, limiting their generalizability.

Based on these considerations, this study aims to examine the effect of ESG on firm value by incorporating leverage as a moderating variable, using data from non-financial firms in ASEAN. The selection of ASEAN as the research context is based on its characteristics as an emerging market with varying levels of ESG adoption and relatively developing capital markets. This study is expected to contribute both theoretically and practically. Theoretically, this study enriches the literature on ESG and firm value by demonstrating that ESG's impact is not universal but depends on firms' financial conditions, particularly leverage as a contingency factor. This study integrates the ESG and capital structure literatures, which have traditionally been developed separately, thereby providing a more comprehensive understanding of how leverage influences the value relevance of ESG. Therefore, this study not only extends empirical evidence on the relationship between ESG and firm value but also highlights the importance of considering the interaction between non-financial and financial factors in explaining firm value.

In practice, the findings are expected to provide insights for corporate management in formulating ESG strategies aligned with their financial structures. Firms need to consider their leverage levels to ensure that ESG implementation is not merely symbolic but truly adds value. In addition, this study offers investors insights for evaluating ESG information by considering firms' financial risk, thereby enabling more rational and comprehensive investment decisions. For policymakers, this study has important implications for improving the quality of ESG disclosure, ensuring it is not merely formal but also credible and informative, particularly in developing countries such as those in ASEAN. Regulators are expected to design policies that not only enhance ESG transparency but also account for firms' financial conditions as a factor influencing the effectiveness of ESG in value creation. As such, policies can be more effective in improving market efficiency and promoting sustainable business practices.

2. Literature review

Signaling theory posits that firms disclose information to the market to reduce information asymmetry between management and investors (Spence, 1973). In capital markets, investors rely not only on financial information but also on non-financial disclosures to assess firms' quality, long-term prospects, and risk profile. In this context, ESG disclosure reflects a firm's commitment to sustainability, transparency, accountability,

and long-term risk management. ESG information functions as a positive signal that may improve investors' perceptions regarding firm quality and future business sustainability, thereby enhancing firm value (Difalla, 2026; Mahmood et al., 2025; Yuan et al., 2025). ESG disclosure also provides relevant non-financial information for investment decision-making, particularly in evaluating environmental, social, and governance risks that are not fully captured in conventional financial reports (García-Sánchez et al., 2025; Li & You, 2025).

Within the signaling theory framework (Connelly et al., 2011), firms with stronger ESG performance tend to disclose broader, more credible sustainability information to enhance market confidence and corporate legitimacy. ESG disclosure may signal that firms possess stronger managerial quality, better long-term strategic orientation, and greater commitment to sustainable business practices. Consequently, investors may perceive firms with higher ESG performance as more transparent, more accountable, and better prepared to manage long-term business risks. Such perceptions may increase investor confidence and ultimately improve market valuation.

Based on stakeholder theory, firms are accountable not only to shareholders but also to broader stakeholder groups (Freeman, 1984). Firms that successfully address stakeholder expectations through ESG practices are more likely to obtain legitimacy, strengthen corporate reputation, and gain long-term support from investors, customers, employees, regulators, and society. Consequently, stronger ESG performance may improve market perceptions and enhance firm value (Aprilina et al., 2025; Huang et al., 2025; Nguyen & La, 2025). Stakeholder theory further argues that long-term value creation depends on firms' ability to maintain sustainable relationships with stakeholders (Freeman, 2010; Freeman et al., 2020). Thus, ESG functions not merely as a reporting mechanism but also as a strategic instrument for strengthening stakeholder trust and supporting sustainable corporate performance.

Conceptually, ESG may enhance firm value through several mechanisms. First, ESG reduces asymmetric information by improving transparency and disclosure quality, enabling investors to evaluate firms more comprehensively (García-Sánchez et al., 2025; Mahmood et al., 2025). Higher transparency may reduce uncertainty regarding firms' long-term prospects and sustainability risks, thereby improving market confidence. Second, ESG strengthens corporate reputation and investor confidence, thereby increasing demand for shares and improving market valuation (Anabtawi et al., 2025; Hassan et al., 2025). Firms with stronger ESG performance are often perceived as more responsible, ethical, and sustainable, thereby enhancing their attractiveness to investors.

Third, ESG practices contribute to better risk management, particularly regarding environmental, social, and governance risks that may affect firms' long-term sustainability and operational stability (Fang et al., 2025; Wu et al., 2025). Firms that effectively manage sustainability-related risks are more likely to maintain operational continuity and reduce potential reputational or regulatory problems. Consequently, investors may perceive stronger ESG performance as an indicator of lower long-term business risk. Fourth, firms with stronger ESG performance may gain broader access to financing as investors increasingly incorporate sustainability considerations into their investment decisions (Lee &

Nam, 2026). This condition may improve firms' financing flexibility and support long-term growth opportunities.

A growing body of empirical literature supports the positive relationship between ESG and firm value. Prior studies indicate that ESG disclosure positively affects firm value by improving transparency, strengthening investor confidence, and enhancing corporate legitimacy (Difalla, 2026; Mahmood et al., 2025; Yuan et al., 2025). Other studies also report that firms with stronger ESG performance tend to achieve higher market valuation and lower firm risk (Anabtawi et al., 2025; Aprilina et al., 2025; Hassan et al., 2025). Similar findings are documented in cross-country studies, suggesting that ESG increasingly plays an important role in shaping firm value across different institutional and market environments (García-Sánchez et al., 2025; Huang et al., 2025; Nguyen & La, 2025). These findings collectively indicate that ESG disclosure serves as a credible signal, enhancing investor confidence while strengthening stakeholder trust and corporate legitimacy.

The relevance of ESG has also increased alongside the growing global emphasis on sustainable business practices and responsible investment. Investors increasingly consider ESG information in evaluating firms' long-term resilience, sustainability commitment, and future growth potential. Consequently, firms with stronger ESG performance are more likely to gain positive market responses because ESG is increasingly perceived as an indicator of long-term corporate quality and sustainability orientation. This condition is particularly important in emerging markets, where sustainability disclosure practices continue to develop, and investors increasingly demand greater corporate transparency and accountability.

Overall, the literature suggests that ESG has increasingly become an important determinant of firm value. ESG disclosure may strengthen transparency, improve stakeholder trust, enhance corporate reputation, and support long-term sustainability, thereby increasing market valuation. Consequently, ESG is expected to positively affect firm value by improving transparency, strengthening investor confidence, and enhancing sustainability-related risk management.

H₁: ESG has a positive effect on firm value

According to signaling theory, ESG disclosure serves as a positive signal to investors by reducing asymmetric information and improving market perceptions regarding firm quality and long-term sustainability (Spence, 1973). ESG reflects a firm's commitment to sustainability, transparency, accountability, and long-term risk management, which is expected to enhance firm value (Difalla, 2026; Mahmood et al., 2025; Yuan et al., 2025). Firms with stronger ESG performance tend to disclose broader, more credible sustainability information to enhance investor confidence and corporate legitimacy. Consequently, ESG disclosure may improve market valuation because investors perceive firms with stronger ESG performance as more transparent, more sustainable, and better prepared to manage long-term business risks.

Firms are responsible not only to shareholders but also to broader stakeholder groups (Freeman, 1984). Firms that successfully address stakeholder expectations through ESG practices are more likely to gain legitimacy, strengthen corporate reputation, and obtain long-term support from investors, customers, employees, regulators, and

society. As a result, ESG practices may strengthen stakeholder trust and improve market perceptions regarding firms' sustainability and long-term performance. Thus, ESG is expected to enhance firm value, as firms with stronger ESG performance are more likely to receive favorable market responses.

However, the effectiveness of ESG as a value-enhancing mechanism may depend on firms' financial conditions, particularly their leverage levels. In this context, trade-off theory suggests that firms must balance the benefits and costs of debt financing (Kraus & Litzenberger, 1973). Although leverage may provide tax advantages and additional financing capacity, higher leverage also increases financial risk, agency costs of debt, and the probability of financial distress. Consequently, investors may become more sensitive to firms' financial risk when leverage levels are high.

Previous studies indicate that leverage may influence how investors evaluate firms' sustainability performance and long-term business prospects. High leverage increases firms' financial vulnerability and may reduce firms' financial flexibility to support long-term sustainability initiatives, including ESG-related activities consistently (Tulcanaza-Prieto et al., 2024). In addition, leverage is often interpreted as a signal of financial risk because firms with substantial debt burdens generally face greater pressure to prioritize short-term financial obligations and debt repayment (Sari & Tjahjadi, 2026). Shubita (2024) further suggest that leverage may strengthen negative market perceptions under conditions of financial uncertainty and risk exposure. Consequently, although ESG disclosure generally provides positive signals regarding sustainability commitment, transparency, and long-term orientation, investors may interpret ESG information differently when firms have high leverage.

Under high-leverage conditions, investors may place greater emphasis on financial stability than on non-financial signals such as ESG disclosure. High leverage may weaken the credibility of ESG signals, as investors may perceive that firms with substantial debt burdens have less financial flexibility to implement sustainability initiatives consistently. In addition, firms with high leverage generally face greater pressure to prioritize short-term financial obligations and debt repayment over long-term sustainability investments. Consequently, the positive effect of ESG on firm value may be weaker when firms have higher leverage.

From the perspective of signaling theory, leverage may simultaneously serve as a negative signal of firms' financial risk and vulnerability. As a result, although ESG disclosure provides favorable information regarding sustainability commitment and long-term orientation, excessive leverage may reduce investors' confidence regarding firms' ability to maintain sustainable business performance. Similarly, stakeholder theory suggests that firms under greater financial pressure may have greater difficulty fulfilling stakeholder expectations through ESG practices, as financial constraints can limit sustainability-related investments and long-term strategic initiatives.

The ESG-firm value relationship may therefore become conditional rather than universal. The effectiveness of ESG in enhancing firm value depends not only on disclosure quality and sustainability performance but also on firms' financial capacity to support ESG implementation. In emerging markets, where investors are often highly sensitive to financial risk and market uncertainty, leverage may become an important factor

in how they interpret ESG information. Firms operating in emerging economies generally face greater financing constraints, institutional uncertainty, and market volatility than those in developed markets. Consequently, although ESG signals a positive signal to investors, higher leverage is expected to weaken its positive effect on firm value.

H₂: Leverage weakens the positive effect of ESG on firm value.

3. Methodology

This study examines non-financial firms listed on the stock exchanges of ASEAN-5 countries, namely Indonesia, Malaysia, Singapore, Thailand, and the Philippines, during the period 2018-2022. The sample was selected purposively based on several criteria. First, firms were required to have ESG scores available in Bloomberg ESG Data Services during the observation period. Second, firms with fiscal year-ends other than December were excluded to ensure comparability of data across firms and countries. Third, firms with negative equity values during the observation period were also excluded from the sample.

Based on Bloomberg ESG Data Services, 204 non-financial firms had ESG scores during the study period. After the screening process, 33 firms were excluded for using fiscal year-ends other than December, and 2 were excluded for negative equity. Consequently, the final sample consists of 164 non-financial firms. Over the 5 years from 2018 to 2022, the total number of firm-year observations is 820, yielding a balanced panel dataset. The study focuses on the ASEAN-5 countries because they represent major capital markets in Southeast Asia and are increasingly adopting ESG awareness and sustainability reporting practices. Nevertheless, the level of ESG adoption, institutional quality, regulatory environments, and market maturity varies across these countries, making ASEAN-5 an important context for examining the relationship between ESG and firm value.

The detailed distribution of the sample by country is presented in Table 1. Indonesia accounts for the largest share of the sample, with 51 firms (31.10%), followed by Thailand with 42 firms (25.61%), Malaysia with 30 firms (18.29%), the Philippines with 23 firms (14.02%), and Singapore with 18 firms (10.98%). This distribution indicates that the sample captures cross-country variation within ASEAN capital markets, which is relevant for analyzing ESG practices and firm valuation across different institutional settings.

Table 1. Cross-Country Sample Distribution

No.	Country	Firm	Percentage (%)
1.	Philippines	23	14,02
2.	Indonesia	51	31,10
3.	Malaysia	30	18,29
4.	Singapore	18	10,98
5.	Thailand	42	25,61
	Total Sample	164	100,00

Firm value reflects investors' perceptions regarding a firm's performance, prospects, and market valuation. This study uses Tobin's Q as the primary proxy for firm value because it comprehensively captures a firm's asset valuation by incorporating both equity and debt components (Chung & Pruitt, 1994). Tobin's Q has been widely employed in prior studies examining the relationship between ESG and firm value (Difalla, 2026; Mahmood

et al., 2025; Yuan et al., 2025). Tobin's Q is calculated as the ratio of the market value of equity plus total debt to total assets. In addition, this study employs Price-to-Book Value (PBV) as an alternative proxy for firm value to enhance robustness, following prior studies (Huang et al., 2025; Yuan et al., 2025). PBV is calculated as the market price per share divided by the book value per share.

Environmental, Social, and Governance (ESG) refers to a firm's performance across environmental, social, and governance dimensions. This study uses ESG scores from Bloomberg ESG Data Services because Bloomberg provides standardized, comprehensive ESG measurements that have been widely used in prior ESG studies (Cardillo & Basso, 2025; Huang et al., 2025; Xu et al., 2025). ESG scores range from 0 to 10 and represent the quality of firms' ESG disclosure and implementation. In addition to the contemporaneous ESG variable, this study employs a lagged ESG variable (ESG_{t-1}) in the robustness analysis to examine whether ESG performance in the previous period continues to influence firm value in the subsequent period. The use of lagged ESG aims to reduce potential endogeneity concerns and capture the delayed market response to firms' sustainability performance.

Leverage reflects a firm's capital structure and its reliance on debt financing. This study measures leverage using the debt-to-equity ratio (DER), which is widely used in financial and firm value studies as a proxy for financial risk and debt dependence (Battisti et al., 2020; Sari & Tjahjadi, 2026). DER is calculated as the ratio of total debt to total equity. This study also employs several control variables, namely profitability, firm size, and sales growth. Profitability is measured using Return on Assets (ROA), which reflects a firm's ability to generate profits from its total assets and is commonly used as a control variable in firm value studies because it captures firms' operational efficiency (Hassan et al., 2025; Zhao et al., 2025). Firm size (SIZE) is measured using the natural logarithm of total assets, following prior studies (Dohrmann, 2025; Sari & Tjahjadi, 2026; Zhao et al., 2025). Meanwhile, sales growth (SGR) is measured as the percentage change in sales from year (t-1) to year (t), following Lee & Nam (2026).

The data are analyzed using panel data regression. This study employs pooled ordinary least squares (OLS) regression with year and country fixed effects to control for time- and country-specific heterogeneity. Pooled OLS is considered appropriate because the study primarily focuses on cross-sectional variation across firms and countries within the ASEAN region. The inclusion of year fixed effects controls for macroeconomic shocks and time-specific factors. In contrast, country fixed effects control for differences in institutional environments, regulatory frameworks, and market characteristics across ASEAN countries. In addition, robust standard errors are employed to address potential heteroskedasticity issues and improve the reliability of the regression estimates. Robustness analyses are further conducted using lagged ESG variables and alternative firm-value proxies to ensure the consistency and reliability of the findings. The regression models used in this study are presented as follows:

Model 1: Main Model (Tobin's Q)

$$TOBINSQ_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 LEV_{it} + \beta_3 (ESG_{it} \times LEV_{it}) + \beta_4 ROA_{it} + \beta_5 SGR_{it} + \beta_6 SIZE_{it} + \text{CountryFE} + \text{YearFE} + \varepsilon_{it}$$

Model 2: Robustness Model with Lagged ESG (Tobin's Q)

$$\text{TOBINSQ}_{it} = \alpha + \beta_1 \text{ESG}_{t-1} + \beta_2 \text{LEV}_{it} + \beta_3 (\text{ESG}_{t-1} \times \text{LEV}_{it}) + \beta_4 \text{ROA}_{it} + \beta_5 \text{SGR}_{it} + \beta_6 \text{SIZE}_{it} + \text{CountryFE} + \text{YearFE} + \varepsilon_{it}$$

Model 3: Robustness Model with PBV

$$\text{PBV}_{it} = \alpha + \beta_1 \text{ESG}_{it} + \beta_2 \text{LEV}_{it} + \beta_3 (\text{ESG}_{it} \times \text{LEV}_{it}) + \beta_4 \text{ROA}_{it} + \beta_5 \text{SGR}_{it} + \beta_6 \text{SIZE}_{it} + \text{CountryFE} + \text{YearFE} + \varepsilon_{it}$$

Model 4: Robustness Model with Lagged ESG and PBV

$$\text{PBV}_{it} = \alpha + \beta_1 \text{ESG}_{t-1} + \beta_2 \text{LEV}_{it} + \beta_3 (\text{ESG}_{t-1} \times \text{LEV}_{it}) + \beta_4 \text{ROA}_{it} + \beta_5 \text{SGR}_{it} + \beta_6 \text{SIZE}_{it} + \text{CountryFE} + \text{YearFE} + \varepsilon_{it}$$

Description:

TOBINSQ and PBV are firm-value proxies for firm *i* in year *t*. α denotes the constant term, while β_1 – β_6 represent the regression coefficients of the explanatory variables. ESG represents the contemporaneous ESG score, whereas ESGT-1 represents lagged ESG measured using the previous year's ESG score. LEV denotes leverage measured by the debt-to-equity ratio. The interaction terms ESG×LEV and ESGT-1×LEV are used to test the moderating effect of leverage on the relationship between ESG and firm value. ROA represents profitability, measured by return on assets; SGR represents sales growth; and SIZE denotes firm size, measured by the natural logarithm of total assets. CountryFE and YearFE represent country fixed effects and year fixed effects, respectively, while ε represents the error term.

4. Results/findings

The descriptive statistics provide an overview of the research variables based on 820 firm-year observations. In general, the close values of the mean and median across most variables indicate that the data distribution is balanced and not highly skewed.

Table 2 Descriptive Statistics

Variable	Obs	Mean	Med.	Std Dev	Min.	Max.
TOBINSQ	820	1.7160	1.0567	1.9937	0.3048	19.8904
PBV	820	3.4107	1.5221	7.0788	0.1602	60.4361
ESG	820	5.1700	5.2294	1.3695	0.0000	8.3221
ESGt-1	820	4.8778	4.9004	1.4387	0.0000	8.3221
LEV	820	0.8706	0.6764	0.9011	0.0000	8.9989
ROA	820	0.0579	0.0449	0.0713	-0.1641	0.5635
SIZE	820	21.8001	21.8613	1.1038	18.4772	24.4532
SGR	820	0.0761	0.0579	0.2537	-0.6666	1.7964

The ESG variable has a mean value of 5.1700 and a median value of 5.2294, indicating that, on average, the sampled firms exhibit relatively strong ESG performance. The standard deviation of 1.3695 suggests moderate variation in ESG practices across firms. The minimum value of 0.0000 and the maximum value of 8.3221 indicate substantial differences in ESG implementation among firms within the ASEAN region. The lagged ESG variable (ESG_{t-1}) also exhibits a similar distribution pattern, with a mean value of 4.8778 and a standard deviation of 1.4387, suggesting that ESG performance tends to remain relatively stable over time.

The leverage variable (LEV) has a mean value of 0.8706 and a median value of 0.6764, indicating that firms generally rely on debt financing to support their operations and investments. The relatively high standard deviation of 0.9011 and the wide range of values, from 0.0000 to 8.9989, indicate substantial variation in firms' capital structures and debt dependence across the sample.

Profitability, measured using return on assets (ROA), has a mean value of 0.0579, indicating that firms generate an average return of approximately 5.79% on total assets. The standard deviation of 0.0713 suggests moderate variation in profitability across firms. In addition, the minimum value of -0.1641 indicates that several firms experienced losses during the observation period, while the maximum value of 0.5635 reflects the presence of highly profitable firms within the sample. Firm size (SIZE), measured as the natural logarithm of total assets, has a mean of 21.8001 and a standard deviation of 1.1038, indicating moderate variation in firm size across the sampled firms. The close agreement between the mean and median also suggests that the distribution of firm size is balanced. Sales growth (SALESGR) has a mean value of 0.0761, indicating that firms experienced average sales growth of approximately 7.61% during the observation period. However, the relatively high standard deviation of 0.2537 and the wide range between the minimum (-0.6666) and maximum (1.7964) values indicate substantial differences in firms' growth performance.

Firm value, measured using Tobin's Q (TOBINSQ), has a mean value of 1.7160 and a median value of 1.0567. The mean value greater than one indicates that, on average, the market values firms above their book value. The relatively high standard deviation of 1.9937 and the maximum value of 19.8904 suggest substantial variation in market valuation across firms. Meanwhile, the alternative firm-value proxy, price-to-book value (PBV), has a mean of 3.4107 and a relatively high standard deviation of 7.0788, indicating considerable heterogeneity in investors' market perceptions across firms in the ASEAN region.

Furthermore, Table 3 presents the correlation matrix among the independent variables used in this study.

Table 3. Correlation Matrix

Variable	ESG	LEV	ROA	SGR	SIZE
ESG	1.0000	0.0791	0.0178	0.1291	0.3553
LEV	0.0791	1.0000	-0.2258	-0.0678	0.2232
ROA	0.0178	-0.2258	1.0000	0.2156	-0.3900
SGR	0.1291	-0.0678	0.2156	1.0000	0.0766
SIZE	0.3553	0.2232	-0.3900	0.0766	1.0000

In general, the correlation coefficients among the explanatory variables are relatively low, indicating that there is no severe multicollinearity problem in the regression models. The highest correlation is observed between firm size (SIZE) and profitability (ROA), with a coefficient of -0.3900, which remains well below the commonly accepted threshold of 0.80. This finding suggests that the independent variables do not exhibit excessively strong linear relationships that could bias the regression estimates.

The ESG variable shows relatively weak correlations with the other explanatory variables. ESG is positively correlated with leverage (LEV), sales growth (SGR), and firm size (SIZE), indicating that firms with stronger ESG performance tend to exhibit slightly higher leverage, stronger growth opportunities, and larger firm size. However, these correlations remain relatively low, suggesting that ESG captures a distinct aspect of firm characteristics and does not overlap substantially with the other explanatory variables. Meanwhile, leverage (LEV) is negatively correlated with profitability (ROA), implying that firms with higher debt levels tend to have lower profitability. Firm size (SIZE) also shows a

negative correlation with ROA, suggesting that larger firms in the sample tend to generate relatively lower returns on assets. Overall, the correlation matrix confirms that the explanatory variables in the regression models are sufficiently distinct, thereby supporting the reliability of the regression estimates and reducing concerns about multicollinearity.

Table 4 presents the regression results examining the effect of ESG on firm value and the moderating role of leverage. Model 1 serves as the main regression model using Tobin's Q as the proxy for firm value. Meanwhile, Models 2, 3, and 4 are robustness models employed to confirm the consistency of the findings across alternative specifications. Model 2 uses lagged ESG variables (ESG_{t-1}) to address potential endogeneity concerns and examine the persistence of ESG effects over time. Models 3 and 4 employ price-to-book value (PBV) as an alternative proxy for firm value to test the robustness of the results using different market valuation measures. All regression models include year fixed effects and country fixed effects.

Table 4. Panel Regression Results

Variables	Model 1	Model 2	Model 3	Model 4
C	8.392***	8.501***	18.437***	17.975***
ESG	0.058***		0.382***	
ESG_{t-1}		0.073***		0.402***
LEV	0.237***	0.319***	2.463***	2.261***
ESG*LEV	-0.016*		-0.251***	
ESG_{t-1} *LEV		-0.027**		-0.104**
ROA	11.380***	11.322***	31.134***	33.032***
SALES_GROWTH	-0.291***	-0.323***	-1.332***	-1.171***
SIZE	-0.362***	-0.370***	-0.932***	-0.916***
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
R ²	0.705	0.709	0.661	0.657
Adj. R ²	0.699	0.704	0.655	0.651
F-statistic	137.073***	140.045***	112.106***	110.002***
Prob(F-statistic)	0	0	0	0

Notes: The regression models include year and country fixed effects. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

The results of Model 1 indicate that ESG has a positive, statistically significant effect on firm value ($\beta = 0.058$, $p < 0.01$), suggesting that firms with stronger ESG performance tend to be associated with higher market valuations. The interaction term between ESG and leverage (ESG $\times$ LEV) is negative and statistically significant at the 10% level ($\beta = -0.016$, $p < 0.10$), indicating that leverage weakens the positive effect of ESG on firm value. Among the control variables, leverage (LEV) and profitability (ROA) exhibit positive, statistically significant effects on firm value, whereas sales growth (SALESGROWTH) and firm size (SIZE) exhibit negative, statistically significant effects.

The robustness results reported in Models 2, 3, and 4 consistently support the main model's findings. In Model 2, lagged ESG (ESG_{t-1}) positively affects firm value ($\beta = 0.073$, $p < 0.01$), suggesting that the positive effect of ESG persists over time. The interaction term between ESG_{t-1} and leverage is also negative and statistically significant ($\beta = -0.027$, $p < 0.05$), further confirming leverage's moderating role. Models 3 and 4, which employ PBV as an alternative proxy for firm value, also show consistent results. ESG and ESG_{t-1} exhibit positive and statistically significant effects on PBV, while the interaction terms between ESG and leverage remain negative and statistically significant. These findings

indicate that the positive effect of ESG on firm value is robust across different model specifications and alternative measures of firm value.

5. Discussions

The Effect of ESG on Firm Value

The hypothesis test results indicate that ESG has a positive and statistically significant effect on firm value. This finding suggests that firms with higher ESG performance tend to obtain higher market valuation, thereby supporting the hypothesis that ESG positively affects firm value. This result is important because ESG is increasingly viewed not only as a sustainability reporting mechanism but also as a strategic instrument that enhances transparency, strengthens corporate reputation, and improves investor confidence (Difalla, 2026; García-Sánchez et al., 2025; Mahmood et al., 2025; Yuan et al., 2025). The findings of this study indicate that, in the context of non-financial firms in ASEAN, ESG has increasingly been recognized by the market as a value-enhancing signal that reflects firms' sustainability commitment and long-term strategic orientation.

This finding can first be explained by the data's descriptive characteristics. The average ESG score of 5.1700 indicates that ESG implementation among the sampled firms is relatively strong. At the same time, the standard deviation of 1.3695 suggests substantial variation in ESG performance across firms. This variation implies that firms differ in the quality, consistency, and comprehensiveness of their sustainability practices, which may influence how investors assess corporate sustainability performance. Although ESG adoption has become increasingly common among large firms in ASEAN, the extent to which ESG practices are integrated into firms' operations and strategies still varies considerably. This condition is important because investors respond not only to the existence of ESG disclosure but also to the credibility and quality of firms' sustainability practices. The favorable market response identified in this study suggests that investors increasingly value firms that demonstrate stronger ESG performance and more comprehensive sustainability initiatives.

From the perspective of signaling theory (Connelly et al., 2011; Spence, 1973), ESG disclosure functions as a credible signal that helps reduce information asymmetry between management and external stakeholders. ESG disclosure provides additional information regarding firms' sustainability commitment, transparency, and long-term orientation. Signaling theory further emphasizes that signals are effective when they are credible, consistent, and difficult to imitate. In this study, the significant positive effect of ESG on firm value suggests that investors perceive ESG disclosure as reliable information regarding firms' future prospects and long-term sustainability. ESG disclosure may reduce uncertainty by providing broader non-financial information concerning corporate responsibility, environmental awareness, social engagement, and governance quality. Consequently, firms with stronger ESG performance are more likely to gain investor confidence and achieve higher market valuations.

The findings of this study also indicate that ESG has become increasingly relevant in shaping market perceptions regarding corporate sustainability and future business prospects. Investors may perceive firms with stronger ESG performance as having better capabilities to manage long-term risks and adapt to sustainability-related challenges. ESG

practices may reflect stronger managerial commitment toward maintaining business continuity, improving corporate accountability, and ensuring sustainable growth. As a result, firms that consistently implement ESG practices are more likely to be perceived as more resilient and sustainable in the long run, thereby enhancing market valuation.

Stakeholder theory also provides an important explanation for these findings. According to stakeholder theory (Freeman, 1984, 2010), firms that successfully address stakeholder expectations through ESG practices are more likely to gain legitimacy, social support, and an enhanced corporate reputation, thereby improving firm value. Firms implementing ESG practices are generally more responsive to the interests of various stakeholders, including investors, customers, employees, regulators, and society. Such responsiveness may improve stakeholder trust and strengthen firms' reputational capital. The findings of this study indicate that firms implementing stronger ESG practices tend to receive more favorable market responses because stakeholders increasingly expect firms to demonstrate greater sustainability commitment and social responsibility.

Furthermore, ESG practices may improve corporate transparency, strengthen reputational capital, and enhance investors' perceptions regarding firms' long-term resilience and sustainability. ESG initiatives may also support firms in improving operational efficiency, strengthening risk management practices, and enhancing organizational adaptability in responding to environmental and social challenges. Consequently, ESG is increasingly perceived not merely as a reporting activity but as a strategic investment capable of generating future economic benefits. This finding is further reinforced by the robustness analysis using lagged ESG variables and alternative firm-value proxies, which consistently show that ESG positively affects firm value across different model specifications.

The ASEAN context is important in interpreting these findings. The sample includes firms from Indonesia, Malaysia, Singapore, Thailand, and the Philippines that exhibit varying levels of ESG adoption, market maturity, regulatory environments, and investor awareness. Despite these differences, the findings consistently indicate that firms with stronger ESG performance tend to obtain higher market valuation. This suggests that investors in ASEAN markets have increasingly recognized ESG as relevant information for assessing firms' sustainability and long-term performance. Although ASEAN markets remain heterogeneous in terms of institutional quality and sustainable development, ESG has increasingly become an important consideration in corporate valuation decisions.

Importantly, this study's findings reinforce the growing relevance of ESG in enhancing firm value. Prior literature predominantly supports a positive relationship between ESG and firm value (Anabtawi et al., 2025; Aprilina et al., 2025; Difalla, 2026; Hassan et al., 2025; Huang et al., 2025; Mahmood et al., 2025; Nguyen & La, 2025; Yuan et al., 2025). The findings of this study are consistent with prior studies indicating that ESG contributes positively to market valuation by improving transparency, legitimacy, and investor confidence. These findings also support the argument that sustainability-related information has become increasingly relevant to capital market decision-making, particularly for investors who consider long-term sustainability and corporate resilience when evaluating firm prospects.

The findings imply that firms in ASEAN should not merely focus on improving ESG disclosure quantitatively but also ensure that ESG practices are genuinely integrated into corporate strategies and operations. ESG will be more highly valued by the market when firms consistently demonstrate their commitment to sustainability and effectively communicate the economic relevance of their sustainability initiatives. This highlights the importance of disclosure quality, consistency, and long-term sustainability orientation in strengthening firm value. Firms that align ESG implementation with corporate strategies and long-term business objectives are more likely to achieve stronger market appreciation and investor confidence.

Thus, the findings of this study indicate that ESG functions as a value-enhancing mechanism for non-financial firms in ASEAN. In this context, ESG positively affects firm value because investors increasingly perceive ESG as a credible indicator of firms' sustainability, transparency, and long-term strategic orientation. This study extends the literature by confirming that the positive effect of ESG on firm value remains significant in the ASEAN context across different firm-value measures and model specifications. The consistency of results across Tobin's Q, PBV, and lagged ESG models further strengthens the reliability of the findings and confirms that ESG has become an increasingly important determinant of market valuation in ASEAN capital markets.

The Moderating Role of Leverage in the ESG-Firm Value Relationship

The results of the hypothesis testing indicate that leverage weakens the positive effect of ESG on firm value. The interaction coefficients between ESG and leverage are negative and statistically significant across the regression models, both in the contemporaneous and lagged ESG models. Specifically, the interaction term $ESG \times LEV$ shows a negative coefficient in both Tobin's Q and PBV models, while $ESG_{t-1} \times LEV$ also exhibits a negative and significant coefficient. These findings indicate that although ESG positively contributes to firm value, the magnitude of this effect is weaker when firms have higher leverage. Therefore, the hypothesis stating that leverage weakens the positive effect of ESG on firm value is supported.

From the perspective of trade-off theory (Kraus & Litzenberger, 1973), firms must balance the benefits and costs of debt financing. Although leverage may provide tax advantages and additional financing capacity, excessive debt also increases financial risk, agency costs of debt, and the probability of financial distress. In this context, highly leveraged firms may face greater pressure to prioritize short-term financial obligations rather than long-term sustainability initiatives. Consequently, investors may perceive ESG activities undertaken by highly leveraged firms as less effective in generating future economic benefits. These findings are consistent with prior studies suggesting that excessive leverage may weaken firm value creation because of increased financial vulnerability and debt-related agency conflicts.

Based on signaling theory, ESG disclosure generally serves as a positive signal of firms' commitment to sustainability, transparency, and long-term strategic orientation. However, high leverage may simultaneously generate a negative signal concerning financial risk and financial stability. As a result, the favorable signal conveyed through ESG disclosure may become less convincing when firms have high debt levels. Investors may

interpret highly leveraged firms as more financially vulnerable, thereby weakening the credibility and effectiveness of ESG as a value-enhancing signal.

The findings of this study suggest that investors in ASEAN markets simultaneously consider sustainability performance and financial risk when assessing firm value. Although ESG performance tends to improve market valuation, investors appear to respond more cautiously to ESG information when firms exhibit higher leverage. This indicates that leverage is a limiting factor in the ESG-firm value relationship, as high debt levels may increase uncertainty about firms' ability to sustain long-term ESG commitments while maintaining financial stability.

From the descriptive statistics, the leverage variable exhibits substantial variation, with a mean value of 0.8706 and a standard deviation of 0.9011. The leverage values range from 0.0000 to 8.9989, indicating considerable heterogeneity in firms' capital structures. This variation suggests that firms in the sample differ substantially in their financing strategies and debt dependence. In firms with relatively high leverage, investors may perceive ESG activities as less likely to generate long-term value because firms are simultaneously under greater financial pressure and subject to greater repayment obligations.

Furthermore, ESG implementation often requires substantial long-term investment in environmental initiatives, governance systems, sustainability reporting, operational transformation, and stakeholder engagement. However, firms with high leverage may face tighter financial flexibility and greater pressure from creditors, limiting their ability to fully realize the long-term benefits of ESG initiatives. Consequently, although ESG generally enhances firm value, its positive effect may become weaker in highly leveraged firms because investors remain concerned about financial sustainability and debt-related risks.

The ASEAN context is also important in interpreting these findings. The sample includes firms from Indonesia, Malaysia, Singapore, Thailand, and the Philippines that exhibit varying levels of market maturity, financial development, and ESG adoption. In emerging markets, investors may remain highly sensitive to financial risk indicators, particularly leverage, because debt-related risk can directly affect firms' financial stability and future performance. Therefore, although ESG has increasingly become an important consideration in investment decisions, high leverage may still erode the market's confidence in firms' long-term sustainability.

Importantly, these findings indicate that the ESG-firm value relationship is conditional rather than universal. ESG contributes positively to firm value. However, the magnitude of its effect depends on firms' financial conditions. The negative interaction coefficients between ESG and leverage demonstrate that the benefits of ESG are less pronounced when firms operate under higher debt burdens. These findings extend prior studies suggesting that financial structure influences how investors interpret sustainability-related information and corporate value creation.

6. Conclusions

This study examines the effect of ESG performance on firm value and the moderating role of leverage in non-financial firms in the ASEAN region. The findings indicate that ESG has a positive, statistically significant effect on firm value, suggesting

that firms with stronger ESG performance tend to command higher market valuations. This result implies that ESG has increasingly become an important consideration for investors in ASEAN capital markets. ESG is no longer perceived merely as a sustainability reporting mechanism but also as a strategic signal that reflects corporate transparency, sustainability commitment, quality of risk management, and a long-term business orientation.

The results further demonstrate that leverage weakens the positive effect of ESG on firm value. Although ESG contributes positively to firm value, its value-enhancing effect diminishes as leverage increases. High leverage may increase financial risk and reduce investors' confidence in firms' ability to maintain long-term sustainability commitments while maintaining financial stability. These findings confirm that the ESG–firm value relationship is conditional rather than universal, as ESG's effectiveness in enhancing firm value depends on firms' financial structures and risk profiles. The findings also support the view that investors in emerging markets consider both sustainability performance and financial risk when evaluating firms.

This study contributes to the literature in several ways. First, the study extends the ESG-firm value literature by integrating ESG and capital structure perspectives within the context of ASEAN emerging markets. Second, the study demonstrates that the relationship between ESG and firm value is influenced by firms' leverage conditions, thereby supporting the conditional nature of ESG value relevance. Third, the study provides additional evidence from ASEAN countries, where ESG implementation, institutional environments, and market maturity remain heterogeneous.

Nevertheless, this study has several limitations. First, the study focuses only on non-financial firms in the ASEAN region, which may limit the generalizability of the findings to other sectors or regions. Second, ESG is measured using aggregate ESG scores, which may not fully capture the quality of implementation for each ESG dimension. Third, although this study controls for country- and year-fixed effects, differences in institutional quality, ESG regulation, and market maturity across ASEAN countries may still influence the results. Fourth, Bloomberg ESG coverage is generally concentrated among larger and more visible firms, which may limit the sample's representativeness. Finally, the study employs a relatively short observation period and static panel models, which may not fully capture the long-term dynamics of the relationship between ESG and firm value.

Future research is encouraged to incorporate additional contextual variables such as institutional quality, investor protection, and ESG regulation across countries. Future studies may also examine each ESG dimension separately to provide deeper insights into the specific contribution of environmental, social, and governance practices to firm value. In addition, the use of more advanced methodologies, such as dynamic panel models, causal inference approaches, or endogeneity-adjusted estimators, may yield more robust evidence on the relationship between ESG and firm value. Future research may also incorporate other moderating variables, such as financial constraints or industry characteristics, to obtain the other conditions under which ESG can optimally enhance firm value.

The findings of this study provide important implications for policymakers, regulators, and corporate managers in the ASEAN region. Regulators need to improve the quality,

credibility, and standardization of ESG disclosure to ensure greater consistency and comparability across firms and countries. Firms should integrate ESG practices into their long-term business strategies rather than treating ESG merely as a reporting obligation. In addition, companies should maintain sound financial management, as excessive leverage may undermine the market benefits of ESG performance. Investors should also increasingly consider ESG information alongside firms' financial risk profiles when making long-term investment decisions. Ultimately, stronger ESG implementation, supported by prudent financial management, may help improve market efficiency, strengthen investor confidence, and promote sustainable business practices in ASEAN capital markets.

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