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The Impact of ESG Performance on Financial Distress: Evidence from ASEAN-5 Banking with Board Gender Diversity as a Moderating Factor

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ABSTRACT

Study's aims: This study examines the effect of Environmental, Social, and Governance (ESG) performance on financial distress in the ASEAN-5 banking industry, with board gender diversity as a moderating variable. The study also investigates whether the relationship between ESG performance and financial distress differs across the periods before, during, and after the COVID-19 pandemic. **Design/Methodology/Approach:** This research employs a quantitative, panel-data regression approach. The sample consists of listed banks in ASEAN-5 countries during 2017–2024. Financial distress is measured using the Z-score, while ESG performance and board gender diversity are used as the main variables, along with several financial and macroeconomic control variables. **Findings:** ESG performance has a positive and significant effect on financial distress in the ASEAN-5 banking industry. This finding suggests that higher ESG performance is associated with higher financial distress risk, potentially due to the substantial costs of ESG implementation, the early stage of ESG adoption, and the lag effect of sustainability investments. The results also show that board gender diversity significantly moderates the relationship between ESG performance and financial distress by strengthening the effectiveness of ESG practices. However, additional analysis across the periods before, during, and after the COVID-19 pandemic reveals that ESG performance does not significantly influence financial distress within each period. **Theoretical contribution/Originality:** This study enriches the literature on sustainable finance by highlighting the role of board gender diversity in the ESG–financial distress relationship within emerging banking markets. **Limitation/Implication:** The study is limited to ASEAN-5 banking institutions and a specific observation period. Future studies should expand the sample, the time horizon, and the variables to yield more comprehensive results.

Keywords: ESG Performance; Financial Distress; Board Gender Diversity; Banking Sector; Corporate Governance; Sustainable Finance

Introduction

In recent years, corporate disclosure has increasingly extended beyond financial information to include non-financial aspects related to sustainability performance. This shift is closely associated with the global commitment to the Sustainable Development Goals (SDGs) introduced by the United Nations under the 2030 Agenda, with the principle *"Leave No One Behind"* (United Nations, 2015). The SDGs emphasize the integration of economic, social, and environmental dimensions of development, commonly framed through the triple bottom line perspective, Planet, People, and Profit. As a consequence, firms are expected to communicate their sustainability commitments through Environmental, Social, and Governance (ESG) practices and disclosures.

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The growing importance of ESG reflects a broader transformation in corporate governance from a traditional shareholder-oriented perspective toward a stakeholder-oriented approach. Companies are increasingly required to demonstrate accountability not only in financial performance but also in their social and environmental responsibilities. (DasGupta, 2022). In response to this global agenda, countries in the ASEAN-5 region—Indonesia, Malaysia, Singapore, Thailand, and the Philippines—have intensified regulatory and institutional pressures to promote sustainable finance practices. For instance, Indonesia issued the Financial Services Authority Regulation (POJK) No. 51/2017 on sustainable finance, while Malaysia, Singapore, Thailand, and the Philippines have also introduced various frameworks for ESG disclosure, climate risk management, and sustainable financial intermediation. These regulatory developments indicate the increasing institutionalization of sustainability practices within Southeast Asian financial systems.

Within this context, the banking sector plays a crucial role in maintaining financial system stability and supporting economic development, particularly in emerging economies. Banks act as financial intermediaries, allocating credit, mobilizing savings, and transmitting monetary policy. Because banking activities heavily rely on public trust, instability in this sector may generate systemic consequences that extend beyond the financial industry to the broader economy (Abdelsalam et al., 2024). Historical events demonstrate the vulnerability of banking systems to financial shocks, including the Asian financial crisis (1997–1998), the global financial crisis (2007–2009) triggered by the collapse of major financial institutions, and the economic disruption caused by the COVID-19 pandemic. These events illustrate how macroeconomic disturbances can raise credit risk, weaken banks' financial positions, and potentially lead to financial distress in the banking sector.

Financial distress refers to a condition in which firms experience deteriorating financial performance, operational inefficiency, liquidity constraints, and high leverage, which may ultimately threaten their solvency and long-term viability. (Abdu, 2022). In the banking industry, financial distress may have severe systemic implications due to the interconnected nature of financial institutions. Governments often intervene through bailouts or restructuring policies to prevent bank failures; however, such interventions may impose substantial fiscal burdens on the state (Wu & Shen, 2013). Consequently, identifying factors that may mitigate financial distress risk has become an important issue for both policymakers and financial institutions.

Recent literature suggests that ESG practices contribute to financial stability by improving risk management, strengthening corporate reputation, and enhancing stakeholder trust. Empirical studies have shown that firms with stronger ESG performance tend to exhibit better long-term performance and lower volatility in financial markets (Burki et al., 2024). From a risk perspective, ESG implementation may also serve as a strategic mechanism to mitigate financial distress by improving governance quality and encouraging responsible management practices. However, empirical evidence regarding the relationship between ESG performance and financial distress remains inconclusive. While some studies report a negative relationship, indicating that stronger ESG practices reduce financial distress risk (Aliazahra & Husodo, 2025; Citterio & King, 2023), Other studies find insignificant or mixed results (Rohman et al., 2024; Zhou et al., 2025). These inconsistencies highlight the need for further investigation, particularly in emerging markets.

Another governance mechanism that may influence the effectiveness of ESG practices is board gender diversity. The presence of women on corporate boards has been associated with improved governance quality, broader perspectives in decision-making, and stronger ethical considerations in corporate strategies (Atalay et al., 2025). Female directors may contribute to more comprehensive evaluations of sustainability initiatives and risk management policies, thereby enhancing firms' ability to address complex environmental and social challenges. Despite these potential benefits, women remain underrepresented in corporate leadership positions, particularly in developing economies. According to Deloitte's Women in the Boardroom Global Perspective (2024), the average proportion of female board members in ASEAN companies is approximately 19.9%, which remains below the global average of 23.3%. Indonesia exhibits the lowest representation among ASEAN-5 countries, indicating persistent gender disparities in corporate governance structures.

Although prior studies have examined the relationship between ESG performance, corporate governance, and financial outcomes, several research gaps remain. First, empirical studies examining the relationship

between ESG performance and bank financial distress in the ASEAN-5 region are still limited, despite the strategic role of banking institutions in supporting regional economic stability. Second, few studies have explicitly explored the moderating role of board gender diversity in strengthening the relationship between ESG performance and financial distress mitigation. Third, the existing literature presents inconsistent findings on the effect of ESG performance on financial distress, suggesting that governance characteristics, such as board diversity, may influence the effectiveness of sustainability practices.

To address these gaps, this study investigates the effect of ESG performance on financial distress in the banking industry of ASEAN-5 countries, with board gender diversity as a moderating variable. Financial distress is measured using the bank Z-score, a widely used indicator that captures bank stability by linking profitability, capital adequacy, and earnings volatility. By integrating ESG performance with corporate governance characteristics, this study contributes to the literature on sustainable finance and banking stability in emerging markets.

This study offers several contributions. First, it extends the sustainable finance literature by examining ESG performance in relation to financial distress in the banking sectors of the ASEAN-5, a region that has received limited empirical attention. Second, it highlights the importance of board gender diversity as a governance mechanism that may strengthen the effectiveness of sustainability practices. Third, the findings provide insights for policymakers and financial institutions in designing governance and sustainability strategies aimed at enhancing financial resilience in emerging financial systems.

Literature Review and Hypotheses Development

Signaling Theory

Signaling theory explains how managers convey information to external parties when information asymmetry exists between firms and stakeholders. High-quality firms tend to disclose relevant information to reduce uncertainty and build credibility (Spence, 1978). In sustainability reporting, ESG disclosure can act as a signal of a firm's commitment to responsible management, transparency, and long-term orientation (Yekini & Jallow, 2012).

In the banking industry, trust is essential because banks rely on depositors and investors. Therefore, good ESG performance may provide a positive signal that a bank has stronger governance, better risk management, and higher accountability. Board gender diversity can also be interpreted as a governance signal. A more gender-diverse board may reflect inclusiveness and improved monitoring, which strengthens public confidence and stakeholder perception (Ranta & Ylinen, 2023; Sundarasen et al., 2024).

Stakeholder Theory

Stakeholder theory emphasizes that firms should balance the interests of multiple stakeholder groups, not only shareholders, to sustain long-term performance (Freeman, 1984). Banks have broad stakeholder exposure, including regulators, depositors, borrowers, employees, and the community. ESG practices may help banks respond to stakeholder expectations, reduce reputational risk, and improve legitimacy (Velte, 2023).

From this perspective, ESG performance can reduce non-financial risks that may later translate into financial risks. For example, better governance reduces misconduct risk, social engagement improves stakeholder trust, and environmental responsibility reduces regulatory and transition risks. These mechanisms are relevant in the ASEAN-5 context where sustainable finance is increasingly promoted through regulatory frameworks.

Resource Dependence Theory and Board Gender Diversity

Resource dependence theory (RDT) suggests that firms depend on external resources and need governance mechanisms that provide access to information, networks, legitimacy, and expertise (Terjesen et al., 2009). The board of directors is a key governance structure that supports strategic decisions and risk oversight.

Board gender diversity may improve board effectiveness by bringing different perspectives, ethical sensitivity, stakeholder orientation, and more careful decision-making. Several studies argue that female directors tend to be more risk-averse and more attentive to monitoring and long-term issues, which can support sustainability governance and risk control (Atalay et al., 2025; Eckel & Grossman, 2008). Consequently, gender diversity may strengthen the implementation of ESG and enhance its impact on financial stability.

The Impact of ESG Performance on Financial Distress

The banking industry operates under strict regulations and relatively tight profit margins, making risk management and public trust essential for maintaining financial stability. ESG performance may provide a competitive advantage by strengthening governance practices, improving transparency, and enhancing corporate reputation. Banks with higher ESG scores are more likely to maintain depositor confidence because stakeholders perceive them as more responsible, reliable, and capable of managing risks effectively (Azmi et al., 2021).

In times of economic uncertainty, ESG practices can serve as a risk-mitigation mechanism, enhancing financial resilience. ESG engagement encourages banks to adopt more responsible lending practices, improve governance quality, and strengthen stakeholder relationships. These practices can act as an "insurance-like" protection mechanism, reducing the negative impact of financial shocks and strengthening financial stability (Chiaramonte et al., 2022). Since banking activities rely heavily on public funds from depositors, maintaining credibility and social legitimacy is crucial. ESG initiatives also reflect banks' commitment to responsible use of public resources and accountability to society. This commitment may help reduce reputational risks and enhance public confidence, which are critical factors for maintaining financial stability (Wu & Shen, 2013).

Empirical studies have reported mixed findings regarding the relationship between ESG and financial distress. Several studies find that ESG performance reduces the likelihood of financial distress because it improves corporate governance, stakeholder trust, and risk management (Antunes et al., 2023; Song et al., 2024). ESG engagement may also increase firm value during distress periods by strengthening investor confidence (Yadav, 2025). Furthermore, ESG activities can generate social capital that improves stakeholder relationships and reduces bankruptcy risk (Lin & Dong, 2018). However, other studies suggest that ESG may not always reduce financial distress risk due to the costs associated with implementing sustainability initiatives (Luthan et al., 2025; Zhou et al., 2025). Despite these mixed results, ESG is generally expected to improve bank resilience and reduce financial distress risk. Therefore, the first hypothesis is formulated as follows:

H_1: ESG performance has a negative effect on financial distress.

The Moderating Effect of Gender Diversity on Corporate Boards of Directors on ESG Performance and Financial Distress

Board gender diversity has been widely discussed in corporate governance literature as an important factor influencing strategic decision-making and sustainability practices. A more balanced representation of men and women on corporate boards may enhance governance quality by introducing diverse perspectives, improving oversight, and strengthening stakeholder orientation. Gender-diverse boards may encourage companies to adopt stronger ESG practices and improve overall firm performance (Harjoto et al., 2015).

Female directors are often associated with greater risk awareness, ethical sensitivity, and a long-term orientation in decision-making. These characteristics may contribute to stronger monitoring and more

responsible governance practices, particularly in sustainability-related decisions (Wu et al., 2025). Gender diversity may also improve transparency and reduce information asymmetry, especially in institutional environments where corporate governance practices are still evolving (Alkhawaja et al., 2023). As a result, companies with gender-diverse boards may be better able to implement ESG strategies effectively and translate them into improved financial outcomes.

Previous studies also suggest that board gender diversity can strengthen corporate governance and reduce bankruptcy risk. Female directors may encourage firms to implement social and environmental responsibility more effectively while maintaining financial performance (Khan et al., 2024). During periods of economic crisis, gender-diverse boards may also play an important role in maintaining ESG transparency and strengthening organizational resilience (Hachicha et al., 2025). Although some studies indicate that board diversity may create coordination challenges and conflicting opinions (Hogg & Reid, 2006), most of the governance literature supports the view that gender diversity enhances monitoring quality and strategic decision-making. Based on this argument, board gender diversity is expected to strengthen the relationship between ESG performance and financial stability. Therefore, the second hypothesis is proposed as follows:

H_2: Board gender diversity strengthens the negative relationship between ESG performance and financial distress.

Based on the ideas, a research model was developed and is depicted in Figure 1.

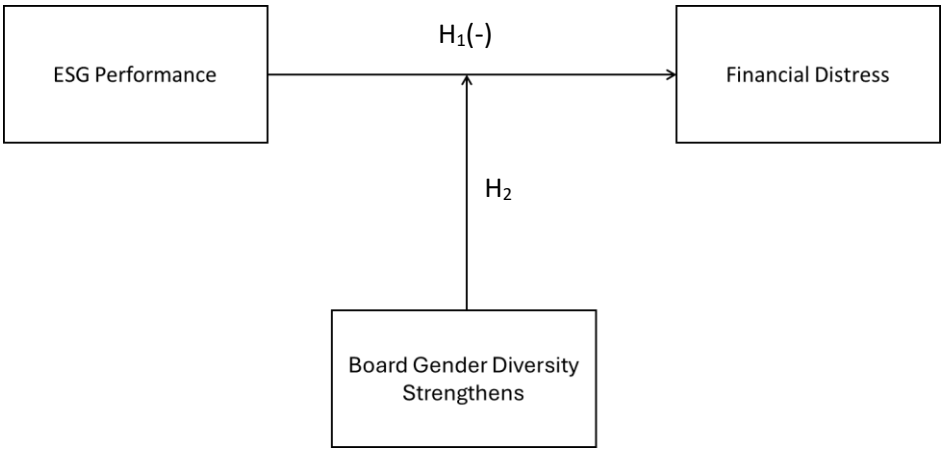

Figure 1. Research Model

Method

This study employs a quantitative research approach to analyze the effect of Environmental, Social, and Governance (ESG) performance on financial distress, with board gender diversity acting as a moderating variable in the banking industry of ASEAN-5 countries. The research utilizes panel data analysis, combining cross-sectional data from multiple banking institutions with time-series observations over a specific period. Panel data analysis is considered appropriate because it enables the examination of variation across firms and over time, yielding more robust empirical results.

The population of this study consists of commercial banks listed on stock exchanges in ASEAN-5 countries, namely Indonesia, Malaysia, Singapore, Thailand, and the Philippines. These countries were selected because they represent major financial markets in Southeast Asia and have increasingly integrated ESG principles into corporate governance and sustainability practices. The sampling technique used in this study is purposive

sampling, where samples are selected based on specific criteria relevant to the research objectives. The criteria include publicly listed banks that publish complete financial statements during the observation period, provide ESG performance data, and disclose information on board composition, including gender diversity.

This study uses secondary data obtained from various sources, including annual reports, financial statements, sustainability reports, and ESG databases. Financial data are collected from company financial reports. In contrast, ESG performance data are obtained from the Refinitiv/LSEG ESG database, which provides standardized ESG scores based on environmental, social, and governance indicators.

Financial distress serves as the dependent variable in this study. It is measured using the bank Z-score, which is widely applied in banking studies to assess financial stability and insolvency risk. A higher Z-score indicates a lower probability of financial distress and greater financial stability. The independent variable in this study is ESG performance, which reflects a company's commitment to environmental responsibility, social engagement, and sound corporate governance practices. ESG performance is measured using ESG scores provided by the Refinitiv/LSEG database, where higher scores indicate better ESG performance.

Board gender diversity is included as a moderating variable. It is measured by calculating the proportion of female directors on the board of directors relative to the total number of board members. This variable reflects the level of gender representation on the board and its potential to influence corporate decision-making and the quality of governance.

In addition, several control variables are incorporated in the analysis to reduce potential bias and improve the robustness of the results. These variables include firm size, measured by the natural logarithm of total assets; leverage, measured as the ratio of total liabilities to total assets; profitability, measured using return on assets (ROA); and firm growth, measured by asset growth.

The data are analyzed using panel data regression to test the relationship between ESG performance and financial distress as well as the moderating effect of board gender diversity. Before estimating the regression model, several model selection tests are conducted, including the Chow test, Hausman test, and Lagrange Multiplier test, to determine the most appropriate panel regression model among the common effect, fixed effect, and random effect models. The moderating effect is examined by incorporating an interaction term between ESG performance and board gender diversity into the regression equation. The regression model used in this study can be expressed as follows:

$$FD_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 BGD_{it} + \beta_3 (ESG \times BGD)_{it} + \beta_4 Controls_{it} + \varepsilon_{it}$$

Where FDrepresents financial distress, ESGrepresents ESG performance, BGDrepresents board gender diversity, and $Controls$represent the control variables used in the model. The subscripts $i$and $t$indicate the firm and time period, respectively. All statistical analyses in this study are conducted using EViews software.

Results

Descriptive Analysis

The descriptive statistics provide an overview of the distribution of the variables used in this study. Financial distress, measured using the Z-score, ranges from 5.680 to 159.69, with an average of 64.573. The highest Z-score is observed in RHB Bank Bhd, while the lowest value is recorded for AMMB Holdings Bhd, indicating variation in financial stability among banks in the ASEAN-5 region.

The independent variable, ESG performance, measured using the ESG score, ranges from 32.374 to 89.112, with an average value of 65.952. The highest ESG score is recorded by Bank Rakyat Indonesia (Persero) Tbk, while the lowest score belongs to Hong Leong Financial Group Bhd, reflecting differences in sustainability performance across banks.

Board gender diversity, used as the moderating variable, is measured by the proportion of female directors on the board. The values range from 0 to 69.231, with an average of 20.438. Several banks show no

female representation on their boards, including Alliance Bank Malaysia Bhd, Bank Central Asia Tbk, Bank Negara Indonesia (Persero) Tbk, Bank Danamon Indonesia Tbk, Bank Mandiri (Persero) Tbk, Metropolitan Bank and Trust Co, and United Overseas Bank Ltd. The highest board gender diversity value is observed in Kasikornbank PCL. Table 1 also presents the descriptive statistics for the control variables used in this study, illustrating the overall distribution of the data.

Table 1. Descriptive Statistics

	Z-Score	ESG	Board Gender Diversity (BGD)	Return on Asset (ROA)	Debt to Asset Ratio (DAR)	GDP Growth	Long Term Debt to Equity (LTDE)	Pandemic Effect	Firm Size
Mean	64.573	65.952	20.438	0.013	1.423	0.034	0.334	0.375	25.009
Median	52.705	66.815	20.000	0.011	0.899	0.044	0.301	0.000	25.027
Maximum	159.690	89.112	69.231	0.037	6.713	0.098	2.054	1.000	27.130
Minimum	5.680	32.374	0.000	-0.023	0.114	-0.095	0.000	0.000	22.715
Std. Dev.	34.812	12.896	13.716	0.007	1.592	0.038	0.236	0.485	0.986
Skewness	0.752	-0.292	0.434	0.632	1.900	-1.527	2.793	0.516	-0.212
Kurtosis	2.798	2.405	3.112	7.401	5.597	5.336	18.187	1.267	2.916
Observations	208	208	208	208	208	208	208	208	208

Source: Data processed with EViews 12

Model Selection Test

Prior to estimating the panel regression model, several model selection tests were conducted to determine the most appropriate model for the analysis. These tests include the Chow test, Hausman test, and Lagrange Multiplier (LM) test.

The Chow test is used to compare the Common Effect Model (CEM) and the Fixed Effect Model (FEM). The test result shows that the Cross-section Chi-square probability value is 0.000, which is lower than the significance level of 0.05. This indicates that the Fixed Effect Model is preferable to the Common Effect Model. Furthermore, the Hausman test is conducted to determine whether the Fixed Effect Model or the Random Effect Model (REM) is more appropriate. The result (Table 2) shows a probability value of 0.2020, which is greater than 0.05, indicating that the Random Effect Model is preferred over the Fixed Effect Model.

Table 2. Results of Model Selection Testing

Probability of Financial Distress Estimation Model			Selected Model
Chow Test **H1: Fixed Effect**	**Hausman Test** **H0: Random Effect**	**Langrange Multiplier Test** **H1: Random Effect**	
0.000	0.202	0.000	Random Effect

Source: Data processed with EViews 12

To further confirm the appropriate model, the LM test is performed to compare the Random Effect Model with the Common Effect Model. The result shows that the Breusch–Pagan probability value is 0.000, which is lower than 0.05. This finding indicates that the Random Effect Model is more suitable than the Common Effect Model.

Based on the results of the Chow test, Hausman test, and Lagrange Multiplier test, it can be concluded that the Random Effect Model is the most appropriate model for this study. Therefore, the hypothesis testing in this research is conducted using a random-effects regression model.

Classical Assumption Tests

Before conducting the regression analysis, several classical assumption tests were performed to ensure the reliability of the regression model. These tests include normality, multicollinearity, heteroscedasticity, and autocorrelation tests.

The normality test was conducted using the Jarque–Bera statistic. The result in Figure 2 shows a Jarque–Bera value of 5.035 and a p-value of 0.0806, which is greater than the significance level of 0.05. This indicates that the residuals of the regression model are normally distributed.

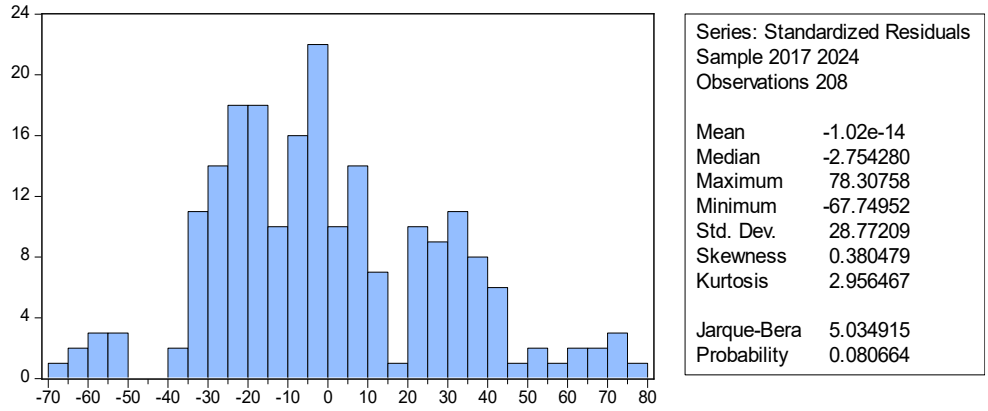

Figure 2. Normality Test
Source: Data processed with EViews 12

The multicollinearity test was performed using a correlation matrix among the independent and control variables. Table 3 indicates that all correlation coefficients are below 0.80, suggesting that there is no serious multicollinearity problem in the regression model.

Tabel 3. Multicollinearity Test

	ESG	Board Gender Diversity (BGD)	Return on Asset (ROA)	Debt to Asset Ratio (DAR)	GDP Growth	Long Term Debt to Equity (LTDE)	Pandemic Effect
ESG	1.000	0.153	0.261	-0.206	-0.039	-0.313	0.134
Board Gender Diversity (BGD)	**0.153**	1.000	-0.240	-0.035	-0.003	-0.028	0.015
Return on Asset (ROA)	**0.261**	**-0.240**	1.000	0.055	0.119	-0.234	-0.215
Debt to Asset Ratio (DAR)	**-0.206**	**-0.035**	**0.055**	1.000	-0.019	0.200	0.043
GDP Growth	**-0.039**	**-0.003**	**0.119**	**-0.019**	1.000	-0.003	-0.505
Long Term Debt to Equity (LTDE)	**-0.313**	**-0.028**	**-0.234**	**0.200**	**-0.003**	1.000	-0.085
Pandemic Effect	**0.134**	**0.015**	**-0.215**	**0.043**	**-0.505**	**-0.085**	1.000

Source: Data processed with EViews 12

Furthermore, the heteroscedasticity test was conducted using the ARCH test. The result shows an F-statistic of 0.753 with a probability value of 0.3866, which is greater than 0.05. This finding indicates that the regression model is not heteroscedastic.

The autocorrelation test also indicates that the regression model is free of autocorrelation. The probability value of 0.0505, which is slightly above the 0.05 threshold, suggests that the residuals are not significantly

correlated across observations. Overall, the results of the classical assumption tests indicate that the regression model satisfies the required statistical assumptions and is therefore appropriate for further analysis.

Hypothesis Testing Results

Hypothesis testing in this study was conducted using panel-data regression with a random-effects model, based on model selection tests. The results of the regression analysis are presented through the F-test, t-test, and the coefficient of determination.

The F-test was conducted to examine whether the independent, moderating, and control variables jointly influence financial distress. The result shows that the F-statistic is 7.2955 and the probability value is 0.000, which is lower than the significance level of 0.05. This finding indicates that the independent variables and control variables, including ESG, Board Gender Diversity (BGD), Return on Assets (ROA), Debt to Asset Ratio (DAR), GDP Growth, Long Term Debt to Equity (LTDE), and Pandemic Effect, simultaneously have a significant effect on the Z-score as a proxy for financial distress in ASEAN-5 banking institutions.

The t-test results (Table 4) further provide insight into the individual effects of each variable. The regression results indicate that ESG performance has a negative and significant effect on the Z-score, with a coefficient of –0.172 and a p-value of 0.0367, suggesting that higher ESG scores are associated with lower Z-scores. Similarly, Board Gender Diversity (BGD) shows a negative and significant effect on the Z-score, with a coefficient of –0.526 and a p-value of 0.0059.

Table 4. T-test Results

Variabel	Coefficient	Std. Error	t values	Prob
ESG	-0.172091	0.081823	-2.103200	0.0367
BGD	-0.525988	0.189051	-2.103200	0.0367
ESG*BGD	0.007716	0.002643	2.919535	0.0039
ROA	318.6227	91.95164	3.465112	0.0006
DAR	5.072382	0.892995	5.680189	0.0000
PANDEMIC	-0.290067	0.798141	-0.363428	0.7167
GDP GROWTH	-10.23162	9.230244	-1.108489	0.2690
LTDE	-2.689245	1.930277	0.5059	0.1651

Source: Data processed with EViews 12

The interaction term between ESG and BGD has a positive and significant effect on the Z-score, with a coefficient of 0.008 and a probability value of 0.0039. This finding indicates that board gender diversity weakens the negative effect of ESG performance on the Z-score. In other words, although ESG performance is associated with lower Z-scores (indicating higher financial distress risk), the presence of gender-diverse boards mitigates this adverse effect. This suggests that female representation on the board helps reduce the negative impact of ESG implementation on financial stability, potentially through more prudent decision-making, improved monitoring, and a stronger long-term orientation in sustainability strategies.

Regarding the control variables, Return on Assets (ROA) has a positive and significant effect on the Z-score, with a coefficient of 318.623 and a p-value of 0.0006, indicating that higher profitability is associated with stronger financial stability. Similarly, the Debt to Asset Ratio (DAR) shows a positive and significant effect, with a coefficient of 5.072 and a p-value of 0.0000.

In contrast, Long-Term Debt to Equity (LTDE), GDP Growth, and the Pandemic Effect do not show statistically significant effects on the Z-score, as their probability values exceed the 0.05 significance level. Furthermore, the coefficient of determination (R-squared) is 0.227, indicating that the independent, moderating, and control variables collectively explain 22.7% of the variation in the Z-score. Other variables outside the scope of this research model explain the remaining 77.3%.

Discussions

The empirical results indicate that ESG performance has a significant positive effect on financial distress, as measured by the Z-score. This finding suggests that higher ESG performance is associated with a higher risk of financial distress in the banking sector of ASEAN-5. Furthermore, the results also show that board gender diversity significantly moderates the relationship between ESG performance and financial distress, indicating that gender-diverse boards strengthen the effectiveness of ESG practices in influencing financial stability.

The Effect of ESG Performance on Financial Distress in ASEAN-5 Banks

The regression results show that ESG performance has a significant effect on financial distress, with a probability value of 0.0367, which is below the 0.05 significance level. The regression coefficient indicates that ESG performance is negatively associated with the Z-score, suggesting that higher ESG performance is associated with greater financial distress risk in ASEAN-5 banking institutions.

This finding can be explained through shareholder theory, which emphasizes that firms primarily aim to maximize shareholder value rather than the interests of broader stakeholders. In this context, ESG investments may create additional financial burdens when the costs of implementing sustainability initiatives exceed the firm's immediate financial benefits. Previous studies suggest that companies often increase ESG expenditures to enhance their reputation and maintain legitimacy among stakeholders, even when the financial returns from such investments are uncertain (Luthan et al., 2025).

Moreover, ESG implementation may constrain a firm's free cash flow, as banks must allocate substantial resources to sustainability-related initiatives, including environmental risk management systems, sustainability reporting, training programs, and compliance with regulatory frameworks. These additional costs may reduce banks' financial flexibility and limit their ability to finance profitable projects or meet financial obligations, thereby increasing the likelihood of financial distress.

The results are also consistent with those of Do et al. (2024), who found that ESG implementation in ASEAN banking institutions often requires significant financial commitments to social and environmental responsibilities. In the short term, such investments may not immediately improve financial stability, particularly in emerging markets where ESG practices are still in the early stages of development. Similarly, Zhou et al. (2025) argue that strong ESG performance does not necessarily reduce long-term financial liabilities, potentially increasing financial risks for firms listed in emerging markets.

Another explanation relates to the overinvestment theory, which suggests that excessive investments in non-core strategic initiatives may reduce financial efficiency and increase financial risk. In the context of ASEAN-5 banks, the rapid adoption of sustainable finance frameworks, green taxonomy, and sustainability reporting requirements may require significant operational adjustments and financial resources.

Furthermore, the development of green financing products in the banking sector may introduce additional credit risks. Previous studies have found that green lending can negatively affect bank profitability and increase credit risk, particularly for small and medium-sized banks (Zhou et al., 2024; Afifah et al., 2024). Higher credit risk and declining profitability may ultimately increase the probability of financial distress.

Additionally, the relationship between ESG performance and financial distress may reflect reverse causality, in which financially distressed firms seek to improve their ESG performance as a signaling mechanism to enhance their reputation with stakeholders. Lohmann et al. (2025) argue that companies under financial pressure tend to increase ESG disclosures to maintain legitimacy and stakeholder trust.

Another potential explanation is greenwashing, the practice of exaggerating or misrepresenting sustainability initiatives without substantial operational improvements. Reports from the UNEP Finance Initiative indicate that the financial services sector is among the industries with the highest incidence of greenwashing. In such situations, banks may increase ESG disclosure levels to meet regulatory expectations

or improve public perception, while their underlying financial conditions remain weak. As a result, ESG scores may appear high even though financial distress risks continue to increase.

The Moderating Role of Board Gender Diversity

The results also indicate that board gender diversity significantly moderates the relationship between ESG performance and financial distress, with a probability value of 0.0039 and a positive interaction coefficient. This finding suggests that the presence of women on corporate boards weakens the negative effect of ESG performance on financial stability. In other words, although ESG performance is associated with a lower Z-score (indicating higher financial distress risk), gender-diverse boards mitigate this adverse effect. This implies that female representation on the board plays a buffering role, reducing the potential negative impact of ESG implementation on financial stability through more prudent decision-making, enhanced monitoring, and a stronger long-term orientation.

This finding is consistent with previous studies conducted in China and the United States, which demonstrate that female directors bring diverse perspectives and contribute to more balanced decision-making processes in corporate governance (Harjoto et al., 2015). Women directors tend to emphasize ethical considerations, long-term sustainability, and stakeholder-oriented strategies, thereby improving the implementation of ESG initiatives.

Similarly, Omenihu et al. (2025) argue that female board members contribute unique perspectives, skills, and ethical orientations that enhance corporate governance practices and promote responsible business decisions. Compared with male directors, who are often associated with higher risk-taking, female directors tend to adopt more cautious, stakeholder-oriented approaches to strategic decision-making.

From the perspective of resource dependence theory, board members represent critical organizational resources that influence strategic decision-making within firms (Wu et al., 2024). A gender-diverse board enhances access to diverse knowledge, expertise, and networks, thereby improving the effectiveness of sustainability strategies and risk management practices.

Furthermore, gender diversity in corporate boards provides broader perspectives and improves the quality of strategic decisions, particularly in relation to sustainability initiatives and corporate governance practices (Jamali et al., 2007). Consequently, the presence of women directors may strengthen firms' ability to implement ESG strategies more effectively, thereby improving financial stability and reducing the risk of financial distress.

Additional Analysis: Before, During, and After the COVID-19 Pandemic

To further examine the robustness of the main findings, this study conducts an additional analysis by dividing the observation period into three phases: before the COVID-19 pandemic (2017–2019), during the pandemic (2020–2022), and after the pandemic (2023–2024). This analysis examines whether the relationship between ESG performance, board gender diversity, and financial distress varies across different macroeconomic conditions.

Model Selection

The appropriate panel-data regression model for each period was determined using the Chow and Hausman tests. The results show in Table 3, that for all three periods, the probability value of the Chow test is 0.000, indicating that the fixed effect model is preferred over the common effect model. Furthermore, the Hausman test yields a p-value below 0.05, confirming that the fixed-effect model is the most appropriate for the periods before, during, and after the COVID-19 pandemic. These findings

indicate that cross-sectional heterogeneity among ASEAN-5 banks is significant, making the fixed-effect model more suitable for capturing differences across banking institutions.

Classical Assumption Tests

Several classical assumption tests were conducted to ensure the validity of the regression models for each period. The normality test results show that the residuals for all three periods are normally distributed, as indicated by probability values greater than 0.05 in the Jarque–Bera test. The histogram distribution of the residuals also forms a bell-shaped curve, confirming the normality assumption.

The multicollinearity test, measured using the Variance Inflation Factor (VIF), indicates that most independent and control variables have VIF values below 10, suggesting no serious multicollinearity problems. Higher VIF values for interaction variables are considered acceptable because interaction terms often lead to higher multicollinearity due to their construction. The heteroscedasticity test indicates that the regression models for the periods before and during the pandemic do not exhibit heteroscedasticity. However, in the post-pandemic period, heteroscedasticity is observed across several control variables, particularly firm size and GDP growth. Despite this issue, the overall model remains suitable for further analysis.

Hypothesis Testing Results

The F-test results indicate that the regression models for all three periods are statistically significant. The F-statistics for the periods before, during, and after the pandemic are 492.42, 577.87, and 299.29, respectively, all with probability values of 0.000. These results suggest that the independent, moderating, and control variables jointly influence financial distress in the ASEAN-5 banking sector.

The t-test results reveal that ESG performance does not have a statistically significant effect on financial distress across the three periods. Similarly, board gender diversity and its interaction with ESG performance also show insignificant effects. Among the control variables, Return on Assets (ROA) consistently shows a significant positive effect in the pre-pandemic and pandemic periods, indicating the importance of profitability in maintaining financial stability. Meanwhile, firm size becomes significant during and after the pandemic, suggesting that larger banks faced greater financial pressures during economic disruptions.

The coefficient of determination indicates a very high explanatory power of the model across the three periods, with adjusted R-square values above 0.99. This suggests that the independent, moderating, and control variables collectively explain most of the variation in financial distress within the observed banking institutions.

Before the COVID-19 Pandemic (2017–2019)

The results show that ESG performance did not significantly influence financial distress before the COVID-19 pandemic. This may be explained by the relatively stable economic conditions in the ASEAN-5 during this period, during which banking institutions maintained stable financial performance and risk management practices.

Furthermore, ESG implementation in ASEAN countries was still at an early development stage between 2017 and 2019. Many sustainable finance regulations and frameworks were only introduced or strengthened around 2019 or later. Consequently, ESG initiatives had not yet produced measurable financial impacts on banking stability.

Additionally, financial distress during this period was more strongly influenced by traditional financial indicators, such as profitability, credit risk, and operational efficiency, rather than by sustainability performance.

During the COVID-19 Pandemic (2020–2022)

During the COVID-19 pandemic, ESG performance also did not show a significant relationship with financial distress. The pandemic created severe economic disruptions, including declining economic activity, increased credit risk, and rising non-performing loans. In this situation, the financial stability of banks was more strongly affected by macroeconomic shocks and government policy interventions, such as loan restructuring programs and monetary stimulus measures. These policies helped mitigate the immediate financial pressures faced by banks during the crisis. Consequently, ESG practices were not the primary determinant of financial distress during this period, as the pandemic was a systemic shock that affected the entire financial system.

After the COVID-19 Pandemic (2023–2024)

In the post-pandemic period, ESG performance also remains statistically insignificant in explaining financial distress. This result may reflect the banking sector's recovery phase, in which financial institutions prioritize operational recovery and financial restructuring following the economic downturn. Another possible explanation is the lag effect of ESG performance, where the benefits of sustainability initiatives are typically realized over a longer time horizon. Therefore, the short observation period after the pandemic may not yet capture the long-term financial impact of ESG implementation.

Similarly, board gender diversity does not significantly moderate the relationship between ESG performance and financial distress in the post-pandemic period. This may be due to the relatively low representation of female directors in banking boards across ASEAN-5, as well as the limited time horizon for observing governance changes after the pandemic.

Conclusion

This study aims to examine the effect of ESG performance on financial distress, with board gender diversity as a moderating variable, in the ASEAN-5 banking industry during 2017–2024. Based on the empirical results obtained from panel data regression analysis, several conclusions can be drawn. First, ESG performance is found to have a significant positive effect on financial distress in ASEAN-5 banking institutions. This finding indicates that higher ESG performance is associated with a higher risk of financial distress. Several factors may explain this relationship. Implementing ESG initiatives often requires substantial financial resources, which may increase operational costs in the short term. In addition, ESG practices in ASEAN banking institutions are still in the early stages of implementation, while the benefits of ESG initiatives tend to emerge over the long term. Furthermore, green financing and sustainability-related lending programs may entail higher credit risk than conventional lending. The findings may also reflect reverse causality, in which firms under financial pressure increase ESG disclosures to enhance their reputations and maintain investor confidence. In some cases, regulatory pressure may also create incentives for symbolic ESG practices or greenwashing.

Second, the results indicate that board gender diversity significantly moderates the relationship between ESG performance and financial distress. The presence of female directors strengthens the effectiveness of ESG practices in improving financial stability. Female board members tend to bring diverse perspectives, ethical considerations, and stakeholder-oriented decision-making, which can enhance corporate governance and improve the implementation of sustainability strategies. Third, an additional analysis across the periods before, during, and after the COVID-19 pandemic shows that ESG performance does not have a significant effect on financial distress in each period, and board gender diversity does not significantly moderate the relationship. These results may be explained by several factors, including the early stage of ESG

implementation in ASEAN countries, the lag effect of sustainability initiatives, and the stronger influence of financial indicators and global economic dynamics on banking stability during periods of economic uncertainty.

This study provides several implications. For banking institutions, the results highlight the importance of carefully implementing ESG strategies to avoid excessive investment that could create short-term financial pressures. For investors, ESG performance should be evaluated from a long-term perspective rather than as an immediate indicator of financial stability. For policymakers, the findings underscore the need to strengthen regulatory frameworks for sustainable finance and corporate governance, including policies that promote greater gender diversity on corporate boards. Finally, this study has several limitations. The observation period is relatively limited, and the analysis focuses only on the banking sector in ASEAN-5. Future research is encouraged to extend the observation period, include broader industries or geographic regions, and incorporate additional variables, theories, or methodological approaches. Further studies may also explore the differences in gender diversity roles within various corporate governance structures, such as one-tier and two-tier board systems, and conduct robustness tests to ensure the consistency of the empirical findings.

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Conflict of Interest

The authors declare no conflict of interest. The founders had no role in the design of the study, the collection, analysis, or interpretation of data, the writing of the manuscript, or the decision to publish the results.