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The Analysis Of ESG Score On Corporate Financial Distress Risk In Emerging And Developed Countries In Asia

Sanamira Aliazahra [1], Zaäfri Husodo [2]
[1,2] Faculty of Economics and Business, University of Indonesia, Indonesia
Email: [1] sanamiraaliazahra@gmail.com

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ABSTRACT

This study aims to examine how Environmental, Social, and Governance (ESG) performance affects the risk of non-financial public corporations in emerging and developed Asian nations over eight years from 2016 to 2023. Refinitiv Eikon data was used to collect data for this study, yielding a result of 208 companies across emerging Asian countries and 143 companies in developed Asian countries. The data were then processed through a regression model, where the dependent variable was the ESG scores and the independent variable was the firm financial distress risk, which was measured by the Altman Z-Score model. The findings of the study prove that improving ESG performance can help reduce firm financial distress risk for emerging Asian countries in the non-manufacturing sector and developed countries in Asia. The better ESG performance can reduce the company's firm financial distress risk from bankruptcy as indicated by the increasingly high Altman Z-Score. The conclusion of the study is that the ESG score is an important factor for companies in sustainable business development.

INTRODUCTION

The drastic changes in climate conditions have significantly impacted economic stability globally, with the Asian region bearing the brunt of these effects. According to the National Oceanic and Atmospheric Administration (NOAA, 2023), the global average temperature has risen by 1.1 degrees Celsius since the late 19th century, with Asia experiencing an approximate increase of 0.20 degrees Celsius per decade. This trend is coupled with Asia-Pacific's substantial contribution to greenhouse gas emissions (IMF, 2021). The significance of this issue lies in the increasing importance of Environment, Society, and Governance (ESG) compliance as a strategic approach to mitigating financial risks in firms within this region. Morgan Stanley (2023) highlights that companies in emerging Asian countries implementing ESG practices demonstrated an average annual growth of 4-6% between 2016 and 2023, underscoring the relevance of ESG compliance in ensuring financial stability. The background of this study is rooted in the growing acknowledgment that ESG compliance positively influences corporate sustainability and value,

particularly in emerging markets. Sustainalytics and MSCI (2022) revealed that firms with high ESG scores experience reduced stock volatility and enhanced financial performance compared to their counterparts with lower ESG scores. Additionally, companies in developed Asian countries such as Japan and South Korea, which adhere to stringent ESG standards, demonstrated greater resilience during financial crises, such as the COVID-19 pandemic (Japan Exchange Group, 2021). In contrast, firms in emerging markets like Indonesia and India struggle to attract foreign investment due to insufficient ESG compliance and reporting transparency (Proklim, 2023). This research addresses the gap in understanding the nuanced impacts of ESG practices on financial risks across both emerging and developed Asian economies.

The relationship between ESG compliance and financial risk is evident through its capacity to reduce financing constraints, enhance risk control, and mitigate agency problems (Fu et al., 2024). For instance, ESG compliance minimizes the financial risks associated with litigation and governance failures. In Asia, this relationship is particularly critical due to the region's diverse economic structures and increasing environmental challenges. Song et al. (2024) emphasized that integrating ESG evaluation improves the prediction accuracy of financial distress, showcasing its relevance in sectors such as mining and energy. The importance of this relationship is amplified in emerging Asian countries, where regulatory and infrastructural limitations make firms more susceptible to risks. On the other hand, developed countries in Asia leverage ESG as a tool to maintain their competitive edge while navigating global sustainability demands (Lozano and Martínez-Ferrero, 2022).

The impact of ESG compliance on financial risk is of significant importance to Asia, given the dichotomy between emerging and developed nations within the region. Emerging countries like Indonesia and the Philippines often grapple with weaker regulatory frameworks and limited stakeholder pressure, making ESG practices a vital risk management tool (Sustainalytics, 2022). In contrast, developed nations such as South Korea and Japan rely on robust governance structures to implement ESG effectively, demonstrating its role in stabilizing financial outcomes. This study seeks to explore these contrasts, providing insights into how ESG compliance drives financial stability across varying economic contexts in Asia.The study aims to examine the extent to which ESG compliance impacts the financial risk of firms in Asia and investigates the mechanisms underlying this relationship. Specifically, it seeks to answer questions such as: How does ESG compliance mitigate financial risk across different sectors in Asia? What are the differences in ESG compliance impacts between emerging and developed economies within the region? This research builds upon the theoretical foundation established by Fu et al. (2024) and Ye & Li (2021), expanding the focus to encompass a broader spectrum of countries and industries in Asia. The eight-year period from 2016 to 2023 provides a comprehensive dataset to analyze trends and outcomes.This study provides two significant contributions to the literature and practice. Firstly, it elucidates the role of ESG assessments in reducing financial risks, highlighting the mechanisms by which high ESG ratings enhance resource allocation, improve governance, and control risks (Song et al., 2024). Secondly, it offers a comparative analysis between emerging and developed countries in Asia, providing a nuanced understanding of how contextual factors influence the effectiveness of ESG practices. The findings will be particularly relevant for policymakers and corporate leaders aiming to integrate ESG strategies into their operations for long-term financial and environmental sustainability.

The paper is organized into sections that sequentially address these objectives. The first section reviews the theoretical framework and literature on ESG and financial risks, followed by an analysis of empirical data from emerging and developed countries in Asia. The results and discussions section compares the impacts of ESG compliance across the two groups, while the conclusion provides actionable recommendations for enhancing ESG practices in the region. This study not only bridges the gap in existing literature but also underscores the strategic importance of ESG compliance in fostering financial stability in Asia's diverse economic landscape.

LITERATURE REVIEW

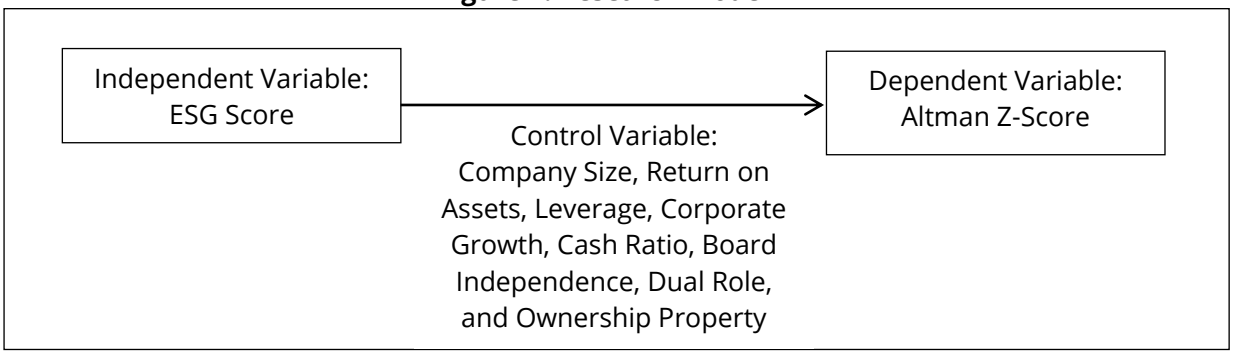
ESG performance has many assessment criteria, one of which is using the ESG score. Aydoğmuş et al. (2022) research states that the ESG score combined has a positive and very significant relationship with company value. Society and Governance also have a very significant positive relationship with company value. However, the Environment has no relationship with company value. Theoretically, these results support stakeholder theory except for the Environment score.

A company's financial risk usually refers to the risk of financial loss that a company faces in its operations, market risk, credit risk, and liquidity risk. In addition to measuring the level of the firm's capital structure, the firm's performance, which is always evaluated at the end of each year, can be used as a basis for a company to measure the condition of their company. The company's situation is a benchmark for the company's implementation of its strategy in the following year. So the company's performance is important for the company to avoid its greatest fear, namely bankruptcy.

In recent years, researchers have been highly interested in finding the correlation between corporate responsibility and corporate financial risk. Arian & Sands (2024) explained that poor corporate carbon emission performance will increase corporate-specific risk and higher cost of capital. Bissoondoyal-Bheenick et al. (2023) showed that ESG commitment can help companies reduce ESG-related risks, provide better protection to investors, support portfolio diversification, and ESG hedging benefits. Fu et al. (2024) described corporate ESG performance as reducing financing constraints, improving risk control, reducing agency problems, and consequently reducing the financial risk of mining companies. Social responsibility and corporate governance contribute to reducing corporate risk, while environmental responsibility has no significant effect. Therefore, investing in ESG can increase corporate value as a sustainable company through value creation for corporate stakeholders.

This study analyzes the effect of ESG scores on corporate risk in emerging and developed countries in Asia. This study uses ESG score variables as independent variables and corporate risk using bankruptcy risk with Altman Z-Score modification measurements as dependent variables.

Figure 1. Research Model



Environmental, Social, and Governance (ESG) Performance

The concept of Environmental, Social, and Governance (ESG) performance was first formalized in the 2006 United Nations Principles for Responsible Investment (PRI) report. It aimed to align corporate financial evaluation with global sustainability goals. ESG criteria, including governance and social responsibility, have gained significant traction, as demonstrated by Aydoğmuş et al. (2022), who found a strong positive correlation between ESG scores and company value, though environmental criteria showed weaker associations. Stakeholder theory underpins this, asserting that companies aligning with ESG principles attract trust from stakeholders and enhance their market appeal. However, gaps remain in understanding the differential impact of environmental factors across industries, necessitating nuanced strategies.

Research has shown that ESG performance not only improves corporate image but also resilience against market instabilities. Chen et al. (2023) highlighted that firms with robust ESG practices exhibit better growth potential and financial health, with larger companies leveraging their resources to meet ESG criteria. Broadstock et al. (2021) emphasized that high ESG-performing stocks showed resilience during crises like COVID-19, signaling ESG as a critical risk mitigation tool. This resilience supports integrating ESG into core business strategies to balance sustainability with profitability, though comprehensive frameworks for industry-specific applications are still developing. ESG performance has many assessment criteria, one of which is by using the ESG score. Research by Aydoğmuş et al. (2022) states that the ESG score combined has a positive and very significant relationship with company value. Society and Governance also have a very significant positive relationship with company value. However, Environment has no relationship with company value. Theoretically, these results support stakeholder theory except for the Environment score.

ESG Performance and Financial Risk

Corporate financial risk encapsulates vulnerabilities like market volatility, liquidity issues, and potential bankruptcy, often exacerbated by poor governance. The Altman Z-score model, introduced in 1983, remains a cornerstone for predicting corporate distress by evaluating key financial ratios (Altman, 2016). While effective, modern complexities necessitate integrating additional factors like ESG performance to refine predictions. Fu et al. (2024) found that high ESG scores reduce financing constraints, improve governance, and lower agency conflicts, consequently mitigating financial risk. Social responsibility and corporate governance contribute to reducing corporate risk, while environmental responsibility has no significant effect.

Further evidence suggests ESG performance aligns with long-term risk management strategies. Citterio & King (2023) explained that financial distress prediction is done by ESG score-based measurement. This is based on the finding that the inclusion of ESG greatly reduces the possibility of misclassifying troubled banks as healthy banks. So that ESG factors are included as potential indicators in advanced prediction models and empirically confirm the importance of including ESG factors in the regulatory authority's oversight mechanism. Habib (2023) explored a sample of US companies from 2016 to 2020. The study explored the relationship between corporate business strategy, ESG performance, and the likelihood of financial distress. One of the findings is that ESG significantly and negatively affects bankruptcy, indicating that companies with better ESG performance are less likely to face bankruptcy. Song et al. (2024) demonstrated that incorporating ESG analysis into financial risk assessments enhances the predictive accuracy of financial distress, particularly in high-risk industries like energy.

Similarly, Cerqueti et al. (2021) identified that lending companies prioritizing ESG-compliant portfolios achieve better risk mitigation, especially during volatile periods. Despite these advancements, Cheng & Huang (2024) noted challenges, as ESG initiatives often incur short-term costs, requiring companies to balance immediate financial pressures with long-term gains. This interplay highlights the need for a dual-focused approach integrating ESG metrics and financial risk models like Altman’s Z-score.

- Hypothesis H1: ESG performance contributes to lowering corporate financial risks.

ESG Performance and Financial Risk in Emerging and Developed Countries

The impact of ESG performance on financial risk varies significantly between emerging and developed markets due to differing economic structures and regulatory environments. This study shows that there are certain differences between the two, in terms of consequences and especially regarding motivating factors. In emerging markets, ESG compliance often encounters obstacles like insufficient governance frameworks and political instability, which can hinder its effectiveness in mitigating risks (Ye & Li, 2021). Conversely, developed countries benefit from established regulatory mechanisms and stakeholder pressures that enhance ESG integration.

Bissoondoyal-Bheenick et al. (2023) emphasized that ESG commitments in developed nations lead to better investor protection and portfolio diversification while emerging markets often face higher systemic risk sensitivity due to structural inefficiencies.

Li et al. (2022) has proven that higher ESG ratings reduce default risks in developed economies, with long-term benefits visible in financial stability and shareholder value. However, in emerging markets, inconsistencies in ESG practices and reporting transparency limit their potential. Curcio et al. (2024) suggested incorporating ESG into credit risk assessments, blending traditional metrics with ESG evaluations to bridge this gap. These findings underscore the importance of tailored ESG strategies that address the unique challenges and opportunities in each market context.Song et al. (2024) highlighted the role of ESG evaluations in reducing financial distress risks, with emerging markets showing distinct vulnerabilities like resource allocation inefficiencies and governance gaps. Developed countries, on the other hand, leverage ESG as a strategic advantage, reflecting their capacity to align sustainability goals with economic stability. While the benefits of ESG are broadly recognized, achieving consistency in its application across regions remains an unresolved issue, presenting a fertile ground for further research.

- Hypothesis H2: ESG scores for developed countries have a lower level of corporate financial distress risk compared to companies in emerging countries.

METHODS

Measurement and Data Collection

This research uses quantitative analysis collected from secondary data to explore the relationship between ESG Performance using ESG Score and Financial Distress Risk using Altman Z-score (1968).

The Dependent Variable

This study uses company financial risk measurement by The Altman (1968) Z-score with the formula:

$$\mathbf{Z = 1.2\ A1 + 1.4\ A2 + 3.3\ A3 + 0.6\ A4 + 0.999\ A5}$$

Information:
Z = Bankruptcy Index *Altman Z-Score*
A1 = Working Capital/Total Assets
A2 = Retained Earnings/Total Assets
A3 = EBIT/Total Assets
A4 = Market Value of Equity/Book Value of Total Liabilities
A5 = Sales/Total Assets

criteria: $Z < 1{,}8$ indicates a bankruptcy prediction, $1{,}8 \leq Z \leq 2{,}99$ indicates a gray area or cannot be predicted whether it will go bankrupt or not, and $Z > 2{,}99$ does not indicate a bankruptcy prediction.

The Independent Variable

ESG performance is used by researchers as an independent variable by using ESG Score. To determine the classification of the ESG score, this study uses data from Refinitiv as shown below:

Table 1. Refinitiv ESG Score range

Score Range	Description
From 0 till 25	Scores in this range imply poor relative ESG performance and insufficient transparency in the public disclosure of relevant ESG data.
From 26 till 50	Scores in this range imply satisfactory relative ESG performance and moderate transparency in the public disclosure of relevant ESG data.
From 51 till 75	Scores in this range imply good relative ESG performance and above average transparency in the public disclosure of relevant ESG data.
From 76 till 100	Scores in this range imply excellent relative ESG performance and high degree transparency in the public disclosure of relevant ESG data.

Source: Refinitiv, 2024

The Control Variable

There are potential factors that may affect corporate financial risk as control variables. This research considers the results of previous studies Fu et al., (2024) with modification. The potential factors used in this research that can influence the company's financial risk as control variables, include Company Size, Return on Assets (ROA), Leverage, Corporate Growth, Cash Ratio, Board Independence, Dual Role, and Ownership Property.

Table 2. Control Variable

Variable	Definition
Company Size	The natural logarithm of total assets.
Return on Assets (ROA)	The ratio of net profit to average total assets.
Leverage	The ratio of total liabilities to (total assets – Net intangible assets – Goodwill net amount).
Corporate Growth	The growth rate of main operating revenue.
Cash Ratio	The ratio of ending cash and cash equivalents to total assets.
Board Independence	The ratio of independent directors to the board size.
Dual Role	A dummy variable that takes the value 1 if the chairman and CEO are the same person and 0 otherwise.
Ownership Property	A dummy variable that takes the value 1 for state-owned companies and 0 for others.

Source: Fu et al., 2024

Research model

Following the study of Fu et al., (2024), this study uses a regression model that modifies the independent, dependent, and control variables. Where the following equation is used:

H1: $$Z_{it} = \beta_0 + \beta_1 ESG_{it} + \Sigma\beta_2 Control_{it} + \epsilon_{it} \quad (1)$$

H2a: $$Z_{it} = \beta_0 + \beta_1 ESGemerging_{it} + \Sigma\beta_2 Control_{it} + \epsilon_{it} \quad (2)$$

H2b: $$Z_{it} = \beta_0 + \beta_1 ESGdeveloped_{it} + \Sigma\beta_2 Control_{it} + \epsilon_{it} \quad (3)$$

The research process involves multiple stages to examine the impact of ESG compliance on company risk. The first stage is descriptive analysis, which summarizes the data using parameters such as mean, mode, median, and standard deviation, displayed in a frequency distribution table. The next step is panel data testing, utilizing various models like the Common

Effect Model (CEM), which is a simple approach but assumes that individual behaviors remain constant over time. However, this model has limitations, which can be addressed by the Fixed Effect Model (FEM) or Random Effect Model (REM). The FEM accounts for individual and time differences, while the REM accommodates these variations with error terms. Significance tests such as the Chow test, Hausman test, and Lagrange Multiplier Test help determine the most appropriate model.

To ensure the reliability of the regression model, classical assumption tests are performed. These include multicollinearity tests using the Variance Inflation Factor (VIF), and heteroscedasticity tests using the Breusch–Pagan tests. Autocorrelation is checked with the Jochmans Portmanteau test, although in panel data, autocorrelation is often disregarded. Hypothesis testing involves the R2 test to assess the explanatory power of the model, the F-test for the overall effect of independent variables, and t-tests to evaluate the impact of each independent variable on the dependent variable. If the significance values meet the expected thresholds, the null hypothesis is rejected, confirming the relationship between the variables.

RESULTS AND DISCUSSION

Descriptive statistics and correlation analysis

Table 3 presents descriptive statistics of all categories. The average zscore variable is 3.779, which indicates that the company has no bankruptcy with that score value and with a standard deviation of 4.361. The minimum value is -2.007, and the maximum value is 46.052. It can be observed that there is significant variation in financial risk among companies. The average ESG score variable is 57.201, indicating that the average ESG score for sample companies is in the score range that implies relatively good ESG performance and above-average transparency in public disclosure of relevant ESG data. The standard deviation or diversity of data from the ESG score is 17.088. Based on the scores of each pillar, it can be seen that the social pillar has the highest value followed by governance and finally the environment. Based on these data, it can be seen that the company cares about social factors, whereas this social pillar includes the company's concern for workforce, human rights, community, and product responsibility. The distribution of other control variables is within the normal range.

Table 3. Descriptive Statistics of Variables

Variable	Obs	Mean	Std. dev.	Min	Max
Zscore	2,808	3.779	4.361	-2.007	46.052
ESG Score	2,808	57.201	17.088	2.168	92.633
Environment	2,808	55.906	22.346	0.000	98.437
Social	2,808	58.591	21.214	1.703	97.378
Governance	2,808	56.566	21.289	2.512	97.368
Company Size	2,808	23.008	1.351	19.101	26.700
ROA	2,808	0.060	0.068	-0.188	0.649
Leverage	2,808	2.385	1.368	0.640	13.770
Corporate Growth	2,808	0.091	0.349	-0.901	11.856
Cash Ratio	2,808	0.098	0.088	0.000	0.682
Board Independence	2,808	0.455	0.136	0.154	0.938
Dual Role	2,808	0.292	0.455	0.000	1.000
Ownership Property	2,808	0.171	0.376	0.000	1.000

The data in Tables 4 and 5 reveals key insights about the characteristics of firms in emerging and developed markets based on various financial and governance metrics. The comparison of descriptive statistics between emerging and developed countries reveals distinct

differences in various financial and ESG (Environmental, Social, Governance) indicators. A key observation is the zscore, which measures bankruptcy risk. In emerging countries, the average zscore is higher (4.440) compared to developed countries (2.819), indicating a lower likelihood of bankruptcy for companies in emerging markets. However, the higher standard deviation (5.130 in emerging countries vs. 2.618 in developed countries) suggests that while the average zscore is favorable, there is greater variability in bankruptcy risk. This variability indicates a higher level of instability and potential for financial distress among companies in emerging markets. Therefore, although companies in emerging countries on average show less bankruptcy risk, they also face a wider range of financial health outcomes, reflecting higher uncertainty in their business environments.

In terms of ESG performance, the average ESG score in emerging countries (58.247) is slightly higher than in developed countries (55.679), indicating that companies in emerging markets generally perform better in terms of environmental, social, and governance factors. However, the greater diversity in the ESG scores of emerging countries (higher standard deviation) points to a more inconsistent approach to ESG practices, with significant differences between individual companies. In comparison, developed countries show more uniformity in their ESG practices, reflecting a more consistent and stable approach to sustainability and corporate governance.Financial indicators also reveal contrasting patterns between the regions. Companies in emerging countries tend to be smaller, but more efficient in managing assets (higher Return on Assets or ROA), and they generally exhibit lower leverage and cash ratios. These characteristics suggest that emerging market companies are more focused on profitability and managing risks with fewer financial resources, although the greater variability in their financial metrics indicates a more volatile business environment. Companies in developed countries, on the other hand, tend to be larger and more stable, with lower variability in financial indicators, suggesting a stronger foundation for long-term growth and sustainability.

Overall, the data suggests that emerging countries offer higher growth potential, with some positive ESG outcomes, but also face greater instability and risk due to the higher variability in financial and ESG performance. In contrast, developed countries exhibit more stability, with consistent and steady improvements in both financial performance and ESG practices, positioning them for long-term resilience and sustainable growth.

Table 4. Descriptive Statistics of Variables Emerging Countries in Asia

Variable	Obs	Mean	Std. dev.	Min	Max
Zscore	1,664	4.440	5.130	-2.007	46.052
ESG Score	1,664	58.247	17.513	2.168	92.633
Environment	1,664	55.471	22.541	0.000	98.388
Social	1,664	60.815	21.395	1.703	97.378
Governance	1,664	57.252	21.737	2.512	97.213
Company Size	1,664	22.753	1.343	19.343	26.700
ROA	1,664	0.070	0.073	-0.159	0.600
Leverage	1,664	2.321	1.251	0.640	12.343
Corporate Growth	1,664	0.087	0.369	-0.901	11.856
Cash Ratio	1,664	0.098	0.098	0.000	0.682
Board Independence	1,664	0.445	0.127	0.154	0.833
Dual Role	1,664	0.257	0.437	0.000	1.000
Ownership Property	1,664	0.204	0.403	0.000	1.000

Table 5. Descriptive Statistics of Variables Developed Countries in Asia

Variable	Obs	Mean	Std. dev.	Min	Max
Zscore	1,144	2.819	2.618	-0.362	20.978
ESG Score	1,144	55.679	16.340	4.046	92.559
Environment	1,144	56.538	22.055	0.000	98.437
Social	1,144	55.356	20.530	1.778	96.724
Governance	1,144	55.568	20.589	8.539	97.368
Company Size	1,144	23.380	1.274	19.101	26.607
ROA	1,144	0.046	0.058	-0.188	0.649
Leverage	1,144	2.479	1.517	0.678	13.770
Corporate Growth	1,144	0.096	0.318	-0.808	3.300
Cash Ratio	1,144	0.099	0.072	0.000	0.492
Board Independence	1,144	0.468	0.147	0.182	0.938
Dual Role	1,144	0.344	0.475	0.000	1.000
Ownership Property	1,144	0.122	0.327	0.000	1.000

Regression Results

Based on the results of the classical assumption test, all models experience heteroscedasticity and autocorrelation problems. Therefore, the fixed effects model robust and random effects model robust methods are used in STATA to overcome heteroscedasticity and autocorrelation issue.

ESG Score on Corporate Financial Distress Risk

Based on the regression results in Table 6 models (1a), (1b), and (1c) show that the effect of ESG scores on corporate risk is insignificant. This indicates that after controlling for other variables such as company size, return on assets, leverage, corporate growth, cash ratio, board independence, dual role, and property ownership, the direct effect of ESG scores on corporate risk becomes less significant. Thus, although ESG scores do not show a significant effect on zscore in the three models, models (1b) and (1c) show stronger results with financial variables such as return on assets and leverage, which have a significant and positive effect on zscore. So the higher the value of the return on assets and leverage ratio of a company, the more the company shows no bankruptcy. This supports the study of Dirman (2020) which states that the higher the return on assets, the higher the financial difficulties measured by zscore. Supports the previous researchers Chintya et al. (2021) and Purba & Muslih (2018) regarding leverage having a significant positive impact on financial distress. On the other hand, company size has a significant and negative effect on zscore. So the larger the company size of a company, the more the company shows bankruptcy. This supports previous research by Ardalan & Askarian (2014) and Chintya et al. (2021), which stated that firm size has a negative effect on financial distress.

Table 6. Impact of ESG Score on Corporate Financial Distress Risk

	Zscore		
	1a	1b	1c
ESG Score	-0.0168	-0.0069	-0.0050
	-1.61	-0.52	-0.47
Company Size		-0.9179**	-0.6152*
		-2.39	-1.73
ROA			14.2812***
			7.24
Leverage			0.9624***

			4.54
Corporate Growth			0.0945
			1.32
Cash Ratio			0.2908
			0.18
Board Independence			-0.3337
			-0.57
Dual Role			0.2063
			0.50
Ownership Property			-0.2296
			-0.67
Constant	4.7410***	25.2964***	15.1586*
	7.18	3.02	1.89
Observation	2,808	2,808	2,808

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

ESG Score on Corporate Financial Distress Risk in Emerging and Developed Countries in Asia

Based on Table 7 which is the result of the regression of ESG scores on corporate risks in emerging countries, it is found that companies in emerging countries show stronger results with financial variables such as return on assets and leverage which have a significant and positive effect on the zscore. Where the higher the value of the return on assets and leverage ratio of a company, it shows that the company is less likely to go bankrupt. This supports previous research that the higher the return on assets, financial distress (Dirman, 2020), and leverage have a significant positive impact on financial distress (Chintya et al., 2021); (Purba & Muslih, 2018).

Table 7. Impact of ESG on Corporate Financial Distress Risk Emerging Asian Countries

	Emerging			
ESG Score	-0.0047			
	-0.29			
Environment		-0.0074		
		-0.62		
Social			-0.0011	
			-0.11	
Governance				-0.0019
				-0.22
Company Size	-0.3912	-0.2871	-0.4548	-0.4661
	-0.73	-0.52	-0.90	-1.12
ROA	19.8767***	19.8224***	19.9087***	19.8982***
	7.07	7.14	7.00	6.93
Leverage	1.3035***	1.3128***	1.2996***	1.2983***
	3.27	3.28	3.26	3.34
Corporate Growth	0.1103	0.1007	0.1115	0.1157

	1.29	1.18	1.29	1.31
Cash Ratio	-2.6017	-2.6357	-2.5687	-2.5694
	-1.03	-1.04	-1.02	-1.03
Board Independence	-0.6389	-0.6404	-0.6972	-0.6489
	-0.79	-0.73	-0.75	-0.76
Dual Role	0.1312	0.1292	0.1446	0.1365
	0.19	0.18	0.20	0.19
Ownership Property	-0.4559	-0.4089	-0.4813	-0.4752
	-0.79	-0.71	-0.85	-0.82
Constant	9.7813	7.5263	11.0538	11.3337
	0.81	0.60	0.96	1.16
Observation	1,664	1,664	1,664	1,664

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Based on the results of the regression of ESG scores on corporate risks in developed countries, the results are more significant when compared to the results in emerging countries. Where the relationship between the influence of ESG scores on corporate risks in developed countries has a higher significance compared to emerging countries which show insignificant results. This can be seen in Table 5 where the ESG score factor and social pillar have a significant and negative effect on company risk. This supports previous research showing that ESG disclosure practices have a negative effect on the risk of financial distress of companies (Adriyani, 2024), social performance has a significant negative relationship with all forms of risk measures based on European companies from all industries (Sassen et al., 2016), and social risk can reduce the company's financial stability and increase the risk of default, thereby incurring default costs (Cohen, 2022). So that companies can economically invest resources to reduce the social damage they cause to the surrounding environment, especially if the damage poses a risk to the survival of the wider community. From the investor's side, they should avoid investing in companies with high social risk. So that ESG disclosure, especially from the social pillar, the company can convey its commitment to implementing good and sustainable governance for the wider community. As with the social pillar, company size also has a significant and negative effect on the zscore. This shows that the larger the company size, the smaller the zscore number. So the relationship indicates that the larger the company, the greater the risk of bankruptcy, which is indicated by a zscore value <1.8. These results support the research of Bhagat et al. (2015) which states that larger companies tend to have a higher risk of bankruptcy due to increased leverage and risk-taking behavior. This is specifically seen in financial institutions where larger size correlates with higher risk taking.

A stronger relationship with variables such as return on assets, leverage, cash ratio, and dual role which have a significant and positive influence on the zscore. These results support previous studies which state that return on assets has a positive relationship with financial performance and is a reliable measure to predict financial stability (Azizan & Abidin, 2024), liquidity measurements such as the cash ratio have been shown to have a positive effect on financial performance and stability (Kazemian et al., 2017), the duality of CEO (management board) / chairman of the board of commissioners (supervisory board) is significantly positively correlated with the debt to equity ratio, which can improve financial stability, higher zscore, and reduce financial stress (Antón & Lin, 2020).

Table 8. Impact of ESG on Corporate Financial Distress Risk Developed Asian Countries.

	Developed			
ESG Score	-0.0082*			
	-1.69			
Environment		-0.0035		
		-1.05		
Social			-0.0064**	
			-2.13	
Governance				-0.0010
				-0.29
Company Size	-0.5870***	-0.8379**	-0.8132**	-0.6706***
	-3.61	-2.54	-2.30	-3.80
ROA	9.2062***	8.6409***	8.6582***	9.2595***
	5.55	5.63	5.62	5.52
Leverage	0.7117***	0.6684***	0.6788***	0.7083***
	7.08	5.06	5.21	6.98
Corporate Growth	0.0733	0.0879	0.0823	0.0775
	0.66	0.78	0.74	0.67
Cash Ratio	2.9977**	2.4498**	2.5059**	2.9611**
	2.40	1.99	2.03	2.40
Board Independence	0.3939	0.0100	0.0420	0.1814
	0.68	0.02	0.08	0.32
Dual Role	0.2299***	0.1330*	0.1350*	0.2271***
	2.63	1.70	1.77	2.67
Ownership Property	-0.0989	-0.0242	-0.0113	-0.1028
	-0.86	-0.15	-0.07	-0.86
Constant	14.2589***	20.2553**	19.7868**	15.9248***
	3.58	2.58	2.37	3.74
Observation	1,144	1,144	1,144	1,144

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Based on the regression results of ESG scores on the risk of financial distress of companies in emerging and developed countries in the manufacturing and non-manufacturing sectors, it was found that companies in emerging countries in the non-manufacturing sector have a significant and positive relationship between ESG scores and the risk of financial distress of companies. So that the higher the ESG score of a company in the non-manufacturing sector, the higher the z-score value, which indicates that the possibility of bankruptcy is smaller. This can be seen in table 9 where the ESG score against the risk level is 0.0144 with a significance level of 0.05. Based on table 9, it can be seen that company size has an influence on the risk of financial distress of companies, especially in the non-manufacturing industry. Where this relationship is characterized by a significant negative relationship, so that the larger the company size in the non-manufacturing industry, the smaller the z-score number. So that this relationship indicates that the larger a company, the greater the risk of financial distress or indicating signs of bankruptcy in the company, which is indicated by a z-score value <1.8. This suggests that while larger firms are often perceived as having more resources to manage financial uncertainty, in reality, they may face greater challenges in managing liquidity, debt management, and operational complexity. Large firms, especially in the non-manufacturing sector, often have more complex organizational structures and more responsibilities, which may exacerbate the risk of bankruptcy characterized by the risk of financial distress.

Table 9. Impact of ESG Score Against Corporate Financial Distress Risk in Emerging and Developed Asian Countries in Manufacturing and Non-Manufacturing Sectors.

	Emerging		Developed	
	Manufacturing	Non-Manufacturing	Manufacturing	Non-Manufacturing
ESG Score	-0.0176	0.0144**	-0.0097	-0.0062
	-0.68	2.02	-0.86	-1.41
Company Size	0.0426	-0.9313***	-0.8420	-0.7195**
	0.04	-2.66	-1.01	-2.60
ROA	21.1299***	15.7510***	13.0977***	6.8371***
	4.82	7.09	3.42	5.29
Leverage	1.7525***	0.9380**	0.3955	0.7659***
	2.96	2.21	0.87	7.33
Corporate Growth	0.7867*	0.0176	0.5550	-0.0639
	1.71	0.30	1.44	-0.76
Cash Ratio	-3.4760	-0.2949	4.2482***	0.7042
	-0.99	-0.16	3.08	0.57
Board Independence	-1.2244	-0.1834	0.9408	-0.6660
	-0.74	-0.30	1.13	-1.20
Dual Role	0.0141	0.0522	0.0653	0.0907
	0.01	0.25	0.31	0.89
Ownership Property	0.5243	-0.6965	0.1886	-0.1049
	0.63	-0.93	0.38	-0.72
Constant	0.3747	21.2210**	20.9073	17.6789***
	0.02	2.61	1.08	2.73
Observation	808	856	416	728

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

CONCLUSION

This study explores the relationship between a company's Environmental, Social, and Governance (ESG) score and its financial distress risk, as indicated by the Altman Z-Score, with a focus on companies in both emerging and developed countries. The Altman Z-Score is a financial metric used to assess the likelihood of a company facing bankruptcy, incorporating factors such as profitability, leverage, and liquidity. The research finds that in emerging countries, especially in the non-manufacturing sector, a higher ESG score is positively correlated with a reduced risk of financial distress, as reflected in an improved Z-Score. This suggests that companies in emerging markets that prioritize strong ESG practices may experience lower financial risk, likely due to improved corporate governance, better risk management, and enhanced investor confidence. In contrast, in developed countries, the study indicates that ESG scores, particularly those related to social factors, have a negative relationship with financial distress risk, meaning that companies with stronger social practices tend to show better financial stability and a lower risk of bankruptcy.

Additionally, the study examines the influence of company size on financial distress risk. It finds a negative correlation between company size and Z-Score, indicating that larger companies, despite their size and resources, are at a higher risk of financial distress. This is somewhat counterintuitive, as large companies are typically considered more stable. However, the research suggests that larger companies often face greater complexity in their operations, higher debt levels, and increased regulatory challenges, all of which could increase their exposure to bankruptcy risk. The study also highlights that key financial variables such as Return on Assets (ROA), leverage, cash ratios, and dual role have a significant positive influence on the Z-Score in developed countries, implying that companies with higher profitability, better liquidity, and optimal debt management are more resilient to financial distress. Companies in developed countries that focus on improving these financial metrics, alongside strong ESG practices, may significantly reduce their risk of bankruptcy.

SUGGESTION

The findings of this study have important implications for both companies and investors. For company managers, especially in emerging markets, the research emphasizes the importance of enhancing ESG scores to reduce financial risk and strengthen their corporate governance. By aligning with global sustainability targets, such as achieving net-zero carbon emissions, companies can not only mitigate risks but also create a long-term value proposition that appeals to stakeholders and investors. For investors, the study offers valuable insights into how ESG scores and the Z-Score can be used as key factors in assessing the financial health and stability of companies, particularly in the non-manufacturing sectors of emerging markets. Investors can use the Z-Score to identify companies with a higher bankruptcy risk, ensuring they make more informed investment decisions. Moreover, the study suggests that investors should consider a company's ESG performance as an indicator of its long-term sustainability and commitment to responsible business practices. The findings indicate that companies with higher ESG scores are more likely to adopt sustainable business models, which align with broader global initiatives, such as the transition to a low-carbon economy.

However, the study also acknowledges certain limitations, including its focus on companies in the non-financial sector over a specific period (2016-2023), and its concentration on companies listed on stock exchanges in eleven Asian countries. Future research could address these limitations by broadening the geographical scope, extending the study period, and exploring other measures of financial risk beyond the Altman Z-Score. Expanding the range of variables considered in the analysis, such as market volatility or other forms of corporate governance, could further enhance the understanding of how ESG practices influence financial risk across different sectors and regions. Additionally, comparing the ESG and financial distress

relationships across more countries and industries could provide deeper insights into the effectiveness of ESG integration in mitigating financial distress risks globally.

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