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Sustainability Performance as a Determinant of Financial Distress

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General Background: Financial distress has become a crucial issue in corporate risk management as more and more companies integrate environmental, social and governance (ESG) practices into their strategic decision-making. **Specific Background:** In emerging markets such as Indonesia, the financial implications of ESG performance are becoming increasingly important amidst evolving institutional and capital market conditions. **Knowledge Gap:** Empirical evidence remains limited regarding whether ESG consistently mitigates financial distress across companies with varying financial conditions in developing countries. **Objective:** This study examines the impact of ESG performance on financial distress amongst companies listed on the Indonesia Stock Exchange. **Method:** Using panel data for the period 2017–2022, financial distress was measured using the Altman Z-score, whilst ESG performance was measured using the Bloomberg ESG score. Panel regression with fixed effects for year and industry, supplemented by matching techniques, was used to address potential endogeneity. **Results:** ESG performance significantly enhances financial resilience by raising the Z-score and reducing the risk of financial distress; however, this effect is only observed in financially stable firms and is not significant for financially vulnerable firms. **Novelty:** This study demonstrates that the financial benefits of ESG are conditional, not universal, thereby challenging the assumption that ESG uniformly enhances corporate resilience. **Implications:** These findings suggest that ESG functions as a long-term risk management strategy, rather than a short-term financial solution, thereby providing valuable insights for managers, investors and policymakers in developing countries.

Keywords: ESG Performance, Financial Distress, Altman Z-Score, Emerging Markets.

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INTRODUCTION

Financial issues are now a key focus in corporate risk management as global pressures mount. Organisations face the challenge of balancing sustainability obligations with financial sustainability. Awareness of non-financial factors, such as environmental impact and governance, is now considered crucial due to their influence on an entity's risk profile and performance (Biduri *et al*., 2023; Gillan *et al*., 2021; Mahendra *et al*., 2025). This shift is driven by evidence that non-financial factors have profound implications for market resilience and long-term capital absorption (Gillan *et al*., 2021; Putrika, 2025). In Indonesia, this topic has become a pressing issue for companies following the Financial Services Authority Regulation No. 51/POJK.03/2017, which requires issuers to be accountable for environmental and social issues. The investment paradigm has also shifted from a short-term orientation towards a more comprehensive risk assessment (Friede *et al*., 2015; Handini & Susilo, 2025). In measuring the threat of potential financial difficulties, the use of the Altman Z-score model, developed by Edward Altman in 1968, is highly relevant due to its ability to map a company's potential for bankruptcy in the medium term based on proven financial statement metrics. Although reliant on quantitative methods and historical financial data, this model continues to demonstrate strong relevance, particularly in assessing the financial health of listed companies.

Mixed results have emerged from empirical studies exploring the relationship between sustainability performance and financial distress. Early studies, largely conducted in developed markets, suggest that improved ESG performance is associated with reduced earnings volatility, a lower probability of bankruptcy risk, and enhanced financial stability. The fact that research findings in emerging markets remain inconsistent indicates that the relationship between sustainability performance and financial distress is highly dependent on a company's operational location. Research by (Cohen, 2023) highlights that high ESG risks can worsen a company's Z-score within the S&P 500 index. Further validation comes from (Pan, 2024), who observed a reduction in credit risk among Chinese banks, and (Vivel-Búa *et al*., 2024), who documented a positive correlation between high ESG ratings and lower default risk in the European context. Overall, these studies indicate that whilst regional variations exist, ESG management remains a vital risk mitigation tool for safeguarding long-term financial health. These findings suggest that sustainability performance functions not only as a reputational signal but also as a mechanism that enhances a company's financial resilience and risk management capacity.

Emerging markets provide a highly informative context for examining the relationship between ESG and financial distress, as the institutional environment, capital market depth, and sustainability infrastructure differ significantly from those in developed countries. Although there is growing pressure for companies to adopt sustainable values, empirical evidence linking ESG performance to the prevention of financial distress in Indonesia remains scarce. There is an urgent need to ascertain whether such commitments truly lead to long-term financial resilience. This study poses the central question: To what extent does sustainability performance influence the risk of financial distress among local firms? By applying the Altman Z-score framework, this study aims to make a robust empirical contribution to the global discourse on corporate sustainability and risk governance.

We analyse a sample of Indonesian public companies using dynamic panel regression and matching techniques to address endogeneity issues. We find that superior ESG performance significantly improves corporate financial health. These findings support the argument that sustainability acts as a bulwark against bankruptcy, although our research also highlights the heterogeneity of impacts, suggesting that the contribution of ESG to financial stability is not universally applicable across all companies. By stratifying the sample based on Altman Z-score classifications—namely safe, grey, and distressed categories—the results show that the positive relationship between ESG performance and financial health is only observed in firms categorised within the safe zone. This finding challenges the dominant assumption in the ESG–financial crisis literature that sustainability performance uniformly enhances financial resilience.

Sustainability Performance

Corporate sustainability performance is essentially the integration of financial profitability, environmental protection, and social responsibility into an organisation's mission and daily operations (Cohen, 2023). This approach is rooted in the triple bottom line concept, where corporate performance is evaluated through ESG metrics encompassing organisational transparency, ethics, and the fulfilment of employee rights (Searcy, 2012; Ahmed *et al*., 2020).

Theoretically, the application of these principles is grounded in legitimacy theory and stakeholder theory. From the perspective of legitimacy theory by (Suchman, 1995), companies use legitimacy as a survival strategy, ensuring that their actions align with the beliefs and value systems held by the wider public. At the heart of this theory is the idea that companies seek to gain social support by demonstrating behaviour that is generally considered acceptable by the wider public. From this theoretical perspective, legitimacy functions as a strategic resource, and companies that fail to meet public expectations are increasingly exposed to the risk of sanctions, reputational damage, and regulatory intervention (Maulana *et al*., 2025; Seefloth *et al*., 2025; Suhardjo *et al*., 2025). By actively engaging in sustainability reporting and achieving commendable sustainability performance, companies can build an image as responsible and trustworthy organisations. Companies utilise the ESG approach to strengthen social ties and enhance public perceptions of business legitimacy. ESG is regarded as a means of fostering trust among markets and the public (Useche *et al*., 2025).

According to stakeholder theory, as originally proposed by (Freeman, 1994), it is based on the assumption that a company's survival depends on its ability to manage relationships with various stakeholder groups whose resources and support are vital to long-term performance (Aslan *et al*., 2021; Seefloth *et al*., 2025). This theory emphasises risk reduction through the alignment of business activities with

stakeholder expectations as a means of building stronger organisational stability. Companies have a responsibility towards shareholders and the wider stakeholder community. Organisations that consistently prioritise the needs of stakeholder groups are more likely to gain a strategic advantage and maintain sustainable financial stability in the future. In this regard, ESG is increasingly recognised as a form of stakeholder responsibility that effectively serves to reduce the risk of bankruptcy (Truong *et al*., 2025). Robust sustainability performance reflects a company's commitment to meeting stakeholder expectations fairly and equitably, whilst sustainability reporting itself serves as a key mechanism for building organisational legitimacy and maintaining transparent communication with relevant parties (Habermann & Fischer, 2023).

Financial Difficulties

Financial distress is a state of financial instability experienced by a company when it is unable to meet its financial obligations in a timely and sustainable manner, which may ultimately lead to bankruptcy if not addressed promptly. According to (Altman, 1968), financial distress constitutes the initial phase of bankruptcy, typically characterised by a significant decline in financial ratios indicating solvency and profitability. According to (Altman *et al*., 2017), the early identification of financial distress is a key foundation for the success of financing strategies, credit assessment, and risk management, particularly in the banking and investment sectors. Credit risk and market confidence are highly dependent on an organisation's ability to mitigate financial disruptions before they escalate into a severe crisis. External pressures, ranging from regulatory changes to global economic challenges, often trigger financial difficulties that become increasingly severe if not properly anticipated.

Previous research by (Useche *et al*., 2025) revealed that companies with high ESG ratings generally have higher Altman Z scores, indicating a lower probability of bankruptcy. This conclusion is reinforced by a study conducted by (Truong *et al*., 2025), which utilised data from US companies to demonstrate that strong ESG performance significantly reduces the risk of financial crisis, particularly through increased institutional ownership and sales growth. The strength of the Altman Z-score lies in its simple methodology yet consistently high predictive accuracy, making it particularly relevant for organisations with limited market data. Consequently, the Altman Z-score remains the method of choice as one of the most widely recognised accounting-based approaches for mapping the risk of financial failure in global markets. In practice, the Z-score serves as an indicator of stability; a higher figure indicates stronger financial resilience and a lower risk of bankruptcy for an organisation. A Z-score above 2.6 is considered a safe zone with low bankruptcy risk; scores between 1.1 and 2.6 fall into a grey zone where financial conditions require vigilance; and scores below 1.1 place the organisation in a crisis zone with high bankruptcy risk.

The Impact of Sustainability Performance on Financial Distress

A company's sustainability performance, as indicated by Environmental, Social, and Governance (ESG) metrics, is increasingly recognised as a factor in assessing its financial resilience. ESG not only represents a company's social and environmental obligations but is also regarded as an effective long-term risk management metric (Chan *et al*., 2017). Stakeholder Theory and Legitimacy Theory provide a relevant framework for explaining how sustainability performance functions as a risk mitigation mechanism, particularly in emerging markets such as Indonesia. In an environment characterised by weak institutional enforcement and high information asymmetry, companies that adhere to social and environmental standards are more likely to gain the trust and support of key stakeholders, including investors, regulators, creditors, and local communities (Maulana *et al*., 2025; Seefloth *et al*., 2025; Suhardjo *et al*., 2025). From a stakeholder perspective, robust ESG practices help companies manage stakeholder expectations and mitigate conflicts that could increase operational and financial risks. From a legitimacy perspective, sustainability performance enables companies to align their activities with prevailing social norms and regulatory expectations, thereby reducing reputational and regulatory risks that could exacerbate financial difficulties. Consequently, in the Indonesian context, ESG practices serve not merely as symbolic compliance but as a strategic mechanism to enhance corporate legitimacy and financial resilience (Aslan *et al*., 2021; Maulana *et al*., 2025).

Previous research indicates that high sustainability performance, as indicated by ESG metrics, is associated with financial distress. Research by (Chan *et al*., 2017; Friede *et al*., 2015; Truong *et al*., 2025) indicates that organisations with high ESG scores generally have higher Z-scores, signifying a reduced likelihood of bankruptcy. Their research utilised ESG data from MSCI and assessed bankruptcy risk via the Altman Z-score, revealing that the positive impact of ESG is more pronounced in competitive industries and for small firms facing external financial constraints. Research by (Useche *et al*., 2025) also confirms that ESG scores are significantly associated with the Altman Z-score, for both ESG performance and disclosure. These results suggest that improved ESG performance can enhance financial health and reduce the probability of bankruptcy. Their study also emphasises that ESG transparency and reporting can strengthen market and investor confidence, which in turn reduces long-term financial risk.

Based on research conducted by (Truong *et al*., 2025) on the influence of each ESG dimension. The Environmental dimension relates to the management of environmental impacts and resource efficiency, which can enhance profitability. The Social dimension relates to labour and customer relations, which influence loyalty and revenue stability. The Governance dimension reflects internal control systems and good governance, which reduce operational and managerial risks. Collectively, ESG performance has a very strong impact as a determining factor in mitigating financial distress, although each ESG dimension has a varying influence on the risk of bankruptcy.

From a stakeholder theory perspective, corporate concern for

social and environmental issues is a key strategy for securing long-term support from key stakeholders. On the other hand, legitimacy theory emphasises that good and responsible governance practices are crucial in helping organisations align themselves with societal expectations and regulatory demands. In line with these theoretical arguments and previous empirical evidence, higher ESG performance is expected to be associated with lower financial distress risk. Based on these grounds, this study develops the following hypotheses:

H1: ESG performance influences a firm's financial distress risk.

H1a: The environmental dimension influences a firm's risk of financial distress.

H1b: The social dimension influences a firm's risk of financial distress.

H1c: The governance dimension influences a firm's risk of financial distress.

METHODS

This study employs a quantitative approach using secondary data. Our initial sample comprised all companies listed on the Indonesia Stock Exchange (IDX) during the period 2013–2022. The sample was selected using purposive sampling, based on data availability and model suitability criteria.

In this study, companies in the financial sector were excluded to reduce research bias. This was done because the unique balance sheet structure of financial institutions makes their leverage and liquidity metrics incomparable with other sectors. Furthermore, the Altman model is not designed for the strictly regulated environment of the financial sector. After excluding the financial sector, the final sample comprised 335 companies.

A company's financial health can be categorised into three groups based on the Altman Z-score. The safe zone is when the Z-score is > 2.99, meaning the company is in a strong financial position. The grey zone is when the Z-score is between 1.81 and 2.99, indicating the company is approaching vulnerability. The distress zone is when the Z-score is ≤ 1.81, signifying a high-risk company. As illustrated in Table 1, the transport and mining sectors fall within the crisis zone. Furthermore, sectors with stable cash flows, such as agriculture, retail, and services, continue to dominate the safe zone. The data reveals a clear disparity, as noted in (Tran *et al*., 2023), which highlights that the construction and property industries face the greatest risk of crisis in their study. Conversely, sectors with more reliable operating cash flows, including Agriculture, Wholesale & Retail Trade, and certain service subsectors, are largely situated in the Safe Zone, in line with (Foerster *et al*., 2017), which indicates that companies with high operating cash flow consistently outperform their peers with low cash flow, with operating cash flow, cash taxes, and capital expenditure providing additional predictive power for financial performance.

[Table 1 about here.]

Variables

The dependent variable in this study is financial distress, which provides a measure of the risk of sustained default based on five business ratios calculated in accordance with the Altman framework. Using the following formula:

$$Z= 1{,}2X_1 + 1{,}4X_2 + 3{,}3X_3 + 0{,}6X_4 + 1{,}0X_5$$

Where X_1 to X_5 represent, respectively, the ratio of working capital to total assets, retained earnings to total assets, EBIT to total assets, market value of equity to book value of total liabilities, and sales to total assets (Altman, 1968). According to commonly used thresholds, a score below 1.88 indicates a high probability of bankruptcy, a score between 1.88 and 2.99 falls within the "Grey Zone" or uncertain condition, and a score above 2.99 indicates a low risk of default ("Safe Zone") (Altman *et al*., 2017; Habermann & Fischer, 2023). The Z-Score has proven accurate in predicting financial distress and is available for almost all listed companies, thereby supporting the formation of a large and robust sample (Vivel-Búa *et al*., 2024).

The Z-Score is widely used in corporate finance research and the prediction of financial distress thanks to its high predictive accuracy, ease of interpretation, and prevalence in large samples of listed non-financial firms (Altman, 1968; Altman *et al*., 2017). The continuous structure of the Z-Score also allows for the analysis of variations in financial health across firms and over time, making it highly suitable for dynamic panel estimations.

The independent variable is ESG performance (ESG_PERFORM), a sustainability score measuring a firm's Environmental, Social, and Governance practices, obtained from the Bloomberg database. The Bloomberg ESG Disclosure Score combines company-level information on environmental, social, and governance practices. The Bloomberg ESG Score is widely used in academic research as it relies on standardised and transparent disclosure metrics and allows for cross-firm and cross-period comparisons (Shaikh, 2022; Xhindole & Tarquinio, 2024).

To isolate the impact of ESG on the Z-Score, this study also includes several control variables: the Debt-to-Assets Ratio (DAR) as a proxy for leverage, the Current Assets to Total Assets Ratio (CASTA) for short-term liquidity, the Tangible Assets Ratio (TANG) and the PPE-to-Total Assets Ratio (PPE) for the proportion of tangible assets, as well as LOSS (a dummy variable for negative earnings), and Firm Size (FSIZE) measured as the natural logarithm of total assets. The complete variable definitions are shown in Table 2. All data were obtained from Bloomberg and Osiris, which served as the primary data sources in this study. Bloomberg provides standardised and systematically collected ESG disclosure data, whilst Osiris offers comprehensive and audited financial reporting information for listed companies.

[Table 2 about here.]

Econometric Approach

We conduct an OLS regression analysis to test our hypotheses in the Indonesian context. OLS is appropriate in this setting due to the ease of interpreting coefficient magnitudes and its facilitation of interaction analysis and separate sample analysis to examine heterogeneous effects. To enhance the precision of our statistical inferences, we use robust standard errors to minimise potential issues related to heteroscedasticity. Furthermore, we include fixed effects for year and industry to reduce potential bias. The regression equation is specified as follows:

$$Zscore_{i,t} = \alpha + \beta_1 ESG_PERFORM_{i,t} + \beta_{2-7} CONTROLS_{i,t} + \beta_8 YEAR_{i,t} + \beta_9 INDUSTRY_{i,t} + \varepsilon_{i,t} \quad \ldots\ldots\ldots\

Resilience Analysis: Dynamic Analysis

We conducted additional tests to examine whether the results were robust by using dynamic regression analysis, as shown in Table 6. In this robustness test, we ran two models: a Z-score regression against lagged ESG performance (lagESG_PERFORM), and a leadZscore regression against current ESG performance (ESG_PERFORM). This approach was adopted to mitigate potential endogeneity issues and to test how ESG influences financial stress over time. Our final sample size was reduced from 335 to 276 observations as the regression required perfectly matched data for both the preceding and subsequent periods.

The results indicate that ESG efforts are strongly associated with better Z-scores, both correlating with current financial health and contributing to improved financial stability in the future. These findings reinforce the view that ESG engagement enhances a firm's resilience to financial stress by improving stakeholder trust and reputation, as discussed in (Boubaker *et al*., 2020; Dyck *et al*., 2019). This is also consistent with stakeholder theory, where ESG efforts strengthen relationships with key stakeholders and contribute to financial sustainability, as well as legitimacy theory, which suggests that responsible practices increase social approval and reduce the risk of distress (Freeman, 1994; Suchman, 1995).

[Table 6 about here.]

Resilience Analysis: Coarsened Exact Matching (CEM)

Although control variables were included in the model, there may still be unobserved differences between the treatment group and the control group. To address this, we applied Coarsened Exact Matching (CEM), a technique that matches the treatment group and the control group based on pre-treatment characteristics, thereby reducing imbalances (Blackwell *et al*., 2009). In this study, we applied CEM using all control variables, and the number of observations decreased from 335 to 324 firm-years due to matching between the treatment and control groups across three strata of control variables. After applying CEM, we conducted a regression analysis with Zscore and ESG_PERFORM, controlling for firm characteristics as well as fixed effects for year and industry.

The results in Table 7 reinforce our main finding that companies prioritising ESG tend to face a lower risk of financial distress. This finding reinforces the robustness of our analysis in addressing self-selection bias related to both unobserved and observed variables, and is consistent with stakeholder theory and legitimacy theory, which highlight that companies engaged in responsible practices strengthen stakeholder trust and social approval, thereby enhancing financial resilience and sustainability (Freeman, 1994; Waddock & Graves, 1997).

[Table 7 about here.]

Additional Analysis

We conducted a sub-sampling analysis across three Z-score zones to test whether a firm's current financial position influences how ESG factors are associated with its risk of distress. We ran separate regressions for each health category by dividing the data into safe, grey, and distress zones. The total sample was divided into 165 firm-years in the safe zone, 65 firm-years in the grey zone, and 105 firm-years in the distress zone.

The results, as shown in Table 8, indicate that ESG performance has a significant positive relationship with the Z-score in the safe zone (coef. = 0.087, t = 3.38), suggesting that companies with stronger ESG practices further strengthen their financial condition (Pham *et al*., 2024). However, in both the grey zone (coef. = −0.007, t = −2.73) and the distress zone (coef. = −0.006, t = −1.85), ESG performance exhibits a significant negative relationship with the Z-Score. These results are consistent with previous studies, which suggest that whilst social performance (SP) or ESG activities may assist distressed firms by reducing bankruptcy risk and supporting recovery, direct financial benefits may not materialise for weaker firms or those in fragile conditions (Godfrey, 2005; Lin & Dong, 2018). This suggests that in weaker firms, ESG investments may actually conflict with existing resource constraints, making it difficult for sustainability efforts to have a significant impact on financial stability in the short term.

[Table 8 about here.]

CONCLUSION

Drawing on stakeholder and legitimacy perspectives, this study examines the relationship between ESG performance and the risk of financial distress among non-financial firms listed in Indonesia. The findings consistently show that better ESG performance correlates with a higher Altman Z-Score, indicating better financial health. This relationship remains robust across baseline regressions, dynamic specifications using lagged ESG, and Coarsened Exact Matching (CEM), suggesting that the results are not driven by endogeneity or sample selection bias. Importantly, the ESG effect is heterogeneous across firms' financial conditions. Our results reveal an important nuance: ESG performance significantly improves financial health only if the firm is already stable. However, for firms in the Grey Zone or Distress Zone, this effect disappears. This suggests that ESG functions as a form of strategic maintenance for healthy firms, rather than as a corrective tool for firms facing acute difficulties.

Our study sharpens the current understanding of stakeholder theory and legitimacy by arguing that a company's operational and financial resources are prerequisites for reaping ESG benefits. Essentially, you need a solid foundation to reap the benefits of sustainability. Whilst we acknowledge limitations such as the qualitative nature of Bloomberg scores and potentially unobserved factors, these results highlight the highly conditional nature of ESG impacts. Future research could further decompose ESG into environmental, social, and governance components to explore their individual contributions, or employ alternative proxies for financial distress for validation.

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LIST OF TABLE

1. Sample Distribution by Industry Code 25
2. Operationalisation of Variables 26
3. Descriptive Statistics 27
4. Correlation Matrix 28
5. Regression Analysis Results – Ordinary Least Squares (OLS) 29
6. Resilience Analysis Results – Dynamic Analysis 30
7. Resilience Analysis Results – Coarsened Exact Matching (CEM) Regression 31
8. Supplementary Analysis: Z-Score Sub-sample 32

***Table 1** / Sample Distribution by Industry Code*

Standard Industrial Classification (SIC)	Safe Zone		Grey Zone		Distress Zone		Total	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
(SIC 0) Agriculture, Forestry and Fisheries	11	100%	0	0%	0	0%	11	100%
(SIC 1) Mining	38	38%	23	23%	38	38%	100	100%
(SIC 2) Construction Industries	50	63%	15	19%	14	18%	79	100%
(SIC 3) Manufacturing	20	61%	9	28%	4	12%	33	100%
(SIC 4) Transportation, Communications and Utilities	16	20%	16	20%	48	60%	80	100%
(SIC 5) Wholesale & Retail Trade	21	92%	1	4%	1	4%	23	100%
(SIC 7) Service Industries	8	89%	1	11%	0	0%	9	100%
Total	165	49%	65	20%	105	31%	335	100%

This table displays industry breakdowns from the Indonesia Stock Exchange sample companies over the period 2013–2022, grouped by Altman Z-Score zone. Zone determination based on the following decimal thresholds: Safe Zone: Z-Score > 2.99; Grey Zone: 1.81 < Z-Score ≤ 2.99; Distress Zone: Z-Score ≤ 1.81.

***Table 2** / Operationalisation of Variables*

Variables	Measures	Sources
Dependent Variable		
Financial Distress (Zscore)	The Altman Z-Score is calculated from a combination of five financial ratios to measure a company's risk of bankruptcy	Osiris
Independent Variable		
Sustainability Performance (ESG_PERFORM)	The company's sustainability performance score, which includes Environmental, Social, and Governance aspects, is taken from Bloomberg data	Bloomberg
Control Variable		
DAR	Ratio of total liabilities to total assets	Osiris
CASTA	Current to total assets ratio	Osiris
TANG	Net fixed assets to total assets ratio	Osiris
LOSS	Dummy variable that is valued at 1 if net income is negative, 0 if positive	Osiris
PPE	Ratio of PPE (property, plant & equipment) to total assets	Osiris
FSIZE	The natural logarithm of total assets	Osiris

This Table outlines all variables that were used in the primary analysis of this study.

***Table 3** / Descriptive Statistics*

	Mean	STD	Minimum	Median	Maximum
Zscore	4.825	5.603	-3.870	2.957	40.166
ESG_PERFORM	47.644	19.258	8.162	46.974	88.861
DAR	0.481	0.229	0.114	0.450	1.898
CASTA	0.141	0.098	0.002	0.123	0.542
TANG	0.395	0.228	0.004	0.406	0.886
LOSS	0.078	0.268	0.000	0.000	1.000
PPE	27.891	3.882	19.031	29.464	32.897
FSIZE	29.171	3.920	20.650	30.891	33.655

This table summarizes the data used in this study. This statistic describes the companies registered in Indonesia during the period 2013-2022, which amounted to 335 observations for the company's year. This test is performed before winsorize data for 1 and 99%.

***Table 4** / Correlation Matrix*

	Zscore	ESG_PERFORM	DAR	CASTA	TANG	LOSS	PPE	FSIZE
Zscore	1.000							
ESG_PERFORM	0.118**	1.000						
	(0.031)							
DAR	-0.462***	-0.029	1.000					
	(0.000)	(0.591)						
CASTA	0.257***	0.236***	-0.480***	1.000				
	(0.000)	(0.000)	(0.000)					
TANG	-0.056	0.046	0.039	-0.304***	1.000			
	(0.308)	(0.397)	(0.481)	(0.000)				
LOSS	-0.210***	0.069	0.326***	-0.147***	0.032	1.000		
	(0.000)	(0.210)	(0.000)	(0.007)	(0.562)			
PPE	0.117**	-0.166***	-0.045	-0.251***	0.163***	-0.039	1.000	
	(0.032)	(0.002)	(0.415)	(0.000)	(0.003)	(0.475)		
FSIZE	0.089	-0.177***	-0.020	-0.217***	-0.082	-0.042	0.960***	1.000
	(0.102)	(0.001)	(0.715)	(0.000)	(0.135)	(0.447)	(0.000)	

This table reports *the results of Pairwise Correlation* for the 8 variables used in this study. This test was carried out on Indonesian companies that were registered non-financial from 2013-2022, amounting to 335 observations of the company's year. p-values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

***Table 5** / Regression Analysis Results – Ordinary Least Squares (OLS)*

	Zscore[1]	Zscore[2]	Zscore[3]	Zscore[4]
ESG_PERFORM	0.053***			
	(3.74)			
ESG_E		0.026**		
		(2.20)		
ESG_S			0.045***	
			(3.82)	
ESG_G				0.035***
				(2.99)
DAR	-7.257***	-7.262***	-7.624***	-6.580***
	(-4.60)	(-4.71)	(-4.90)	(-3.96)
CASTA	2.697	3.805	1.886	5.266
	(0.76)	(1.07)	(0.51)	(1.55)
TANG	0.725	1.037	0.949	1.371
	(0.31)	(0.45)	(0.41)	(0.58)
LOSS	-1.422*	-1.180	-1.478*	-1.498**
	(-1.88)	(-1.53)	(-1.89)	(-1.98)
PPE	0.177	0.170	0.169	0.160
	(0.47)	(0.43)	(0.43)	(0.42)
FSIZE	-0.055	-0.044	-0.074	-0.007
	(-0.15)	(-0.11)	(-0.19)	(-0.02)
Constanta	1.538	2.103	2.273	1.042
	(0.53)	(0.72)	(0.80)	(0.35)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R^2	0.462	0.444	0.461	0.451
Adjusted R2	0.424	0.405	0.423	0.413
N	335	335	335	335

[1]This table reports a key regression analysis of 335 company year observations. This analysis uses winsorized data at levels 1 and 99% and strong standard errors. *t* statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; This column includes regression results with ESG_PERFORM as independent variables with controls and fixed effects of industry and year;
[2-4] This column reports the regression results with the variables of each ESG_E, ESG_S; ESG_G as independent variables, including controls and fixed effects of the industry and year.

***Table 6** / Resilience Analysis Results – Dynamic Analysis*

	Zscore	leadZscore
ESG_PERFORM		0.057***
		(3.50)
lagESG_PERFORM	0.050***	
	(2.96)	
DAR	-6.624***	-7.758***
	(-4.13)	(-4.00)
CASTA	4.519	-2.426
	(1.07)	(-0.57)
TANG	4.231**	1.856
	(2.12)	(0.81)
LOSS	-1.039	-0.671
	(-1.42)	(-0.84)
PPE	-0.432	-0.154
	(-1.44)	(-0.47)
FSIZE	0.560*	0.243
	(1.84)	(0.74)
Constanta	-1.292	1.789
	(-0.41)	(0.54)
Year FE	Yes	Yes
Industry FE	Yes	Yes
R^2	0.482	0.468
Adjusted R^2	0.439	0.424
N	276	276

This table reports the Dynamic Analysis regression result on 276 firm-year observations. This test was done after winsorizing the data for 1 and 99 percent and robust standard error. *z*-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

***Table 7** / Resilience Analysis Results – Coarsened Exact Matching (CEM) Regression*

	Zscore
ESG_PERFORM	0.052***
	(3.630)
Constanta	2.205
	(0.754)
Control	Yes
Industry FE	Yes
Year FE	Yes
R^2	0.455
Adjusted R^2	0.415
N	324

This table reports the CEM regression result on 324 firm-year observations. This test is done after winsorizing the data for 1 and 99 percent and robust standard error. t-values in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01

***Table 8** / Supplementary Analysis: Z-Score Sub-sample*

	Safe zone Zscore	Grey zone Zscore	Distress zone Zscore
ESG_PERFORM	0.087***	-0.007***	-0.006*
	(3.38)	(-2.73)	(-1.85)
DAR	-9.488***	-1.108*	-2.135***
	(-2.62)	(-1.96)	(-5.15)
CASTA	1.346	-1.898**	1.856*
	(0.25)	(-2.39)	(1.87)
TANG	7.049	-2.249***	1.550***
	(1.53)	(-5.08)	(3.95)
LOSS	-5.663***	-0.692***	-0.502**
	(-3.75)	(-4.79)	(-2.37)
PPE	-2.706	0.462***	-0.226***
	(-1.65)	(5.21)	(-3.26)
FSIZE	2.649	-0.432***	0.273***
	(1.57)	(-5.02)	(3.81)
Constanta	1.316	3.896***	0.742
	(0.22)	(5.08)	(1.37)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
R^2	0.459	0.593	0.815
Adjusted R^2	0.375	0.395	0.771
N	165	65	105

This Table reports the results of a split sample regression based on Z-Score zone, categorizing the sample into Safe zone, Grey zone, and Distress zone. All continuous variables are winsorized at the 1st and 99th percentiles. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$