



THE IMPACT OF ESG ON STOCK PRICE VOLATILITY: FIRM SIZE AS MODERATING VARIABLE

(An Empirical Study on Indonesian Manufacturing Companies Listed on the IDX during the Year 2021-2024)

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ABSTRACT

This study aims to analyze the effect of Environmental, Social, and Governance (ESG) disclosure on stock price volatility and examine the role of firm size as a moderating variable. The independent variable in this study is ESG disclosure, measured using content analysis methods, and the dependent variable is stock price volatility. Return on Assets (ROA) and leverage, measured using the Debt to Equity Ratio (DER), serve as control variables.

The population of this study was manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2021-2024 period. The sample selection used a purposive sampling method, with a total of 288 observations meeting the research criteria. The research approach used a quantitative method with panel data regression using the Random Effects model, and MRA to test the moderating role of firm size. A sensitivity analysis is also carried out by decomposing the ESG score into its environmental, social, and governance dimensions.

The results show that although the coefficient for ESG disclosure on stock price volatility is negative, the effect is not statistically significant. This indicates that higher ESG disclosure, when aggregated, does not consistently lead to lower stock price volatility. Firm size also does not strengthen the negative relationship between ESG disclosure and stock price volatility; instead, the interaction terms suggest that any potential risk-reducing effect of ESG tends to weaken as firm size increases. The sensitivity analysis further reveals that only social disclosure has a negative and significant impact on volatility, while environmental and governance disclosures are not significant. These findings imply that investors respond more social-related information than to ESG performance as a whole.

Keywords: ESG disclosure, stock price volatility, firm size, return on assets, debt to equity ratio

INTRODUCTION

Investment is a key driver of economic growth and a crucial means for investors to achieve balanced returns through capital gains and dividends. Every investment carries risks, reflected in stock price volatility, a key indicator in investment decision-making (Rahman et al., 2024). Volatility reflects the uncertainty market, and investors use it to measure how external factors, such as environmental and operational risks, might affect a company's performance (Asgharian et al., 2023).

Environmental issues have recently become a key determinant of stock price behavior and corporate financial stability. Cases such as deforestation, pollution, and overuse of natural resources demonstrate how environmental damage can affect ecosystems and infrastructure, impacting financial stability (Liu et al., 2021). Climate

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change also poses direct risks to assets and operations, with extreme weather conditions potentially reducing asset values, particularly sectors like steel and communication manufacturing. (Liang et al., 2024; Wu, 2025).

As vital natural resources become increasingly scarce, companies find it more difficult to navigate financial and operational risks (Wang & Azam, 2024). Environmental changes such as disrupted water cycles and more frequent extreme weather events have caused major setbacks in supply chains in manufacturing, agriculture, and energy, leading to reduced production and heightened financial pressure for companies. As a result, it is increasingly necessary for business to include natural resource management into their business strategy and risk management plans to maintain long-term stability and profitability (Regmi et al., 2023).

According to S. Chen et al. (2023), ESG investing has seen rapid development over the past decades, especially as many countries have pursued carbon neutrality. Environmental, Social, and Governance (ESG) considerations have become increasingly integral to corporate strategies, shaping firm value, financial outcomes, and risk management approaches. By disclosing ESG data, businesses can attract investment, reduce borrowing costs, strengthen their brand, and increase market value. Some investors are motivated by a genuine concern for social and environmental issues, and others see robust ESG practices as a means to secure better financial returns or improve their public image (Sciarelli et al., 2024).

Companies with strong ESG practices frequently receive lower borrowing costs in the bond market, indicating that solid ESG policies may result in financial benefits (Fiorillo et al., 2025). However, the focus on ESG has also brought difficulties, especially concerning the reliability and consistency of the company's reporting. Without consistent reporting standards and the lack of standardized metrics, it can be demanding for investors to assess and compare companies effectively, which often creates uncertainty about the true extent of a company's ESG performance. Indonesia, ESG disclosure is regulated by the Peraturan Otoritas Jasa Keuangan (PJOK) No. 51/PJOK.03/2017, however, the ESG scores of Indonesian companies are still below the averages of countries such as Singapore, Thailand, and Malaysia (Nareswari et al., 2023).

Several studies have been conducted on the relationship between ESG and stock price volatility, but the results are still debatable. Several studies have shown that ESG disclosure can reduce stock price volatility by increasing investor confidence and strengthening long-term stability (Mechrgui & Theiri, 2024; Moalla & Dammak, 2023; Naseer et al., 2024; Xu et al., 2025). However, other studies show that ESG can increase risk or have a positive impact on stock price volatility (Ridwan & Alghifari, 2025; Tasnia et al., 2021). Furthermore, Sharma et al. (2024) found that companies with both high and low ESG scores experienced similar patterns of stock price volatility, suggesting there is no convincing evidence that ESG scores directly reduce volatility during crisis periods.

Several previous studies have examined the impact of ESG on stock price volatility. However, the results remain inconsistent. Considering these factors, this study adds firm size as a moderator to the relationship between ESG disclosure and stock price volatility. Furthermore, firm size is also closely related to ESG disclosure. Based on findings from Bissoondoyal-Bheenick et al. (2023), larger companies tend to be more active in ESG activities and reporting because the companies are under greater public scrutiny, have greater resources, and face greater reputational risks. Pertiwi & Wiagustini (2020) found a negative relationship between firm size and stock price volatility, indicating that larger companies tend to exhibit lower volatility due to greater capitalization, more diverse business activities, and higher investor confidence. However, Duffee (1995) finds that the positive relationship between stock returns and volatility is most substantial among



small companies and companies with low financial leverage, indicating that smaller companies exhibit greater volatility sensitivity to market movements. Moolkham (2025) and Shakil (2022) report conflicting findings regarding the moderating role of firm size. On the one hand, firm size can strengthen the influence of ESG in reducing stock price volatility. However, within specific sectors and countries, firm size has not been shown to moderate this relationship significantly.

This study aims to reexamine the effect of ESG exposure on stock price volatility and assess whether company size can amplify this effect. This study considers the variability of previous findings and the limited availability of similar research in developing countries. The research focuses on manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2021–2024 period. The manufacturing sector was chosen because it is one of the largest contributors to emissions and environmental impacts, underscoring the urgency of implementing and disseminating ESG (Egilmez et al., 2017).

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Stakeholder Theory

Stakeholder theory opposes the conventional focus on shareholders by emphasizing that a company's long-term success and viability rely on its ability to effectively engage with all parties who have an interest in or are affected by its operations, not solely its investors. According to Freeman (1984) organizations operate within a web of interconnected interests, where each stakeholder group can affect or be affected by corporate actions.

Stakeholders have increasingly high expectations of firms to solve environmental and social issues. ESG disclosure allows businesses to demonstrate their commitment to responsible business practices and satisfy stakeholder expectations (Bolognesi et al., 2025). As companies grow more aware that sustainability is a priority for their stakeholder, they tend to improve the quality of their reporting to comply with regulations and as a strategic move to build trust and maintain social legitimacy. The influence of stakeholder engagement aligns with stakeholder theory, which emphasizes that the expectations and pressures from stakeholders play a critical role in shaping the depth and quality of ESG disclosures (Talan et al., 2024).

Signaling Theory

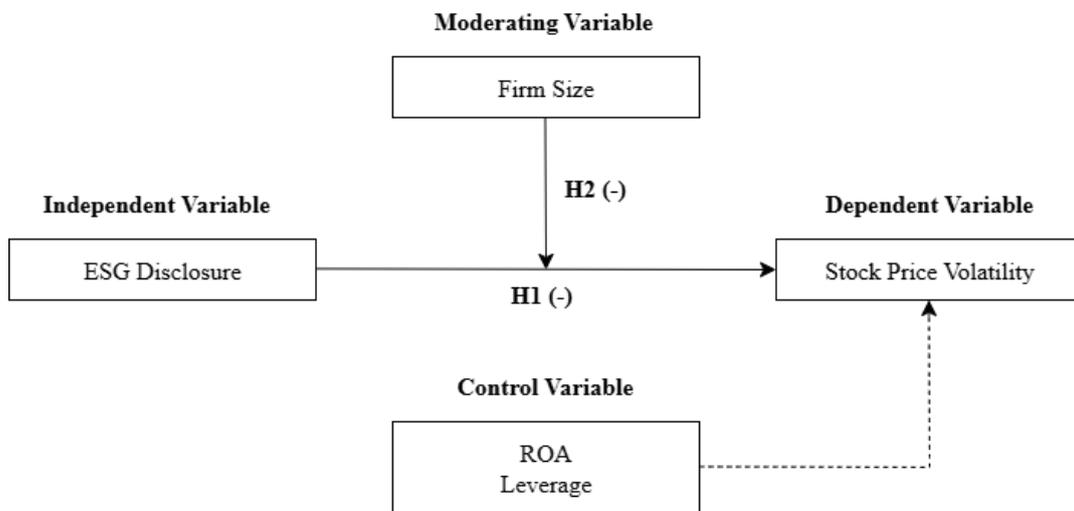
Information is important in helping individuals make decisions, whether in households, businesses, or government. Since each person has a different ability to access and understand information, this leads to unequal knowledge, which is known as information asymmetry. Information asymmetry happens when people hold various pieces of information, leading them to understand a situation differently. Signaling theory, introduced by Spence (1973), explains how information asymmetry can be reduced when one party (the signaler) provides credible information to another party (the receiver). It explains that individuals can use visible actions or characteristics, known as signals, to represent qualities that cannot be directly observed and help others make judgments in situations where direct assessment is not possible. In business, this theory is often applied to financial reporting practices, particularly in assessing the timeliness of disclosures. When firms release information, investors usually view it as either a positive or negative signal about the company's health. Timely and credible disclosures help reduce information asymmetry between firms and investors, enabling more informed decision-making.

Non-financial disclosures, such as ESG disclosures, can serve as positive signals that companies send to external parties to influence decision-making. Investors often perceive information related to environmental, social, and governance practices as a reflection of the company's social responsibility, which can enhance the company's image and contribute to improved performance. The positive signals also help reduce uncertainty and build investor confidence, potentially reducing share price volatility (F. Chen et al., 2024).

Conceptual Framework

The conceptual framework visually illustrates the study's concept to facilitate reader understanding. The study involves dependent, independent, moderating, and control variables.

Figure 1. Conceptual Framework



The Impact of Environmental, Social, and Governance (ESG) Disclosure on Stock Price Volatility

The relationship between ESG disclosure and stock volatility can be reflected through signaling theory. ESG disclosure functions as a positive signal given by the company to investors. In signal theory, Spence (1973) stated that companies that disclose information voluntarily and transparently can reduce information asymmetry and are more likely to be trusted, which can be considered a positive signal to investors. For investors, ESG disclosure may reduce uncertainty and perceptions of investment risk, thereby encouraging a more stable market response. Consistent with stakeholder theory, companies committed to and transparent in ESG disclosure generally experience lower stock price volatility due to increased trust and support from stakeholders (Naseer et al., 2024).

ESG disclosure can reduce the risks faced by the company, such as environmental risks related to ecosystem damage, climate change, or social risks related to human rights or community relations. By disclosing commitment to these issues, companies send a message to investors that effective risk mitigation strategies are in place and that external challenges can be managed. Therefore, stock price volatility tends to decrease as investors become more confident that companies that manage risks well, are committed to sustainability, and disclose non-financial information transparently will be more stable in the long term. This claim is supported by several previous studies, which have found a negative relationship between ESG disclosure and stock price volatility (Gidage & Bhide, 2024; Mechrgui & Theiri, 2024; Moalla & Dammak, 2023; Naseer et al., 2024; Xu et al., 2024). Regarding the analysis, the following initial hypothesis explains:

H1: Environmental, Social, Governance (ESG) disclosure has a negative impact on stock price volatility.

The Impact of Environmental, Social, and Governance (ESG) on Stock Price Volatility with Firm Size as Moderating Variable

According to stakeholder theory, companies are responsible to all parties that affected by the business operations (Freeman, 1984). ESG disclosure is a form of corporate responsibility towards sustainability issues that are relevant to stakeholders. Transparent ESG reporting demonstrated a company's commitment to sustainable and ethical business practices. Following signaling theory, large companies are more likely to disclose information about the company's financial and non-financial aspects than small companies (Watson et al., 2002). By providing clear information on how the issues are managed, companies can reduce investor uncertainty and increase confidence in the company's long-term stability and performance.

The influence of ESG disclosure on stock price volatility may differ depending on firm-specific characteristics, particularly firm size. Larger firms tend to attract more public attention and are subject to greater scrutiny from a wide range of stakeholders. The increased visibility increases pressure for transparent ESG practices and enhances the credibility of disclosures. Large firms generally have more resources and better systems to implement ESG strategies effectively, resulting in more comprehensive and reliable disclosures. Moolkham (2025) found that the impact of ESG in reducing stock price volatility is more substantial in larger firms, because the heightened exposure to stakeholders expectations and reputational concerns. Therefore, this study proposes that firm size strengthen the negative impact of ESG disclosure on stock price volatility. Regarding the analysis, the following hypothesis is proposed:

H2: Firm size strengthens the negative impact of ESG disclosure on stock price volatility.

RESEARCH METHODOLOGY

Variables and Measurement

This study uses dependent, independent, moderating, and control variables. The dependent variable is stock price volatility, while the independent variable is ESG disclosure. Company size is used as a moderating variable, while ROA and leverage are used as control variables. The following are the variables used and their measurements:

Table 1. Variable and Measurement

Variable	Symbol	Measurement
ESG Disclosure	ESG	Total GRI items disclosed (GRI Index Score)
Stock Price Volatility	VOL	$VOL = \sqrt{\frac{\sum_{t=1}^n (R_t - \bar{R})^2}{n - 1}} \times \sqrt{252}$
Firm Size	FSIZE	Log natural(Total Assets)
Return on Assets	ROA	Net Profit/Total Assets
Leverage (Debt to Equity Ratio)	DER	Total Liabilities/Total Equity

Population and Sample

The population of this study is manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2021 to 2024. The sample was selected using a purposive

sampling method, which involves identifying a research sample based on a population that meets certain criteria. The sample selection was based on the following criteria:

1. Firms in the manufacturing industry and listed on the IDX between 2021 and 2024.
2. Manufacturing firms that released annual and sustainability reports from 2021 to 2024.
3. Manufacturing firms that have complete data regarding the variables used in research.

Analysis Method

This study uses multiple regression analysis to test Hypothesis 1. For Hypothesis 2, the researcher applies Moderated Regression Analysis. The test equation is shown below:

Model 1

$$VOL = \alpha + \beta_1 ESG + \beta_2 ROA + \beta_3 DER + \varepsilon$$

Model 2

$$VOL = \alpha + \beta_1 ESG + \beta_2 FSIZE + \beta_3 ROA + \beta_4 DER + \beta_5 ESG * FSIZE + \varepsilon$$

Description:

VOL	: Stock price volatility
ESG	: Environmental, social, and governance disclosure
ROA	: Return on assets
DER	: Debt to equity ratio
FSIZE	: Firm size
ESG*FSIZE	: The interaction between ESG and FSIZE
α	: Constant
ε	: Error

RESULTS AND DISCUSSION

Description of Research Object

The criteria used were companies listed throughout 2021-2024, consistently published both an annual report and a sustainability report for each year, and provided complete observations for every variable.

Table 2. Data Sample Selection

Criteria	Total
Manufacturing firms listed on the IDX between 2021 and 2024	353
Manufacturing firms that not consistently released annual reports and sustainability reports from 2021 to 2024	(248)
Manufacturing firms that not have complete data regarding the variable used in the research	(33)
Research Samples (72 x 4)	288
Total Sample	288

Descriptive Statistics

Table 3. Descriptive Statistics

Variable	N	Minimum	Maximum	Median	Mean	Std. Dev.
ESG	288	0.196078	0.941176	0.549020	0.558177	0.156662
E	288	0.093750	0.968750	0.468750	0.462999	0.203087
S	288	0.050000	0.875000	0.450000	0.423698	0.186455



G	288	0.300000	1.000000	0.966667	0.836574	0.203866
VOL	288	0.062950	2.853597	0.356398	0.417700	0.270073
ROA	288	-0.191000	0.333500	0.057550	0.063744	0.081371
DER	288	0.000100	3.845300	0.324600	0.506513	0.603692
FSIZE	288	26.25000	33.79000	29.15500	29.31316	1.623100

Source: Secondary data, processed (2025)

Based on Table 3, ESG, as the independent variable, has a minimum value of 0.196078 (Sekar Laut Tbk, 2022), indicating low ESG disclosure, and a maximum value of 0.941176 (Lautan Luas Tbk, 2024), indicating very high ESG disclosure. The mean ESG score is 0.558177, with a standard deviation of 0.156662, indicating a medium level of disclosure.

For environmental aspects, the average disclosure is 0.462999 with a standard deviation of 0.203087, indicating a moderate level of environmental disclosure across firms. The lowest score, 0.093750, is shared by four companies, reflecting low transparency in environmental disclosure, while three companies reached the highest score of 0.968750, indicating a strong commitment to environmental-related reporting.

Social disclosure has a mean of 0.423698 and a standard deviation of 0.186455, indicating a moderate level of disclosure. Three companies recorded the lowest social disclosure score of 0.050000, suggesting limited transparency on social issues. In contrast, Lautan Luas Tbk achieved the highest score of 0.875000 in 2024, reflecting a strong commitment to disclosing socially related information.

Governance is the most highly disclosed aspect among Indonesian companies in the sample, with a mean score of 0.836574 and a standard deviation of 0.203866. The lowest governance score is 0.300000 (PT Communication Cable Systems Indonesia Tbk, 2023), indicating relatively low transparency, while 42 companies have a 100% governance disclosure score, suggesting well-established, transparent governance practices, particularly regarding organizational details, employees, and the governance structure.

The dependent variable, stock price volatility, has a minimum value of 0.062950 (PT Merck Tbk, 2024), indicating relatively stable price movements, and a maximum value of 2.853597 (PT Wahana Interfood Nusantara Tbk, 2024), reflecting very high volatility. The mean volatility is 0.417700 with a standard deviation of 0.270073; this relatively low average suggests that most firms exhibit stable stock price movements, although a few experience extreme fluctuations.

The first control variable is return on assets (ROA). Three companies recorded the lowest ROA of -0.191000, indicating losses and an inability to generate profit from total assets, which may signal reduced operational efficiency or financial pressure. The highest ROA is 0.333500 (Multi Bintang Indonesia Tbk, 2024), indicating optimal asset utilization. The mean ROA is 0.063744 with a standard deviation of 0.081371, which can be categorized as medium, reflecting moderate profitability overall.

The second control variable is the debt to equity ratio (DER). The minimum DER is 0.000100 (Akasha Wira International Tbk, 2024), indicating almost no debt and operations financed mainly by equity. The maximum DER of 3.845300 (Krakatau Steel (Persero) Tbk, 2021) indicates a very high reliance on debt. The mean DER is 0.506513 with a standard deviation of 0.603692, suggesting that, on average, firms use a relatively low proportion of debt compared to equity.

The moderating variable is firm size. The minimum firm size is 26.250000 (PT Surya Biru Murni Acetylene Tbk, 2021), indicating relatively small total assets, while the maximum is 33.790000 (Astra International Tbk, 2024), reflecting a very large asset base and a leading market position. The mean firm size is 29.31316 with a standard deviation of



1.623100, which can be classified as medium, indicating that moderately sized firms dominate the sample.

Hypothesis Test Results

Table 4. Multiple Linear Regression Analysis Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.929473	0.126445	-7.350834	0.0000
ESG	-0.188633	0.198035	-0.952523	0.3416
ROA	-1.310330	0.459518	-2.851532	0.0047
DER	0.210019	0.065840	3.189852	0.0016

Source: Output E-views 12, 2025

Based on table 4, the results of the multiple linear regression model 1 in this study are as follows:

$$VOL = -0.929473 - 0.188633 \text{ ESG} - 1.310330 \text{ ROA} + 0.210019 \text{ DER} + \varepsilon$$

Table 5. Moderated Regression Analysis Model 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.051368	0.039924	-26.33427	0.0000
ESG	-0.216323	0.207703	-1.041498	0.2985
FSIZE	-0.047777	0.025251	-1.892097	0.0595
ROA	-1.084583	0.458260	-2.366742	0.0186
DER	0.261654	0.067021	3.904048	0.0001
ESGFSIZE	0.426698	0.125398	3.402746	0.0008

Source: Output E-views 12, 2025

Based on table 5, the equation of model 2 using Moderated Regression Analysis (MRA test) in this study can be seen as follows:

$$VOL = -1.051368 - 0.216323 \text{ ESG} - 0.047777 \text{ FSIZE} - 1.084583 \text{ ROA} + 0.261654 \text{ DER} + 0.426698 \text{ ESGFSIZE} + \varepsilon$$

Sensitivity Analysis

Sensitivity analysis in this research is conducted to examine the robustness of the main results when the specification of the independent variable is changed. In the main regression, the firm’s sustainability performance is represented by the total ESG score as one aggregate index. However, this index is constructed from three dimensions, namely environmental (E), social (S), and governance (G). Therefore, in this section, the ESG total variable is replaced by the three dimensions E, S, and G that are included simultaneously in the model. The purpose of this additional testing is to determine whether the conclusion remains consistent when the measurement of ESG is modified, and to identify which ESG dimension has the strongest effect on stock price volatility.

Table 6. Sensitivity Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.988436	0.142407	-6.940947	0.0000
E	0.271552	0.199694	1.359839	0.1750

S	-0.498997	0.212157	-2.352016	0.0194
G	0.043159	0.162726	0.265226	0.7910
ROA	-1.326088	0.445099	-2.979308	0.0031
DER	0.218443	0.063411	3.444883	0.0007

Source: Output E-views 12, 2025

The findings from the sensitivity analysis indicate that only the social dimension has a significant impact on stock price volatility. This implies that the reduction in volatility is mainly driven by social disclosures, such as responsibilities towards employees, communities, and customers, rather than by environmental or governance disclosures. The non-significant coefficients of the environmental and governance disclosures also help explain why the total ESG score in the regression does not have a significant impact on volatility.

The Impact of Environmental, Social, and Governance (ESG) Disclosure on Stock Price Volatility

The first hypothesis (H1) states that ESG disclosure negatively impacts stock price volatility. Based on the results of model 1 test, shown in table 4, ESG has a coefficient of -0.188633 and a probability value of 0.3416, which is higher than the 5% significance level. Although the sign of the coefficient is line with the expected direction, the effect is not strong enough to be concluded as significant. There the first hypothesis is not supported by the empirical evidence in this study.

The results of the sensitivity analysis support this interpretation. When the overall ESG score is decomposed into environmental, social, and governance dimensions, the regression shows that only the social dimension has a negative, statistically significant coefficient. In contrast, the environmental and governance dimensions do not have a significant impact on volatility. This suggests that the decline in stock price volatility is more closely related to social disclosures, such as information about employees and community engagement, rather than to environmental or governmental disclosures. As a result, when the three dimensions are combined into a single ESG score, the meaningful contribution of the social dimension is overshadowed by the weaker environmental and governance components, and the combined index no longer shows a statistically clear impact on stock price volatility.

Signaling theory explains that transparent disclosure of ESG performance signals a firm's commitment and long-term risk management, which, in turn, can reduce information asymmetry and perceived investor uncertainty and lower stock price volatility. Stakeholder theory also suggests that firms that are more accountable to their stakeholders through ESG practices can build stronger trust and more stable relationships, which ideally support more stable stock prices. The insignificant effect of ESG disclosure found in this study implies that investors in the Indonesian manufacturing sector may not yet fully incorporate ESG information into their risk assessments, or the other factors, such as macroeconomics conditions, profitability, and leverage, play a more dominant role in driving stock price volatility during the research period.

The results of this study are consistent with the findings of Sharma et al. (2024), who examined high and low ESG scores and found that both groups exhibit broadly similar volatility structures over time, suggesting that ESG performance does not result in lower stock price volatility. This study also aligns with Meher et al. (2020) who found that environmental, social, and governance scores are not statistically predictive of historical stock volatility, suggesting that ESG scores cannot serve as reliable explanatory variables for volatility.

The Impact of Environmental, Social, and Governance (ESG) on Stock Price Volatility with Firm Size as Moderating Variable

The second hypothesis (H2) in this study is that firm size strengthens the negative impact of ESG disclosure on stock price volatility. The hypothesis test result in table 5 shows a coefficient of 0.426698 and a probability value of 0.0008, which is statistically significant at the level 5% but carries a positive sign. Based on this result, H2 is rejected because the interaction coefficient has the opposite sign.

The results of this study indicate that, although larger companies theoretically have greater capacity to implement ESG practices and reach a broader range of stakeholders, firm size has not been shown to moderate the relationship between ESG disclosure and reduce stock price volatility. One reason is that investors tend to value the quality and substance of ESG disclosures themselves more than the size of the disclosing company. In other words, even small companies can gain market trust if they are able to convey ESG information in a concrete, credible, and relevant manner. Furthermore, the moderating effect of firm size is also potentially influenced by other variables, such as industry characteristics, the level of media exposure, and the intensity of a company's involvement in public issues, which can further determine how the market receives and responds to ESG information.

The findings of this study are consistent with previous research by Shakil (2022), who also reported that firm size had an insignificant moderating effect on the relationship between ESG and stock price volatility.

CONCLUSION

This study examines the relationship between ESG disclosure and stock price volatility, with firm size as a moderating variable. The study used a sample of manufacturing companies listed on the Indonesia Stock Exchange between 2021 and 2024. Based on the hypothesis testing and the additional sensitivity analysis, this study provides a more detailed picture of the relationship between ESG disclosure and stock price volatility. In the main regression using the aggregate ESG score, the effect of ESG disclosure on volatility is negative but not significant, so the expected risk-reducing role of ESG does not appear clearly at the index level. However, when ESG is decomposed into its environmental, social, and governance dimensions, only the social dimension shows a negative and significant impact on stock price volatility. This indicates that the reduction in volatility in this sample is mainly associated with socially related information, such as how companies treat employees and engage with communities. In this sense, the findings only partially support the implication of signaling and stakeholder theory; investors do not react strongly to ESG performance in general, but do respond to credible social disclosures that reduce uncertainty and help stabilize stock prices.

Firm size does not strengthen the negative effect of ESG disclosure on stock price volatility. The interaction term between ESG and firm size is significant but has a positive sign, indicating that the negative effect of ESG disclosure becomes weaker as firm size increases. Investors appear to focus more on the quality and transparency of a company's ESG disclosure rather than simply the scale of the company disclosing it. As a result, improvements in ESG disclosure may reduce volatility regardless of firm size, indicating that investors evaluate ESG performance based on its real contribution to sustainability and long-term value creation, rather than firm size.

Limitation

This study focused solely on registered manufacturing companies in Indonesia, so the findings reflect the specific conditions and characteristics of that sector. Therefore, the



results of this study cannot necessarily be generalized to other industrial sectors with different operational factors, risk structures, and market dynamics.

Suggestion

1. Future research is recommended to expand the research object beyond the manufacturing sector to include other sectors in the Indonesian capital market and in other countries to obtain a more comprehensive comparison.
2. Future research can add other variables that also have the potential to influence stock price volatility, such as inflation, interest rates, exchange rates, and more specific ESG variables for each environmental, social, and governance component.



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