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Research Article

Linking ESG and EMA to Firm Value: The Moderating Role of Green Innovation

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Abstract: This study investigates the impact of Environmental, Social, and Governance (ESG) and Environmental Management Accounting (EMA) on firm value, with Green Innovation (GI) as a moderating variable. The research is based on secondary data from manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2021 to 2023, analyzed using path analysis with a moderated regression approach in SPSS. The findings reveal that ESG has a significant but negative impact on firm value, suggesting that ESG investments may be perceived as cost burdens in the short term. Meanwhile, EMA does not have a significant effect on firm value, indicating that its role in firm valuation remains unclear. The moderating role of GI does not significantly strengthen the relationship between ESG and firm value, while the interaction between EMA and GI negatively affects firm value, implying that green innovation strategies may introduce additional financial burdens. These findings highlight the complexity of sustainability investments and emphasize the need for a balanced approach to ESG and EMA implementation to optimize long-term firm value. The study contributes to legitimacy and stakeholder theories by demonstrating how sustainability strategies can influence financial outcomes. It provides practical insights for businesses to develop more effective ESG disclosure and EMA implementation strategies that align with investor expectations and long-term firm sustainability.

Keywords: Environmental Management Accounting, ESG, Firm Value, Green Innovation.

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1. INTRODUCTION

The rapid development of the global economy, especially in the financial and investment sectors, encourages companies to pay more attention to sustainability aspects (Kartika et al., 2023). Many environmental problems such as pollution, global warming, and the global financial crisis have forced companies to not only pursue profits but also be environmentally and socially responsible (Fadilah & Rosdiana, 2024). In such a situation, the action that must be taken by the company is environmental management and production processes that apply sustainability principles (Bibi & Narsa, 2022). Environmental management activities include the development of environmental management strategies, the application of environmental evaluation methods, the determination of environmental performance goals, and staff training in the field of environmental protection (Hsu et al., 2021). A company that has carried out environmental management not only because of regulatory demands, but also to gain social legitimacy and maintain its reputation (Xie et al., 2019).

The Indonesian government has issued regulations to all industries, especially manufacturing, to implement sustainable practices. The environment generated in the manufacturing industry contributes greatly in the case of environmental pollution because it

produces waste that is very harmful to human life (Sari et al., 2020). The manufacturing industry is also exposed to social and governance issues from time to time such as community welfare, employment, and occupational safety. If the company does not address this problem, then this can negatively impact the company's value. The value of manufacturing companies is influenced by how they manage environmental, social, and governance (ESG) issues (Chouaibi, 2021). The implementation of a good strategy can improve a company's reputation, attract more investors, and improve financial performance in the long run.

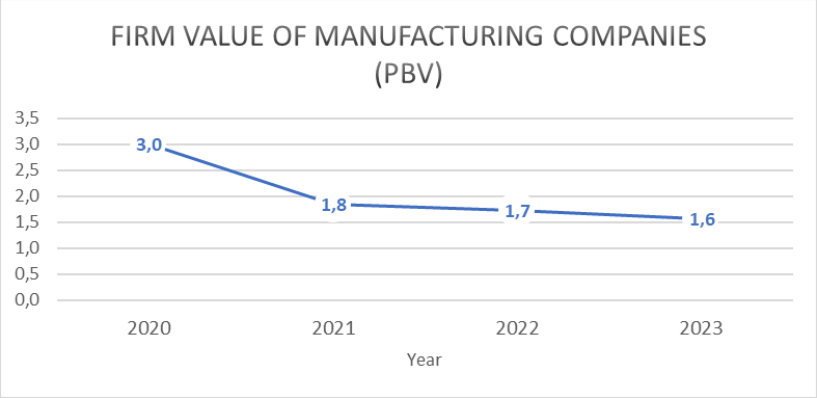

Figure 1. Firm Value

Based on the graph above, it can be seen that the Price to Book Value (PBV) value of manufacturing companies has decreased from 2020-2023. In 2020, PBV was at a high of 3.0 but declined drastically to 1.6 in 2023. This decline shows that the valuation of manufacturing companies in the market has become lower which can be affected by various factors such as global economic conditions, supply chain challenges, and the impact of the COVID-19 pandemic. Additionally, a lower PBV may indicate that stocks in the sector are undervalued. Investors and stakeholders are increasingly demanding companies to adopt sustainability practices to reduce environmental impact and improve good governance (Hartomo & Adiwibowo, 2023). Overall, this trend reflects the great challenge in the manufacturing sector to adjust its business strategy to remain relevant in the market.

With this phenomenon, companies need to implement Environmental, Social, and Governance (ESG) practices. ESG is a set of ways in which companies manage environmental, social, and governance aspects that will affect a company's ability to remain sustainable. The implementation of ESG is not only for environmental sustainability and social welfare, but also to meet ESG discussion standards that are increasingly needed by stakeholders. Companies that have ESG values are more trusted by the public than companies without ESG commitments whose credibility is often questioned (Jeanice & Kim, 2023). Several studies have shown that the implementation of ESG can meet the internal needs of companies with industry concentration and growth moderating the relationship between ESG and firm value, so it is important to consider the industry environment in ESG strategies. Research Wu et al., (2022) demonstrate that ESG performance is important in increasing a company's value and that ownership structures, such as executive and institutional ownership, positively and significantly affect a company's value. Another study found that ESG activities have a positive influence on firm value Chang & Lee, (2022) while Angela & Sari, (2023)This suggests that only governance has a significant positive effect, while environmental and social disclosures do not show significant influence. However, it is different from the findings Behl et al., (2022) which found that environmental and social performance had a significant negative effect on the company's value in the short term.

In addition to ESG, Environmental Management Accounting (EMA) is an important factor in increasing a firm value. EMA involves identifying, collecting, analyzing, and using financial and non-financial information to improve environmental and economic performance. Research Wicaksono & Tarisa, (2022) gave the results that EMA strengthens the positive influence of sustainability performance on firm value and weakens the positive influence of green innovation on firm value. Other research Agustia et al., (2019) revealed that the implementation of EMA can increase the effectiveness of green innovation, thereby further increasing the company's value.

This is inconsistent with the results of the study as previously explained, so it is necessary to study more deeply related to these 3 variables. One way is to add Green

Innovation (GI) as a moderation variable, which is an environmental strategy through business development without violating government regulations (Asni & Agustia, 2022). Research Chouaibi et al., (2021) ESG practices have a positive influence on a firms value, and Green Innovation strengthens this relationship by improving the company's market valuation and financial performance. The application of GI can improve the environmental reputation to gain greater social recognition, and achieve premium price and sales growth of the enterprise (Zhang & Ma, 2021). Companies that are already pioneers in GI strategies, will have a greater chance of achieving and maintaining their competitive advantage (Xie et al., 2019). GI also helps reduce the negative impact of the company's activities and systems on the environment, so that the decisions taken become more effective and efficient in the context of environmental protection (Borsatto et al., 2020).

With increasingly complex environmental and social challenges, companies need to adopt integrated and sustainable strategies to maintain competitive advantage and create long-term value. The implementation of ESG and EMA practices is a strategic step that is not only in accordance with regulations but also increases the social legitimacy and reputation of the company in the eyes of stakeholders. In addition, GI plays an important role as a moderation variable that strengthens the relationship between sustainability performance and firm value. Several previous studies have used various methods to measure the value of companies. Chang & Lee, (2022) using Return on Assets (ROA) and Return on Equity (ROE) found that ESG practices have a significant positive impact on a company's probability. Angela & Sari, (2023) Measuring firm value using Price to Book Value (PBV) found that governance disclosure has a significant influence on firm value, while the environment and society do not show the same effect. Other research by Behl et al., (2022) using Earning per Share (EPS) and Market Value Added (MVA) which shows that environmental and social performance has a significant negative impact on the firm value in the short term. On the other hand Wu et al., (2022) using Tobin's Q and found that ESG performance plays an important role in increasing firm value where executive and institutional ownership structures have a positive and significant effect on company profitability.

Based on the explanation above, this study aims to deepen the understanding of the relationship between ESG, EMA, and firmvalue by adding Green Innovation (GI) as a moderation variable. By implementing GI, companies can mitigate environmental and social risks while strengthening the relationship between ESG and EMA in increasing firm value. To comprehensively measure the value of a company, this study will use Tobin's Q as a tool to measure the value of a company, as it is able to reflect market expectations for tangible and intangible assets.

2. LITERATURE REVIEW

Legitimacy Theory

Legitimacy theory focuses on the interaction between companies and society. This theory says that organizations are part of society so they must pay attention to social norms because conformity with social norms can make companies more legitimate (Suchman, 1995). Dowling & Pfeffer, (1975) said that the legal aspect of society is very important for a business entity, because in legitimacy there are certain norms and limits. The limitations included in the norms and regulations can foster motivation regarding the importance of environmental management activities for companies. On the other hand, companies need external validation regarding the activities, actions, and decisions they take (Khalid et al., 2012). Deegan, C. (2004). argues that the company strives to ensure that external parties can provide and consider their business activities as appropriate and legitimate. Therefore, to gain legitimacy from the community, the company carries out environmental management activities as a form of the company's attention to the community. So that with this legitimacy, the company's image in the eyes of the public and shareholders is getting better, which is expected to have an impact on the company's value (Laksmi & Narsa, 2022). This will have a positive impact on the company's sustainability, so that the company can achieve more optimal performance (Safriani & Utomo, 2020).

Stakeholder Theory

Stakeholder Theory emphasizes that companies as business entities must provide benefits to stakeholders Freeman & David, (1983) Having a stable company survival depends on the extent of stakeholder support for the company, so the company is required to create

a harmonious influence with stakeholders. Donaldson & Preston, (1995)states that stakeholder theory should extend the responsibility of the organization not only to the owner or investor, but also to all interested parties. Gray et al., (1995) Saying that the company needs to get support from every stakeholder for the business activities carried out because this support is very important for the survival of the company. Every business activity carried out by the company is expected to meet the expectations and demands of stakeholders.

One of the efforts that can provide a harmonious relationship between the company and stakeholders is to carry out environmental management practices that are carried out to attract investors to invest their capital in the company, because investors pay attention to this (Angelia & Suryaningsih, 2015). Stakeholder theory holds the view that an organization will consider aspects of the company's sustainability in the long term. Therefore, organizations need management that is more sensitive to the interests and benefits of all stakeholders (Oruc & Sarikaya, 2011). The attention and support given to stakeholders is expected to have a good impact on the company's value both through investment and the provision of capital to the company (Hartomo & Adiwibowo, 2023).

Conceptual Framework

Differing from the findings of the previous study with a number of empirical studies related to ESG and EMA on the value of companies that have been previously stated, the researcher included Green Innovation as a moderation variable. To clarify the relationship between these variables, the following conceptual framework is prepared:

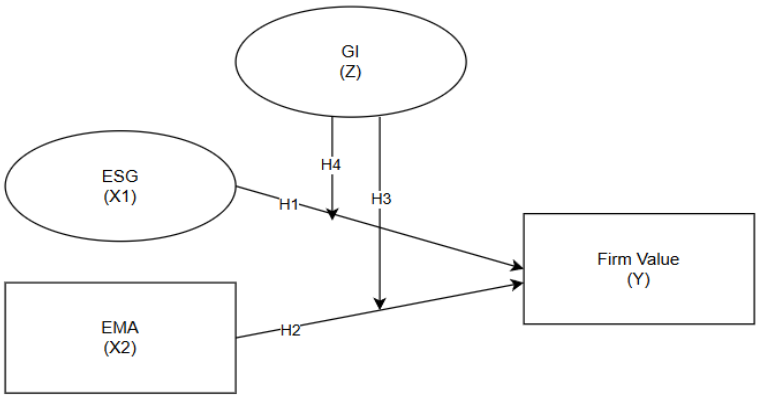

Figure 1. Conceptual Framework

2.1. Hypothesis Development

Effect of ESG on Firm Value

Today, the company believes that cost efficiencies in environmental programs can provide a competitive advantage or improve customer satisfaction (Jeanice & Kim, 2023). This approach is in line with stakeholder theory submitted by Donaldson & Preston, (1995), which states that the company must consider the interests of all stakeholders, including investors, customers, the government, and the public in its operations. This theory emphasizes that business sustainability depends not only on the interests of shareholders, but also on the welfare of all stakeholders. Therefore, ESG (Environmental, Social, and Governance)-based strategies can provide long-term benefits by improving the company's relationship with stakeholders. In addition, legitimacy theory also supports the importance of ESG in increasing firm value. According to this theory, companies must operate in accordance with the norms, values, and expectations of society in order to maintain its social legitimacy (Dowling & Pfeffer, 1975). By disclosing good ESG performance, companies can reinforce positive perceptions from the public and investors, which in turn improves reputation and access to capital and other business opportunities. Good environmental management and transparency in business practices can help companies gain public trust, which has a positive impact on their operational sustainability and profitability.

Issues regarding ESG can have an impact on a company's performance, especially financially. As time goes by, ESG is increasingly gaining attention from investors who care

about corporate ethics and social responsibility, especially in terms of environmental management. ESG has become one of the data for investors in deciding to invest their capital. ESG score that reflect good governance can increase a firm value reflected in rising stock prices, as investors assume most of a company's profits will be returned to them in the form of dividends (Putri, 2021). Revealing ESG provides a positive response from the public so that it can increase the investment obtained. This proves that the company can take advantage of the additional capital to increase production, increase sales, and increase the company's profitability (Safriani & Utomo, 2020).

Various studies that have been conducted, there is evidence that supports the hypothesis that there is a positive influence between ESG performance and firm value. In general, if ESG performance is good, it will show a significant positive relationship with the company's value. Learn Yu & Xiao, (2022)which uses company data in China found that improving ESG performance increases firm value as measured by Tobin's Q, Return on Assets (ROA), and Market-to-Book (MB). Other research Chang & Lee, (2022)with data from companies in South Korea showing that ESG activities have a positive effect on firm value, where industry characteristics also moderate this relationship. In contrast to other studies, Espinosa-Méndez et al., (2023) found that overall ESG performance had a positive relationship with firm value, although this influence was lower under financial constraints and agency costs. Based on this description, the hypotheses that can be formulated are as follows:

H_1: There is a significant positive influence of ESG on Firm Value.

Effect of EMA on Firm Value

EMA is an accounting approach that provides environmental information into a company's accounting system. In this case, EMAs not only assist companies in managing environmental costs but also increase transparency and accountability to stakeholders. Stakeholder theory by Donaldson & Preston, (1995) The company should extend the organization's responsibilities not only to the owner or investor, but also to all interested parties. By implementing EMA, companies can show their commitment to stakeholders through more transparent and accountable reporting related to environmental impacts. According to investors, the implementation of EMA can have a positive impact on the company in controlling the company's survival (Dalila & Khairunnisa, 2024). Companies that have experienced stock price increases are one of the reasons why investors are interested in investing capital in the form of stocks when the company implements EMA well. Endiana & Suryandari, (2020)said that if a company implements a lot of environmental activities that show good transparency and accountability, it can increase the company's value.

In addition, legitimacy theory also supports the importance of EMA in increasing firm value. This theory states that companies must operate in accordance with the norms, values, and expectations of society in order to maintain its social legitimacy (Suchman, 1995). By implementing an EMA, a company can strengthen its social legitimacy by demonstrating a commitment to environmentally responsible business practices. Several studies that have been conducted have shown that EMAs can increase a company's value through various mechanisms. Research by Wicaksono & Tarisa, (2022) shows that EMA can strengthen the positive influence of sustainability performance on firm value. Other research Agustia et al., (2019) found that the EMA has a positive influence on firm value by strengthening the relationship between green innovation and firm value. Moreover Effendi, (2021) said certain aspects of the EMA, such as environmental complaint mechanisms and material inputs have a significant positive influence on the firm value. Based on this description, the hypotheses that can be formulated are as follows:

H_2: There is a significant positive influence of EMA on Firm Value.

GI affects ESG and Firm Value

Several studies prove that strong ESG performance has a positive impact on a firm value, while ESG weaknesses can lower it (Chouaibi, 2021). The moderation role of green innovation between ESG performance and firm value has been empirically supported. Research Liu & Hou, (2023) suggests that green innovation can fully or partially moderate this relationship, meaning that ESG practices drive green innovation which in turn increases firm value. The effect that occurs due to this moderation makes ESG practices have financial benefits. Studies in countries such as China Zheng et al., (2022), supporting the moderation

role of green innovation, emphasizing the importance of combining green innovation and ESG practices to increase firm value.

The theory of legitimacy states that companies must adapt their activities to the norms and expectations of society in order to obtain social recognition Dowling & Pfeffer, (1975). The implementation of ESG and green innovation helps companies achieve legitimacy by strengthening a positive image in the eyes of the public and investors and reducing environmental impact (Deegan, 2004). Meanwhile, stakeholder theory emphasizes that companies are accountable not only to shareholders but also to customers, employees, society, and the government (Donaldson & Preston, 1995). ESG and green innovation increase transparency, social responsibility, and environmental sustainability, ultimately attracting stakeholder support and increasing firm value. Based on this, GI is believed to be able to moderate the relationship between ESG and firm value, the researcher hypothesizes:

H_3: GI moderates the significant influence between ESG and Firm Value.

GI affects EMA and Firm Value

Today, the company has strategic objectives that must be implemented to ensure the company's future sustainability with the support of internal and external stakeholders. Stakeholder theory emphasizes that companies are not only accountable to shareholders, but also to all stakeholders such as customers, employees, society, and the government (Donaldson & Preston, 1995). In this context, EMAs play an important role in providing information regarding environmental costs, which drives GIs and creates a competitive advantage (Sari et al., 2020). In addition, the theory of legitimacy explains that companies need to adapt their activities to societal norms and expectations in order to maintain their social legitimacy (Dowling & Pfeffer, 1975). EMAs and GIs help companies increase transparency as well as demonstrate a commitment to sustainability, which strengthens legitimacy in the eyes of the public and investors.

While green innovation requires a high initial investment, EMAs can help manage this process, improve productivity, product differentiation, and customer loyalty, and ultimately positively impact a company's financial performance (Bibi & Narsa, 2022). Research Yan & Zhang, (2021)said that GIs acting as mediators between EMAs and firm value can have a positive impact on firm value. This effect is supported by empirical evidence showing that GI can fully moderate the relationship between environmental management and environmental performance, as it relates to firm value. Based on this, GI is believed to moderate the relationship between EMA and firm value Researchers hypothesize:

H_4: GI moderates the significant influence between EMA and Firm Value.

3. METHODS

The type of data used in this study is secondary data, this study uses secondary data in the form of audited annual financial statements, Sustainability Reporting of manufacturing companies listed on the IDX in 2021-2023. The data needed in this study was obtained from the website of each company and the IDX website, namely www.idx.co.id.

3.1. Population and Sample

This study uses the population of all manufacturing companies in all subsectors listed on the IDX in 2021-2023. This study uses a purposive sampling technique to determine the number of samples that meet the research criteria. The data collection technique used is a documentation technique, which is the collection of data from official documents prepared by the company and published in the form of financial statements by the Indonesia Stock Exchange. The financial statements used include annual financial statements, in accordance with the issuance period. In addition, data collection is also taken from official documents of the company's sustainability report.

The total population data of manufacturing companies recorded on the IDX in 2021-2023 is 127 companies, of which 108 companies meet the selection criteria and can be observed in the study. Furthermore, the descriptive statistics of the predetermined sample criteria are explained as follows:

Table 1. Population and Sample

Criterion	Sum

A manufacturing company listed on the Indonesia Stock Exchange (IDX) and has a sustainability report in 2021-2023	127
Manufacturing companies that do not yet have a complete sustainability report for the period 2021-2023	(28)
Manufacturing companies that do not have complete financial statements for the 2021-2023 period	0
Manufacturing companies that do not use GRI standards in their sustainability reports for the 2021-2023 period	(63)
Total Company	**36**
Total Observations (3 years x 36 Firm)	**108**

3.2. Operational Definition of Variables and Their Measurement

Firm value is an important concept in finance and economics that reflects how much a company is worth according to various stakeholders. Understanding the company's value is essential for investors, managers, and policymakers to make informed decisions. A company's value is often linked to the stock price, which reflects investors' perception of the company's success and performance (Novatiani, 2021). The valuation is based on the company's level of achievement related to the stock market price and is measured in percentage terms (Agustia et al., 2019). The value of companies in this study is measured using the Q Tobin ratio.

$$Q = \frac{(\mathrm{QS\ x\ P}) + (\mathrm{D} + \mathrm{I}) - \mathrm{CA}}{(\mathrm{TA})}$$

OS = Awesome Parts
P = Stock Price
D = Total Debt
I = Inventory
CA = Current Assets
TA = Total Assets

ESG is a working tool used to evaluate the sustainability and ethical impact of investments in a company or business. ESG criteria are a set of standards for corporate operations that are used by socially conscious investors to screen potential investments. ESG refers to the investment concept and evaluation standards of companies that focus on the environmental, social, and governance performance of the company, not just financial performance (Shen, 2023). ESG assessments are obtained from information reported by the company to the public through the company's official website (Xaviera et al., 2023). Measurements are carried out by following the Global Reporting Initiative (GRI) standard guidelines in reporting its economic, environmental, and social impacts. GRI has identified each item in the ESG aspect, therefore if the item is disclosed in the sustainability report, it is given a value of 1 if it is not rated 0. After that, add up all the value of the items that have been obtained. Calculate the ESG score with the following formula:

$$Score\ ESG = \frac{\Sigma XYi}{ni}$$

Sigma XYi = Number of item ranks
Ni = Total number of GRI items used

EMA is included in the environmental accounting section. EMA practices not only on recording environmental costs, but also on recording all costs and benefits arising from changes in environmental impacts (Agustia et al., 2019). EMA is information that focuses on the cost flow related to the input and output of physical materials in a company's production process to produce a product, aiming to achieve the resource efficiency that the company strives for (Bibi & Narsa, 2022). According to IFAC, (2005), environmental and economic performance management is carried out by developing and implementing accounting systems that are relevant to the environment. While in some companies this can include reporting and auditing, EMA generally includes lifecycle cost calculations, full-cost accounting, benefit assessments, and strategic planning for environmental management. This study uses EMA calculations based on Peters, (2005) which includes production cost indicators, which are formulated as follows:

$$EMA = \frac{Environmental\ cost\ this\ year - Environmental\ cost\ last\ year}{Total\ sales}$$

Green innovation is a production technique and process that aims to reduce the impact of environmental damage, leading to energy efficiency, pollution reduction, waste recycling, and eco-friendly products (Agustia et al., 2019). Green innovation involves change and implementation in organizations focused on reducing environmental impact (Guinot et al., 2022). Green innovation is obtained through the analysis of items in the company's annual report. In the annual report, there are several indicators used to determine whether a company has implemented green innovation. The indicators used in content analysis are as follows:

1. has the goal of reducing the use of resources, water, and energy and improving the efficiency of these resources.
2. It has the benefits of recycled materials, recycling techniques and environmental technology.
3. Prepare an environmental campaign.
4. Having advantageous technology reduces energy, water, and waste.
5. Have a product design to prevent pollution or harmful materials in the production process.
6. Have eco-friendly packaging for old and new products.
7. Have a product design to improve energy efficiency during use.
8. Have a product that uses fewer pollutants or harmful substances (green materials).

3.3. Data Analysis Techniques

The analysis technique used in this study uses path analysis. The path coefficient is calculated by making a structural equation, which is a regression equation that shows the influence of the hypothesis. The form of regression equation that can be formulated based on the hypothesis developed is as follows:

Empirical model 1:

$Y_1 = \alpha + \beta_1X_1 + \beta_2X_2 + e$

Empirical model 2:

$Y_2 = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_1Z + \beta_4X_2Z + e$

Y_1 = Firm Value (FV)
Y_2 = FV model MRA
α = Constant
β_1 β_2 β_3 β_4 = Regression Coefficient
X_1 = ESG
X_2 = EMA
Z = Green Innovation
X_1Z = The interaction between ESG and GI
X_2Z = Interaction between EMA and GI
e = Error

This study uses the influence of moderation variables as a reinforcement of the influence of independent variables on dependent variables in hypothesis testing. The researcher tested the hypothesis with the help of a statistical tool, namely SPSS version 25.

4. RESULTS

Descriptive Statistics

The object of the research comes from companies listed on the Indonesia Stock Exchange (IDX) for the 2021-2023 period. Based on the criteria that have been set by the purposive sampling method, 108 company year data were obtained.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ESG	108	.00	10.00	5.7778	2.82622
EMA	108	-27.00	18.00	-.0370	3.15614
GI	108	.00	8.00	4.3704	1.80649
FV	108	-6.00	19.00	7.4815	5.12185
Valid N (listwise)	108				

Source: data processed, 2024

Based on the results of descriptive statistics, the variables ESG, EMA, GI, and FV each have different characteristics. The ESG variable has an average score of 5.77 and a standard deviation of 2.82, which indicates the level of ESG adoption at an intermediate level with considerable variation between observations. The EMA has an average score of -0.03 with a standard deviation of 3.15, indicating a relatively close to zero value with considerable variation in data. Meanwhile, the GI had an average score of 4.37 with a standard deviation of 1.80 which reflects a moderate level of GI adoption with significant differences across observations. The FV variable had the highest average score of 7.48 among other variables but with a standard deviation of 5.12 which reflects a significant difference in the value of the company among the observations. Overall, the mean provides an overview of the level of implementation or performance of each variable, while the standard deviation reflects the degree of variation between observations.

Classic Assumption Test

Table 3. Classic Assumption Test

Panel A. Normality Test			
Model	Sig.Kolmogorov-Smirnov	Number of samples	
$Y_2 = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3 X_1Z + \beta_4X_2Z + e$	0.180	108	
Panel B. Heteroskedastistas Test			
Variable	Sig.		
ESG	0.251		
EMA	0.745		
GI	0.643	GI	
Panel C. Multicollinearity Test			
Variable	Tolerance	VIF	Conclusion
ESG	0.996	1.004	No multicollinearity
EMA	0.989	1.011	No multicollinearity
GI	0.985	1.015	No multicollinearity
Panel D. Autocorrelation Test			
Durbin Watson			Conclusion
1.860			No autocorrelation

Source: data processed, 2024

The results of the normality test using the Kolmogorov-Smirnov method showed a probability value (Sig.) of 0.180 which was greater than the significance value of 0.05. This shows that the residual data is normally distributed, so the regression model with a sample of 108 companies is feasible because it has met the assumption of normality. In addition, the heteroscedacity test showed that the significance value for the ESG variable was 0.251, the EMA was 0.745, and the GI was 0.643. Since the overall significance value is greater than 0.05, it can be concluded that there is no heteroscedasticity in the regression model. Thus, the homoskedastic assumption is fulfilled, which suggests that the residual variance is constant.

Multicollinearity testing is carried out by looking at tolerance value and VIF (Variance Inflation Factor). The results showed that the tolerance value of ESG variables was 0.996, EMA was 0.989, and GI was 0.985, all of which were more than 0.10. In addition, the VIF value for ESG is 1,004, EMA is 1,011, and GI is 1,015, all of which are less than 10. Based on these results, it can be concluded that there is no symptom of multicollinearity between independent variables. The autocorrelation test using the Durbin-Watson (DW) method showed a value of 1,860. Based on the results of this test, the regression model can be considered worthy of further analysis because it meets the assumptions of normality, homoscedasticity, absence of multicollinearity, and autocorrelation that are at the tolerance limit.

Coefficient of Determination

Table 4. Coefficient of Determination

Type	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.365a	.133	.091	4.88423

Source: data processed, 2025

The results of this model test show that the model has a weak relationship between independent and dependent variables, with low explanatory ability (Adjusted R Square = 9.1%). The ability of independent variables (ESG, EMA) and moderation (GI) is only able to explain 9.1% of the variability of dependent variables. In other words, as many as 90.9% of the ariability of dependent variables is influenced by other factors outside the research model.

Hypothesis Test

Model 1

Table 5. Hypothesis Test Model 1

		Unstandardized Coefficients		
Type		B	Sig.	Conclusion
1	(Constant)	11.850	.000	
	ESG	-.405	.020	Significant
	EMA	-.008	.959	Insignificant

Source: data processed, 2025

Model 2

Table 6. Hypothesis Test Model 2

		Unstandardized Coefficients		
Type		B	Sig.	Conclusion
1	(Constant)	15.555	.000	
	ESG	-.965	.035	
	EMA	2.370	.051	
	GI	-1.349	.043	
	MRA1	.127	.190	Insignificant
	MRA2	-.323	.049	Significant

Source: data processed, 2025

The results of the analysis that has been tested in model 1 show that ESG variables have a significant influence on Firm Value (FV) with a significance value of 0.020 and a negative coefficient of -0.405. This means that even though ESG is significant, ESG improvements will reduce the company's value. In contrast, EMAs individually have no significant influence on firm value with a significant value of 0.959 each. Model 2 shows that ESG moderated by GI (MRA1) is not significant with a significance value of 0.190. In contrast to ESG, the EMA and GI (MRA2) interaction gave a significant result with a value of 0.049 which is almost close to the threshold of insignificance.

F Test

Table 7. F Test

Type	Sum of Squares	Df	Mean Square	F	Sig.
Regression	373.681	5	74.736	3.133	0.011
Residual	2433.282	102	23.856		
Total	2806.963	107			

Source: data processed, 2025

The test results that have been carried out with an F value show a result of 3,133 with a significance value of 0.011. Since this significance value is smaller than the significance level of 0.05, it can be concluded that the regression model is statistically significant. In other words, the independent variables in the model together have a significant influence on the dependent variables.

5. DISCUSSION

Effect of ESG on Firm Value

The results of the research that have been conducted show that ESG has a significant but negative influence on the company's value. This finding contradicts the stakeholder theory which states that companies need to pay attention to the interests of all stakeholders such as investors, customers, employees, and the wider community. ESG

disclosure is not considered a strategic component that is able to increase the company's value in the short term. In addition, these findings support the view that spending on ESG implementation is still considered an additional burden by companies. Investors consider ESG as an additional cost burden that can reduce the operational efficiency of companies. In reality, ESG implementation often requires large investments in terms of green technology, social responsibility, and better corporate governance. This has resulted in a decline in the company's profitability, especially when the benefits are not yet visible in the near future. In line with research Safriani & Utomo, (2020), Behl et al., (2022), Prayogo et al., (2023) and Arofah & Khomsiyah, (2023) which found that ESG significantly negatively impacts firm value. This research is different from what has been done Yu & Xiao, (2022), Chang & Lee, (2022), Espinosa-Méndez et al., (2023) showing significant positive results between ESG and firm value.

Non-financial disclosures such as ESG tend to be seen as fulfilling stakeholder demands that can create conflicts of interest between management and shareholders. Investors prioritize financial information that is directly related to their profits over non-financial aspects such as ESG. One of the main factors that investors are concerned about is the use of capital and assets in generating profits which is assessed through financial ratios such as return on equity (ROE) and return on assets (ROA), while the debt-to-equity ratio (DER) helps investors in understanding the company's debt structure to meet financial obligations. For some investors, the impact of ESG is still considered to be long-term and does not provide direct certainty of financial returns because financial information can be measured concretely to evaluate potential investment returns over a certain period of time.

Effect of EMA on Firm Value

The findings of the study show that EMA does not have a significant influence on the value of companies. This shows that the application of EMA which focuses on reporting and managing environmental aspects in corporate accounting has not been a factor that is considered important by investors in determining investment decisions. Not in line with the research that has been conducted by Hidayat et al., (2024), Effendi, (2021) and Bibi & Narsa, (2022) which results in an EMA has a significant positive effect on the value of the company. Research conducted by Carandang & Ferrer, (2020)This shows that the results of the study that are in line with this research with environmental accounting do not have any significance for the value of the company. In the theory of legitimacy, the failure of the EMA to affect the value of the company can be caused by the lack of public disclosure regarding the environmental management efforts carried out by the company. A theory that emphasizes that companies must operate in accordance with social norms and expectations in order to maintain legitimacy in the eyes of stakeholders. If the practice of EMA is not properly disclosed to investors, then its benefits will not be recognized as a factor that increases the value of the company. Investors who tend to be more interested in results directly can influence profits such as dividends or net income than environmental initiatives reflected through EMAs.

Companies must openly report relevant and measurable environmental data in sustainability reports or annual reports by adopting Integrated Reporting (IR) so that financial and non-financial information can be presented in an integrated manner. In addition, environmental certificates such as ISO 14001, Carbon Disclosure Project (CDP), or Leadership in Energy and Environmental Design (LEED) can also increase competitiveness and attract more investors. Therefore, the integration of EMA with an effective disclosure strategy is essential to build a positive perception among stakeholders.

The effect of GI as ESG, EMA moderation on Firm Value

The results of the moderation test show that green innovation (GI) does not have a significant role in strengthening the relationship between ESG and firm value (FV). These results show that GI is not effective enough as a moderator in strengthening the influence of ESG on firm value. Although the direction of this interaction relationship is positive, the influence is still statistically weak. One compelling reason is that green innovation requires a lot of time and resources, while the benefits are not directly visible in the company's financial statements. The positive impact of GI on firm value takes a long time to be reflected in financial reports, so investors who focus more on short-term results are less likely to see the potential of GI directly. This finding is not in line with research conducted by Zheng et al., (2022) who support the role of green innovation as moderation emphasizes the importance of combining green innovation and ESG practices to increase firm value.

In addition, the interaction between EMA and GI had a significant result (0.049) on the value of the company. However, a regression coefficient of negative value (-0.323) indicates that the GI actually weakens the relationship between EMA and FV. This shows that when companies implement green innovation along with EMA, the impact on the increase in firm value tends to decrease. In contrast to the research conducted by Bibi & Narsa, (2022)which shows that GI can act as a mediator influencing the EMA in improving financial performance. This negative moderation effect can be caused by several factors. First, the high cost of implementing green innovation is a financial burden for companies, especially in short-term investments because it requires large investments in environmentally friendly technologies Yang et al., (2025). Second, investors' perception of green innovations is still diverse by seeing these innovations as additional expenses that do not directly increase profitability, so as not to encourage an increase in the company's market value (Anggraeni et al., 2019). Third, companies lack in their strategies to integrate EMA and green innovations that can make implementation less than optimal, so that the expected benefits are not achieved.

The findings of this study have important implications for company management. First, companies must ensure that spending on ESG is not only focused on regulatory compliance but also provides tangible benefits that can increase long-term profitability. In addition, the implementation of effective strategies in uncovering the positive potential of ESG makes it difficult for investors to see. Second, the implementation of GI must be balanced between long-term costs and benefits and optimized through a good communication strategy to investors so that the company's value is maintained. By highlighting the cost efficiency and risk reduction generated by EMAs, companies can build an image as an environmentally responsible organization while also strengthening their appeal in the eyes of stakeholders.

6. CONCLUSION

This research has made a significant theoretical contribution by highlighting the relationship between ESG, EMA, GI, and firm value. The results of the tests that have been carried out by this study produce 3 main conclusions, first, ESG has a significant influence but has a negative impact on the company's value. This indicates that although ESG is increasingly attracting the attention of stakeholders, its implementation is still considered an additional burden for companies in the short term. Huge spending on sustainability practices such as carbon emission reduction, social responsibility, and improved governance goes hand in hand as it reduces the company's operational efficiency and profitability. Investors tend to focus more on immediate financial results than the long-term benefits of ESG. Second, EMAs have no influence on the company's value. The lack of effective disclosure is one of the reasons for this weak influence on investment decisions. Finally, GIs do not have a significant role as moderators in the relationship between ESG and firm value. However, the interaction between EMA and GI was found to have a significant negative effect on the company's value which gives an indication that the implementation of green innovation can be a financial burden that reduces the company's value in the short term. Overall, the study confirms that while ESG and EMA are important in a company's sustainability strategy, their impact on a company's value still depends on how the company manages and communicates benefits to investors. Therefore, the sustainability strategy implemented must be able to balance between long-term benefits and short-term costs in order to have an optimal positive impact on the company's value.

References

[1] D. Agustia, T. Sawarjuwono, and W. Dianawati, "The Mediating Effect of Environmental Management Accounting on Green Innovation - Firm Value Relationship," Int. J. Energy Econ. Policy, vol. 9, pp. 299–306, 2019. [Online]. Available: https://consensus.app/papers/mediating-effect-environmental-management-accounting-agustia/7327ded7ca7856ef877740ab25816d4e/

[2] T. Angela and N. Sari, "The Effect of Environmental, Social, and Governance Disclosure on Firm Value," E3S Web Conf., vol. 426, 2023. [Online]. Available: https://doi.org/10.1051/e3sconf/202342601078

[3] D. Angelia and R. Suryaningsih, "The effect of environmental performance and corporate social responsibility disclosure towards financial performance (Case study to manufacture, infrastructure, and service companies that listed at Indonesia stock exchange)," Procedia-Soc. Behav. Sci., vol. 211, pp. 348–355, 2015.

[4] Y. Anggraeni, D. Retnoningsih, and A. W. Muhaimin, "The influence of satisfaction on consumer loyalty of Sumawe Coffee Malang," Agric. Socio-Econ. J., vol. 19, no. 1, pp. 19–25, 2019.
[5] S. N. Arofah and Khomsiyah, "Pengaruh Good firm Governance dan Environmental Social Governance terhadap Nilai Perusahaan dengan Kinerja Keuangan Sebagai Moderasi," Jurnal Informatika Ekonomi Bisnis, vol. 5, pp. 125–133, 2023. [Online]. Available: https://doi.org/10.37034/infeb.v5i1.208
[6] N. Asni and D. Agustia, "The mediating role of financial performance in the relationship between green innovation and firm value: evidence from ASEAN countries," Eur. J. Innov. Manag., vol. 25, no. 5, pp. 1328–1347, 2022.
[7] A. Fadilah and Y. Rosdiana, "Pengaruh Environmental, Social dan Governance (ESG) Disclosure terhadap Kinerja Perusahaan," Bandung Conf. Ser.: Accountancy, vol. 4, no. 1, pp. 300–306, 2024. [Online]. Available: https://doi.org/10.29313/bcsa.v4i1.11584
[8] A. Behl, P. S. R. Kumari, H. Makhija, and D. Sharma, "Exploring the relationship of ESG score and firm value using cross-lagged panel analyses: case of the Indian energy sector," Ann. Oper. Res., vol. 313, no. 1, pp. 231–256, 2022. [Online]. Available: https://doi.org/10.1007/S10479-021-04189-8/TABLES/7
[9] Y. S. Bibi and N. P. D. R. H. Narsa, "Pengaruh Enviromental Management Terhadap Kinerja Keuangan Dengan Green Innovation Sebagai Variabel Mediasi," Jurnal Akuntansi Universitas Jember, vol. 20, no. 2, p. 90, 2022. [Online]. Available: https://doi.org/10.19184/jauj.v20i2.34896
[10] J. M. L. S. Borsatto, C. Bazani, and L. Amui, "Environmental regulations, green innovation and performance: An analysis of industrial sector companies from developed countries and emerging countries," BBR. Braz. Bus. Rev., vol. 17, no. 5, pp. 559–578, 2020.
[11] J. Carandang and R. Ferrer, "Effect of Environmental Accounting on Financial Performance and Firm Value of Listed Mining and Oil Companies in the Philippines," Asia-Pac. Soc. Sci. Rev., 2020. [Online]. Available: https://doi.org/10.59588/2350-8329.1287
[12] Y. J. Chang and B. H. Lee, "The Impact of ESG Activities on Firm Value: Multi-Level Analysis of Industrial Characteristics," Sustainability, vol. 14, no. 21, p. 14444, 2022. [Online]. Available: https://doi.org/10.3390/SU142114444
[13] S. Chouaibi and J. Chouaibi, "Social and ethical practices and firm value: the moderating effect of green innovation: evidence from international ESG data," Int. J. Ethics Syst., 2021. [Online]. Available: https://doi.org/10.1108/IJOES-12-2020-0203
[14] S. Chouaibi, J. Chouaibi, and M. Rossi, "ESG and corporate financial performance: the mediating role of green innovation: UK common law versus Germany civil law," Euromed J. Bus., 2021. [Online]. Available: https://doi.org/10.1108/EMJB-09-2020-0101
[15] F. Dalila and K. Khairunnisa, "Pengaruh Family Control, Environmental Management Accounting, dan Profitabilitas Terhadap Nilai Perusahaan," Owner, vol. 8, no. 1, pp. 246–257, 2024. [Online]. Available: https://doi.org/10.33395/owner.v8i1.1836
[16] C. Deegan, Financial Accounting Theory, New South Wales: McGraw-Hill Australia Pty Ltd, 2004. [Online]. Available: https://www.sciepub.com/reference/189405
[17] T. Donaldson and L. E. Preston, "The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications," Acad. Manage. Rev., vol. 20, no. 1, pp. 65, 1995. [Online]. Available: https://doi.org/10.2307/258887
[18] J. Dowling and J. Pfeffer, "Organizational legitimacy: Social values and organizational behavior," Sociol. Perspect., vol. 18, no. 1, pp. 122–136, 1975. [Online]. Available: https://doi.org/10.2307/1388226
[19] B. Effendi, "The Effect of Environmental Management Accounting on Firm Value," Int. J. Soc. Sci., vol. 1, no. 4, 2021. [Online]. Available: https://doi.org/10.53625/ijss.v1i4.707
[20] I. D. M. Endiana and N. N. A. Suryandari, "Perspektif akuntansi manajemen lingkungan dan pengungkapannya pada nilai perusahaan," Jurnal Akuntansi Dan Auditing, vol. 17, no. 1, pp. 80–89, 2020.
[21] C. Espinosa-Méndez, C. P. Maquieira, and J. Arias, "The Impact of ESG Performance on the Value of Family Firms: The Moderating Role of Financial Constraints and Agency Problems," Sustainability, vol. 15, no. 7, 2023. [Online]. Available: https://doi.org/10.3390/su15076176
[22] R. E. Freeman and D. L. R. David, "Stockholders and Stakeholders: A New Perspective on Corporate Governance," J. Manage. Rev., vol. 25, no. 3, pp. 88–106, 1983. [Online]. Available: https://doi.org/10.2307/41165018
[23] R. Gray, R. Kouhy, and S. Lavers, "Corporate social and environmental reporting A review of the literature and a longitudinal study of UK disclosure," Account. Audit. Account. J., vol. 8, no. 2, pp. 47–77, 1995. [Online]. Available: https://doi.org/10.1108/09513579510146996/FULL/XML
[24] J. Guinot, Z. Barghouti, and R. Chiva, "Understanding Green Innovation: A Conceptual Framework," Sustainability, vol. 14, no. 10, p. 5787, 2022. [Online]. Available: https://doi.org/10.3390/su14105787
[25] H. M. Hartomo and A. S. Adiwibowo, "Pengaruh Pengungkapan ESG terhadap kinerja perusahaan (Studi Empiris pada Perusahaan manufaktur yang terdaftar di BEI tahun 2016-2021)," Diponegoro J. Account., vol. 12, no. 4, pp. 1–14, 2023.
[26] I. Hidayat, H. Hamdani, D. Abbas, N. T. Lam, and P. A. Sari, "The Role of Environmental Management Accounting in Mediating Green Innovation to Firm Value: Moderated by Quality Management," Int. J. Energy Econ. Policy, vol. 14, no. 2, 2024. [Online]. Available: https://doi.org/10.32479/ijeep.15869
[27] C.-C. Hsu, N. Quang-Thanh, F. Chien, L. Li, and M. Mohsin, "Evaluating green innovation and performance of financial development: mediating concerns of environmental regulation," Environ. Sci. Pollut. Res., vol. 28, no. 40, pp. 57386–57397, 2021.
[28] C. Jasch and D. E. Savage, "The IFAC International Guidance Document on Environmental Management Accounting," in International Guidance on Environmental Management Accounting, 2008. [Online]. Available: https://doi.org/10.1007/978-1-4020-8913-8_17
[29] J. Jeanice and S. S. Kim, "Pengaruh Penerapan ESG Terhadap Nilai Perusahaan di Indonesia," Owner: Riset Dan Jurnal Akuntansi, vol. 7, no. 2, pp. 1646–1653, 2023.
[30] F. Kartika, A. Dermawan, and F. Hudaya, "Pengungkapan environmental, social, governance (ESG) dalam meningkatkan nilai perusahaan publik di Bursa Efek Indonesia," SOSIOHUMANIORA: Jurnal Ilmiah Ilmu Sosial Dan Humaniora, vol. 9, no. 1, pp. 29–39, 2023. [Online]. Available: https://doi.org/10.30738/sosio.v9i1.14014
[31] D. A. Laksmi and N. P. D. R. H. Narsa, "Corporate Social Responsibility, Capital Intensity, and Tax Aggressiveness: Evidence from Indonesia," AKRUAL: Jurnal Akuntansi, vol. 13, no. 2, pp. 132–143, 2022.

[32] Y. Liu and W. Hou, "ESG, Green Innovation and Corporate Value: A Conditional Process Analysis Moderated by External Pressure," Adv. Econ. Manag. Res., vol. 7, no. 1, pp. 485–503, 2023. [Online]. Available: https://doi.org/10.56028/aemr.7.1.485.2023
[33] F. Mohd Khalid, B. R. Lord, and K. Dixon, "Environmental management accounting implementation in environmentally sensitive industries in Malaysia," 2012.
[34] R. A. Novatiani, "Analysis of Financial Performance Affecting Corporate Value," Turcomat J., vol. 12, no. 8, pp. 1006–1009, 2021. [Online]. Available: https://doi.org/10.17762/TURCOMAT.V12I8.2980
[35] I. Oruc and M. Sarikaya, "Normative stakeholder theory in relation to ethics of care," Soc. Responsib. J., vol. 7, no. 3, pp. 381–392, 2011.
[36] B. Peters, "Employment Effects of Different Innovation Activities: Microeconometric Evidence," SSRN Electron. J., 2011. [Online]. Available: https://doi.org/10.2139/ssrn.604481
[37] E. Prayogo, R. Handayani, and T. Meitiawati, "ESG Disclosure dan Retention Ratio terhadap Nilai Perusahaan dengan Ukuran Perusahaan sebagai Pemoderasi," Reviu Akuntansi Dan Bisnis Indonesia, vol. 7, no. 2, pp. 368–379, 2023. [Online]. Available: https://doi.org/10.18196/rabin.v7i2.18212
[38] H. K. D. Putri, "Pengaruh environmental, social, governance (ESG) disclosure terhadap nilai perusahaan (studi empiris perusahaan manufaktur yang terdaftar di bei)," Univ. Muhammadiyah Malang, 2021.
[39] M. N. Safriani and D. C. Utomo, "Pengaruh Environmental, Social, Governance (ESG) Disclosure Terhadap Kinerja Perusahaan," Diponegoro J. Account., vol. 9, no. 3, 2020.
[40] R. N. Sari, A. Pratadina, R. Anugerah, K. Kamaliah, and Z. M. Sanusi, "Effect of environmental management accounting practices on organizational performance: role of process innovation as a mediating variable," Bus. Process Manage. J., vol. 27, no. 4, pp. 1296–1314, 2020.
[41] Y. Shen, "ESG and Firm Performance: A Literature Review," BCP Bus. Manage., vol. 46, 2023. [Online]. Available: https://doi.org/10.54691/bcpbm.v46i.5107
[42] M. C. Suchman, "Managing Legitimacy: Strategic and Institutional Approaches," Academy of Management Review, vol. 20, no. 3, pp. 571–610, 1995. [Online]. Available: https://doi.org/10.2307/258788
[43] D. D. Wicaksono and B. Tarisa, "The Moderating Role of Environmental Management Accounting on Firm Value," Jurnal Akuntansi Trisakti, vol. 9, no. 2, pp. 14005, 2022. [Online]. Available: https://doi.org/10.25105/jat.v9i2.14005
[44] S. Wu, X. Li, X. Du, and Z. Li, "The Impact of ESG Performance on Firm Value: The Moderating Role of Ownership Structure," Sustainability, vol. 14, no. 21, p. 4507, 2022. [Online]. Available: https://doi.org/10.3390/su142114507
[45] A. Xaviera, A. Rahman, S. Program, S. Akuntansi, F. Ekonomi, D. Bisnis, and P. Artikel, "Pengaruh Kinerja ESG Terhadap Nilai Perusahaan dengan Siklus Hidup Perusahaan Sebagai Moderasi: Bukti Dari Indonesia," Jurnal Akuntansi Bisnis, vol. 16, no. 2, pp. 226–247, 2023. [Online]. Available: https://doi.org/10.30813/JAB.V16I2.4382
[46] X. Xie, J. Huo, and H. Zou, "Green process innovation, green product innovation, and corporate financial performance: A content analysis method," J. Bus. Res., vol. 101, pp. 697–706, 2019.
[47] X. Yan and Y. Zhang, "The effects of green innovation and environmental management on the environmental performance and value of a firm: An empirical study of energy-intensive listed companies in China," Environ. Sci. Pollut. Res., vol. 28, pp. 35870–35879, 2021. [Online]. Available: https://doi.org/10.1007/s11356-021-12761-9
[48] E. Yang, T. Di, and B. Periode, "YUME: Journal of Management Pengaruh Penerapan Strategi Hijau dan Biaya Lingkungan Terhadap Kinerja Keuangan: Studi Pada Perusahaan Sektor," vol. 8, no. 1, pp. 195–204, 2025.
[49] X. Yu and K. Xiao, "Does ESG Performance Affect Firm Value? Evidence from a New ESG-Scoring Approach for Chinese Enterprises," Sustainability, vol. 14, no. 24, p. 16940, 2022. [Online]. Available: https://doi.org/10.3390/su142416940
[50] Q. Zhang and Y. Ma, "The impact of environmental management on firm economic performance: The mediating effect of green innovation and the moderating effect of environmental leadership," J. Clean. Prod., vol. 292, p. 126057, 2021. [Online]. Available: https://doi.org/10.1016/j.jclepro.2021.126057
[51] J. Zheng, M. Khurram, and L. Chen, "Can Green Innovation Affect ESG Ratings and Financial Performance? Evidence from Chinese GEM Listed Companies," Sustainability, vol. 14, no. 14, p. 8677, 2022. [Online]. Available: https://doi.org/10.3390/su14148677