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Determining Factors of Green Competitive Advantage and Its Impact on Stock Return: Evidence from Industrial Companies in Indonesia

Nuryatun[A], Etty Murwaningsari[B*], Sekar Mayangsari[C], Namungo Hamzah[D]

Abstract

The objectives of this study are to analyze (1) the effect of the Green Innovation, and Green Environmental Ethics on green competitive advantage, (2) how social responsibility moderates the effect of Green Innovation, and Green Environmental Ethics on green competitive advantage, and (3) how green competitive advantage affects stock returns. The quantitative research method uses content analysis and secondary data. The population in this study are companies listed on the Indonesia Stock Exchange (IDX-IC) that publish sustainability reports and annual reports during the 2022-2023 period. Non-financial industry companies, where companies publish annual reports audited by independent auditors and sustainability reports of companies listed on the Indonesia Stock Exchange for 2022-2023, are taken from the IDX-IC (IDX Industrial Classification). Using a purposive sampling method, 375 data sets were obtained over two years of research, resulting in a total of 750 panel data observations. Data processing used Stata with Moderated Regression Analysis. The results of this study indicate that Green innovation and green environmental ethics have a significant positive effect on green competitive advantage. Social responsibility strengthens the influence of green innovation, and green environmental ethics on green competitive advantage. Green competitive advantage has a significant positive effect on stock returns. Sensitivity tests demonstrate that innovation is superior to legacy models, indicating the need for additional green innovation. The expansion test for green process innovation did not significantly impact green competitive advantage. This study confirms that Green competitive advantage has been shown to increase stock returns, thus providing financial value for environmentally-oriented strategies. The government needs to focus on monitoring the implementation of environmental innovation and ethics, while investors can use green competitive advantage as an indicator in fundamental stock analysis. This study has several limitations, including the use of content analysis, which poses potential subjectivity, as data interpretation depends on the researcher's understanding. The presence of outliers also reduces the number of valid samples. Furthermore, the use of linear regression has certain assumptions and results are sensitive to

[A]*Faculty of Economics and Business, Universitas Trisakti, Jakarta, Indonesia, Email: 221022214007@std.trisakti.ac.id*
[B]*Faculty of Economics and Business, Universitas Trisakti, Jakarta, Indonesia,* ***Corresponding Author Email****: etty.murwaningsari@trisakti.ac.id*
[C]*Faculty of Economics and Business, Universitas Trisakti, Jakarta, Indonesia, Email: sekar_mayangsari@trisakti.ac.id*
[D]*College of Economics and Management, Kampala International University, Uganda, Email: hamzah.namungo@kiu.ac.ug*

changes in the data or model. This research contributes to the development of Green Innovation measurements that support corporate sustainability.

Keywords: *Green Competitive Advantage, Green Innovation, Green Environmental Ethics, Stock Returns.*

INTRODUCTION

Climate change is a serious global issue characterized by increasing temperatures and extreme weather due to human activities. The industrial sector is one of the most significant contributors to greenhouse gas (GHG) emissions, including Indonesia, which recorded emissions of 238.1 million tons of CO_2e in 2022 (Kurniawan et al., 2024; Mayapada & Lyu, 2025). The record-high temperature in October 2023 emphasized the climate crisis in Indonesia (Gui et al., 2024). This condition requires the industry to be more concerned about sustainability to maintain competitiveness in an increasingly climate-conscious global market (Octavio & Setiawan, 2025).

The industry's transformation towards low carbon drives the importance of Green Innovation and integrated sustainability performance reporting (Anugrah et al., 2025; Qian et al., 2025). According to (Alhemimah et al., 2025), Green Competitive Advantage is a company's strategic ability to create excellence through operational efficiency, innovation, and environmental ethics that are not easily imitated. (L. Wang & Hussin, 2024) argue that Green Innovation is seen as capable of encouraging the implementation of environmentally friendly practices in all aspects of the organization, including the supply chain, culture, and marketing strategy. Meanwhile, (Baah et al., 2024) describe that Green Environmental Ethics reflects the company's moral commitment to reducing environmental impacts and maintaining its reputation. In order to strengthen the influence of these two aspects on Green Competitive Advantage, Social Responsibility is positioned as a moderating variable that strengthens the synergy between Green Innovation and Green Environmental Ethics (Padilla-Lozano & Collazzo, 2022).

However, previous studies have found inconsistent findings regarding Green Innovation and Environmental Ethics' influence on competitive advantage. Thus, this difference is often caused by variations in industrial sectors and the intermediary variables used (Baah et al., 2024). Then, several studies have analyzed the role of Social Responsibility as a moderator in this relationship. On the other hand, many previous studies have not comprehensively controlled the company's external factors or internal attributes that can affect the ability to adapt to sustainability challenges (Akhter et al., 2023; Yue et al., 2025).

This research contributes to developing a theoretical model by integrating Social Responsibility as a moderator variable between integrated reporting, Green Innovation, and Green Environmental Ethics

in forming a Green Competitive Advantage. In addition, this study analyzes the effect of green advantage on company stock returns as a form of the economic value of sustainability strategy. This study also controls internal company factors through two control variables: leverage, company size, audit quality, and profitability towards Green Competitive Advantage, and leverage, company size, profitability, and company age towards Stock Return. By including control variables such as financial structure, business scale, audit quality, and company age, this model is expected to provide a more robust, less biased, and relevant analysis in the context of the transition to a low-carbon economy (Akhter et al., 2023; Padilla-Lozano & Collazzo, 2022). A recent study by (Turzo et al., 2022) describes that integrated reporting (IR), which consists of financial and non-financial information, plays an essential role in communicating sustainability efforts and increasing corporate legitimacy.

LITERATURE REVIE

Theoretical Background

This study uses Legitimacy Theory as the primary theoretical basis, which emphasizes the importance of companies gaining social recognition through actions that are in line with community values and expectations within a sustainability framework (Kheireddine et al., 2024; Muaaz & Ali, 2024). This legitimacy can be achieved through transparency in delivering non-financial information, such as environmental, social, and governance (ESG) aspects, as a form of stakeholder accountability. According to several researchers, e.q. (Choi & Kim, 2024; Gunawan & Lindrawati, 2024) state that the strategic way to build legitimacy is an integrated annual report that combines financial and non-financial information. It increases public trust and the company's long-term value perception.

The second theory used is the Resource-Based View (RBV), which views sustainable competitive advantage as originating from a company's internal assets that are valuable, rare, difficult to imitate, and irreplaceable (VRIN). In this context, (Baah et al., 2024) describe that the variables of Green Innovation and Green Environmental Ethics are positioned as intangible resources that are useful for strengthening the company's competitive position in the long term. Based on RBV, organizations that develop an ethical culture towards the environment, environmentally friendly products, and processes become more adaptive and superior in facing external pressures.

In addition, this study is based on the stakeholder theory, which emphasizes that companies have broad social responsibilities to all stakeholders, not just shareholders (Freeman & Dmytriyev, 2017). Within this framework, Social Responsibility is a link between companies and stakeholders and a sustainability strategy that creates economic and social value. This study places Social Responsibility as a moderating variable that strengthens the influence of integrated reporting, Green

Innovation, and Green Environmental Ethics on Green Competitive Advantage (Padilla-Lozano & Collazzo, 2022).

Green Innovation and Green Competitive Advantage

Green Innovation is a strategic adaptation of innovation that combines environmental and sustainability considerations in product development and business processes (Awwad et al., 2025). According to (Dangelico & Pujari, 2010), Green Innovation results from integrating technological innovation and environmental sustainability principles, which create economic value and pay attention to ecological impacts. Theoretically, this approach is relevant to the Legitimacy Theory developed by (Dowling & Pfeffer, 1975). According to (Dowling & Pfeffer, 1975), Legitimacy Theory states that companies must adapt to prevailing social values and norms to gain and maintain legitimacy from society. The company's commitment to environmental sustainability through Green Innovation is important in building positive perceptions from stakeholders while strengthening its social legitimacy in its institutional environment (D. Li et al., 2017). Empirical research by (Chen et al., 2006) found that green product and process innovation contribute positively to Green Competitive Advantage, namely the company's ability to compete sustainably through environmentally friendly practices.

Soewarno et al. (2019) showed that when Green Innovation strategies are implemented consistently and reinforced by the image of an environmentally conscious company and social acceptance of the practice, it can be an important driving factor for the company's long-term competitive advantage. In line with this, (Rachmawati, 2023) describes that sustainability-based innovation meets regulations and community expectations and can expand access to a broader market and strengthen the company's position in an industrial ecosystem that increasingly emphasizes sustainability. Thus, Green Innovation plays an important role as a managerial strategy in responding to sustainability challenges and strengthening environmentally-based competitive advantages. Based on these theories and findings, the hypothesis proposed is:

H1: Green Innovation significantly affects Green Competitive Advantage.

Green Environmental Ethics and Green Competitive Advantage

According to (Chi et al., 2009), Green Environmental Ethics in a company consists of an organization's perspective and level of commitment towards various environmental issues. (Chi et al., 2009) identify three aspects of Green Environmental Ethics: environmental protection, implementation of environmental policies, sustainability-oriented management systems, and responsibility for environmental sustainability in general. In line with this, (Chen & Chang, 2013) stated that Green Environmental Ethics reflects the principles of corporate values in carrying out environmentally responsible practices. It becomes an important element of the organization's identity and part of realizing its Social Responsibility.

Based on the Resource-Based View (RBV) Theory, sustainable competitive advantage can be obtained through internal company resources that are valuable, rare, not easily imitated, and difficult to replace (Barney, 1991). In this case, Green Environmental Ethics are intangible assets that reflect organizational culture and can strengthen long-term business sustainability (Chen & Chang, 2013). When ethical values related to the environment have been embedded in the organization's systems and behavior, a positive reputation will be created for the public and stakeholders (A. Ali et al., 2025; Chang, 2011). This reputation becomes a form of differentiation that is difficult for competitors to imitate. Ultimately, this reputation becomes a form of differentiation difficult for competitors to imitate. Ultimately, reputation becomes a sustainable competitive advantage, as (Chang, 2011) explained in his research on the influence of Green Environmental Ethics on innovation and the competitive advantage of companies.

(Khan, 2025) shows that Social Responsibility enhances an organization's reputation and facilitates positive financial outcomes. This is supported by other studies by (Chang, 2011; Chen et al., 2006). The causal factor is the role of Green Environmental Ethics in driving Green Innovation and strengthening the company's reputation as a socially and ecologically responsible organization. Furthermore, (Chang, 2011) emphasized that increasing environmental awareness and strict government regulations encourage companies to make Green Environmental Ethics an adaptive and competitive business strategy to meet external demands and create sustainable, solid value. This description proposes the following hypothesis: H2: Green Environmental Ethics significantly affects Green Competitive Advantage.

Social Responsibility, Green Innovation and Green Competitive Advantage

Social Responsibility is a form of commitment of a corporate entity to carry out its operations ethically, considering social and green environmental impacts, and positively contributing to the surrounding community and environment (Vaikunthavasan, 2025). Social Responsibility has become part of a moral obligation and an increasingly important business strategy in the era of sustainability (Clarke et al., 2024). Social Responsibility also acts as a supporting element to strengthen the effectiveness of a Green Innovation strategy (Lord & Beeston, 2019). Thus, Social Responsibility is a catalyst for building a positive reputation for a corporate entity, increasing stakeholder involvement, creating an organizational climate that encourages innovation, and building commitment to sustainable practices (Lins et al., 2017). Social Responsibility also functions in risk and compliance management, thus creating operational excellence that supports long-term sustainability (Wahyuni et al., 2024).

Previous studies have shown that social responsibility has a significant relationship with strengthening the influence of green innovation on green competitive advantage. (Lin et al., 2013) found that

actively implementing Social Responsibility creates an environment that supports the development of environmentally friendly products and processes. This social responsibility (SR) not only accelerates the implementation of green innovation but also improves the company's overall performance and strengthens its competitiveness in the market by becoming more concerned about environmental and social issues. Thus, the proposed hypothesis is
H3: Social Responsibility strengthens the affects of Green Innovation on Green Competitive Advantage.

Social Responsibility, Green Environmental Ethics, and Green Competitive Advantage

Social Responsibility commitment to Green Environmental Ethics can significantly increase Green Innovation and the competitive advantage of companies (Gherghina, 2024; Setyowati, 2024). Social Responsibility also strategically implements practical environmental ethics and supports company competitiveness by implementing sustainability values (Bhattacharjee et al., 2025). (Gherghina, 2024) states that Social Responsibility integrated with Green Environmental Ethics principles significantly strengthens a company's reputation, minimizes risks, improves regulatory compliance, and deepens stakeholder engagement. Strategically embedded Social Responsibility strengthens long-term competitive advantage, especially in markets increasingly demanding sustainability and environmental Responsibility. This is supported by other studies showing that Social Responsibility improves reputation and customer trust, which contributes to market advantage (Röxeis, 2023; Sharma, 2024).

Social Responsibility implemented effectively and committed to Green Environmental Ethics helps companies meet environmental standards and improve their position in a market increasingly concerned about sustainability (Larijani et al., 2024; Mironova et al., 2025). Integrating Social Responsibility and Green Environmental Ethics has proven a relevant strategy for strengthening Green Competitive Advantage in corporate entities (Bhattacharjee et al., 2025; Gordon, 2024). Furthermore, (Kim et al., 2021) also support that social Responsibility, oriented toward ethics, can increase employee creativity and green innovation. Ultimately, social Responsibility has a positive influence on the competitive advantage of the company. Social Responsibility also encourages the implementation of environmentally friendly products and process development and creates strategic value in a market that prioritizes sustainability (Vilca & Janett, 2024). Thus, the hypothesis proposed is
H4: Social Responsibility strengthens and affects of Green Environmental Ethics on Green Competitive Advantage.

Green Competitive Advantage and Stock Returns

Companies with Green Competitive Advantages gained through environmentally friendly and sustainable practices tend to experience

higher Stock Returns. Research by (Zhu et al., 2023) proves that adopting green technology and developing green dynamic capabilities significantly enhance green product innovation and a company's competitive advantage. (Hendarjanti & Nawangsari, 2023) support this, which shows that companies with Green Competitive Advantages experience increased market value and Stock Returns. Furthermore, research by (van der Beck, 2021) found that investment flows into sustainable funds increase the valuation of green companies, contributing to increased Stock Returns. These findings suggest that companies that invest in sustainable practices improve their environmental performance and gain financial benefits in the stock market. Thus, based on the description above, the proposed hypothesis is: H5: Green Competitive Advantages significantly affect Stock Returns.

Conceptual Model and Hypotheses Development

Based on the theoretical framework and previous research, a conceptual model of Green Competitive Advantage is developed to examine the factors that influence the dependent variable and its impact on Stock Return. The independent variables include Green Innovation (IH) and Green Environmental Ethics (ELH). The conceptual model is illustrated in Figure 1.

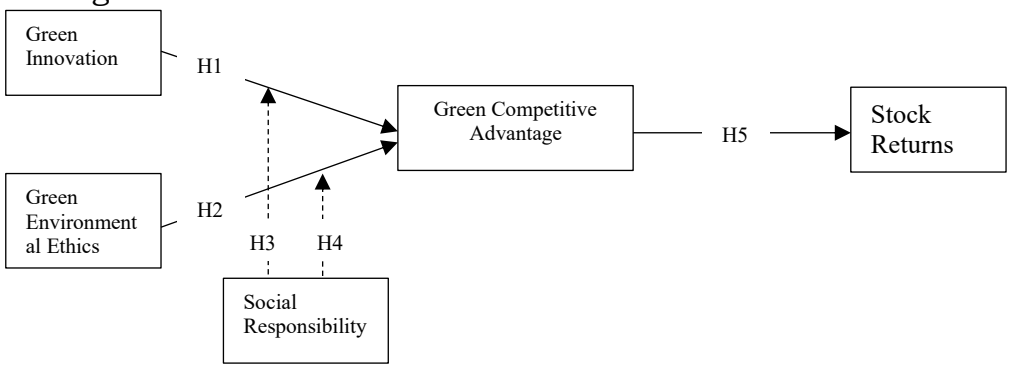

Figure 1. Conceptual Model of Green Competitive Advantage

METHODS

In this study, the method used is quantitative, with secondary data derived from annual and sustainability reports of companies audited and listed on the Indonesia Stock Exchange (IDX) in 2022–2023 based on the IDX-IC classification. The research sample was taken by purposive sampling using four criteria: 1.) Financial Companies which listed on the IDX (IDX-IC) and 2.) Published sustainability reports and annual reports during the period 2022-2023, 3.) Delisted Companies for the period 2022-2023, and 4.) Sample companies are publishing AR and SR respectively. Although the research period only covers two years (2022–2023), it can still provide a relevant baseline for predicting the long-term impact of green competitive advantage on stock returns. First, sustainability trends and green practices have become a major focus for industrial companies in Indonesia in recent years, particularly due to regulatory pressure and increasing environmental awareness. Two years of data can capture the

rapid market response to green initiatives, given that investors are increasingly sensitive to environmental issues. Significant changes in stock returns over a short period can indicate a sustainable pattern, especially if supported by consistent company policies and a long-term commitment to sustainability. Second, although two years is considered relatively short, this period encompasses quite diverse market dynamics, including post-pandemic economic fluctuations and the transition to sustainable business practices. If the research finds a positive correlation between green competitive advantage and stock returns over this timeframe, this could be an early indicator that green strategies have an immediate impact that has the potential to persist over the long term. Moreover, by considering determinants such as government regulations, consumer demand, and operational efficiency, the findings over two years can be extrapolated to predict sustainable trends, provided they are supported by a strong theoretical framework and comparative analysis with similar studies in different contexts.

The variables used in this study are Independent Variables (Green Innovation, and Green Environmental Ethics), dependent variables (Green Competitive Advantage and Stock Return), moderating variables (Social Responsibility), and control variables (Leverage, Size, Audit Quality, Profitability, and Company Age). Table 1 explains the operational variables in detail.

Table 1. Operational Variables

No	Variable	Indicator	Score
1	Green Innovation (IH)	7 elements, 26 indicators	IH = (∑ disclosed items / ∑ total items) × 100
2	Green Environmental Ethics (ELH)	6 elements	ELH = (∑ disclosed items / ∑ total items) × 100
3	Green Competitive Advantage (KKH)	Strategic green elements	KKH = (∑ disclosed items / ∑ total items) × 100
4	Stock Return (RS)	Stock price change between year t and t−1	RS = (Pt − Pt−1) / Pt−1
5	Corporate Social Responsibility (TJS)	4 dimensions (formal, environment, workplace, market) – 14 items	TJS = (∑ disclosed items / ∑ total items) × 100
6	Leverage (LV)	Total debt over total assets	LV = Total Debt / Total Assets
7	Size	Total assets	Size = Ln(Total Assets)
8	Audit Quality (KA)	Big 4 vs Non-Big 4 auditor	Dummy variable: 1 = Big 4, 0 = Non-Big 4
9	Profitability (PF)	Net income over total assets	PF = Net Income / Total Assets
10	Company Age (MP)	Years since IPO	Age = Ln(Year t – IPO Year)

Source: processed (2025)

In this study, three data analysis techniques were used: Panel Regression Model, Classical Assumption Test, and Hypothesis Regression Model. In detail, each analysis is presented in Table 2, Table 3, and Table 4.

Table 2: Selection of Panel Regression Model

Test	Purpose	Models Compared	Decision Making Criteria
Chow Test	Determining the best model between CEM and FEM	CEM vs FEM	p > 0,05 → choose CEM p < 0,05 → choose FEM
Hausman Test	Determining the best model between REM and FEM	REM vs FEM	p > 0,05 → choose REM p < 0,05 → choose FEM
Lagrange Multiplier Test	Determining the best model between CEM and REM	CEM vs REM	p > 0,05 → choose CEM p < 0,05 → choose REM

Source: processed (2025)

Table 3: Classical Assumption Test (If CEM Model)

Test Type	Objectives	Test Tools / Criteria
Normality Test	To test whether the residuals are normally distributed	Kolmogorov-Smirnov (p > 0.05) or
Multicollinearity Test	To test the relationship between independent variables	Normal Probability Plot (spread on the diagonal line)
Heteroscedasticity Test	To test the equality of residual variances between observations	VIF < 10 and Tolerance > 0.1 → not multicollinear
Autocorrelation Test	To test the correlation between time residuals (if time series)	Glejser Test (p > 0.05) or scatter plot spread randomly above and below the Y axis

Source: Processed (2025)

Table 4: Hypothesis Regression Model

Hypothesis	Regression Equation	Explanation
H1	Green Innovation → Green Competitive Advantage	Direct positive effect
H2	Green Environmental Ethics → Green Competitive Advantage	Direct positive effect
H3	Social Responsibility moderates Green Innovation → Green Competitive Advantage	Moderating effect
H4	Social Responsibility moderates Green Environmental Ethics → Green Competitive Advantage	Moderating effect
H5	Green Competitive Advantage → Stock Return	Direct positive effect

Source: processed (2025)

Model 1: Determinants of Green Competitive Advantage

$$KKH = \alpha + \beta 1IH + \beta 2ELH + \beta 3(IH \times TJS) + \beta 4(ELH \times TJS) + \beta 5LV + \beta 6UP + \beta 7KA + \beta 8PF + \varepsilon$$

Model 2: Effect of Green Competitive Advantage on Stock Return

$$RS = \alpha + \beta 1KKH + \beta 2LV + \beta 3UP + \beta 4PF + \beta 5MP + \varepsilon$$

RESULTS AND DISCUSSION

Descriptive Statistics and Outlier Analysis

Of the 750 firm observations that met the criteria, most showed high scores on Green Competitive Advantage (average 0.706) and Green Environmental Ethics (0.78), reflecting a relatively strong sustainability commitment. However, Stock Returns and leverage showed high standard deviations, indicating firm variation. The total observations are 724 observation, which improved the accuracy of the regression. In detail, descriptive statistics can be seen in Table 5.

Table 5: Descriptive Statistics

Variabel	Obs	Mean	Standard Deviasion	Min	Max
KKH	724	0,706	0,172	0,13	0,88
IH	724	0,566	0,144	0,128	0,897
ELH	724	0,783	0,242	0,25	1
TJS	724	0,670	0,211	0,071	1
RS	724	0,444	0,646	-0,971	4,741
LV	724	0,494	0,476	0,002	7,090
UP	724	28,661	1,828	22,078	33,730
KA	724	0,287	0,452	0	1
PF	724	0,036	0,211	-4,835	0,784

Source: Processed (2025)

Model Selection and Estimation Method

Chow, Hausman, and Lagrange Multiplier tests were used to determine the best regression model. The results of the study show that the most appropriate model to use in hypothesis testing is the Random Effect Model (REM), so that classical assumption tests such as normality are not needed in the analysis process (Sari et al., 2023). Selanjutnya, regression results for the determining factors of Green Competitive Advantage are presented in Table 8 below.

Table 6: Main Model Hypothesis Test (Green Competitive Advantage)

Variable	Coefficient	p-value	Hypothesis Tested	Result
Green Innovation (IH)	0.314	0.000	H1	Supported
Green Environmental Ethics (ELH)	0.023	0.039	H2	Supported
Social Responsibility × Green Innovation	0.354	0.031	H3	Supported
Social Responsibility × Green Environmental Ethics	0.050	0.007	H4	Supported
r^2 = 0.3455				

Source: Processed (2025)

Table 6 shows that Green Innovation and Green Environmental Ethics significantly increase Green Competitive Advantage.

Green Competitive Advantage and Stock Return

Regression on the 7th hypothesis shows the results that can be seen in Table 9.

Table 7: Regression Results for Green Competitive Advantage and Stock Return

Variable	Coefficient	p-value	Hypothesis Tested	Result
Green Competitive Advantage (KKH)	0,138	0.001	H5	Supported
r^2 = 0,318				

Source: processed (2025)

Table 7 shows that Green's competitive advantage contributes positively to Stock Returns, supporting the signaling theory. Companies with sustainable competitiveness tend to gain higher market trust and appreciation.

This study conducted a sensitivity test by comparing the basic model with an alternative model To ensure the robustness of the main model that adopted measurements from (Rachmawati, 2023). This test aims to determine whether the research results remain consistent when changes are made to the dimensions of the green innovation variables, which are developed into seven dimensions with 26 indicators.

Table 8: Sensitivity Test

Variable	Direction Prediction	Model 1 Novelty			Model 2 Sensitivity		
		Coefficient	Prob.		Coefficient	Prob.	
C		0,6885137	0,000		0,688751	0,000	
IH	+	0,3143541	0,000		0,2618502	0,000	
ELH	+	0,0225775	0,039		0,0226234	0,038	
TJSIH	+	0,3539793	0,031		0,3139962	0,000	
TJSELH	+	0,0496735	0,007		0,049817	0,007	
LV		0,0000527	0,449		0,0000533	0,449	
UP		-0,0000527	0,010		-0.0074197	0,015	
KA		0,0023053	0,450		0,0023507	0,449	
PF		-0,0000318	0,473		-0,0000267	0,477	
Adj R-squared				0,3381			0,3082

Source: processed (2025)

Table 8 showed that most of the hypotheses remained significant and in the same direction, strengthening the validity of this study's main findings. Based on the test above, model 1 (novelty) yielded better results than model 2 (sensitivity). This is demonstrated by several statistics:

1. Model 1 with modifications had a higher Adj. R Squared value (0.338) than model 2 without modifications, with an Adj. R Squared value (0.308). The results of this sensitivity test demonstrate that the addition of novelty is superior to the old model, thus necessitating the addition of green innovation.
2. Based on the sensitivity test results table, it can be seen that with the addition of two novelty dimensions, the effect of green innovation on green competitive advantage remained unchanged, with the P-value increasing from 0.000 to 0.000, but the coefficient increased from 0.261 to 0.314. For the effect of green integrated reporting on green competitive advantage, the P-value increased from 0.188 to 0.167, with the coefficient increasing from 0.119 to 0.013. For the influence of green environmental ethics on green competitive advantage, the P value increased from 0.038 to 0.039 with a coefficient value increasing from 0.022 to 0.022. The role of social responsibility in moderating the influence of integrated annual reports on green competitive advantage decreased, which can be seen from the increase in P Value from 0.000 to 0.001, with a coefficient value increasing from 0.227 to 0.257. The role of social responsibility in moderating the influence of green innovation on

green competitive advantage decreased, which can be seen from the increase in P Value from 0.000 to 0.031, with a coefficient value of 0.313 to 0.353. The role of social responsibility in moderating the influence of green environmental ethics on green competitive advantage did not change, which can be seen from the P Value from 0.000 to 0.000, with a coefficient value of 0.049 to 0.049.

An expansion test is an additional analysis conducted to expand or deepen the primary research findings. This test aims to determine whether the obtained results remain consistent or relevant when tested on specific conditions, variables, or subgroups different from those in the primary test. This study examines green innovation as a novelty for researchers. The expansion test of green innovation, broken down into two dimensions: environmentally friendly packaging and green entrepreneurial orientation, influences green competitive advantage.

Tabel 9. Ekspansi Test

KKHit = 0,701952 + 0,000033IH1 + 0,0001167IH2+ 0,0798716IH3 + 0,0001525IH4 + 0,0548965IH5 + 0,0736328H6 + 0,0674241IH7 + 0,0000483LV + 0,0000929UP + 0,0000557KA – 0,0000208PF

Variabel	Coef.	Z	P>(t)
IH1	0,000	0,03	0,486
IH2	0,000	1,69	0,046*
IH3	0,079	2,27	0,012*
IH4	0,000	1,80	0,037*
IH5	0,054	1,67	0,048*
IH6	0,073	1,66	0,049*
IH7	0,067	1,89	0,030*
LV	0,000	0,13	0,449
UP	0,000	0,17	0,432
KA	0,000	0,94	0,173
PF	-0,000	-0,60	0,274
Conts	0,701	37,40	0,000
Nilai R Square	0,379		
Adjusted R Square	0,373		
Sigma_u	0,170		
Sigma_e	0,001		
rho	0,999		

*Significance 5%. ** Significance 10%.

H1 does not have a positive effect on the Green Innovation Competency Scale (KKH) because the calculated t-value is 0.03 > 1.65 and the P-value is 0.486 < 0.05. This first hypothesis indicates that green process innovation does not have a significant effect on the green innovation dimension, although overall green innovation still has a positive effect on green competitive advantage. This may be due to the difference in focus between innovations related to operational processes and innovations that focus more on visible products or technologies that have a direct impact on consumers. Therefore, although green process innovation is important for sustainability and operational efficiency, its

impact on the creation of the green innovation dimension may not be as significant as innovations more directly related to environmentally friendly products or technologies.

H2 has a positive effect on the Green Innovation Competency Scale (KKH) because the calculated t-value is 1.69 > 1.65 and the P-value is 0.046 < 0.05. 3. IH3 has a positive effect on KKH because the calculated t-value is 2.27 > 1.65 and the P-value is 0.012 < 0.05. H4 has a positive effect on KKH because the calculated t-value is 1.80 > 1.65 and the P-value is 0.037 < 0.05. H5 has a positive effect on KKH because the calculated t-value is 1.67 > 1.65 and the P-value is 0.048 < 0.05.

H6 has a positive effect on KKH because the calculated t-value is 1.66 > 1.65 and the P-value is 0.049 < 0.05. The addition of this sixth dimension of novelty illustrates that eco-friendly packaging and distribution are not only practices that can help reduce environmental impacts, but also important elements of green innovation that can contribute to increasing green competitive advantage. Thus, companies that successfully integrate environmentally friendly packaging and distribution practices into their business strategies will gain a competitive advantage. Green packaging refers to the use of packaging materials that are recyclable, made from natural materials, or designed to reduce environmental impacts throughout a product's life cycle. Green distribution refers to the use of delivery methods that minimize the carbon footprint, such as the use of electric vehicles or optimizing distribution routes to reduce fuel consumption. Both concepts reflect companies' efforts to develop solutions that are not only cost-effective and functional, but also environmentally friendly. Green innovation encompasses the application of technology, design, and processes aimed at improving sustainability and reducing negative environmental impacts in an increasingly environmentally sensitive market.

H7 has a positive effect on KKH (the calculated t-value of 1.89 > 1.65 and the p-value of 0.030 < 0.05). This seventh hypothesis indicates that green entrepreneurial orientation has a strong influence on green innovation, which in turn contributes to increasing green competitive advantage. Companies with a green entrepreneurial orientation are more likely to develop environmentally friendly and sustainable innovations, which not only helps them stay relevant in a market that increasingly prioritizes sustainability but also allows them to gain a greater competitive advantage over competitors. 8. The R-square value, or coefficient of determination, is 0.379 or 37.9%. 9. The adjusted R-square value, or coefficient of determination, is 0.373 or 37.3%.

The Impact of Green Innovation on Green Competitive Advantage

Based on the regression test results in Table 6, the regression coefficient value of the Green Innovation (IH) variable of 0.314 indicates a positive relationship direction, which means that Green Innovation contributes to increasing Green Competitive Advantage (KKH). This positive direction aligns with the proposed hypothesis that Green Innovation is an important strategic factor in helping companies achieve

competitive advantage through the ability to meet market demands and stakeholder expectations and support the sustainable development agenda. In addition, the p-value of 0.000 <0.05 indicates that this influence is statistically significant, so Hypothesis 1 is accepted.

Theoretically, these findings support the Legitimacy Theory of (Dowling & Pfeffer, 1975), which states that companies need to align their activities and policies, including Green Innovation, with social values and expectations to maintain legitimacy in the eyes of the public. These findings are consistent with research by (Chen, 2008) which shows that Green Innovation positively impacts Green Competitive Advantage. These results of this study are also in line with the results of (Rachmawati, 2023) that Green Innovation improves efficiency, corporate image, and operational sustainability and increases corporate competitiveness sustainably.

Influence of Green Environmental Ethics on Green Competitive Advantage

Based on the regression test results shown in Table 6, it is known that the regression coefficient value of the Green Environmental Ethics (ELH) variable is positive at 0.022, which indicates that ELH has a positive influence on Green Competitive Advantage (KKH). This positive direction aligns with the proposed hypothesis: the higher the application of Green Environmental Ethics in the company's strategy and operations, the greater the company's ability to build sustainable competitive advantages. The p-value of 0.038 <0.05 indicates that the influence is statistically significant, so Hypothesis 2 is accepted.

Theoretically, these findings support the Legitimacy Theory developed by (Dowling & Pfeffer, 1975), which states that organizations must align their values and actions with social norms to maintain legitimacy. In this context, applying Green Environmental Ethics is one way for companies to demonstrate the alignment of sustainability values with the expectations of society and stakeholders. The results of this study show that there is harmony with previous research by (Chen, 2008) and (Yang et al., 2011), which found that Green Environmental Ethics practices can also strengthen companies' green reputation and image in the market. Furthermore, (Silva et al., 2019) found that companies that integrate Green Environmental Ethics tend to gain higher stakeholder trust. Ultimately, (Jones, 1995) emphasized that organizational ethics based on moral values is an important foundation for building sustainability strategies and long-term excellence.

Social Responsibility Moderates the Effect of Green Innovation on Green Competitive Advantage

Based on the regression test results in Table 6, the regression coefficient value is 0.353, which indicates that Social Responsibility strengthens the influence of Green Innovation on Green Competitive Advantage (KKH). This coefficient is positive and in line with the proposed hypothesis, which states that companies that actively implement Social

Responsibility tend to have a greater capacity to support and encourage Green Innovation. With a p-value of 0.031 <0.05, the effect is statistically significant, so Hypothesis 3 is accepted.

Theoretically, these results align with Legitimacy (Suchman, 1995), which states that innovations that align with social values—such as sustainability and Social Responsibility—will strengthen the legitimacy of the company in the eyes of the public and stakeholders. In this case, Social Responsibility functions as a medium to build credibility and form the perception that the Green Innovation being implemented is part of a real commitment to the environment.

This study is also supported by (Lin et al., 2013), who stated that Social Responsibility creates a foundation for an organizational culture that supports the development of Green Innovation in terms of technology and operational management. Social Responsibility facilitates stakeholder engagement, strengthens reputation, encourages regulatory compliance, and increases the company's internal motivation to innovate sustainably. Therefore, integrating Social Responsibility and Green Innovation substantially contributes to the company's competitive advantage.

Social Responsibility Moderates the Effect of Green Environmental Ethics on Green Competitive Advantage

Based on the regression test results in Table 6, the regression coefficient value is 0.0496735, which is positive and in line with the proposed hypothesis. This means that Social Responsibility strengthens the influence of Green Environmental Ethics on Green Competitive Advantage (KKH). However, the direction of influence weakens the relationship between ELH and KKH. The p-value of 0.007 <0.05 indicates that the influence is statistically significant, so Hypothesis 4 is accepted. This finding is based on the premise that corporate social responsibility (CSR) acts as a reinforcing mechanism that moderates the relationship between green environmental ethics and green competitive advantage. Companies that not only adopt environmentally friendly practices but also actively engage stakeholders through CSR programs (such as sustainability education or community empowerment) tend to gain social legitimacy and a positive reputation, ultimately strengthening the impact of environmental ethics on competitive advantage (Alshukri et al., 2024; Ruan et al., 2022). CSR functions as a catalyst by increasing transparency, building consumer trust, and reducing reputational risk, so that green practices impact not only internal efficiency but also market perception (W. Li et al., 2023). Thus, the integration of environmental ethics and corporate social responsibility creates a synergy that increases a company's chances of achieving sustainable competitive advantage (Ma et al., 2023).

The Influence of Green Competitive Advantage on Stock Returns

Based on the regression test results shown in Table 7, it is known that the regression coefficient value for the Green Competitive Advantage

variable is 0.349403 and has a positive value. This shows that the higher the level of Green Competitive Advantage owned by the company, the higher the Stock Returns generated. The p-value is 0.012, smaller than the 5% significance level (0.05), showing that Green Competitive Advantage significantly effects Stock Returns. Therefore, Hypothesis 6 is accepted: Green Competitive Advantage positively and significantly effects Stock Returns. In addition to the Green Competitive Advantage, leverage and profitability also significantly influence, respectively, negatively and positively, Stock Returns, per the findings of the REM model.

This research results align with the Signal Theory, which states that companies can send positive signals to the market through strategic policies and explain the prospects for sustainability (Spence, 1973). Green Competitive Advantage plays a role in signalling companies to have adaptive capacity to environmental regulations, be innovative in green practices, and be resilient in facing environmental risks. The results of this study are also supported by (W. Wang et al., 2023), that companies with sustainability-based strategies can improve their reputation and internal efficiency. Thus, the strategy created can generate financial benefits through increased market value and Stock Returns.

CONCLUSION

This study concludes that Green Innovation and green environmental ethics positively impact Green Competitive Advantage. However, Social Responsibility is proven to strengthen the relationship between Green Innovation and green environmental ethics on Green Competitive Advantage; however, it weakens the effect of Green Environmental Ethics. This suggests that the role of Social Responsibility in environmental ethics and green innovation impacts green competitiveness. Social Responsibility often includes practices prioritizing sustainability, environmental impact reduction, and social welfare. When companies take Social Responsibility seriously, it can strengthen green innovation strategies and green environmental ethics. An example is a company that invests in environmentally friendly practices. Alternatively, focusing on community empowerment can increase the credibility and reputation of the company, which supports a green competitive advantage. Green Competitive Advantage also has a positive impact on Stock Returns. Companies that consistently implement sustainable strategies tend to gain market appreciation. This finding reinforces the importance of sustainable business practices focusing on reporting and actual values and actions supporting sustainability. The implications of these results provide input for management to emphasize environmentally friendly innovation and sustainability ethics as strategic advantages.

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