

Green Innovation and Sustainable Growth: How Green Reputation Strengthens the Value Creation of Environmental Strategies

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ABSTRACT

The relationship between green innovation and corporate sustainable growth has produced mixed findings, suggesting that green reputation may help explain the effectiveness of green innovation implementation. This study examines the effect of green innovation on corporate sustainable growth and the moderating role of green reputation in basic materials companies listed on the Indonesia Stock Exchange during 2020–2024. Panel data regression was conducted using Stata 19.0 on an unbalanced panel of 106 firms (472 firm-year observations). Sustainable growth was measured using the Sustainable Growth Rate (SGR). Green innovation was represented by four indicators, while green reputation was measured using 15 environmental disclosure indicators. The results indicate that green innovation has a negative and significant effect on SGR, whereas green reputation positively and significantly moderates this relationship. These findings suggest that the benefits of green innovation for sustainable growth are enhanced when firms possess a strong green reputation, thereby strengthening stakeholder trust.

Keywords: Basic Materials; Green Innovation; Sustainable Growth; Green Reputation

Inovasi Hijau dan Pertumbuhan Berkelanjutan: Peran Reputasi Hijau dalam Memperkuat Penciptaan Nilai dari Strategi Lingkungan

ABSTRAK

Hubungan antara inovasi hijau dan pertumbuhan berkelanjutan perusahaan masih menunjukkan temuan yang beragam, sehingga reputasi hijau dipandang berpotensi menjelaskan efektivitas implementasi inovasi hijau. Penelitian ini menganalisis pengaruh inovasi hijau terhadap pertumbuhan berkelanjutan perusahaan dengan peran moderasi reputasi hijau pada sektor bahan baku yang terdaftar di Bursa Efek Indonesia periode 2020–2024. Analisis menggunakan regresi data panel terhadap 106 perusahaan dengan data unbalanced panel (472 observasi) menggunakan Stata 19.0. Pertumbuhan berkelanjutan diukur menggunakan Sustainable Growth Rate (SGR). Inovasi hijau direpresentasikan oleh empat indikator, sedangkan reputasi hijau diukur melalui 15 indikator pengungkapan lingkungan. Hasil menunjukkan inovasi hijau berpengaruh negatif dan signifikan terhadap SGR, sedangkan reputasi hijau memoderasi hubungan tersebut secara positif dan signifikan. Temuan ini menunjukkan bahwa manfaat inovasi hijau lebih optimal ketika perusahaan memiliki reputasi hijau yang kuat sehingga meningkatkan kepercayaan pemangku kepentingan.

Kata Kunci: Sektor Barang Baku; Inovasi Hijau; Pertumbuhan Berkelanjutan; Reputasi Hijau

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INTRODUCTION

Environmental sustainability issues have become a strategic aspect in corporate management because businesses are no longer solely oriented toward profit generation but also toward value creation through environmental, social, and governance (ESG) dimensions. This pressure is increasingly significant in resource-intensive sectors that face high energy consumption, carbon emissions, and natural resource exploitation (Khanchel et al., 2023; Susilowati et al., 2023; Tang et al., 2017). Stakeholder theory, legitimacy theory, and the natural resource-based view (NRBV) explain that sustainability practices can serve as sources of legitimacy and competitive advantage (Appiah & Essuman, 2024; Jing et al., 2023). Companies respond to these challenges by implementing green innovation (GI) through product, process, and organizational innovations to reduce environmental impacts while improving efficiency, reputation, and corporate value (Albort-Morant et al., 2016; A'zizah et al., 2024; Deb et al., 2022; Fitriana et al., 2025; Xu et al., 2025). Regulations, investor expectations, and consumer preferences further encourage firms to adopt credible sustainability strategies and avoid symbolic environmental practices or greenwashing (Mensah et al., 2025; Zhai et al., 2022).

The NRBV perspective views GI as a strategic capability that enables companies to respond to technological, regulatory, and market changes through sensing, seizing, and reconfiguring capabilities (Adusei et al., 2023; Xu et al., 2025). The implementation of GI can improve resource efficiency, strengthen corporate reputation, and enhance environmental and financial outcomes, thereby connecting ESG or corporate social responsibility (CSR) commitments with long-term value creation (Le & Gia, 2024; Liu et al., 2024). Nevertheless, empirical findings regarding the relationship between GI and corporate performance remain inconsistent due to differences in investment costs, technological readiness, governance mechanisms, regulatory environments, and organizational capabilities (Khanchel et al., 2023; Yin et al., 2023). Firms that successfully integrate GI into their organizational strategies are more likely to obtain sustainable benefits compared with firms that implement environmental initiatives only symbolically (Hui et al., 2025; Liu et al., 2024).

The mixed findings regarding the impact of GI may also be related to differences in the measurement of corporate performance. Previous studies predominantly rely on short-term accounting indicators, such as Return on Assets (ROA) and Return on Equity (ROE), which mainly reflect current profitability and may not fully capture a firm's ability to maintain long-term growth (Albort-Morant et al., 2016; Bermúdez-Edo et al., 2016). Therefore, this study employs Sustainable Growth Rate (SGR) as a more comprehensive measure of sustainable corporate growth because it integrates profitability, asset efficiency, funding structure, and earnings retention. Through resource efficiency, operational improvements, competitiveness, and improved access to green financing, GI has the potential to enhance SGR, although the magnitude of its effect may vary depending on industry characteristics, technological readiness, regulations, and market conditions (Andries & Stephan, 2019; Khanchel et al., 2023; Liao & Liu, 2023).

The effectiveness of GI is not solely determined by internal capabilities but also by green reputation (GR), which reflects stakeholder perceptions of a firm's

environmental commitment and performance through green innovation practices, sustainability policies, and environmental disclosures (Blas, 2020; Zhai et al., 2022). GR strengthens legitimacy, stakeholder trust, access to capital, and competitive advantage when supported by consistent environmental practices and credible disclosures (Appiah & Essuman, 2024; Khanra et al., 2021; Le & Gia, 2024). Therefore, the relationship between GI and sustainable growth may depend on how effectively firms communicate and legitimize their environmental initiatives through a strong green reputation, which can enhance consumer confidence, investor support, and access to green financing (Aftab et al., 2023; Xu et al., 2025; Zhai et al., 2022).

Previous studies have measured GI using various approaches, including surveys, patents, composite indices, and corporate disclosures. Each approach captures different dimensions of GI and has specific limitations, such as perception bias, limited data availability, or difficulties in comparing firms across industries (Albort-Morant et al., 2016; Bermúdez-Edo et al., 2016; Li, 2022). Among these approaches, corporate disclosure-based measurement provides relevant information regarding firms' adoption and communication of green innovation practices, particularly in public company settings where sustainability reports and annual reports represent important sources of stakeholder information. Meanwhile, most prior studies continue to emphasize conventional financial performance indicators rather than sustainable growth measures. Consequently, the relationship between GI, GR, and sustainable growth requires further investigation, particularly in developing economies such as Indonesia and in the basic materials sector, which faces substantial environmental pressures (Adi & Wijayanti, 2026; Agyeiwaa et al., 2024; Bag et al., 2022; Munodawafa & Johl, 2021; Romano et al., 2023).

This study examines how GI influences sustainable growth through resource efficiency, organizational capabilities, and environmental reputation. This study contributes to the literature by employing SGR as a measure of sustainable growth and examining GR as a reinforcing mechanism in the relationship between GI and corporate growth (Appiah & Essuman, 2024; Ong et al., 2019; Zhai et al., 2022). The contribution of this research lies in integrating RBV, NRBV, and Dynamic Capability View (DCV) perspectives within the Indonesian context, particularly in the basic materials sector, thereby providing implications for companies, investors, and policymakers in promoting credible green innovation and reducing greenwashing practices (Hui et al., 2025; Zhang et al., 2018).

Natural Resource-Based View (NRBV) is an extension of the Resource-Based View (RBV) that incorporates environmental aspects as part of a company's strategic resources. NRBV explains that competitive advantage does not only originate from internal resources, but also from the company's ability to manage environmentally oriented resources and capabilities, such as green technology, resource efficiency, and environmental innovation (Lee & Min, 2015). These resources can become sources of competitive advantage because they possess valuable characteristics, are difficult to imitate, and are capable of creating economic value while improving environmental performance (Anik & Sulisty, 2021; Li et al., 2025). The NRBV perspective extends RBV by positioning the environment as a strategic opportunity rather than merely a regulatory obligation,

allowing companies to develop green capabilities to address changes in markets, regulations, and stakeholder demands (Liu et al., 2022; Nair et al., 2026).

NRBV explains that GI becomes the primary mechanism that transforms green resources and capabilities into corporate value through improved efficiency, cost reduction, enhanced competitiveness, and improved environmental performance (Agyeiwaa et al., 2024; Karaman et al., 2024). A company's ability to develop and reconfigure green resources enables the creation of sustainable competitive advantages through environmentally friendly product, process, and technology innovations (Liu et al., 2022). Therefore, NRBV is relevant as a theoretical foundation for explaining the relationship between GI and sustainable growth, as this theory demonstrates that environmental strategies integrated with organizational capabilities can generate long-term economic benefits while maintaining environmental sustainability (Nair et al., 2026; Suki et al., 2022).

Stakeholder theory explains that companies are not only responsible to shareholders but must also consider the interests of various stakeholders, including investors, consumers, regulators, suppliers, and society. This theory emphasizes that a company's long-term success is influenced by its ability to meet stakeholder expectations through strategies that create economic, social, and environmental value (Aftab et al., 2023; Singh et al., 2021). Pressure from investors regarding ESG practices, consumer demands for environmentally friendly products, and public and regulatory concerns regarding environmental issues encourage companies to adopt GI as a strategic response to improve legitimacy and competitiveness (Acquah et al., 2021; Johl & Toha, 2021). Consistent implementation of GI not only improves environmental performance but also shapes GR through transparency, sustainability commitments, and positive stakeholder perceptions (Liu et al., 2022; Tariq et al., 2019). From this perspective, GR serves as a mechanism that strengthens the relationship between green innovation and corporate growth because a strong environmental reputation can enhance investor confidence, consumer loyalty, and access to strategic resources. Therefore, stakeholder theory is relevant for explaining that the success of GI in promoting sustainable growth depends not only on internal corporate capabilities but also on how companies build relationships and obtain support from various stakeholders (Zhang et al., 2025; Zhang et al., 2018).

Green innovation represents a form of innovation oriented toward reducing environmental impacts through the development of more environmentally friendly products, processes, and organizational practices. This concept includes green product innovation, which focuses on creating products with more sustainable materials, designs, and characteristics, as well as green process innovation, which emphasizes energy efficiency, waste reduction, and more optimal resource utilization (Albort-Morant et al., 2016). The development of literature indicates that GI is no longer viewed merely as a response to regulatory pressure or social demands but has evolved into a strategic corporate capability capable of creating economic value while improving environmental performance through the perspectives of RBV, NRBV, and Dynamic Capability View (Taneja et al., 2023; Zhang et al., 2018).

The mechanism of GI in creating corporate value can be observed through improvements in resource efficiency, product innovation, and process innovation.

The adoption of green technologies and cleaner production processes can help companies reduce energy consumption, operational costs, and production waste in the long term (Albort-Morant et al., 2016; Xu et al., 2022). Green product innovation also enables companies to meet consumer preferences for sustainable products, enhance market differentiation, and strengthen corporate environmental image (Sukı et al., 2022; Wu, 2026). Process innovation capabilities allow companies to integrate environmental knowledge into operational activities, thereby improving efficiency while maintaining competitiveness.

Based on the NRBV perspective, GI becomes a strategic resource that can support sustainable growth because companies are able to transform environmental capabilities into difficult-to-imitate competitive advantages. The implementation of GI can enhance green reputation, strengthen stakeholder legitimacy, expand access to capital, and increase market confidence (Tariq et al., 2019; Zhang et al., 2018). Nevertheless, the relationship between GI and corporate growth still shows mixed results. Several studies have found that GI contributes positively to corporate performance and growth, while other studies indicate more limited impacts due to initial investment costs, technological uncertainty, resource constraints, and differences in industry characteristics and regulations (Johl & Toha, 2021; Lestari & Soewarno, 2023). These conditions indicate that the economic benefits of GI do not always emerge immediately, meaning that the relationship between GI and sustainable growth requires further empirical examination. Based on theoretical arguments and previous research findings, this study proposes the following hypothesis:

H₁: Green innovation has a positive effect on corporate sustainable growth.

Green reputation represents stakeholders' positive perceptions of a company's environmental commitment and performance, which are developed through sustainability practices and credible environmental disclosures. From the perspectives of stakeholder theory and NRBV, GR represents an intangible asset that reflects a company's ability to fulfill the expectations of regulators, investors, consumers, and society (Blas, 2020; Tariq et al., 2019). This reputation does not merely represent corporate image but also builds stakeholder trust in the consistency of the sustainability strategies implemented by the company (Liu et al., 2022).

The implementation of GI through green product and process innovations plays an important role in developing GR because it can improve resource efficiency, reduce environmental impacts, and provide positive signals to the market regarding the company's commitment to sustainability (Albort-Morant et al., 2016; Wu, 2026). Transparent environmental disclosures further strengthen corporate legitimacy and increase stakeholder confidence in the green practices implemented by companies (Ashraf et al., 2024; Blas, 2020).

GR also has strategic value because it can enhance investor confidence, consumer loyalty, and corporate access to resources such as capital and market support. Companies with strong GR are more likely to obtain greater economic benefits from green innovation because the market perceives their sustainability practices as more credible (Karaman et al., 2024; Zhang et al., 2025). Therefore, several studies position GR as a factor that can strengthen the relationship between GI and corporate performance through enhanced legitimacy, product

differentiation, and competitive advantage (Chen et al., 2026; Osei & Amoah, 2026).

Testing the moderating role of GR remains necessary, particularly among companies in the basic materials sector in Indonesia, which have high environmental intensity characteristics and face increasing regulatory pressures. Differences in institutional conditions and market characteristics may influence the strength of the relationship between green innovation and sustainable growth (Khanchel et al., 2023; Lestari & Soewarno, 2023). Based on this argument, companies with higher green reputation are expected to obtain greater benefits from GI implementation, leading to the following hypothesis:

H₂: Green reputation strengthens the effect of green innovation on corporate sustainable growth.

RESEARCH METHOD

This study uses a quantitative approach with an associative method. The quantitative approach was selected because this study aims to empirically examine the relationships among variables through statistical analysis. The associative method is used to analyze the effect of green innovation on corporate sustainable growth and to examine the role of green reputation in strengthening this relationship. This approach is expected to provide empirical evidence regarding the causal relationships among the variables examined.

The population in this study consists of all companies in the basic materials industry sector listed on the Indonesia Stock Exchange (IDX). The selection of this sector is based on its characteristics as a resource- and energy-intensive industry with significant potential environmental impacts. This sector includes various subsectors, such as metals, mining, chemicals, cement, and pulp and paper, making it relevant to issues related to green innovation and corporate sustainability.

The research sample was determined using the purposive sampling technique, namely selecting samples based on specific criteria aligned with the research objectives. The criteria include basic materials sector companies that were consecutively listed during the 2020–2024 period, companies that consistently published annual reports or sustainability reports during the observation period, and companies with complete data related to the research variables. Based on these criteria, the final sample consists of 106 companies with an unbalanced panel dataset comprising 472 firm-year observations. The five-year observation period generates panel data that combines time dimensions (time series) and individual company dimensions (cross-section), although not all companies provide complete observations for each year.

This study uses secondary data obtained indirectly through various relevant sources. The data used include annual reports, sustainability reports, and information available on companies' official websites and the Indonesia Stock Exchange database. The use of secondary data was selected because such data are objective, verifiable, and appropriate for quantitative analysis in this study.

This study involves four types of variables, namely dependent, independent, moderating, and control variables. The dependent variable in this study is sustainable growth rate (SGR), which reflects the company's ability to

maintain sustainable growth without excessive dependence on external financing. SGR is measured using a formula that multiplies Return on Equity (ROE) by the retained earnings ratio, namely one minus the dividend payout ratio.

The independent variable in this study is green innovation (green innovation-GI), which refers to the company's internal capability and efforts to develop and implement environmentally oriented products, processes, or technologies. GI captures specific innovation practices undertaken by firms to improve environmental efficiency and reduce ecological impacts. Measurement is conducted using a green innovation disclosure index obtained from annual reports or sustainability reports. This index consists of four indicators, namely the selection of low-pollution materials, energy and resource efficiency, reduction in material usage, and product sustainability aspects (recyclable, reusable, and biodegradable). Each indicator is measured using a dummy variable (1 if the company discloses the implementation of the practice, and 0 otherwise), then aggregated and normalized.

The moderating variable in this study is green reputation (green reputation-GR), which reflects stakeholders' perceptions regarding the company's environmental commitment, credibility, and legitimacy. Unlike GI, which captures the implementation of specific environmental innovation practices, GR represents the extent to which companies establish and communicate their environmental responsibility to stakeholders. Measurement is conducted using an environmental disclosure index consisting of 15 items covering environmental policies, strategic commitments, implementation mechanisms, environmental performance, and stakeholder involvement in environmental issues. Each item is measured using a dummy variable (1 if disclosed, 0 if not disclosed), then aggregated and normalized. Although GI and GR are measured using content analysis from similar corporate reporting sources, they represent distinct constructs because GI focuses on internal environmental innovation practices, whereas GR captures external stakeholder recognition and legitimacy derived from environmental commitments and disclosures.

To improve the accuracy of the model, this study also employs control variables consisting of firm size (SIZE), firm age (AGE), and leverage (LEV). Firm size is measured using the natural logarithm of total assets, firm age is calculated from the year of establishment until the research year, while leverage is measured using the debt-to-assets ratio or debt-to-equity ratio.

The operational definitions and measurements of the research variables are summarized in Table 1 below.

Table 1. Operational Definitions and Measurement of Variables

No	Variable	Operational Definition	Measurement
1	Sustainable Growth Rate (SGR)	The company's ability to grow sustainably without significantly increasing external financing	$SGR = ROE \times (1 - \text{Dividend Payout Ratio})$
2	Green Innovation (GI)	The company's efforts to develop environmentally friendly products, processes, or technologies	Green innovation disclosure index based on 4 items
3	Green Reputation (GR)	Stakeholders' perceptions of the company's commitment to environmental preservation	Green reputation disclosure index based on 15 items

No	Variable	Operational Definition	Measurement
4	Firm Size (SIZE)	The size of the company reflecting its available resource capacity	Ln (Total Assets)
5	Firm Age (AGE)	The length of time the company has been established until the research year	Research year – Year of establishment
6	Leverage (LEV)	The level of debt utilization in the company's capital structure	Debt to Equity Ratio (DER)

Source: Research Data, 2026

Data analysis in this study was conducted using panel data regression with the assistance of Stata 19.0 software. The use of panel data regression was selected because it is capable of combining variations across companies and over time, thereby producing more accurate and efficient estimations.

The analysis stages begin with descriptive statistics to provide an overview of the characteristics of the research data. The selection of the most appropriate panel regression model, namely among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), is conducted through the Chow test, Hausman test, and Lagrange Multiplier test.

To test the hypotheses in this study, two panel data regression models are employed as follows:

Model 1 (Testing Hypothesis 1)

This model is used to examine the direct effect of green innovation on sustainable growth:

$$SGR_{it} = \alpha + \beta_1 GI_{it} + \beta_2 SIZE_{it} + \beta_3 AGE_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \dots\dots\dots (1)$$

Model 2 (Testing Hypothesis 2 – Moderation)

This model is used to examine the moderating role of green reputation in the relationship between green innovation and sustainable growth:

$$SGR_{it} = \alpha + \beta_1 GI_{it} + \beta_2 GR_{it} + \beta_3 (GI_{it} \times GR_{it}) + \beta_4 SIZE_{it} + \beta_5 AGE_{it} + \beta_6 LEV_{it} + \varepsilon_{it} \dots\dots\dots (2)$$

RESULTS AND DISCUSSION

Descriptive statistics are used to provide an overview of the characteristics of the research data. This analysis includes the mean value, standard deviation, minimum value, and maximum value of each variable used in the study. The research sample consists of companies in the basic materials sector listed on the Indonesia Stock Exchange during the 2020–2024 period. Based on the data collection and processing process, the initial number of observations was 565 (113 companies × 5 years). However, after adjustments were made regarding data availability, the number of observations that could be used in this study became 542. Therefore, the data used in this study are classified as unbalanced panel data. The results of the descriptive statistics are presented in Table 2.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SGR	542	0.048	0.180	-1.022	0.586
GI	542	0.216	0.219	0.000	0.750
GR	542	0.279	0.199	0.000	0.867
SIZE	542	27.958	1.703	24.431	32.049

Variable	Obs	Mean	Std. Dev.	Min	Max
AGE	542	30.636	15.961	1.000	73.000
LEV	542	1.015	1.141	0.002	6.588

Source: Research Data, 2026

Based on Table 2, the sustainable growth variable (SGR) has a mean value of 0.048, indicating that companies in the basic materials sector tend to experience relatively stable growth. The minimum value of -1.022 indicates the existence of companies experiencing contraction, while the maximum value of 0.586 reflects companies with relatively high growth. The standard deviation of 0.180 indicates variations in growth among companies.

The green innovation variable (GI) has a mean value of 0.216, indicating that the implementation of green innovation among companies is still relatively low to moderate. This is also reflected in the minimum value of 0 and the maximum value of 0.75, which shows that not all companies have optimally implemented green innovation. The green reputation variable (GR) has a mean value of 0.279 with considerable variation, reflecting that stakeholder perceptions of companies' environmental commitments still differ across firms.

The firm size variable (SIZE) shows a mean value of 27.958, indicating that the sample is dominated by large-scale companies. The firm age variable (AGE) has an average of approximately 30 years, indicating that most companies have been operating for a relatively long period. Meanwhile, the leverage variable (LEV) has a mean value of 1.015 with a maximum value reaching 6.588, indicating differences in companies' financing structures, particularly in the use of debt.

To ensure that the regression model used in this study is free from multicollinearity problems, testing was conducted through the analysis of the correlation matrix among variables. The test results are presented in Table 3 below.

Table 3. Multicollinearity Test Results

	SGR	GI	GR	SIZE	AGE	LEV
SGR	1.000					
GI	-0.033	1.000				
GR	-0.016	0.245	1.000			
SIZE	0.098	0.122	0.429	1.000		
AGE	0.044	0.093	0.189	0.448	1.000	
LEV	-0.176	-0.004	-0.013	0.081	0.028	1.000

Source: Research Data, 2026

Based on Table 3, it can be observed that the correlation coefficients among the independent variables are relatively low. The highest correlation occurs between the SIZE and AGE variables, with a value of 0.448, followed by the correlation between GR and SIZE, with a value of 0.429. These values remain below the commonly accepted threshold of 0.80, indicating the absence of a very strong linear relationship among the independent variables.

The correlation between the main research variables, namely GI and GR, is recorded at 0.245, indicating a weak relationship. Other variables also show low correlation values, both with the dependent variable (SGR) and among the independent variables themselves. Therefore, it can be concluded that the research model does not experience multicollinearity problems, and the independent variables used are appropriate for further analysis in the regression model.

Table 4. Regression Test Results - Model 1

SGR	Coefficient	Std. Error	t-statistic	p-value
GI	-0.219	0.116	-1.88	0.031**
SIZE	0.015	0.008	1.78	0.034**
AGE	0.000	0.001	-0.07	0.948
LEV	-0.042	0.010	-4.44	0.000***
Adj R ² (overall)	0.117			
Prob. Chi ²	0.000			

Note: *, **, ***, represent significance levels of 10%, 5%, and 1%, respectively.

Source: Research Data, 2026

Table 4 presents the results of the Model 1 regression test, which examines the effect of green innovation on corporate sustainable growth (SGR) by including control variables. The test results show that green innovation (GI) has a negative coefficient of -0.219 and is significant at the 5% level (p-value 0.031). This finding indicates that, in this model, an increase in green innovation is associated with a decrease in SGR. This condition may reflect the initial implementation costs of green innovation, which have not yet been able to provide direct financial benefits.

The control variables show mixed results. Firm size (SIZE) has a positive and significant effect on SGR, indicating that companies with larger assets have a better ability to maintain growth. Leverage (LEV) has a negative and significant effect at the 1% level, indicating that higher debt utilization can reduce the company's ability to achieve sustainable growth. Meanwhile, firm age (AGE) does not have a significant effect on SGR. The adjusted R² value of 0.116 indicates that the model is able to explain approximately 11.65% of the variation in SGR, while the significant Prob. Chi² value (0.000) indicates that the overall model is feasible for use.

Table 5. Regression Test Results - Model 2

SGR	Coefficient	Std. Error	t-statistic	p-value
GI	-0,198	0,110	-1,810	0,022**
GR	-0,187	0,095	-1,960	0,002***
GI*GR	0,476	0,269	1,770	0,038**
SIZE	0,014	0,007	1,890	0,030**
AGE	0,000	0,001	-0,140	0,891
LEV	-0,033	0,011	-3,140	0,002***
Adj R ² (overall)	0,132			
Prob. Chi ²	0,000			

Note: *, **, ***, represent significance levels of 10%, 5%, and 1%, respectively.

Source: Research Data, 2026

Table 5 presents the results of the Model 2 regression test, which examines the effect of green innovation on corporate sustainable growth (SGR) by including the moderating variable and control variables. The test results show that green innovation (GI) has a negative coefficient of -0.198 and is significant at the 5% level (p-value 0.022). Green reputation (GR) also has a negative coefficient of -0.187 and is significant at the 1% level (p-value 0.002). Meanwhile, the interaction between green innovation and green reputation (GI×GR) has a positive coefficient of 0.476 and is significant at the 5% level (p-value 0.038).

The control variables show mixed results. Firm size (SIZE) has a positive and significant effect on SGR, indicating that companies with larger assets have a

better ability to maintain growth. Leverage (LEV) has a negative and significant effect at the 1% level, indicating that higher debt utilization can reduce the company's ability to achieve sustainable growth. Meanwhile, firm age (AGE) does not have a significant effect on SGR. The adjusted R^2 value of 0.132 indicates that the model is able to explain approximately 13.17% of the variation in SGR, while the significant Prob. χ^2 value (0.000) indicates that the overall model is feasible for use.

The research findings in Model 1 indicate that green innovation has a negative and significant effect on corporate sustainable growth. This finding suggests that higher levels of green innovation practices disclosed by companies in the basic materials sector have not yet contributed to improved sustainable growth during the observation period. Instead, green innovation demonstrates a negative relationship with sustainable growth. This result differs from the perspective of the Natural Resource-Based View (NRBV), which explains that green innovation can become a source of competitive advantage through improved resource efficiency, cost reduction, and the creation of long-term economic value (Lee & Min, 2015). However, the economic benefits of green innovation do not always emerge immediately because companies require the ability to develop, integrate, and transform environmental capabilities into strategic advantages (Borah et al., 2024; Ledi et al., 2024).

The negative effect of green innovation on sustainable growth can be explained by the characteristics of green innovation implementation as an organizational transformation process. In this study, green innovation is measured through the disclosure of environmentally oriented innovation practices, including the use of low-pollution materials, energy and resource efficiency, material reduction, and sustainable product development. Therefore, a higher level of green innovation disclosure reflects greater attention and commitment toward environmental innovation practices, but it does not necessarily indicate that these practices have already generated economic benefits. Companies may still be in the process of adapting operational activities, developing environmental capabilities, and integrating green innovation into their business strategies before such initiatives can contribute to sustainable growth.

This condition is particularly relevant in the basic materials sector, which is characterized by high resource dependency, intensive production processes, and substantial environmental pressures. Companies in this sector may disclose more extensive green innovation practices due to increasing regulatory requirements and stakeholder expectations regarding environmental responsibility. However, the ability to transform these practices into sustainable growth depends on internal capabilities, such as green dynamic capability, absorptive capacity, and organizational learning capability. Limited capability to integrate environmental initiatives into operational improvements may cause green innovation practices to have not yet been effectively translated into productivity enhancement and long-term corporate growth (Singh et al., 2021; Taneja et al., 2023).

This finding is consistent with previous studies showing that the relationship between green innovation and firm performance remains contextual and is influenced by organizational capabilities, access to resources, sustainability governance, and industry characteristics (Johl & Toha, 2021; Khanchel et al., 2023).

Therefore, the negative results of this study do not imply that green innovation fails to provide benefits, but rather indicate that the contribution of green innovation to sustainable growth requires time and supporting mechanisms to be realized. Companies in the basic materials sector need to strengthen dynamic capabilities and develop mechanisms that enable green innovation practices to be transformed into operational efficiency, competitive advantages, and sustainable growth. This finding provides a basis for examining the role of green reputation as a factor that can strengthen the relationship between green innovation and sustainable growth.

The results of Model 2 show that green reputation has a negative and significant effect on SGR, while the interaction between GI and GR (GI×GR) has a positive and significant effect. This finding indicates that green reputation does not directly improve corporate sustainable growth but strengthens the relationship between green innovation and SGR. The negative direct effect of green reputation may indicate that building environmental credibility requires continuous organizational efforts, including strengthening environmental commitments, improving transparency, and maintaining communication with stakeholders. These efforts may not immediately generate economic benefits because companies require time to establish legitimacy and obtain stakeholder recognition.

The role of green reputation as a moderating variable can be explained through the perspectives of stakeholder theory, NRBV, and Dynamic Capability View (DCV), which position reputation as an intangible strategic asset that enhances the value of green innovation. Although green innovation practices may provide environmental benefits, their contribution to sustainable growth depends on how effectively companies communicate and legitimize these practices to stakeholders. Strong green reputation can reduce uncertainty regarding environmental initiatives by increasing legitimacy, investor confidence, and market acceptance of corporate sustainability strategies. Therefore, green innovation practices that initially provide limited economic benefits can generate greater value when companies possess environmental credibility recognized by stakeholders (Blas, 2020; Tariq et al., 2019; Zhang et al., 2018).

The positive and significant GI×GR interaction results indicate that companies with stronger green reputation have greater ability to transform green innovation practices into sustainable growth. Green reputation functions as a strengthening mechanism that helps companies obtain strategic resources, including capital access, market support, and stakeholder trust (Chen et al., 2026; Liu et al., 2022). This finding is particularly relevant in the context of the basic materials sector in Indonesia, which faces significant environmental impacts and increasing sustainability pressures. Therefore, green reputation does not merely represent corporate image but also serves as a strategic mechanism that enables companies to maximize the value creation potential of green innovation and encourage sustainable growth. Based on these results, the hypothesis stating that green reputation strengthens the effect of green innovation on corporate sustainable growth is supported.

CONCLUSION

This study shows that green innovation has a negative and significant effect on sustainable growth in basic materials sector companies in Indonesia. This finding indicates that green innovation investment does not always generate immediate economic benefits because companies still face implementation costs, technology investment requirements, and operational adaptation processes that require time. However, this study finds that green reputation is able to strengthen the relationship between green innovation and sustainable growth. This result indicates that companies with stronger green reputations have a greater ability to transform green innovation investments into economic value through enhanced legitimacy, investor trust, and market acceptance. This finding strengthens the RBV, NRBV, and DCV perspectives that green innovation requires organizational capabilities and intangible assets to create sustainable competitive advantages.

This study has several limitations. The measurement of green innovation and green reputation still uses a disclosure-based approach from annual reports and sustainability reports, making it highly dependent on the level of corporate transparency and not fully reflecting actual environmental practices. In addition, this study only focuses on basic materials sector companies listed on the Indonesia Stock Exchange, so the findings cannot yet be generalized to other industrial sectors with different characteristics. The measurement of sustainable growth using the SGR approach also does not fully capture broader sustainability aspects, such as environmental, social, and corporate market value performance.

Future research is recommended to employ more diverse approaches for measuring green innovation, such as green patent data, environmental research and development investment, or company operational indicators. Further studies may also incorporate other variables that potentially explain the mechanism between green innovation and sustainable growth, such as green dynamic capability, ESG disclosure quality, environmental management accounting, and sustainability governance. The use of longer observation periods and the expansion of samples across industries and countries are also needed to understand how green innovation generates long-term economic benefits, particularly through the strengthening of green reputation and corporate capabilities.

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