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The Role of Company Size in the Influence of Sustainability Practices on Financial Performance

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Abstract

Sustainability issues encourage manufacturing companies to focus not only on profitability but also on environmental responsibility. Green accounting practices, ISO 14001, and innovations in green technology are strategies for managing environmental impacts. Using regression analysis, this study analyzed secondary data from 55 manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the period from 2019 to 2023. The quantitative data that has been collected is processed and analyzed using the Statistical Package for the Social Sciences (SPSS) software. Multiple linear regression analysis models and Moderated Regression Analysis (MRA) are used to examine the relationship between independent variables (green accounting, ISO 14001, and green technology innovation) and dependent variables (financial performance), as well as the role of moderating variables (company size). The study's results indicate that green accounting and ISO 14001 have a positive impact on financial performance. Green technology innovation does not affect financial performance. Company size moderates the relationship between green accounting and ISO 14001 on financial performance, but does not moderate the effect of green technology innovation.

Keywords: *Green Accounting, Green Technology Innovation, ISO 14001, Financial Performance, Firm Size.*

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INTRODUCTION

The manufacturing industry is an essential sector in the Indonesian economy. According to the Minister of Industry, this sector contributed 18.34% to GDP in 2022, increasing to 18.67% in 2023 and reaching 18.98% in 2024. As a sector with high economic value, manufacturing companies strive to enhance their financial performance to achieve maximum profitability. Financial performance is a leading indicator that reflects a company's profitability. In the business world, earning a profit is a key indicator of financial performance, as it plays a crucial role in maintaining a company's sustainability and maximizing return on investment, as well as facilitating business expansion (Angelina & Nursasi, 2021).

However, to maximize financial performance, many manufacturing companies tend to overlook their social responsibilities. Increasingly tight corporate competition has led many companies to become more profit-oriented, often without considering the environmental impact of their operations.(Sari & Asrori, 2022).

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Manufacturing companies not only create waste from their operational activities, but also from the remaining products and packaging used by consumers.(Adyaksana & Pronosokodewo, 2020).One of the problems that often arises due to company activities is B3 waste (Hazardous and Toxic Materials). According to data from the Ministry of Environment and Forestry (KLHK), Indonesia generated approximately 60 million tons of B3 waste in 2021, with 2,897 manufacturing companies being the primary contributors (Katadata.co.id, 2022). Several cases of environmental pollution in Indonesia include instances of pollution carried out by Mayora, one of the three most significant contributors to single-use plastic packaging, which has been proven to pollute 11 coastal areas in Indonesia. (Walhi, 2022). Residents of Kalijaya village experienced severe impacts that are suspected to originate from waste owned by PT Fajar Surya Wisesa (Telusur.co.id, 2019). Similar problems were also found in the activities of PT Japfa Comfeed Indonesia Tbk, which produced waste and production waste that polluted the surrounding environment (Lintasmerah.com, 2019).

This phenomenon demonstrates that the suboptimal management of industrial waste in manufacturing can compromise environmental sustainability. The government has anticipated this problem by issuing various regulations that govern corporate responsibility towards the environment, including those in the manufacturing sector. One of these regulations is Law No. 47 of 2012 concerning Corporate Social and Environmental Responsibility (TJSLP), which requires every company to carry out social responsibility and sustainable environmental management. In response to environmental issues, manufacturing companies have begun implementing green accounting as a means to mitigate the environmental impact of their operational activities (Putra & Sisdianto, 2024). This implementation is increasingly relevant with the implementation of Law No. 32 of 2009 concerning environmental protection and management. This regulation outlines the obligation of companies to conduct an Environmental Impact Analysis (AMDAL) and manage their waste. This encourages companies to allocate sustainability budgets and report environmental performance transparently. In addition to green accounting, ISO 14001 is an internationally recognized environmental management system standard that helps organizations systematically and measurably manage their environmental responsibilities (Salimi, 2024). By implementing this standard, companies can improve operational efficiency and reduce environmental risks (Imansari et al., 2024).

Along with the development of technology and an increasing awareness of the importance of sustainability, digital transformation is becoming increasingly crucial for manufacturing companies. Digital transformation opens up new opportunities for companies to innovate in more environmentally friendly technologies (green technology innovation). Green technology innovation is a series of actions, including the development, implementation, or introduction of new ideas, behaviors, processes, products, procedures, and organizational systems that contribute to reducing environmental impacts. (Ye & Cheng, 2019). The implementation of green technology innovation in companies can increase competitiveness in the market while minimizing environmental impacts throughout the production and consumption process (Xie et al., 2019). However, implementing environmental sustainability is not easy (Surotenojo et al., 2019). One of the factors that influences it is the size of the company (Gayatri & Dewi, 2024). Large-scale companies have more adequate resources to implement comprehensive environmental policies. In line with Barney's (1996) resource-based view theory, large companies tend to have greater

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opportunities to obtain support, both in financial and non-financial aspects, which can facilitate the implementation of environmental sustainability.

The implementation of green accounting, ISO 14001, and green technology innovation continues to yield mixed results in terms of financial performance. Several studies, including those by Putri et al. (2022), Angelina and Nursasi (2021), and Faizah (2020), have found that green accounting has no significant impact on financial performance. However, different findings were presented by Ramadhani et al. (2022) and Alina & Rahman (2023), which showed a positive impact of green accounting. Likewise, according to Ong et al. (2016), Arifah (2024), and Kinasih et al. (2022), ISO 14001 affects financial performance, particularly in terms of ROA and ROE. However, Ermaya & Mashuri (2020) found the opposite results. In line with research by Xie et al. (2019), The Last Supper (2024), and Sari (2024), it is stated that green technology innovation has an impact on financial performance. This differs from the research on The Last Supper (2021), which shows that green technology innovation has no impact on financial performance.

The increasing demands for transparency and accountability in the sustainability aspect require manufacturing companies to balance economic and environmental interests. Based on the information provided above, the author is interested in researching "The Influence of Green Accounting, ISO 14001, and Green Technology Innovation on Financial Performance with Company Size as a Moderating Variable."

Legitimacy Theory

Legitimacy Theory (Suchman, 1995) posits that companies must operate by social norms and expectations to garner public support. This theory emphasizes the importance of social and environmental responsibility in maintaining business continuity (Latifah & Abdullah, 2022). Companies that demonstrate concern for the environment through the implementation of green accounting, compliance with ISO 14001 standards, and environmentally friendly technological innovation can increase public legitimacy, which ultimately has a positive impact on financial performance (Amira & Siswanto, 2022). Thus, legitimacy theory becomes the basis for understanding the relationship between sustainability practices and corporate performance.

Resource-Based Theory

RBV was first proposed by (Wernefelt, 1984; Barney, 1991). RBV theory posits that high-quality company resources and capabilities are the primary source of sustainable competitive advantage (Rahadian, 2017). The success of a company does not only depend on external factors such as market or industry conditions, but more on internal factors, namely how the company utilizes and manages its resources effectively (Dasuki, 2021). Companies that have superior resources and capabilities will have higher competitiveness compared to their competitors.

The Influence of Green Accounting on Financial Performance

Legitimacy Theory suggests that companies must adapt to societal norms and expectations to gain social legitimacy. In this context, green accounting is a form of corporate commitment to environmental sustainability that integrates environmental impact management into financial statements. This is important because society and

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other stakeholders are increasingly paying attention to the environmental impact of corporate activities (Zain, 2021). Green accounting can reduce operational costs through more efficient waste management and avoidance of fines related to environmental regulations. For example, companies that are active in waste management can reduce costs related to waste management and regulatory compliance, which in turn increases the company's profitability. Research by (Alina & Rahman, 2023; Ramadhani et al., 2022) indicates that green accounting has a positive impact on a company's financial performance, specifically by enhancing operational efficiency. (Angelina & Nursasi, 2021; Faizah, 2020) Stated that green accounting does not affect financial performance.

H1: *Green accounting affects financial performance.*

The Impact of ISO 14001 on Financial Performance

Legitimacy Theory explains that disclosure or certification of ISO 14001 as an environmental management system sends a positive signal to the public and stakeholders that the company is responsible for managing its environmental impacts. This certification is also important for gaining social legitimacy, as it demonstrates the company's commitment to environmental sustainability (Life, 2021). Research by (Ong et al., 2016; Kinasih et al., 2022) shows that companies that implement ISO 14001 tend to have better financial performance, because this certification not only reduces operational costs through efficient waste management, but also strengthens the company's image in the market, leading to increased customer loyalty and product demand. Juwita *et al.,* (2024) also found that companies with ISO 14001 certification are more transparent and accountable, which can improve stakeholder relationships and drive improved financial performance.

H2: *ISO 14001 has a positive impact on financial performance.*

The Impact of Green Technology Innovation on Financial Performance

Resource-Based View Theory (RBV) posits that unique, valuable, rare, and difficult-to-imitate resources can confer sustainable competitive advantages to companies. Green technology innovation falls into this category because it can create sustainable added value, reduce operational costs, and enhance company competitiveness. Additionally, companies that implement green technology innovations can gain higher trust from customers, which in turn leads to increased loyalty and market demand (Xie et al., 2019). Research by (Przychodzen & Przychodzen, 2015; Supper, 2020) indicates that companies adopting green technology innovations exhibit higher ROA and ROE, as they are more efficient in utilizing resources and energy. The study by (Asila & Falikhatun, 2023; Sari, 2024), also stated that green technology improves long-term financial performance by enhancing production efficiency and meeting market demand that is increasingly concerned with sustainability issues.

H3: *Green Technology Innovation Affects Financial Performance.*

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Company Size Moderates the Effect of Green Accounting on Financial Performance

According to legitimacy theory, large companies tend to face higher external pressures to maintain their environmental image and accountability. Therefore, they are more motivated to implement green accounting as a public communication strategy (Wibowo & Linggarsari, 2024). Large companies also have more adequate resources to implement green accounting comprehensively (Rofiqoh & Hariyanto, 2024). Thus, company size can strengthen the impact of green accounting on improving financial performance.

H4: *Company size moderates the effect of green accounting on financial performance.*

Company Size Moderates the Effect of ISO 14001 on Financial Performance

From the RBV perspective, large companies are better equipped to absorb and implement ISO 14001 because they possess superior infrastructure, human resources, and support systems (Aprilasani et al., 2017). Meanwhile, from the legitimacy theory perspective, large companies are more visible in the public eye, so they are more motivated to obtain environmental certification to meet social expectations (Sari & Asrori, 2022). Therefore, company size strengthens the effectiveness of ISO 14001 implementation on financial performance.

H5: *Company size moderates the effect of ISO 14001 on financial performance*

Company Size Moderates the Effect of Green Technology Innovation on Financial Performance

Green technology innovation requires significant investments and access to advanced technologies, which are more likely to be undertaken by large companies. According to RBV theory, large companies have the capital, R&D capabilities, and organizational capacity to develop valuable and sustainable innovations (Sari, 2024). In contrast, small companies face capital and technological limitations, making it challenging for them to adopt green innovations fully.(Indra & Hendayana, 2024). Therefore, company size affects the strength of the relationship between green technology innovation and financial performance..

H6: *Company size moderates the influence of green technology innovation on financial performance*

METHODOLOGY

This study adopts a quantitative approach to explain the impact of green accounting, ISO 14001, and green technology innovation on financial performance. Quantitative research is based on the philosophy of positivism and involves testing established hypotheses by analyzing data statistically (Sugiyono, 2017).

Research Variables

This study uses the following five variables. The dependent variable is financial performance, which reflects a company's ability to generate profits. The indicator used to measure financial performance is Return on Assets (ROA), calculated as the ratio of profit after tax to the company's total assets (Manurung & Rachmat, 2019).

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The independent variables include green accounting, ISO 14001 certification, and green technology innovation. Green accounting is an accounting system that incorporates environmental costs into a company's financial reports. The indicator for this variable is environmental costs, measured by the formula of total Corporate Social Responsibility (CSR) costs divided by net profit (Arindra & Praptoyo, 2024). ISO 14001 represents recognition that a company has met international standards for environmental management. The indicator for this variable is nominal: a company is assigned a score of 1 if it holds ISO 14001 certification and zero if it does not (Ermaya & Mashuri, 2020). Green Technology Innovation is the company's effort to develop and adopt environmentally friendly technologies. According to Xie et al. (2019), Green technology innovation encompasses both green process innovation and green product innovation. Green process innovation involves improving production methods to be more efficient and sustainable, including the use of renewable energy, reducing emissions, and enhancing waste management. Green product innovation focuses on developing new products or modifying existing ones to be more environmentally friendly, for instance, by using recycled raw materials or reducing the use of hazardous substances. This variable is measured by the ratio of the number of green technology innovation items disclosed to the total number of items that should be disclosed (Asila & Falikhatun, 2023). The moderating variable in this study is company size, which refers to the scale of a company and is typically associated with the amount of assets it possesses. Company size is measured using the natural logarithm of total assets (Dita & Ervina, 2021).

Population and Sample

The population in this study consists of all manufacturing sector companies listed on the Indonesia Stock Exchange (IDX) during the period from 2019 to 2023, totaling 220 companies. The research sample was selected using the purposive sampling method based on specific criteria. First, the companies must be actively operating during the 2019-2023 period and remain listed on the IDX throughout that time. Second, the companies are required to publish both annual reports and sustainability reports that provide information related to green accounting, specifically disclosing Corporate Social Responsibility (CSR) costs consistently for the 2019-2023 period. Lastly, only companies that use the Indonesian rupiah (Rp) as their reporting currency were included in the sample.

Table 1. Determination of Sample Size

No.	Sampling Criteria	Amount
1	A company manufacturing is listed on the IDX	220
2	Manufacturing companies not listed on the IDX from 2019 to 2023	(39)
3	Manufacturing companies that did not report financial statements for the 2019-2023 period	(19)
4	Manufacturing companies that do not use the Rupiah (Rp) currency	(28)
3	Manufacturing companies that do not report sustainability reports for the 2019-2023 period and include CSR cost information	(79)
	Number of Samples Meeting the Criteria	**55**
	Sample Year of Research	**275**

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Data analysis

Researchers' quantitative data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS) software. This study uses multiple linear regression analysis and moderation with the moderated regression analysis (MRA) method.

Classical Assumption Test

The classical assumption test is a crucial stage in regression analysis, used to verify that the model employed meets several fundamental assumptions, ensuring that the analysis results are reliable and valid. (Ghozali, 2018). Classical assumption tests include those for normality, multicollinearity, heteroscedasticity, and autocorrelation.

Hypothesis Testing

Hypothesis test analysis was conducted to investigate the influence of green accounting, ISO 14001, and green technology innovation on financial performance. This study uses several statistical tests, including:

Coefficient of Determination Test (R-squared). This test shows that the coefficient of determination can be analyzed through the Adjusted R2 square value, which measures the extent to which the model can explain the related (dependent) variables and shows how much influence variable X has on the contribution of variable Y (Ghozali, 2018).

Partial Significance Test (t-Test). This test measures the partial relationship between each independent variable and the dependent variable (Ghozali, 2018).

Multiple Linear Regression Analysis. Forecasting the extent to which two or more independent variables (X) influence the dependent variable (Y). Multiple linear regression is used to find out the extent to which two or more independent variables (X) influence the dependent variable (Y).

$$y = \alpha + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + e$$

Information:
Y : Financial performance
X1 : *Green Accounting*
X2 : ISO 14001
X3: *Green Technology Innovation*
e: error

Moderated Regression Analysis(MRA). To test whether there are other variables (moderators) that strengthen or weaken the relationship between green accounting, ISO 14001, and green technology innovation on financial performance. The interaction test, also known as MRA, is a data analysis method used to maintain sample accuracy and provide a basis for controlling the influence of moderator variables (Ghozali, 2018). The models used are:

$$y = \alpha + \beta_1 X1 + +\beta_2 X2 + \beta_3 X3 + \beta_4 YZ + \beta_5 (X1 * Z) + \beta_6 (X2 * Z) + \beta_7 (X3 * Z) + e$$

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Information:
Y: Financial performance
X1: *Green Accounting*
X2: ISO 14001
X3: *Green Technology Innovation*
Z: Company Size
e: error

RESULTS AND DISCUSSION

Descriptive statistical analysis. This study aims to provide a comprehensive overview of the data used and to understand the relationship patterns between the variables studied. Descriptive statistics encompass four primary indicators: the maximum value, the minimum value, the average value, and the standard deviation.

Table 2. Descriptive Statistics Results

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Financial performance	275	1,949	-.949	1,000	.04221	.115315
Green Accounting	275	1,370	-.127	1.243	.03724	.114068
ISO 14001	275	1	0	1	.60	.491
Green Technology Innovation	275	.92	.08	1.00	.5260	.23173
Company Size	275	6.61	25.55	32.16	28.8784	1.48413
Valid N (listwise)	275					

Source: *Secondary data processed using IBM SPSS 26, 2025*

Table 2 presents descriptive statistics of the variables used in this study. The financial performance variable with the proxy Return on Assets (ROA) has an average value of 0.0422, indicating that, in general, the companies in the research sample generated a profit of 4.22% of their total assets. The standard deviation of 0.115 indicates a relatively moderate variation in financial performance between companies. This suggests that the financial performance of the companies in this sample is generally low but relatively stable. The spread of data is not too large, so it does not describe uniform conditions among these companies. The minimum value of -0.949 is found in PT Indofarma Tbk for the 2023 period, and the maximum value of 1,000 is found in PT Emdeki Utama Tbk for the 2019 period.

The green accounting variable with an environmental cost proxy yields an average value of 0.1045, indicating that, in general, the environmental costs recorded by the company remain low. The standard deviation of 0.849 indicates a significant difference between companies in terms of commitment to reporting and spending on environmental costs, suggesting that the implementation of green accounting is not evenly distributed. The minimum value of -0.127 is found in PT Surya Toto Indonesia Tbk for the 2020 period, and the maximum value of 1.24 is found in PT Wismilak Inti Makmur Tbk for the 2019 period.

In ISO 14001 variables, as presented in The Last Supper (2020), a minimum value of 0 and a maximum value of 1 were obtained, as this variable is measured as a dummy variable. The average of 0.60% indicates that approximately 60% of the sample companies hold ISO 14001 certification, indicating a relatively good level of compliance with international environmental management standards. The standard

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deviation of 0.491 indicates a balanced distribution between companies that have and do not have this certification.

The green technology innovation variable has an average value of 0.526, indicating that most companies have adopted more than half of the green technology innovation indicators used in this study. A minimum value of 0.08 indicates that some companies implement only one or two types of environmentally friendly technological innovations. While the maximum value of 1.00 indicates that there are companies that fully adopt all green technology indicators. The standard deviation of 0.231 indicates significant variation between companies in terms of implementing green technology innovations.

The company size variable has an average value of 28.8784, indicating that, in general, the companies in the sample are categorized as medium to large in size. The standard deviation of 1.484 indicates that there is variation in company size, meaning that the data used includes a combination of large and medium-sized companies. The maximum value of 32.16 is found in PT Gudang Garam Tbk for the 2023 period. While the minimum value of 25.55 is found in PT Lionmesh Prima Tbk.

Classical Assumption Test

Normality Test

A good regression model requires the assumption that the residuals follow a normal distribution so that the results of the regression parameter estimates are valid and unbiased. (Ghozali, 2018). In this study, the normality test was conducted using the Kolmogorov-Smirnov method.

Table 3. Results of the Kolmogorov-Smirnov Normality Test

		Unstandardized Residual
N		275
Normal Parameters a,b	Mean	.0000000
	Std. Deviation	.11405057
Most Extreme Differences	Absolute	.185
	Positive	.126
	Negative	-.185
Test Statistics		.185
Asymp. Sig. (2-tailed)		.000c

Source: *Secondary data processed using IBM SPSS 26, 2025*

Based on the data processing above, the Asymp. Sig. (2-tailed) value is 0.000 or less than 0.05. It can be concluded that the data is not normally distributed. This is because financial reports and sustainability reports naturally have extreme variations, and the nature of time series data tends to fluctuate over time. Therefore, the normality test used in this study still employs parametric analysis, concerning the central limit theorem (CLT). CTL explains that if the number of observations (n) is greater than 30 (n ≥ 30), then the greater the number of observations, the closer the data will be to the normal distribution of Dielman (1961), as cited in Ghozali (2009).

Multicollinearity Test

A multicollinearity test was conducted to determine whether there is a high correlation between independent variables in the regression model. (Ghozali, 2018).

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In detecting multicollinearity in this study, tolerance and variance inflation factor (VIF) values were used. A regression model that is free from multicollinearity has a tolerance value > 0.10 and a VIF value < 10.

Table 4. Multicollinearity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.086	.148		.583	.561		
	Green Accounting	-.114	.048	-.158	-2.397	.017	.970	1,031
	ISO 14001	.033	.016	.143	2.124	.035	.930	1,076
	Green Technology Innovation	-.008	.031	-.018	-.270	.787	.966	1,035
	Company Size	-.001	.005	-.010	-.153	.878	.922	1,085

a. Dependent Variable: Financial Performance

Source: *Secondary data processed using IBM SPSS 22, 2024*

Based on the test results shown in the table above, it can be seen that all independent variables have a tolerance value above 0.10 and a VIF value below 10. Thus, it can be concluded that the regression model in this study does not experience multicollinearity.

Heteroscedasticity Test

The heteroscedasticity test aims to determine whether there is inequality of variance in the residuals of one observation compared to another in the regression model. One method used to detect heteroscedasticity is the Glejser test, where the absolute residual is regressed against the independent variable.

Table 5. Heteroscedasticity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.249	.114		2.175	.030
	Green Accounting	-.088	.051	-.104	-1,706	.089
	ISO 14001	.012	.012	.059	.948	.344
	Green Technology Innovation	-.013	.025	-.031	-.510	.611
	Company Size	-.006	.004	-.099	-1,584	.114

a. Dependent Variable: ABS_RES

Source: *Secondary data processed using IBM SPSS 26, 2025*

Based on Table 5, the significance value of all variables is more than 0.05. This indicates the absence of heteroscedasticity in the regression model.

Autocorrelation Test

The autocorrelation test aims to determine whether there is a correlation between the residuals of one period and those of the previous period. (Ghozali, 2018).

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Table 6. Autocorrelation Test Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.666[a]	.444	.438	.16302	1,778

Source: *Secondary data processed using IBM SPSS 26, 2025*

Based on the test results above, the Durbin-Watson value of 1.778 indicates that there is no autocorrelation in this regression model.

Hypothesis Testing 1

Coefficient of Determination Test

Test: The coefficient of determination is used to assess the extent to which the independent variable can explain the variations that occur in the dependent variable.

Table 7. Adjusted R Square Coefficient Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.667[a]	.446	.437	.16305

Source: *Secondary data processed using IBM SPSS 26, 2025*

The regression analysis results, presented in Table 7, indicate an adjusted R-squared value of 0.437. This value indicates that the developed model can only explain 43.7%, while 56.3% is influenced by other factors outside the model that could not be detected in this study.

Partial Significance Test (t-Test)

The t-test aims to partially test each independent variable against the dependent variable. The alternative hypothesis (H_a) is accepted if the significance value (p-value) is less than 0.05, which indicates a significant effect at the 95% confidence level.

Table 8. Results of Simple Linear Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.064	.022		2,858	.005
Green Accounting	-.114	.048	-.158	-2.397	.017
ISO 14001	.033	.015	.141	2.143	.033
Green Technology Innovation	-.009	.031	-.020	-.303	.762

a. Dependent Variable: Financial Performance

Source: *Secondary data processed using IBM SPSS 26, 2025*

Based on the results of the simple linear regression analysis in Table 8, statistical evidence suggests that green accounting has a significant influence on financial performance. This is indicated by the significance value (sig.) of 0.017, which is smaller than the significance level of 0.05. ISO 14001 shows that ISO influences financial performance with a significance value of 0.033 <0.05. However, green technology innovation does not influence financial performance.

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Hypothesis Testing 2

R-squared Determination Coefficient Test

Moderated Regression Analysis (MRA) is a specialized form of multiple linear regression that incorporates an interaction term, specifically the result of multiplying two or more independent variables in the regression model. (Ghozali, 2018). The results of the analysis are presented in the following table.

Table 9. Results of the R2 Determination Coefficient Test for Moderated Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.666[a]	.444	.438	.16302

Source: *Secondary data processed using IBM SPSS 26, 2025*

Based on Table 9, the value-adjusted value is 0.438. This value indicates that the interaction between green accounting, ISO 14001, and green technology innovation, with company size as a moderator variable, significantly contributes (43.8%) to explaining variations in financial performance.

Partial Significance Test (t-Test)

In moderated regression analysis, the t-test is used to determine whether the independent variable, the moderating variable, or the interaction between the two significantly affects the dependent variable.

Table 10. Results of Moderated Regression Analysis (MRA)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.064	.022		2,908	.004
	X1*Z	-.004	.002	-.160	-2.438	.016
	X2*Z	.022	.010	.141	2.152	.032
	X3*Z	-.006	.021	-.019	-.297	.767

Source: *Secondary data processed using IBM SPSS 26, 2025*

The results of the regression analysis indicate that company size significantly moderates the relationship between green accounting and financial performance. This is indicated by the interaction regression coefficient of 0.16, which is statistically significant ($p < 0.05$)—the company size variable moderates the effect of ISO 14001 on financial performance, with a significance value of 0.032. However, company size is unable to moderate the effect of green technology innovation on financial performance. The regression equation obtained is:

$$Financial\ Performance = 0.064 - 0.004X1*Z + 0.022X2*Z - 0.006X3*Z$$

Discussion

The Influence of Green Accounting on Financial Performance

The first hypothesis posits that green accounting has a positive impact on financial performance. The results of the study indicate that green accounting has a significant (adverse) impact on financial performance, supporting the acceptance of

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H1. This finding suggests that green accounting practices may reduce short-term profitability due to the high environmental costs incurred by companies, such as waste management and pollution control (Mutiara et al., 2024). According to legitimacy theory, environmental disclosure is undertaken to garner public support, but its impact on financial performance is only realized in the long term (Putri et al., 2019). In this study, the observation period was limited to 2019-2023. This is categorized as medium-term (Yusuf et al., 2023). This means that the negative results found are still reasonable because the economic benefits of green accounting are often only realized after more than 5 years, when efficiency, reputation, and market acceptance begin to form optimally. This result is reinforced by Ulil et al. (2023), which states that green accounting has a negative impact in the short term but can have strategic value if managed as a sustainability investment.

The Impact of ISO 14001 on Financial Performance

ISO 14001 has a significant (positive) effect on financial performance; it is concluded that H2 is accepted. This certification reflects compliance with environmental regulations and improves the image and trust of stakeholders. Legitimacy theory supports this result, indicating that companies demonstrating environmental commitment will gain social acceptance and market trust. Research by (Ong et al., 2016; Arifah, 2024) also indicates that ISO 14001 enhances the competitiveness and profitability of companies by increasing efficiency and fostering a positive reputation.

InfluenceGreen Technology Innovation on Financial Performance

Green technology innovation does not significantly affect financial performance; H3 is rejected. Specifically, green process innovation generally requires significant investments in the form of procuring environmentally friendly technology, HR training, and adjusting production processes. High costs and complex transition processes often burden short-term profitability. Meanwhile, green product innovation also requires investment in product development costs, the replacement of raw materials, and the redesign of environmentally friendly packaging. Unfortunately, the implementation of green product innovation in many companies remains symbolic, serving primarily to meet regulatory requirements rather than as a core business strategy. This condition prevents green innovation, both in terms of process and product, from creating efficiency or added value that has a direct impact on financial performance. This finding does not support the Resource-Based View theory, which posits that unique resources, such as green innovation, should drive a competitive advantage. This result aligns with research by The Greatest (2023), The Last Supper (2021), and Sari & Handayani (2020), which stated that neither green process innovation nor green product innovation has a significant effect on financial performance.

Company Size Moderates the Effect of Green Accounting on Financial Performance

Company size significantly moderates the effect of green accounting in a negative direction, indicating that the impact of green accounting on financial performance is weaker in large companies (H4 is accepted). Large companies already possess strong legitimacy, so environmental disclosure does not significantly enhance their financial performance (Putri et al., 2022). This aligns with the

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legitimacy theory, which suggests that the effect of social reporting is more pronounced in small companies that are establishing a reputation. This finding is reinforced by Tunggal and Fachrurrozie (2014), who stated that environmental costs can reduce profits when recorded as expenses.

Company Size Moderates the Effect of ISO 14001 on Financial Performance

The interaction between ISO 14001 and company size is significant and positive, indicating that the influence of ISO 14001 on financial performance is more substantial in large companies. It can be concluded that company size moderates the relationship between ISO 14001 and financial performance (H5 is accepted). Large companies have more resources to implement ISO 14001 effectively and meet stakeholder expectations. According to legitimacy theory, this strengthens social acceptance and enhances reputation. Wang and Zhao's (2020) research also shows that large companies can utilize ISO 14001 to build long-term competitive advantages.

Company Size Moderates the Effect of Green Technology Innovation on Financial Performance

Company size does not moderate the effect of green technology innovation on financial performance (H6 is rejected). This means that both large and small companies have not been able to feel significant benefits from green technology innovation. This is due to high investment costs and the less-than-optimal implementation of innovation as a core business strategy. This finding does not support the RBV theory because strategic resources have not been utilized effectively. This result is consistent with (Pangesti, 2023; Sari & Handayani, 2020), who stated that green innovation does not affect financial performance.

CONCLUSION

Based on the results of the analysis and discussion regarding the influence of green accounting, ISO 14001 certification, and green technology innovation on the financial performance of manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the period 2019 to 2023, with company size as a moderating variable, several conclusions can be drawn. The findings indicate that the green accounting variable has a significant effect on the financial performance of manufacturing companies during this period. Similarly, ISO 14001 certification also has a positive influence on financial performance. However, green technology innovation does not have a significant impact on the financial performance of these companies.

Furthermore, company size plays a moderating role in certain relationships. Specifically, company size can moderate and weaken the influence of green accounting on financial performance. In contrast, company size moderates and strengthens the relationship between ISO 14001 certification and financial performance. On the other hand, company size does not moderate the relationship between green technology innovation and financial performance. These conclusions offer valuable insights into how environmental practices and firm characteristics interact to influence financial outcomes in the manufacturing sector on the IDX.

This study has made a significant contribution to understanding the relationship between green accounting, ISO 14001, and green technology innovation

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in Indonesia. However, there are still many opportunities for further research to increase understanding of this phenomenon. The study is limited to three independent variables; however, there are other variables not used in this study, such as green intellectual capital and environmental audits, which make research on environmental aspects in companies increasingly complex. Further research is expected to expand the scope of the study by incorporating other sectors that have an impact on the environment, such as the oil and gas industry.

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