

## Green Accounting, Capital Structure, and Firm Size: Does GCG Moderate Their Effects on Financial Performance?

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### Abstract

*This study examined the effects of green accounting, capital structure, and firm size on financial performance and investigated whether Good Corporate Governance (GCG) moderates these relationships. A quantitative approach was employed using panel data regression and Moderated Regression Analysis (MRA), with the analysis conducted using EViews 12. The sample comprised ten companies that consistently received the Indonesian Institute for Corporate Directorship (IICD) Corporate Governance Award from 2020 to 2024. The findings show that green accounting has a negative but statistically insignificant effect on financial performance, whereas capital structure has a significant negative effect. Firm size has a significant positive effect. GCG did not significantly moderate the relationships between green accounting, capital structure, firm size, and financial performance. However, the three independent variables had a significant simultaneous effect on the financial performance. These findings indicate that financial performance is influenced collectively by environmental accounting practices, financing decisions, and firm characteristics, while GCG does not provide an additional moderating effect. This study was limited by its small sample size and the incomplete availability of ASEAN Corporate Governance Scorecard (ACGS) data. It contributes empirical evidence on the context-dependent role of GCG among companies with relatively established governance practices.*

**Keywords:** Capital Structure, Financial Performance, Firm Size, Good Corporate Governance, Green Accounting

### 1. INTRODUCTION

Financial performance is a key indicator of a company's ability to manage its resources and generate economic value. Return on Assets (ROA) is commonly used to measure how effectively a company utilizes its assets to generate profits. Therefore, identifying factors that influence financial performance is important, particularly as companies are increasingly expected to consider environmental and governance aspects alongside financial objectives ([Fan, Chen, and Yuan 2022](#); [Kuang et al. 2023](#)).

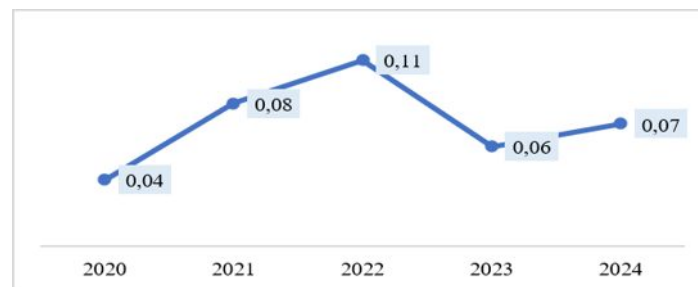


Figure 1. Trends in average financial performance (RoA)

Figure 1 shows the trend in the average financial performance, as measured by ROA, from 2020 to 2024. The average ROA increased from 0.04 in 2020 to 0.08 in 2021 and reached a peak of 0.11 in 2022 before declining to 0.06 in 2023 and slightly increasing to 0.07 in 2024. This fluctuation indicates that the financial performance remained dynamic during the observation period.

Green accounting is one factor that may influence financial performance because it incorporates environmental costs into accounting practices and can support better environmental cost management and resource efficiency [Rounaghi \(2019\)](#). However, previous findings have been inconsistent. [Khan and Gupta \(2024\)](#), through a meta-analysis of 68 studies, found a positive relationship between green accounting and firm performance, whereas [Misutari and Ariyanti \(2021\)](#) found no significant effect.

Capital structure is also relevant because debt can provide financing benefits but may increase financial costs and risk ([Dao and Ta 2020](#)). Previous studies have reported both positive [Rahman \(2020\)](#) and negative [Sakr and Bedeir \(2019\)](#) and [Tesema \(2024\)](#), relationships between capital structure and financial performance. Firm size may provide greater resources, operational capacity, and access to financing, whereas greater organizational complexity may create agency problems. Accordingly, previous studies have reported positive [Goet \(2022\)](#) and [Maila and Sichoongwe \(2024\)](#) and insignificant effects [Ernawati and Santoso \(2021\)](#). These inconsistent findings indicate that the relationships between green accounting, capital structure, firm size, and financial performance may depend on the characteristics and contexts of the firms examined.

Good Corporate Governance (GCG) is relevant because effective governance can strengthen managerial oversight and accountability and reduce agency conflicts and information asymmetry ([Jensen and Meckling 1976](#)). Therefore, GCG may influence the management of environmental costs, financing decisions, and corporate resources. However, evidence of its moderating role is inconsistent. [Sunarjo, Sustrisno, and Kurnia \(2024\)](#) found that GCG strengthened the relationship between Green Accounting and financial performance, whereas [Ulfa and Citradewi \(2023\)](#) found no significant moderating effect. [Bawuah \(2024\)](#) also showed that corporate governance can moderate the capital structure performance relationship. These differences suggest that the effectiveness of the GCG as a moderating mechanism may be context-dependent.

An important research gap concerns the context in which the moderating role of GCG is examined in. Previous studies have generally examined corporate governance among broader samples of listed firms, while limited attention has been paid to companies that already demonstrate recognized governance practices. This study addresses this gap by focusing on companies that consistently received the IICD Corporate Governance Award between 2020-2024. Such companies provide a distinctive governance-oriented context because they are recognized for their corporate governance practices. This context makes it possible to examine whether GCG provides an additional moderating effect when governance mechanisms are already relatively established.

From the perspective of agency theory, stronger governance is expected to improve monitoring and align managerial decisions with shareholders' interests. However, when governance practices are already relatively well-established, the incremental effect of GCG may be limited because monitoring and accountability mechanisms are already embedded in corporate decision-making. Thus, the issue is not only whether GCG is important but also whether it continues to function as an effective moderating mechanism in firms with recognized governance practices ([Husnaini & Basuki, 2020](#)). This provides both theoretical and empirical relevance to this study.

Accordingly, this study examines the effects of green accounting, capital structure, and firm size on financial performance and investigates whether GCG moderates these relationships among companies that consistently received the IICD Corporate Governance Award during 2020-2024. Theoretically, this study extends the application of agency theory by examining whether the monitoring function of GCG provides an incremental moderating effect on firms with relatively established governance practices. Empirically, it provides evidence from a governance-oriented sample and offers a context-specific perspective on the relationship between environmental accounting, financing decisions, firm characteristics, and financial performance.

## **2. LITERATURE REVIEW**

### **2.1 Agency Theory**

Agency theory explains the relationship between principals and agents that arises from the separation of ownership and management control. This separation can lead to conflicts of interest and information asymmetry because managers may have interests and information that differ from those of shareholders ([Jensen and Meckling 1976](#)). These agency problems can result in agency costs associated with monitoring managerial actions and aligning managers' interests with those of shareholders. Therefore, effective oversight is necessary to mitigate agency problems and reduce agency costs ([Ngatno, Apriatni, and Youlianto 2021](#)). Agency theory serves as the theoretical

foundation for this study because green accounting, capital structure, and firm size involve managerial decisions and resource utilization, while good corporate governance serves as a monitoring mechanism in agency relationships.

## **2.2 Green Accounting and Financial Performance**

Green Accounting incorporates environmental costs and considerations into a company's accounting and decision-making processes ([Rounaghi, 2019](#)). From the perspective of agency theory, the implementation of green accounting can provide greater transparency regarding a company's environmental activities and resource use, which can help reduce information asymmetry and strengthen managerial accountability ([Hartoyo & Abdullah, 2023](#)). Better accountability and monitoring can help control agency costs arising from managerial decisions and resource utilization, thereby encouraging managers to make more responsible and efficient decisions that can contribute to improved financial performance ([Setiawan and Mayangsari 2020](#)).

This expectation is supported by research conducted by [Khan and Gupta \(2024\)](#), who found a positive relationship between green accounting and firm performance based on a meta-analysis of 68 studies, with a stronger relationship when green accounting was measured using environmental costs. [Imtikhanah, Sobrotul, Anisa, and Andayani \(2025\)](#) also found a positive effect of green accounting on financial performance. Thus, the theoretical mechanisms regarding stronger accountability and more effective resource management, together with supporting empirical evidence, provide a basis for expecting a positive effect of green accounting on financial performance. Therefore, the research hypothesis is formulated as follows:

*H<sub>1</sub>: Green Accounting has a positive effect on financial performance*

## **2.3 Capital Structure and Financial Performance**

Capital structure refers to the composition of financing sources used by a company, specifically debt and equity, to finance its assets and business activities ([Lukman and Hartikayanti 2022](#)). From the perspective of agency theory, debt can serve as a disciplinary mechanism because managers must carefully consider the use of company funds and their ability to meet debt obligations ([Wijaya & Sanjaya, 2026](#)). These obligations encourage managers to make more prudent financial decisions, limit excessive managerial discretion, and reduce agency costs, thereby promoting a more disciplined use of resources and improving financial performance ([Sdiq and Abdullah 2022](#)).

This expectation is supported by [Rahman \(2020\)](#), who found a positive effect of capital structure on financial performance. [Ramli, Latan, and Solovida \(2019\)](#) also found a positive and significant relationship between leverage and financial performance. Thus, the theoretical mechanism regarding stronger managerial discipline and more effective resource management, together with supporting empirical evidence, provides a basis for expecting a positive effect of capital structure on financial performance. Therefore, the research hypothesis is formulated as follows:

*H<sub>2</sub>: Capital structure has a positive effect on financial performance*

## **2.4 Firm Size and Financial Performance**

Company size reflects the scale of a firm and is generally measured using the natural logarithm of its total assets ([Agung, Wandebori, & Sirait, 2026](#)). From the perspective of agency theory, larger firms involve greater resources and higher organizational complexity, making managerial oversight and effective resource utilization crucial. Greater oversight capacity and access to managerial resources can help mitigate agency problems and support more effective resource utilization ([Johannes and Lefebvre 2025](#)). This expectation is supported by [Goet \(2022\)](#), who found a significant effect of firm size on financial performance. [Maila and Sichoongwe \(2024\)](#) also found a positive relationship between firm size and financial performance. Thus, the greater resources and oversight capacity associated with firm size, together with supporting empirical evidence, provide a basis for expecting a positive effect of firm size on financial performance. Therefore, the research hypothesis is formulated as follows:

*H<sub>3</sub>*: Firm size has a positive effect on financial performance

## 2.5 Good Corporate Governance, Green Accounting, and Financial Performance

Based on the expected positive impact of green accounting on financial performance, Good Corporate Governance (GCG) can strengthen this relationship by enhancing oversight and management accountability in the implementation of environmental practices ([Ratnaningtyas, Martaleni, & Wijayanti, 2026](#)). From the perspective of agency theory, stronger governance can encourage managers to implement green accounting more effectively and align environmental decisions with corporate objectives and shareholder interests ([Chanry, Maya, and Siahaan 2023](#)). This expectation is supported by [Sunarjo et al. \(2024\)](#), who found that GCG strengthens the influence of green accounting on financial performance. Thus, stronger governance and managerial oversight provide the basis for expecting that GCG will strengthen the influence of Green Accounting on Financial Performance. Therefore, the research hypothesis is formulated as follows:

*H<sub>4</sub>*: Good Corporate Governance strengthens the effect of Green Accounting on financial performance

## 2.6 Good Corporate Governance, Capital Structure, and Financial Performance

Based on the expected positive impact of capital structure on financial performance, Good Corporate Governance (GCG) can strengthen this relationship by enhancing the oversight of financing decisions made by management. From the perspective of agency theory, stronger governance can enhance the role of debt discipline by encouraging managers to use debt prudently and allocate borrowed funds effectively ([Bawuah 2024](#); [Ngatno et al. 2021](#)). This expectation is supported by [Ngatno et al. \(2021\)](#), who found that corporate governance strengthens the relationship between capital structure and firm performance. [Bawuah \(2024\)](#) also found that corporate governance strengthens the relationship between capital structure and firm performance. Thus, stronger governance and oversight provide the basis for expecting GCG to amplify the influence of capital structure on financial performance. Therefore, the research hypotheses are as follows:

*H<sub>5</sub>*: Good Corporate Governance strengthens the effect of capital structure on financial performance

## 2.7 Good Corporate Governance, Firm Size, and Financial Performance

From the perspective of agency theory, larger firms generally have greater resources and more complex organizational structures, which can increase the need for effective monitoring and control mechanisms ([Amalia, Rosalina, & Anggita, 2026](#)). Previous research has shown that firm size is related to agency costs and corporate governance, highlighting the importance of effective governance mechanisms in addressing agency problems in larger firms [Garanina and Kaikova \(2016\)](#). Effective corporate governance can reduce agency problems by strengthening managerial oversight and aligning managerial decisions with shareholder interests, thereby supporting financial performance [Kyeré and Ausloos \(2021\)](#). Therefore, in larger firms, stronger corporate governance is expected to ensure that greater organizational resources and capacity are managed efficiently. Empirically, [Putri, Rokhmawati, and Fitri \(2022\)](#) found that firm size significantly affects financial performance and that corporate governance moderates the relationship between firm size and financial performance. Based on the agency theory perspective and these empirical considerations, the following hypothesis is proposed:

*H<sub>6</sub>*: Good Corporate Governance strengthens the effect of firm size on financial performance

## 2.8 The Simultaneous Effect of Green Accounting, Capital Structure, and Firm Size on Financial Performance

Green accounting, capital structure, and firm size represent various aspects of corporate activities that can influence financial performance. From the perspective of agency theory, effective management of environmental responsibilities, financing decisions, and corporate resources can support the alignment of management's actions with shareholders' interests and promote more efficient resource utilization ([Andini, Solikah, & Faisol, 2026](#)). As discussed in the previous

hypotheses, these factors have been linked, both theoretically and empirically, to financial performance. Therefore, green accounting, capital structure, and firm size are expected to influence financial performance. Based on these theoretical considerations, the following hypothesis is proposed.

*H<sub>7</sub>*: Green Accounting, capital structure, and firm size simultaneously affect financial performance

## 2.9 Conceptual Framework

Based on the theoretical arguments and previous empirical findings, the conceptual framework illustrates the proposed relationships among green accounting, capital structure, firm size, financial performance, and good corporate governance. Green Accounting, capital structure, and firm size were proposed as independent variables affecting financial performance, whereas GCG was proposed as a moderating variable.

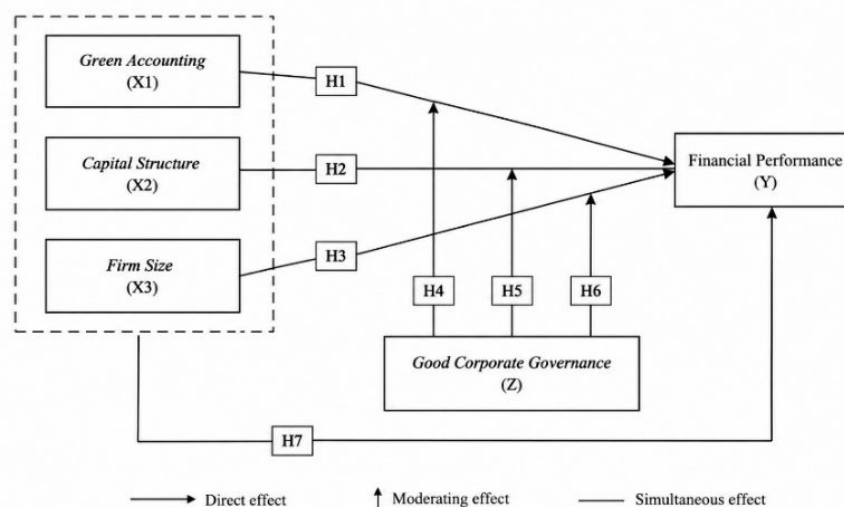


Figure 2. Research conceptual framework

Figure 2 shows the influence of green accounting ( $X_1$ ), capital structure ( $X_2$ ), and firm size ( $X_3$ ) on financial performance ( $Y$ ). good corporate governance ( $Z$ ) is proposed as a moderating variable that strengthens or weakens the relationships between the independent variables and financial performance. The framework consists of seven hypotheses ( $H_1$ – $H_7$ ) examining both the direct effects and the moderating role of good corporate governance.

## 3. RESEARCH METHODOLOGY

This study employed a quantitative approach with an associative research design to examine the effects of green accounting, capital structure, and firm size on financial performance, with Good Corporate Governance (GCG) as a moderating variable.

### 3.1 Data Collection Procedure

This study uses secondary data obtained from the annual and sustainability reports of companies that received the IICD Corporate Governance Award between 2020 and 2024. The IICD Corporate Governance Awards were used to determine the study population, while a purposive sampling technique was applied to select companies that met the predetermined criteria and provided complete information necessary to measure all research variables. The sample selection process is described in Table 1.

Table 1. Description of sample selection

| Description                                                                                       | Firms |
|---------------------------------------------------------------------------------------------------|-------|
| Companies receiving the IICD Corporate Governance Awards during 2020-2024                         | 100   |
| Companies that did not consistently receive the IICD Corporate Governance Awards during 2020–2024 | (54)  |
| Companies with incomplete research data during 2020-2024                                          | (36)  |
| Final Sample                                                                                      | 10    |
| Total Observations (10 Companies × 5 Years)                                                       | 50    |

Selection criteria were applied to ensure consistency in observations and the availability of the data needed to operationalize all research variables over the five-year observation period. Specifically, this study requires environmental cost information to measure green accounting and ACGS scores to measure GCG. Although financial information such as net income, total assets, liabilities, and equity is generally available in companies' financial statements, environmental cost information and ACGS scores are included only if the relevant figures can be identified in the companies' annual reports. Therefore, companies that did not consistently provide the necessary information were excluded from the final sample. Based on the application of these criteria, 10 companies met all the requirements and were included in the final sample size. The selected companies are presented in Table 2.

Table 2. Research sample

| No | Code | Company                                |
|----|------|----------------------------------------|
| 1  | ANTM | PT Aneka Tambang Tbk                   |
| 2  | ITMG | PT Indo Tambangraya Megah Tbk          |
| 3  | SMSM | PT Selamat Sempurna Tbk                |
| 4  | SMGR | PT Semen Indonesia (Persero) Tbk       |
| 5  | POWR | PT Cikarang Listrindo Tbk              |
| 6  | INTP | PT Indocement Tunggul Prakarsa Tbk     |
| 7  | WIKA | PT Wijaya Karya (Persero) Tbk          |
| 8  | TINS | PT Timah Tbk                           |
| 9  | BNGA | PT Bank CIMB Niaga Tbk                 |
| 10 | BBNI | PT Bank Negara Indonesia (Persero) Tbk |

The final sample consisted of 10 companies observed over five consecutive years, resulting in 50 company-year observations and constituting a balanced panel dataset. This limited number of firms reflects the application of predetermined inclusion criteria and the availability of information needed to measure all research variables. However, the relatively small sample size may limit the generalizability of the research findings. Therefore, the results of this study should be interpreted in the context of the sample firms and selection criteria applied.

### 3.2 Variable Measurement

The following table presents the operational definitions of the variables used in this study, which aims to facilitate the search for relationships between variables and ensure that the measurements are more structured and accurate.

Table 3. Operational definition of variables

| Variables        | Description                                                                                           | Measurement                        | Sources         |
|------------------|-------------------------------------------------------------------------------------------------------|------------------------------------|-----------------|
| Independent      |                                                                                                       |                                    |                 |
| Green Accounting | An accounting approach that incorporates environmental costs into corporate accounting and reporting. | GA = Environmental Cost/Net Profit | Rounaghi (2019) |

| Variables             | Description                                                                                                                  | Measurement                                 | Sources                                                  |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------|
| Capital Structure     | represents the proportion of debt financing relative to shareholders' equity and reflects the company's financing structure. | DER = Total Debt/Total Equity               | Ayo and Muba (2021), Dao and Ta (2020), and Essel (2026) |
| Firm Size             | represents the scale of a company based on the resources and assets it controls.                                             | Size = Ln (Total Asset)                     | Karlsson (2021), Le (2024), and Tjahjadi et al. (2021)   |
| Dependent             |                                                                                                                              |                                             |                                                          |
| Financial Performance | Reflects a company's ability to generate net income through effective asset utilization.                                     | ROA = Net Profit/Total Asset                | Fan et al. (2022), Kuang et al. (2023), and Le (2024)    |
| Moderation            |                                                                                                                              |                                             |                                                          |
| GCG                   | Represents the mechanisms and practices used to direct, monitor, and control corporate activities                            | ASEAN Corporate Governance Scorecard (ACGS) | Basuki (2021), OECD (2015), and Simamora (2020)          |

Table 3 shows the measurement procedures for each variable are based on the information disclosed in the company's annual and sustainability reports. Green accounting is measured using the environmental costs disclosed by the company, which are identified from the environmental disclosure section in the annual report or sustainability report, specifically environmental information reported in accordance with *Peraturan Otoritas Jasa Keuangan/POJK* No. 51/POJK.03/2017. These disclosed environmental costs are then divided by the net income to obtain a measure of green accounting. Capital structure is measured using the Debt-to-Equity Ratio (DER), with total debt and total equity derived from the company's annual report. Company Size is measured using the natural logarithm of total assets, while financial performance is measured using Return on Assets (ROA), with net income and total assets derived from the annual reports. Meanwhile, Corporate Governance (GCG) is measured using the ASEAN Corporate Governance Scorecard (ACGS) score reported by companies in their annual reports. Thus, the measurement of each variable is based on information directly disclosed in the companies' official reports.

### 3.3 Model Analysis

The hypotheses were tested using panel data regression and Moderated Regression Analysis (MRA). Panel data regression was employed to examine the effects of green accounting, capital structure, and firm size on financial performance. The appropriate panel data model was determined through model selection tests to identify the most suitable estimation approach for the panel data and to moderate the relationships between the independent variables and financial performance.

$$FP_{it} = \alpha + \beta_1 GA_{it} + \beta_2 CS_{it} + \beta_3 FS_{it} + \epsilon_{it} \quad 1$$

Formula 1 shows Moderated Regression Analysis (MRA) was subsequently employed to examine the moderating role of GCG in the relationships between Green Accounting, capital structure, firm size, and financial performance. The variables were mean-centered before the interaction terms were constructed.

$$FP_{it} = \alpha + \beta_1 GA_{it} + \beta_2 CS_{it} + \beta_3 FS_{it} + \beta_4 GCG_{it} + \beta_5 (GA \times GCG)_{it} + \beta_6 (CS \times GCG)_{it} + \beta_7 (FS \times GCG)_{it} + \epsilon_{it} \quad 2$$

Formula 2 shows the regression model is used to examine the effect of Green Accounting (GA), Capital Structure (CS), and Firm Size (FS) on Financial Performance (FP), while also testing the

moderating role of Good Corporate Governance (GCG). The interaction terms  $GA \times GCG$ ,  $CS \times GCG$ , and  $FS \times GCG$  are included to determine whether GCG strengthens or weakens the relationships between the independent variables and financial performance. The model can therefore be used to test both the direct effects and the moderating effects proposed in the research hypotheses.

## 4. RESULTS AND DISCUSSION

### 4.1 Descriptive Statistics

Descriptive statistics were used to provide an overview of the characteristics of Green Accounting (GA), Capital Structure (CS), Firm Size (FS), Financial Performance (FP), and Good Corporate Governance (GCG) based on their mean, standard deviation, minimum, and maximum values.

Table 4. Descriptive statistics

| Variables | Mean     | Std. Dev | Maximum  | Minimum   |
|-----------|----------|----------|----------|-----------|
| GA        | 0.053147 | 0.087865 | 0.314582 | -0.156675 |
| CS        | 2.036436 | 2.318922 | 6.625971 | 0.223259  |
| FS        | 31.49732 | 1.511015 | 34.66111 | 28.84757  |
| FP        | 0.069770 | 0.095461 | 0.454267 | -0.118587 |
| GCG       | 0.966148 | 0.116820 | 1.229900 | 0.771300  |

Table 4 shows that GA has a mean of 0.053147 and a standard deviation of 0.087865, with values ranging from -0.156675 to 0.314582. A standard deviation exceeding the mean indicates a relatively high variation in GA across all 50 observations. The maximum GA value was recorded by PT Indo Tambangraya Megah Tbk (ITMG) in 2020 at 0.314582, whereas the minimum value was recorded by PT Timah Tbk (TINS) in 2020 at -0.156675.

CS has a mean of 2.036436 and a maximum standard deviation of 2.318922, with values ranging from 0.223259 to 6.625971, respectively. A standard deviation exceeding the mean indicates a significant variation in the capital structure of the sample companies. The maximum CS value was recorded by PT Bank Negara Indonesia (Persero) Tbk (BBNI) in 2021 at 6.625971, and the minimum value was recorded by PT Indocement Tungal Prakarsa Tbk (INTP) in 2020 at 0.223259.

The FS has a mean of 31.49732 and a standard deviation of 1.511015, with values ranging from 28.84757 to 34.66111. This standard deviation is much lower than the mean, indicating that the company size is relatively homogeneous across the sample. The maximum FS value was recorded by PT Bank Negara Indonesia (Persero) Tbk (BBNI) in 2024 at 34.66111, and the minimum value was recorded by PT Cikarang Listrindo Tbk (POWR) in 2023 at 28.84757.

FP has a mean of 0.069770 and a standard deviation of 0.095461, with values ranging from -0.118587 to 0.454267. A standard deviation that exceeds the mean indicates a considerable variation in the financial performance of the companies in the sample. The negative minimum value indicates that some observations experienced negative financial performance, whereas the positive maximum value indicates significantly higher performance in other observations. Meanwhile, GCG has a mean of 0.966148 and a standard deviation of 0.116820, with values ranging from 0.771300–1.229900. The standard deviation is relatively small compared to the mean, indicating that the GCG scores are relatively consistent across the sample companies. Overall, the descriptive statistics show that CS and GA exhibited relatively greater variation, whereas FS and GCG exhibited relatively lower variation compared with their respective means.

### 4.2 Panel Data Model Selection

A panel data model was selected to determine the most appropriate estimation model for the research data. The model selection process was performed using a 5% significance level as the decision-making criterion.

Table 5. Chow test

| Effect Test              | Statistic | df     | Prob   |
|--------------------------|-----------|--------|--------|
| Cross-section F          | 16.354953 | (9.37) | 0.0000 |
| Cross-section Chi-square | 80.253739 | 9      | 0.0000 |

The Chow test was conducted to determine whether the Common Effects Model (CEM) or the Fixed Effects Model (FEM) is more appropriate for estimating panel data. As shown in Table 5, the probability values for both the Cross-Section F-statistic and the Cross-Section Chi-Square statistic are 0.0000, which is smaller than the 5% significance level ( $0.0000 < 0.05$ ). These results indicate that the Fixed Effects Model (FEM) is more appropriate than the Common Effects Model (CEM).

Table 6. Hausman test

| Test Summary         | Chi-Square Statistic | Chi-Square df | Prob   |
|----------------------|----------------------|---------------|--------|
| Cross-section random | 12.918459            | 3             | 0.0048 |

Because the Chow test showed that the FEM is more appropriate than the CEM, the Hausman test was conducted to determine whether the FEM or the Random Effects Model (REM) is more appropriate. As shown in Table 6, the probability value for the cross-sectional randomness test is 0.0048, which is smaller than the 5% significance level ( $0.0048 < 0.05$ ). These results indicate that the Fixed Effects Model (FEM) is more appropriate than the Random Effects Model (REM). Based on the results of the Chow and Hausman tests, the fixed effects model (FEM) was selected as the most appropriate panel data estimation model for this study. Therefore, the Lagrange Multiplier (LM) test is not required.

### 4.3 Test of Classical Assumption

After selecting the Fixed Effects Model (FEM), tests for multicollinearity and heteroscedasticity were conducted. According to Basuki (2021), not all tests of classical assumptions are necessary in panel data regression. Therefore, the analysis focused on tests for multicollinearity and heteroscedasticity. The multicollinearity test was first conducted for the basic regression model, as presented in Table 7.

Table 7. Multicollinearity test results for the basic regression model

| Variables | VIF      |
|-----------|----------|
| GA        | 1.081023 |
| CS        | 1.081003 |
| FS        | 1.037377 |

Table 7 shows that the Variance Inflation Factor (VIF) values for Green Accounting (GA), Capital Structure (CS), and Firm Size (FS) are 1.081023, 1.081003, and 1.037377, respectively. These values are close to 1 and well below the commonly used threshold of 10, indicating that the independent variables do not exhibit multicollinearity. The relatively similar VIF values also suggest that no independent variable has a substantially stronger linear relationship with any other variable. For the moderation model, the independent variables and GCG were mean-centered before the interaction terms were constructed. Mean centering was performed by subtracting the mean value of each variable from its original value to reduce the potential multicollinearity between the main effects and interaction terms and to improve the stability of the coefficient estimates.

Table 8. Multicollinearity test results for the moderation model

| Variables | Centered VIF |
|-----------|--------------|
| GA_C      | 1.147714     |
| CS_C      | 1.228763     |
| FS_C      | 1.120736     |

| Variables    | Centered VIF |
|--------------|--------------|
| GCG_C        | 1.355260     |
| GA_C × GCG_C | 1.411656     |
| CS_C × GCG_C | 6.232395     |
| FS_C × GCG_C | 5.168568     |

Table 8 shows the centered VIF values for the variables in the moderation model ranged from 1.120736 to 6.232395. The lowest centered VIF value was observed for Firm Size (FS) at 1.120736, indicating a very low level of multicollinearity. The centered VIF values for GA, CS, and GCG were 1.147714, 1.228763, and 1.355260, respectively, while the interaction terms GA × GCG, CS × GCG, and FS × GCG had values of 1.411656, 6.232395, and 5.168568, respectively. Although the interaction terms, particularly CS × GCG and FS × GCG, have relatively higher Centralized VIF values compared to the other variables, all values remain below the 10 threshold. Thus, the moderation model did not exhibit problematic multicollinearity and was suitable for further analysis.

The heteroscedasticity test was conducted using the Glejser method by Regressing Absolute Residual Values (RESABS) against the independent variables. A probability value greater than 0.05 indicates that the model does not exhibit heteroscedasticity, whereas a probability value below 0.05 indicates the presence of heteroscedasticity. The results of the basic regression model are presented in Table 9.

Table 9. Heteroscedasticity test results for the basic regression model

| Variables | Prob.  |
|-----------|--------|
| GA        | 0.0365 |
| CS        | 0.2577 |
| FS        | 0.0038 |

Table 9 shows the results show that GA has a probability value of 0.0365, which is below 0.05, thus indicating the presence of heteroscedasticity. Conversely, CS has a probability value of 0.2577, which is above 0.05, indicating no evidence of heteroscedasticity associated with the CS. The FS has a probability value of 0.0038, which is below 0.05, indicating the presence of heteroscedasticity associated with FS. Therefore, the basic regression model indicates the presence of this heteroscedasticity. A heteroscedasticity test was conducted for the moderation model. The results are presented in Table 10.

Table 10. Heteroscedasticity test results for the moderation model

| Variables    | Prob.  |
|--------------|--------|
| GA_C         | 0.0243 |
| CS_C         | 0.2472 |
| FS_C         | 0.0167 |
| GCG_C        | 0.1765 |
| GA_C × GCG_C | 0.8183 |
| CS_C × GCG_C | 0.7665 |
| FS_C × GCG_C | 0.5410 |

Table 10 shows that GA and FS have probability values of 0.0243 and 0.0167, respectively, both of which are below 0.05, indicating the presence of heteroscedasticity associated with these variables. The probability values of CS, GCG, GA × GCG, CS × GCG, and FS × GCG were 0.2472, 0.1765, 0.8183, 0.7665, and 0.5410, respectively. These values were all above 0.05, indicating no evidence of heteroscedasticity associated with these variables. Therefore, the moderation model also indicates the presence of this heteroscedasticity. To address the issue of heteroscedasticity, subsequent regression analyses used

white diagonal standard errors, which produced standard errors that were robust to heteroscedasticity.

#### 4.3.1 Regression and Moderation Analysis

Panel data regression analysis was conducted to examine the effects of Green Accounting (GA), Capital Structure (CS), and Firm Size (FS) on Financial Performance (FP), both partially and simultaneously. The partial effects were assessed using the *t*-statistic and probability value, whereas the simultaneous effect was assessed using the *F*-statistic and its probability value. The regression results are shown in Table 11.

Table 11. Basic Panel Regression Results

| Dependent Variable : FP                                            |             |            |                     |        |
|--------------------------------------------------------------------|-------------|------------|---------------------|--------|
| White diagonal standard errors & covariance ( <i>df</i> corrected) |             |            |                     |        |
| Variables                                                          | Coefficient | Std. Error | <i>t</i> -Statistic | Prob   |
| C                                                                  | -5.228991   | 2.275393   | -2.298061           | 0.0273 |
| GA                                                                 | -0.329596   | 0.165157   | -1.995650           | 0.0534 |
| CS                                                                 | -0.047072   | 0.011841   | -3.975246           | 0.0003 |
| FS                                                                 | 0.171828    | 0.072130   | 2.382208            | 0.0225 |
| Effects Specification                                              |             |            |                     |        |
| Cross-section fixed (dummy variables)                              |             |            |                     |        |
| R-squared                                                          |             | 0.854189   | Observations        | 50     |
| Adjusted R-squared                                                 |             | 0.806899   | Cross-sections      | 10     |
| F-statistic                                                        |             | 18.06273   |                     |        |
| Prob(F-statistic)                                                  |             | 0.000000   | Periods             | 5      |

$$FP_{it} = -5.228991 - 0.329596GA_{it} - 0.047072CS_{it} + 0.171828FS_{it} + \epsilon_{it} \quad 3$$

Table 11 and Formula 3 shows that the constant of -5.228991 represents the estimated FP when GA, CS, and FS are set to zero. The coefficients of GA (-0.329596) and CS (-0.047072) indicate negative relationships with FP, whereas the coefficient of FS (0.171828) indicates a positive relationship, assuming that the other variables remain constant. Moderated Regression Analysis (MRA) was subsequently conducted to examine whether Good Corporate Governance (GCG) moderates the effects of GA, CS, and FS on FP. The moderation effect was assessed through the interaction terms between each independent variable and GCG, with the coefficients indicating the direction of the interaction and the probability values indicating its significance. The results are presented in Table 12.

Table 12. Moderated Regression Analysis Results

| Dependent Variable : FP                                            |             |            |                     |        |
|--------------------------------------------------------------------|-------------|------------|---------------------|--------|
| White diagonal standard errors & covariance ( <i>df</i> corrected) |             |            |                     |        |
| Variable                                                           | Coefficient | Std. Error | <i>t</i> -Statistic | Prob   |
| C                                                                  | 0.076812    | 0.008040   | 9.554234            | 0.0000 |
| GA_C                                                               | -0.324113   | 0.143604   | -2.256992           | 0.0308 |
| CS_C                                                               | -0.051310   | 0.013397   | -3.830078           | 0.0005 |
| FS_C                                                               | 0.187845    | 0.060498   | 3.104996            | 0.0039 |
| GCG_C                                                              | -0.269766   | 0.116558   | -2.314432           | 0.0270 |
| GA_C x GCG_C                                                       | -2.221673   | 1.376579   | -1.613908           | 0.1161 |
| CS_C x GCG_C                                                       | -0.128662   | 0.095213   | -1.351308           | 0.1858 |
| FS_C x GCG_C                                                       | 0.087610    | 0.108101   | 0.810445            | 0.4235 |
| Effects Specification                                              |             |            |                     |        |

| Dependent Variable : FP               |          |                |    |
|---------------------------------------|----------|----------------|----|
| Cross-section fixed (dummy variables) |          |                |    |
| R-squared                             | 0.886848 | Observations   | 50 |
| Adjusted R-squared                    | 0.831986 | Cross-sections | 10 |
| F-statistic                           | 16.51615 |                |    |
| Prob(F-statistic)                     | 0.000000 | Periods        | 5  |

$$FP_{it} = 0.076812 - 0.324113GA_{it} - 0.051310CS_{it} + 0.187845FS_{it} - 0.269766GCG_{it} - 2.221673(GA \times GCG)_{it} - 0.128662(CS \times GCG)_{it} + 0.087610(FS \times GCG)_{it} + \epsilon_{it} \quad (18)$$

Table 12 and Formula 4 shows that the coefficients of GA (-0.324113) and CS (-0.051310) are negative, while FS (0.187845) is positive. The GCG coefficient was -0.269766. The interaction coefficients of GA × GCG (-2.221673), CS × GCG (-0.128662), and FS × GCG (0.087610) indicate negative, negative, and positive moderation directions, respectively. The statistical significance of these interaction effects was determined based on their probability values.

#### 4.3.2 Hypothesis Testing

Hypothesis testing was conducted using a probability value at a 5% significance level. A probability value below 0.05 indicated a statistically significant effect, whereas a value above 0.05 indicated that the effect was not statistically significant. The coefficient was also considered to determine the direction of this relationship. The results of the partial tests are shown in Table 13.

Table 13. Partial test results

| Variables | Coefficient | t-Statistic | Prob.  | Decision            |
|-----------|-------------|-------------|--------|---------------------|
| GA        | -0.329596   | -1.995650   | 0.0534 | $H_1$ Not Supported |
| CS        | -0.047072   | -3.975246   | 0.0003 | $H_2$ Not Supported |
| FS        | 0.171828    | 2.382208    | 0.0225 | $H_3$ Supported     |

Table 13 shows that Green Accounting (GA) has a negative but statistically insignificant effect on financial performance ( $p=0.0534$ ), so  $H_1$  is not supported. Capital Structure (CS) has a negative and significant effect on financial performance ( $p=0.0003$ ), although  $H_2$  is not supported based on the proposed hypothesis direction. Meanwhile, Firm Size (FS) has a positive and significant effect on financial performance ( $p=0.0225$ ), supporting  $H_3$ .

Table 14. Moderation Test Results

| Interaction Term | Coefficient | t-Statistic | Prob.  | Decision            |
|------------------|-------------|-------------|--------|---------------------|
| GA × GCG         | -2.221673   | -1.613908   | 0.1161 | $H_4$ Not Supported |
| CS × GCG         | -0.128662   | -1.351308   | 0.1858 | $H_4$ Not Supported |
| FS × GCG         | 0.087610    | 0.810445    | 0.4235 | $H_4$ Not Supported |

Table 14 shows the coefficients, t-statistics, and probability values for the GA × GCG, CS × GCG, and FS × GCG interaction terms. These results were used to evaluate  $H_4$ – $H_6$ , which concern the moderating role of GCG. Finally, the simultaneous effects of GA, CS, and FS on FP were assessed using the  $F$ -statistic and its probability value. The  $F$ -statistic evaluates the overall significance of the regression model, whereas the R-squared and Adjusted R-squared indicate the proportion of variation in FP explained by the variables included in the model. The results are listed in Table 15.

Table 15. Model fit results

| Statistic          | Basic Model | Moderation Model |
|--------------------|-------------|------------------|
| R-squared          | 0.854189    | 0.886848         |
| Adjusted R-squared | 0.806899    | 0.831986         |
| F-statistic        | 18.06273    | 16.51615         |

| Statistic                  | Basic Model | Moderation Model |
|----------------------------|-------------|------------------|
| Prob( <i>F</i> -statistic) | 0.00000     | 0.00000          |

Table 15 shows the basic regression model has an *R*-squared of 0.854189 and an Adjusted *R*-squared of 0.806899, while the moderation model has an *R*-squared of 0.886848 and an Adjusted *R*-squared of 0.831986. The *F*-statistic is 18.06273 for the basic model and 16.51615 for the moderation model, with probability values of 0.000000 for both. These results indicate that the regression models are statistically significant and provide explanatory power for variations in FP.

#### 4.3.3 Discussions

The results show that green accounting has a negative but statistically insignificant effect on Financial Performance ( $\beta = -0.329596$ ,  $p = 0.0534$ ), indicating that is not supported. From the perspective of agency theory, green accounting is expected to improve transparency regarding environmental activities and resource use, reduce information asymmetry, and strengthen managerial accountability, thereby encouraging more efficient managerial decisions and potentially improving financial performance. This expectation is supported by previous studies that have reported a positive relationship between green accounting and financial performance, including [Khan and Gupta \(2024\)](#) and [Imtikhanah, Sobrotul, Anisa, and Andayani \(2025\)](#). However, the insignificant finding in this study is consistent with that of [Misutari, Ariyanto, and Budiasih \(2021\)](#). This result may be explained by the fact that environmental expenditures do not necessarily generate immediate financial benefits. As noted by [Atikah and Sastradipraja \(2024\)](#), higher environmental costs do not necessarily indicate more effective environmental management, particularly when preventive practices have not been adequately implemented. Therefore, although green accounting may enhance transparency and accountability as predicted by agency theory, its financial benefits may require a longer period to materialize and depend on how effectively environmental expenditures are integrated into operational and strategic decision making.

Capital structure has a negative and statistically significant effect on financial performance ( $\beta = -0.047072$ ,  $p = 0.0003$ ), indicating that is not supported. From the perspective of agency theory, debt can serve as a disciplinary mechanism by limiting managerial discretion and encouraging managers to use corporate funds more prudently because of their obligation to meet debt commitments. This mechanism is expected to reduce agency costs and improve resource utilization. The positive relationship proposed in the hypothesis is supported by [Rahman \(2020\)](#) and [Ramli, Latan, and Solovida \(2019\)](#), who found that capital structure or leverage positively affects financial performance. However, the negative and significant finding in this study is consistent with [Sakr and Bedeir \(2019\)](#) and [Tesema \(2024\)](#), who reported a negative relationship between capital structure and firm performance. This finding differs from those of [Fauziyah and Paramita \(2025\)](#) and [Putra, Taruna, and Larasati \(2024\)](#), who found no significant effect of capital structure on financial performance. These differences may be related to variations in the level and composition of debt, firm characteristics, industry conditions, and effectiveness of debt utilization. In the context of the present study, the negative coefficient suggests that the financial burden associated with debt may outweigh its benefits. Higher leverage can increase interest expenses and other financial obligations, thereby reducing the returns generated from corporate assets. Thus, although debt may mitigate certain agency problems by disciplining managerial behavior, its associated financial costs may become more dominant when debt is not used effectively, resulting in lower financial performance.

Firm size has a positive and statistically significant effect on financial performance ( $\beta = 0.171828$ ,  $p = 0.0225$ ), indicating that is supported. From the perspective of agency theory, larger firms generally have greater resources and more complex organizational structures, which increase the need for effective managerial oversight and resource utilization. Greater resources and oversight capacity can help mitigate agency problems and support the more efficient use of corporate resources ([Johannes & Lefebvre, 2025](#)). This finding is consistent with [Goet \(2022\)](#) and [Maila and Sichoongwe \(2024\)](#), who reported a positive relationship between firm size and financial performance. The results indicate that larger firms may benefit from greater operational capacity, broader access to financing, and economies of scale, enabling them to utilize their assets more effectively and generate higher

returns. However, this finding differs from that of [Ernawati and Santoso \(2021\)](#), who found no significant effect of firm size on financial performance. This difference may be related to variations in firm characteristics, industry conditions, asset utilization, and managerial effectiveness. In the context of this study, the positive and significant effect suggests that the resource and scale advantages of larger firms outweigh the potential agency problems arising from greater organizational complexity, allowing firm size to contribute positively to financial performance

Good corporate governance does not significantly moderate the relationship between green accounting and financial performance ( $\beta=-2.221673$ ,  $p=0.1161$ ), indicating that is not supported. From the perspective of agency theory, GCG is expected to strengthen the effect of green accounting by enhancing managerial oversight and accountability, reducing information asymmetry, and aligning environmental decisions with shareholders' interests ([Chanry, Maya, & Siahaan, 2023](#)). This expectation is supported by [Sunarjo and Sutrisno \(2024\)](#), who found that GCG significantly strengthens the effect of green accounting on financial performance. However, the insignificant finding in this study is consistent with that of [Ulfa and Citradewi \(2023\)](#). One possible explanation lies in the characteristics of the sample, which consists of companies that consistently received the IICD Corporate Governance Award between 2020 and 2024. These firms, therefore, represent companies with relatively established governance practices, while the descriptive statistics indicate relatively limited variation in GCG scores (mean=0.966148, standard deviation=0.116820). This limited variation may reduce the incremental role of GCG in moderating. Moreover, governance mechanisms may emphasize monitoring and compliance without necessarily integrating environmental cost considerations into strategic decision making. Thus, although GCG is theoretically expected to strengthen the financial benefits of green accounting, its additional moderating effect may be less pronounced when firms already operate under relatively established governance practices.

Similarly, good corporate governance does not significantly moderate the relationship between capital structure and financial performance ( $\beta=-0.128662$ ,  $p=0.1858$ ), indicating that is not supported. From the perspective of agency theory, stronger governance is expected to reinforce the disciplinary role of debt by strengthening the oversight of financing decisions and encouraging managers to use borrowed funds prudently and efficiently ([Bawuah, 2024](#); [Ngatno, Apriatni, & Youlianto, 2021](#)). This expectation is supported by [Ngatno et al. \(2021\)](#), who found a significant moderating role of corporate governance, whereas our finding is consistent with [Ulfa and Citradewi \(2023\)](#), who reported no significant moderating effect. Given the relatively established and consistent governance practices within the sample, the differences in GCG may not be sufficiently large to alter the financial consequences of debt financing. Instead, the negative effect of capital structure observed in this study appears to be more closely associated with the financial burden of debt, including interest expenses and other obligations. Thus, although GCG may improve the monitoring of managerial financing decisions, it does not appear to provide sufficient incremental influence to offset the negative financial consequences associated with higher leverage in the sampled firms.

Good corporate governance also does not significantly moderate the relationship between firm size and financial performance ( $\beta=0.087610$ ,  $p=0.4235$ ), indicating that is not supported. Agency theory suggests that larger firms require stronger monitoring because greater resources and organizational complexity can increase agency problems. Effective governance should therefore help ensure that the resources and operational capacity of larger firms are managed in accordance with shareholders' interests ([Garanina, & Kaikova, 2016](#); [Kyere, & Ausloos, 2021](#)). This expectation is supported by [Putri, Rokhmawati, and Fitri \(2022\)](#), who found that GCG moderates the relationship between firm size and financial performance. However, the present findings are consistent with those of [Ulfa and Citradewi \(2023\)](#), who reported no significant moderating effect. In the context of this study, the insignificant interaction suggests that the performance advantages associated with larger firms are not substantially dependent on differences in GCG. Larger firms may benefit directly from greater resources, operational capacity, access to financing, and economies of scale, while the relatively consistent governance practices across the sample may limit the incremental contribution of GCG to firm value. Therefore, GCG may support the overall accountability of larger firms but does not significantly change the positive relationship between firm size and financial performance.

The simultaneous test shows that green accounting, capital structure, and firm size jointly have a statistically significant effect on financial performance ( $F$ -statistic=18.06273,  $p=0.0000$ ), indicating that is supported. The basic regression model explains 85.42% of the variation in financial performance, as indicated by the  $R$ -squared value of 0.854189, while the Adjusted  $R$ -squared of 0.806899 indicates substantial explanatory power after accounting for the number of predictors. From the perspective of agency theory, these findings suggest that financial performance is influenced collectively by managerial decisions concerning environmental responsibilities, financing, and the allocation and utilization of corporate resources. Effective management of these aspects can improve managerial accountability, support more efficient resource utilization, and align managerial actions with shareholders' interests. This finding is consistent with [Saputri and Kusumastuti \(2025\)](#), who found that green accounting, environmental costs, capital structure, and firm size simultaneously affect financial performance. The significant simultaneous effect also indicates that the insignificant individual effect of green accounting does not imply that the variable is irrelevant to financial performance. Rather, its contribution becomes meaningful when considered with financing decisions and firm characteristics. Therefore, financial performance appears to be determined by the combined interaction of environmental accounting practices, capital structure decisions, and the scale of corporate resources rather than by any single factor in isolation.

## **5. CONCLUSIONS**

### **5.1 Conclusion**

This study provides empirical evidence on how green accounting, capital structure, and firm size relate to financial performance and whether good corporate governance strengthens these relationships within companies with relatively established governance practices. From the perspective of agency theory, the findings highlight that financial performance is not determined solely by the presence of environmental accounting or governance mechanisms, but also by how effectively managerial decisions concerning financing and corporate resources are translated into economic outcomes

These findings provide several theoretical insights. The insignificant effect of green accounting suggests that greater environmental accounting does not automatically translate into short-term financial benefits. Although green accounting can enhance transparency and managerial accountability, its contribution to financial performance may depend on the extent to which environmental expenditures are integrated into strategic and operational decision-making. The negative effects of capital structure indicate that, in the context of the companies in the sample, the financial burden associated with debt outweighs the potential disciplinary benefits proposed by agency theory. In contrast, the positive effect of firm size suggests that larger firms' resource capacity and operational advantages can contribute to better financial performance, even though greater organizational complexity can create agency problems.

An important empirical contribution of this study is the moderating role of good corporate governance. GCG does not significantly strengthen the relationship between green accounting, capital structure, or firm size and financial performance. This finding suggests that the theoretical monitoring role of governance does not necessarily produce an additional moderating effect when firms operate under relatively established governance practices. In the context of this study, the limited variation in governance among firms with recognized corporate governance practices may constrain the incremental influence of GCG on these relationships. Therefore, good governance should not be interpreted as automatically strengthening every managerial or strategic factor that affects financial performance.

Overall, this study demonstrates that financial performance is better understood through the combined consideration of environmental practices, financing decisions, and firm characteristics. The significant simultaneous effect of green accounting, capital structure, and firm size further indicates that these factors collectively provide meaningful explanatory value, even when one of them does not show a significant individual effect. Empirically, the findings contribute to the literature by demonstrating that the effectiveness of governance mechanisms and corporate practices is

context-dependent, particularly in a sample of firms with relatively established governance practices.

## **5.2 Research Limitations**

This study had several limitations. The sample was restricted to companies that consistently received the IICD Corporate Governance Award during the 2020–2024 period, which provided a research context characterized by recognized corporate governance practices but may have limited the generalizability of the findings to companies outside the selected sample. In addition, not all companies consistently disclosed their ACGS scores in their annual reports during the observation period. The limited availability of these data restricted the number of companies that met the sample criteria, resulting in a final sample of ten companies. This relatively small sample size may have reduced the statistical power of the analysis, particularly in detecting moderating effects.

## **5.3 Suggestions and Directions for Future Research**

Future research should consider expanding the sample size and observation period to improve the generalizability of the findings. Researchers may also consider alternative measures of green accounting, capital structure, firm size, financial performance, and corporate governance, particularly governance measures with more consistent data availability. Incorporating other relevant variables may provide a broader understanding of the factors influencing financial performance.

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## **AUTHOR CONTRIBUTIONS**

EO contributed to the conceptualization of the research, development of the research framework, data collection, data analysis, interpretation of results, and preparation of the initial manuscript draft. US contributed to the research methodology, validation of the analysis, critical review, revision of the manuscript, and supervision of the research process. Both authors contributed to the discussion of findings, approved the final version of the manuscript, and agreed to be accountable for all aspects of the work.

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