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# The Effect of Green Finance on Firm Value with Financial Performance and Capital Structure as Mediators: A Study on Electronic Retail Companies Listed on the Indonesia Stock Exchange

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A R T I C L E I N F O

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A B S T R A C T

This research aims to analyze the influence of Green Finance, financial performance, and capital structure on firm value, and to examine the moderating effects of the interactions between Green Finance with Return on Equity (ROE) and Debt to Asset Ratio (DAR) in electronic retail companies listed on the Indonesia Stock Exchange. The study utilizes panel data analysis and employs panel regression techniques. Model selection is carried out through the Chow and Hausman tests, which ultimately indicate that the Random Effect Model is the most appropriate for explaining the relationships among variables. The results show that Green Finance does not have a direct significant influence on firm value, suggesting that market recognition of sustainability-oriented investments may require time. ROE exhibits a significant positive effect on firm value, indicating that profitability remains a dominant consideration for investors. DAR does not significantly affect firm value, suggesting that leverage is not a key determinant in this sector. The interaction between Green Finance and ROE significantly enhances firm value, while the interaction between Green Finance and DAR does not.

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## INTRODUCTION

In the classification system of the Indonesia Stock Exchange (BEI), the Non-Primary Consumer Goods sector (code E) includes the Retail Trade subsector (E7), within which the Special Retail industry (E74) hosts the Electronic Retail sub-industry coded E742. Issuers in this category are companies that have listed their shares and offer them publicly. As part of a fast-growing and highly competitive sector, electronic retail companies play a crucial role in supporting economic development while simultaneously facing increasing pressure to adopt sustainable business practices, including green finance initiatives. The industry is expected not only to generate profit but also to minimize its environmental footprint.

This study analyzes seven companies within the electronic retail sector listed on the Indonesia Stock Exchange, although only five met the data availability requirements for the 2018–2023 observation period. The rapid rise of digital transformation and sustainability as central pillars of modern industry development has significantly shaped the Indonesian retail landscape. Products such as mobile phones, laptops, televisions, and audio equipment have become essential for everyday life, supporting productivity and entertainment (Nianty et al., 2023). According to Passport and Bloomberg Intelligence, total national retail sales are projected to rise from IDR 2,493 trillion in 2019 to IDR 4,108 trillion in 2028, driven predominantly by e-commerce, whose market share is forecast to jump from 10.1% to 40.4%. This rapid shift underscores the importance of electronic retail companies as key actors navigating digital acceleration while balancing sustainability demands.

In recent years, business sustainability has gained unprecedented attention due to growing awareness of environmental impacts. This global movement is aligned with the United Nations Sustainable Development Goals (SDGs), with the electronic retail sector playing an especially relevant role in achieving SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). As a sector characterized by high energy consumption and substantial electronic waste output, electronic retailers face the challenge of reconciling growth with sustainability principles. Consequently, green finance emerges as a strategic mechanism that supports environmentally responsible operations. In this study, green finance refers to financial policies and investments promoting energy efficiency, low-emission technologies, and improved waste management. Indicators include environmentally oriented investment proportions, disclosure of environmental policies in sustainability reports, and adoption of green innovations such as energy-efficient products, e-bikes, and low-power electronic devices, consistent with the characteristics of the industry (Gu et al., 2023). Greenhouse gas (GHG) emissions are also incorporated as an indicator of green finance performance, reflecting a company’s progress in reducing environmental impact.

Business sustainability has become increasingly important among firms, regulators, and investors alike. Stakeholders increasingly incorporate sustainability metrics into investment decisions (Minggu et al., 2023; Benedict & Hadiprajitno, 2024). Green finance promotes environmentally responsible investments within broader financial strategies (Ghazali & Zulmaita, 2020). Various industries have adopted green finance to support renewable energy projects, resource-efficient manufacturing, and reduced environmental impact. In the electronic retail sector, initiatives include energy-efficient products and digitalization aimed at reducing electronic waste (Suparjan & Mulya, 2012). However, challenges remain, especially high initial investment costs and risks of greenwashing, which may undermine investor trust. Several Indonesian electronic retailers experience difficulties in implementing green finance, demonstrating the need for strong commitment and transparency.

The IDX Statistical Report (2023) shows that the average Debt to Equity Ratio (DER) among Indonesian electronic retail companies ranges from 0.8 to 1.5, indicating moderate reliance on debt financing. This structural reality affects firms' capacity to fund green projects. Highly leveraged companies such as Trikomsel Oke Tbk have limited financial flexibility, unlike firms with lower DERs such as Erajaya Swasembada Tbk. High debt levels reduce the financial space needed for green investment initiatives, consistent with findings by Chen et al. (2021), which show that firms with lower debt can adopt green finance more effectively. Green finance has also supported sustainable infrastructure development in Indonesia, such as green buildings and environmentally friendly public transportation (Ramadhan & Sulistyowati, 2022). Regulatory support further strengthens its relevance, particularly with the issuance of OJK Regulation No. 51/POJK.03/2017 concerning Sustainable Finance (OJK, 2017), which positions sustainability as a competitive advantage.

Indonesian companies progressively integrate sustainability and digital transformation to strengthen operational efficiency and environmental performance. Companies like PT Electronic City Indonesia Tbk, PT Trikomsel Oke Tbk, PT Erajaya Swasembada Tbk, PT Globe Kita Terang Tbk, and PT Gaya Abadi Sempurna Tbk (SELIS) have taken concrete steps to align digital strategies with sustainability goals, using eco-friendly product offerings and platform-based digital solutions. PT SELIS, for example, introduced energy-efficient electric vehicles, while PT Erajaya Swasembada Tbk promotes low-environmental-impact electronic products. Such strategies not only improve customer satisfaction but also mitigate electronic waste.

Despite theoretical expectations that green finance should enhance firm value, empirical findings remain inconsistent. Some studies report positive effects (Flammer, 2021; Chen et al., 2021), whereas others find weak, insignificant, or even negative relationships (Lyon et al., 2021). This inconsistency suggests the possibility of mediating variables, such as financial performance, that influence how green finance affects firm value, as well as moderating factors such as capital structure (Prasetia, 2024). Additional evidence shows that strong sustainability initiatives can enhance firm reputation and financial performance, boosting investor confidence and long-term competitiveness (Gustiana et al., 2019).

Prior research has explored green finance in contexts such as energy and infrastructure (Ghazali & Zulmaita, 2020; Yulianty, 2019), yet studies on electronic retail—especially in Indonesia—remain limited. Moreover, the mediating role of financial performance and moderating role of capital structure have not been thoroughly examined within this industry. Financial performance often mediates relationships between financial policies and firm value, though evidence remains mixed (Wulandari & Damayanti, 2021). Capital structure may also moderate the relationship between profitability and firm value, as shown by Prasetia (2024), who found that DER influences the strength of ROE's impact on PBV. Understanding these mechanisms is essential in a highly competitive and rapidly evolving sector such as electronic retail.

Given these gaps, this study investigates the influence of green finance on firm value while incorporating financial performance as the first mediator and capital structure as the second moderator. The results are expected to provide practical implications for companies seeking to optimize green finance implementation, assist investors in sustainable investment decisions, and guide policymakers in formulating strategies that support green finance development in Indonesia.

## LITERATURE REVIEW

### Green finance's role in company value and capital structure

Green Finance refers to financing approaches that support environmentally oriented economic activities. In this study, it includes green investments, greenhouse gas emission reduction efforts, green bond issuance, and the adoption of environmental policies within electronic retail companies. By allocating resources to environmentally responsible initiatives, firms may gain long-term benefits such as operational efficiency, reduced energy costs, and enhanced corporate reputation. Broadly, Green Finance encompasses various financial instruments and investments designed to fund environmentally sustainable projects (NURP, 2022). According to the OECD (2020), Green Finance promotes economic growth while mitigating negative ecological impacts such as pollution, greenhouse gas emissions, and waste generation, thereby accelerating the transition toward a sustainable green economy (Rahmanisa, 2023).

Globally, governments, financial institutions, and corporations have begun implementing policies and strategies to expand green financing as a response to increasing environmental and social challenges. Empirical studies show that green financial initiatives can improve profitability by enhancing efficiency and generating cost savings related to energy consumption or government incentives. From a market perspective, firms with strong environmental, social, and governance (ESG) practices tend to attract more long-term investors, thereby increasing their market valuation.

Several theoretical perspectives support the role of Green Finance in shaping firm outcomes. Legitimacy Theory posits that firms adopt sustainable financial policies to maintain social acceptance and legitimacy (Suchman, 1995). Stakeholder Theory (Freeman, 1984) emphasizes the need to consider the interests of all stakeholders, whereby Green Finance signals corporate commitment to environmental responsibility, which is valued by customers, regulators, and communities. Triple Bottom Line Theory (Elkington, 1997) further argues that firm performance must be assessed through economic, social, and environmental dimensions, and Green Finance acts as an instrument to balance these three pillars. In the electronic retail sector specifically, access to

Green Finance enables companies to invest in eco-efficient technologies, such as energy-saving products or materials from recycled components, which has been shown to strengthen consumer purchasing intentions for green products (Gu et al., 2023).

The role of capital structure is also crucial within the Green Finance framework. A balanced capital structure—an effective mix of debt and equity—enhances a firm's flexibility to allocate resources toward sustainable investments (Xie et al., 2019). As defined by Rahma et al. (2023), capital structure represents the ratio of debt to equity used to finance corporate activities and indicates the firm's capacity to meet financial obligations. A sound capital structure can amplify the positive effect of Green Finance on firm value, as companies with moderate debt levels can implement green strategies more efficiently. Conversely, firms with high leverage may face financial constraints due to heavy interest burdens, reducing the benefits derived from green investments and potentially weakening firm value.

In summary, Green Finance in electronic retail firms is not merely a financial mechanism but a strategic tool influenced by sustainability theories, consumer behavior, and financial structure considerations. Its effectiveness depends on both internal financial conditions and the firm's commitment to environmental innovation and long-term sustainability.

***capital structure and it's role in company value***

Capital structure represents the proportion of debt and equity used to finance a company's operations. According to Trade-Off Theory, firms aim to balance the benefits of debt—such as tax shields—with the potential costs of financial distress (Myers, 1984). Meanwhile, Pecking Order Theory suggests that companies prefer internal financing, followed by debt, and issue equity only as a last resort. Both theories are relevant to electronic retail firms, which often face fluctuating consumer demand and substantial investment needs for technological upgrades.

Research by Kurniasih et al. (2022) indicates that capital structure can moderate the relationship between cost of capital and firm value, meaning that an optimal combination of debt and equity can strengthen the positive effect of efficient capital costs on market valuation. Thus, capital structure decisions extend beyond choosing between debt and equity—they play a strategic role in shaping long-term firm value.

In the context of green finance, Trade-Off Theory incorporates not only traditional financial considerations but also environmental risks and sustainability objectives. Firms pursuing green investment projects with lower environmental risk tend to achieve more favorable capital costs and greater access to sustainable financing instruments, including green loans and green bonds. This suggests that capital structure decisions increasingly reflect a firm's ability to leverage green financial instruments as part of a sustainable financing strategy (Xie, Fang, & Liu, 2019; Zerbib, 2019).

**Influence of financial performance on company value**

The mediating role of financial performance can be explained through Signaling Theory and the Resource-Based View (RBV). According to Signaling

Theory (Spence, 1973), strong financial performance sends a positive signal to investors, indicating that the firm is effectively implementing green initiatives—such as green finance or green innovation—while managing resources efficiently and responsibly. From the RBV perspective (Barney, 1991), environmentally oriented strategies create valuable, rare, and difficult-to-imitate capabilities that enhance competitive advantage, ultimately improving financial outcomes.

Empirical evidence by Yuniarti, Soewarno, and Isnalita (2022) supports these theoretical arguments, demonstrating that green innovation positively influences firm value through financial performance as a mediating variable. This indicates that financial performance serves as an essential pathway through which green finance contributes to higher firm value. Collectively, these theoretical and empirical insights highlight financial performance as a critical mechanism linking sustainability-driven financial policies to enhanced corporate valuation.

**Relationship between green finance, corporate performance, capital structure, and firm value**

Relationship Between Green Finance, Corporate Performance, Capital Structure, and Firm Value

The implementation of green finance contributes to improved operational efficiency and strengthens corporate reputation (Flammer, 2021). The resulting efficiency can enhance profitability, positioning financial performance as a mediating variable that links the influence of green finance to firm value (Li et al., 2022). In addition, capital structure functions as a moderating variable that shapes the strength of this relationship, as the proportion of debt and equity determines a firm's flexibility in financing environmentally oriented projects (Prasetia, 2024; Rahma et al., 2023).

**Conceptual Framework**

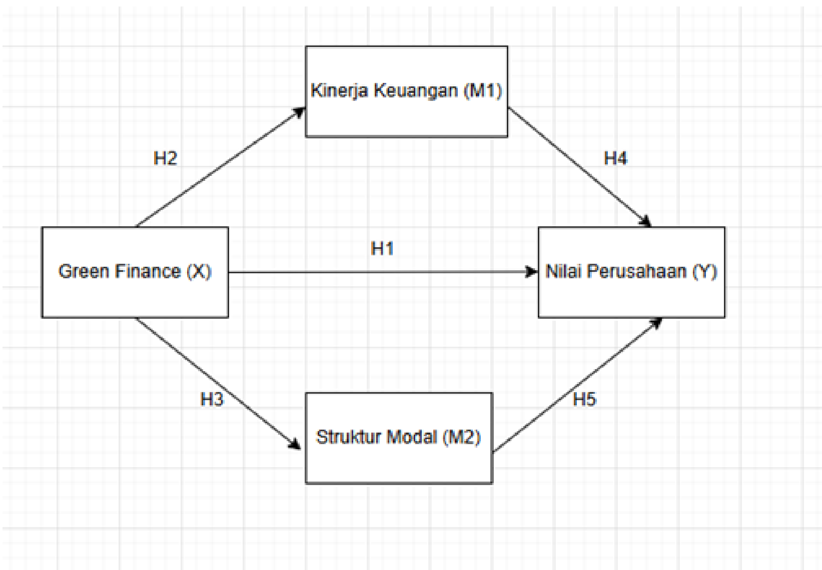


Figure 1. Research Variable

The conceptual framework of this study illustrates the direct and indirect pathways through which Green Finance (X) influences Firm Value (Y) by incorporating two interconnected mediating variables, namely Financial Performance (M1) and Capital Structure (M2). As shown in the framework, Green Finance is theorized to affect Firm Value not only directly (H1) but also indirectly through improvements in financial performance (H2 → H4) and through adjustments in capital structure (H3 → H5). These relationships are grounded in the Resource-Based View, which posits that sustainability-driven financial practices represent strategic resources that enhance operational efficiency and competitive advantage, and Signaling Theory, which suggests that investment in environmentally oriented financial policies sends positive signals to investors regarding the firm's long-term commitment, risk management, and credibility. Simultaneously, Capital Structure functions as a second mediating mechanism, reflecting the Trade-Off Theory and Modigliani & Miller's capital structure propositions, which argue that the configuration of debt and equity can strengthen or weaken the influence of strategic financial decisions on firm value. Thus, the model integrates both sustainability-based and financial-theoretical perspectives to capture the multidimensional nature of the relationship between Green Finance and Firm Value.

The scope of this research is limited to five electronic retail companies listed on the Indonesia Stock Exchange (BEI) during 2018–2023, using publicly available financial statements and sustainability reports. A synthesis of prior studies reveals inconsistent findings regarding the relationships among Green Finance, financial performance, capital structure, and firm value, indicating the presence of internal mechanisms that may not have been fully explored. By incorporating dual mediation effects into one integrative analytical model, this study contributes to the literature by offering a more comprehensive explanation of how Green Finance shapes firm value within Indonesia's electronic retail sector.

## METHODOLOGY

This study employs a quantitative research method with descriptive and causal-comparative approaches. The descriptive approach is used to outline the characteristics of green finance and firm value, while the causal-comparative approach examines whether green finance influences firm value by comparing firms that apply green financial practices and those that do not. A quantitative approach is deemed appropriate because it enables statistical measurement and hypothesis testing using numerical data, allowing objective conclusions in line with the positivist paradigm (Sugiyono, 2018). In this research, financial performance is positioned as a mediating variable to assess whether the influence of green finance on firm value occurs directly or indirectly through financial improvements.

Operational definitions and measurement scales were established for each variable to ensure clarity and consistency. Green Finance (X) is measured through indicators such as greenhouse gas (GHG) emissions reported in corporate sustainability reports. Financial Performance (M1) is assessed using Return on Assets (ROA) and Return on Equity (ROE), while Firm Value (Y) is measured through Tobin's Q and stock value indicators. Capital Structure (M2) is measured using Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR). All variables use ratio scales to allow precise quantitative analysis. Green finance is assessed based on reductions in GHG emissions and corporate allocations toward environmentally oriented initiatives, while firm value measurements such as Tobin's Q and PBV capture market perceptions of a firm's performance and growth prospects.

The population of this study includes firms listed on the Indonesia Stock Exchange (BEI) under the retail trade subsector (E7) and the special retail industry (E74), categorized under the non-primary consumer goods sector (E742). This population is selected due to the sector's relevance to sustainability and the adoption of green finance practices. Following the definition of population by Sugiyono (2017), the study considers firms that meet specific criteria related to data availability and relevance. Using purposive sampling (Sugiyono, 2022; Prasetya, 2019), five companies were selected based on the availability of complete financial statements and sustainability reports, as well as the implementation of green financial policies.

Data collection uses secondary data sourced from corporate financial statements and sustainability reports, which are publicly accessible through company websites and related financial documentation. Secondary data are suitable for this research because they provide reliable and comprehensive information related to financial performance, firm value, and sustainability indicators. This method ensures that the data utilized are accurate, verifiable, and aligned with the research objectives.

To analyze the relationships among the variables, this study uses multiple linear regression to test the effects of green finance and financial performance on firm value. A moderation test is conducted by interacting the green finance variable with capital structure measures, specifically the debt-to-equity ratio, to determine whether capital structure strengthens or weakens the relationship between green finance and firm value. These regression models allow the researcher to evaluate both the direct and conditional effects among variables in accordance with the hypotheses formulated earlier.

## RESEARCH RESULT

### Preliminary data processing and variable overview

The research begins with the preparation of panel data derived from annual and sustainability reports publicly disclosed by the selected companies. Each variable—Green Finance, ROE, DAR, Tobin's Q, GF*ROE, and GF*DAR—was constructed for each observation year. Before hypothesis testing, the data were examined to ensure suitability for regression analysis. This includes reviewing the range, variation, and consistency of the variables across the six-year period. Although descriptive statistics are not displayed in a formal table, the underlying analysis confirmed that the variables demonstrated adequate variation for meaningful statistical testing. All variables were then subjected to diagnostic procedures to ensure that panel regression assumptions were fulfilled, thereby supporting the validity and reliability of subsequent results.

**Mediation test using sobel analysis**

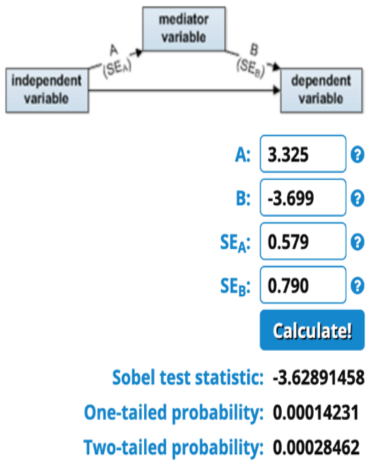


Figure 2. Sobel Test Result

The role of financial performance (ROE) as a mediating variable was examined through a Sobel Test, which evaluates the significance of the indirect relationship between Green Finance and firm value. The Sobel analysis produced a Z-value of –3.628 with a significance level of 0.00028, indicating that the mediating effect is statistically significant. This means that ROE serves as an intermediary pathway through which Green Finance affects firm value. The negative sign of the Z-value reflects the nature of the suppression effect present in the model: although Green Finance positively influences ROE, ROE itself exhibits a negative relationship with firm value in this industry context. Thus, the indirect pathway remains statistically relevant but directionally complex.

Table 1. Green Finance Regression Result Against ROE

Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | 269.607 | 87.992 | | 3.064 | .005 |
| | gf (X) | -8.270 | 3.572 | -.310 | -2.315 | .028 |
| | roe (Z1) | -3.699 | .790 | -.628 | -4.681 | <.001 |

a. Dependent Variable: fv1 (Y)

The regression supporting this analysis further strengthens the mediation conclusion. The regression of GF on ROE, presented in Table 4.1, shows a positive and statistically significant coefficient, which demonstrates that firms allocating resources to green financial practices tend to experience improvements in profitability. Meanwhile, Table 4.2 presents the regression of GF and ROE on firm value, both showing significant negative effects. These results confirm that the indirect pathway from GF to firm value via ROE is both significant and theoretically meaningful. The Sobel Test output should be inserted after this narrative section to illustrate the mediation calculations.

Table 2. Green Finance Regression Result Against Company Value

Coefficients[a]

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 269.607 | 87.992 | | 3.064 | .005 |
| | gf (X) | -8.270 | 3.572 | -.310 | -2.315 | .028 |
| | roe (Z1) | -3.699 | .790 | -.628 | -4.681 | <.001 |

a. Dependent Variable: fv1 (Y)

**Bootstrapping Analysis for Direct and Indirect Effects**

To provide additional empirical strength to the mediation findings, a bootstrapping analysis was conducted. Bootstrapping re-estimates the direct and indirect effects using repeated sampling to test the stability of the coefficients. The results show that Green Finance has a strong and significant direct effect on ROE, with an original sample value of 0.736 and a p-value of 0.000, which indicates that GF consistently enhances financial performance. In contrast, GF demonstrates a direct negative effect on firm value, with an original sample of –0.310 and a p-value of 0.025, suggesting that while green initiatives may improve internal operations, investors may view their short-term financial implications as costly.

Table 3. Path Coefficients Result

| | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics (\|O/STDEV\|) | P values |
|---|---|---|---|---|---|
| Green Finance (X) -> Kinerja keuangan (Z) | 0.736 | 0.745 | 0.080 | 9.208 | 0.000 |
| Green Finance (X) -> Nilai Perusahaan (Y) | -0.310 | -0.343 | 0.139 | 2.238 | 0.025 |
| Kinerja keuangan (Z) -> Nilai Perusahaan (Y) | -0.628 | -0.598 | 0.139 | 4.517 | 0.000 |

Similarly, ROE shows a negative and significant direct effect on firm value, with an original sample of –0.628 and a p-value of 0.000. The indirect effect of GF on firm value through ROE is also statistically significant (original sample –0.462; p = 0.000), further supporting the Sobel Test findings. These results highlight that the impact of Green Finance is not straightforward; rather, its influence on firm value is primarily channeled through internal financial mechanisms.

Table 4. Specific Indirect Result

| | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics (\|O/STDEV\|) | P values |
|---|---|---|---|---|---|
| Green Finance (X) -> Kinerja keuangan (Z) -> Nilai Perusahaan (Y) | -0.462 | -0.439 | 0.095 | 4.877 | 0.000 |

## Panel Regression Model Selection Tests

Table 5. Chow Test Result

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

| Effects Test | Statistic | d.f. | Prob. |
|---|---|---|---|
| Cross-section F | 18.398286 | (4,20) | 0.0000 |

Before estimating the main regression model, it was necessary to determine the most appropriate panel data estimation technique. The first step was the Chow Test, which compares the Common Effect Model with the Fixed Effect Model. The Chow Test produced a significance value of 0.0000, indicating that the Fixed Effect Model provides a better fit than the Common Effect Model. Following this, the Hausman Test was performed to compare the Fixed Effect Model with the Random Effect Model. The Hausman Test returned a significance value of 1.0000, suggesting that the Random Effect Model is the more appropriate choice. Consequently, the Random Effect Model was selected for the main regression analysis because it provides the most efficient and unbiased parameter estimates for the given dataset.

Table 6. Hausman Test Result

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Cross-section random | 0.000000 | 5 | 1.0000 |

## Classical Assumption Tests

Table 7. Normality Test Results

**One-Sample Kolmogorov-Smirnov Test**

| | | Unstandardized Residual |
|---|---|---|
| N | | 30 |
| Normal Parameters[a,b] | Mean | .0000000 |
| | Std. Deviation | 22.11758918 |
| Most Extreme Differences | Absolute | .106 |
| | Positive | .106 |
| | Negative | -.083 |
| Test Statistic | | .106 |
| Asymp. Sig. (2-tailed)[c] | | .200[d] |

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

A series of classical assumption diagnostics were conducted to ensure that the Random Effect Model meets the statistical assumptions required for reliable inference. The normality test indicated a significance value of 0.190, which is above the 0.05 threshold, confirming that the residuals follow a normal distribution. Multicollinearity was assessed by examining Tolerance and VIF values, all of which fell within acceptable ranges, indicating that no multicollinearity exists among the variables. Heteroskedasticity testing revealed that all variables had significance levels greater than 0.05, demonstrating that heteroskedasticity is absent in the model. Finally, the Durbin–Watson statistic was 1.750, falling within the acceptable range between du and 4 – du, indicating the absence of autocorrelation. These diagnostic results collectively confirm that the Random Effect Model satisfies all classical assumptions.

Table 8. Multicollinearity Test Results

**Coefficients**[a]

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. | Collinearity Statistics Tolerance | Collinearity Statistics VIF |
|---|---|---|---|---|---|---|---|---|
| 1 | (Constant) | 269.607 | 87.992 | | 3.064 | .005 | | |
| | gf (X) | -8.270 | 3.572 | -.310 | -2.315 | .028 | .459 | 2.179 |
| | roe (Z1) | -3.699 | .790 | -.628 | -4.681 | <.001 | .459 | 2.179 |

a. Dependent Variable: fv1 (Y)

Table 9. Heteroscedasticity Test Results

**Coefficients**[a]

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 102.889 | 41.877 | | 2.457 | .021 |
| | gf (X) | -3.343 | 1.700 | -.462 | -1.967 | .060 |
| | roe (Z1) | -.202 | .376 | -.126 | -.538 | .595 |

a. Dependent Variable: Abs_Res

Table 10. Autocorrelation Test Results

**Model Summary**[b]

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .882[a] | .777 | .761 | 22.92213 | 1.750 |

a. Predictors: (Constant), roe (Z1), gf (X)

b. Dependent Variable: fv1 (Y)

**Random Effect Regression Results**

Table 11. Multiple Linear Regression Analysis

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Cross-section random | 0.000000 | 5 | 1.0000 |

* Cross-section test variance is invalid. Hausman statistic set to zero.

Cross-section random effects test comparisons:

| Variable | Fixed | Random | Var(Diff.) | Prob. |
|---|---|---|---|---|
| GF | -0.000000 | -0.000000 | 0.000000 | 0.0505 |
| ROE_F | -6.604872 | -11.106153 | 6.472207 | 0.0768 |
| GF*ROE_F | 0.000000 | 0.000000 | 0.000000 | 0.0819 |
| DAR | -0.001149 | -0.001620 | 0.000000 | 0.0546 |
| GF*DAR | 0.000000 | 0.000000 | 0.000000 | 0.0649 |

Cross-section random effects test equation:
Dependent Variable: FV1_F
Method: Panel Least Squares
Date: 11/23/25 Time: 18:51
Sample: 2018 2023
Periods included: 6
Cross-sections included: 5
Total panel (balanced) observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 888.6536 | 786.6235 | 1.129706 | 0.2720 |
| GF | -1.16E-09 | 2.18E-09 | -0.533880 | 0.5993 |
| ROE_F | -6.604872 | 3.731175 | -1.770186 | 0.0919 |
| GF*ROE_F | 1.32E-11 | 7.49E-12 | 1.762807 | 0.0932 |
| DAR | -0.001149 | 0.001088 | -1.055805 | 0.3036 |
| GF*DAR | 1.54E-15 | 3.03E-15 | 0.506961 | 0.6177 |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|---|---|---|---|
| R-squared | 0.838042 | Mean dependent var | 46.87433 |
| Adjusted R-squared | 0.765161 | S.D. dependent var | 67.94396 |
| S.E. of regression | 32.92577 | Akaike info criterion | 10.08759 |
| Sum squared resid | 21682.12 | Schwarz criterion | 10.55466 |
| Log likelihood | -141.3138 | Hannan-Quinn criter. | 10.23701 |
| F-statistic | 11.49877 | Durbin-Watson stat | 1.557766 |
| Prob(F-statistic) | 0.000004 | | |

The Random Effect Model regression results illustrate the complex relationships among Green Finance, financial performance, capital structure, and firm value. The overall model is statistically significant, with an F-statistic of 11.49877 and a significance value of 0.000004, indicating that the model jointly explains variations in firm value. However, individual variable significance varies. Green Finance does not exhibit a significant direct effect on firm value, suggesting that sustainability initiatives have not yet translated into immediate market valuation benefits. ROE, however, shows a significant negative effect on firm value, reflecting possible investor skepticism regarding the profitability signals of electronic retail firms in the short term.

Table 12. F Test Results

| **Model** | **F - Statistik** | **F- Tabel** | **Prob (F – Statistik)** |
|---|---|---|---|
| REM | 11.49877 | 2.76 | 0.000004 |

The interaction between GF and ROE is statistically significant, which implies that the effect of Green Finance on firm value depends substantially on the firm's profitability level. Conversely, the interaction between GF and DAR does not significantly influence firm value, indicating that capital structure does not play a meaningful moderating role in this context. These findings underscore that internal financial strength, rather than leverage structure, is more critical in determining the effectiveness of sustainability strategies in shaping firm value within the electronic retail sector.

Table 13. T-Test Results

| **Variabel** | **Prob** | **t – table (α=0,05)** | **Signifikan** |
|---|---|---|---|
| GF | 0.9315 | 2,05954 | Tidak signifikan |
| ROE_F | 0.0094 | 2,05954 | Signifikan |
| GF *ROE_F | 0.0034 | 2,05954 | Signifikan |
| DAR | 0.3937 | 2,05954 | Tidak signifikan |
| GF * DAR | 0.3801 | 2,05954 | Tidak signifikan |

## DISCUSSION

The empirical findings of this study provide nuanced insights into how Green Finance (GF), financial performance (ROE), capital structure (DAR), and their interactions influence firm value among electronic retail companies listed on the Indonesia Stock Exchange (BEI). While GF alone does not yield a significant direct increase in firm value, the significant mediating role of financial performance and the interaction effect between GF and ROE underscore the complexity of sustainability-value relationships, particularly in industries characterized by high investments in technology and fluctuating demand.

First, the mediation analysis—supported by the Sobel Test and bootstrapping—confirms that ROE functions as a crucial internal channel through which GF influences firm value. This aligns with theoretical expectations from both Signaling Theory and Resource-Based View (RBV). According to Signaling Theory, firms that engage in green financing and subsequently translate that into strong financial performance send positive signals to investors about their ability to manage resources responsibly and foresee future growth. Meanwhile, RBV suggests that green finance investments constitute strategic, value-creating resources—particularly when they lead to efficiencies and competitive advantages—that manifest in improved financial metrics. The evidence that GF significantly raises ROE supports these theoretical arguments, indicating that green investments may indeed enhance operational efficiency or cost savings (e.g., via energy efficiency, waste reduction), improving profitability.

Yet, the negative direct and total effects of GF (and ROE) on firm value reveal a counter-intuitive outcome: despite internal gains, the market seems to respond unfavorably—or conservatively—toward firms with green investments, at least in the short term. There are several possible explanations. Investors might perceive green initiatives as costly without immediate return, especially in the electronic retail industry, where margins may be thin and competition intense. Alternatively, the market may apply a "wait-and-see" approach: investors may expect tangible, sustained results before rewarding green strategies with higher valuations. This could suggest that the benefits of green finance are long-term and not immediately capitalized.

The significant positive interaction between GF and ROE further clarifies this dynamic: GF appears to contribute to firm value only when underlying financial performance is strong. In other words, green investments alone are insufficient; they must be embedded in a context of healthy profitability. This suggests that internal financial capacity determines whether green finance can translate into market value. Firms with stronger ROE may be better positioned to absorb initial costs, manage green projects efficiently, and signal sustainability credibly, which leads to higher valuations.

On the other hand, the lack of a significant moderating effect of capital structure (GF*DAR) indicates that leverage does not significantly influence how GF affects firm value in this sector. This may imply that debt levels or financing mix are less important than actual financial performance in determining whether green finance is rewarded by investors — at least for electronic retail firms. Given the industry's characteristics (high technology investment, volatility in consumer demand), it seems plausible that investors focus more on profitability and operational results than on leverage when evaluating green initiatives.

These findings carry several implications. For corporate managers in electronic retail, adopting green finance initiatives remains important, but such efforts should be accompanied by strategies that ensure robust profitability — only then are green investments likely to be valued by the market. For investors, the results caution against simplistic assumptions that green finance automatically leads to higher firm value; instead, investor assessment should consider both sustainability practices and overall financial health. For policy-makers and regulators encouraging green finance, the findings highlight a potential hurdle: firms may invest in sustainability, but market valuation may not reflect these investments unless firms deliver consistent financial performance. Thus, supportive policies (e.g., incentives, subsidies, tax advantages) might be needed to bridge the gap between long-term environmental benefits and short-term market valuation.

However, this study has limitations. First, the sample is relatively small (five firms) and limited to the electronic retail sector listed on the BEI; results may not generalize to other industries or to unlisted firms. Second, the observation period (2018–2023) may not be long enough to capture long-term market recognition of green investments, which often yield returns over a longer horizon. Third, the measures of Green Finance adopted in this study (e.g., sustainability report data, GHG emissions) may not fully capture the qualitative aspects of green innovation — such as brand perception, customer loyalty, or long-term environmental impact — which could affect firm value differently.

Given these limitations, future research could expand the sample size by including more firms across diverse sectors or different stock markets to improve external validity. Longer-term longitudinal studies would help assess whether market valuation adjusts over time to reflect green investments. Additionally, future studies might incorporate non-financial indicators — such as ESG ratings, consumer attitudes, or corporate reputation metrics — to provide a more holistic assessment of how green finance influences firm value beyond accounting and market valuation metrics.

In conclusion, this study contributes to the growing empirical literature on green finance by demonstrating that its positive effect on firm value is not automatic but mediated by internal financial performance and contingent on profitability. The results underscore the importance of strong financial fundamentals in realizing the value potential of sustainability strategies and suggest that green finance should be considered as part of a broader corporate strategy rather than a standalone initiative.

## CONCLUSIONS AND RECOMMENDATIONS

### *Conclusion*

Based on the analyses conducted using the Random Effect Model—selected through the Chow and Hausman tests—this study provides several key insights into the influence of Green Finance, financial performance, and capital structure on firm value in Indonesian electronic retail companies. The findings show that Green Finance does not have a significant direct impact on firm value, suggesting that sustainability initiatives may yield benefits only in the long term and that investors in this sector may not yet fully value green activities. In contrast, financial performance, measured by ROE, exerts a significant positive effect on firm value, reaffirming profitability as a central determinant of market evaluation.

Capital structure, represented by DAR, is found to have no significant effect on firm value, indicating that leverage is not a primary consideration for investors in the electronic retail industry. The interaction between Green Finance and ROE shows a significant effect, demonstrating that firms with stronger profitability are better positioned to convert green financing initiatives into enhanced firm value. Meanwhile, the interaction between Green Finance and DAR is not significant, suggesting that capital structure does not moderate the relationship between Green Finance and firm value.

Overall, the study concludes that profitability plays the most critical role in determining whether green finance initiatives translate into higher firm value. Green finance becomes impactful only when supported by strong internal financial performance.

### Recommendation

The findings of this study suggest several important recommendations for stakeholders. For companies, maintaining and improving profitability is essential, as ROE has the strongest influence on firm value. Firms implementing Green Finance should prioritize initiatives that offer cost efficiency or long-term benefits, while also enhancing transparency through sustainability reports or ESG disclosures to help investors better assess the impact of green initiatives on corporate performance. For investors, profitability should remain a key indicator when evaluating firms with sustainability commitments, given its significant effect on firm value, while less emphasis may be placed on capital structure since leverage was found to be insignificant in this context. For future researchers, expanding the scope of analysis to other sectors—such as manufacturing, energy, or banking—would improve generalizability, and incorporating additional variables such as CSR disclosure, environmental performance, or green innovation may provide a more comprehensive understanding of how sustainability practices influence firm value.

**ADVANCED RESEARCH**

This study has several limitations that should be acknowledged in interpreting the findings. First, the sample size is relatively small, consisting of only five electronic retail companies listed on the Indonesia Stock Exchange. This limited sample restricts the generalizability of the results, as the behavior of Green Finance, financial performance, and capital structure may differ in other industries or among larger and more diverse firms. Second, the research period of 2018–2023 may not fully capture the long-term effects of Green Finance initiatives, which often require extended time horizons before their benefits are reflected in financial performance or market valuation. As a result, the study may not completely account for delayed sustainability impacts that could emerge beyond the observation window.

Third, the measurement of Green Finance relies primarily on publicly disclosed sustainability information, including indicators such as GHG emissions and environmental programs. These indicators may not fully represent the depth or quality of green practices, as differences in reporting standards, data completeness, or disclosure transparency across companies can affect accuracy. Fourth, firm value is assessed using financial market indicators that may be influenced by external factors unrelated to sustainability or company performance, such as macroeconomic conditions, investor sentiment, or industry shocks. This makes it difficult to isolate the pure effect of Green Finance on firm valuation.

Fifth, the study includes only a limited set of variables—Green Finance, ROE, DAR, and interaction terms—while other potentially influential factors such as CSR disclosure, environmental performance ratings, governance quality, or innovation intensity were not included. The absence of these variables may lead to omitted variable bias and limit the explanatory power of the model. Lastly, although the Random Effect Model was statistically appropriate, it assumes that individual firm effects are uncorrelated with the independent variables, which may not always hold in real-world corporate settings.

These limitations suggest that the findings should be interpreted with caution, and they highlight opportunities for future studies to expand the scope, incorporate richer datasets, extend the timeline, and utilize broader sustainability indicators to provide a more comprehensive understanding of how Green Finance shapes firm value.

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