

# How Green Investment Affects Stock Returns: Exploring the Role of Financial Performance

Uun Putrika<sup>1</sup>, Ardianto<sup>2</sup>

General Background: Green investment is increasingly recognized as a key driver of financial and environmental sustainability. Specific Background: While prior research has examined its impact on stock returns, limited studies focus on emerging markets and the moderating role of financial performance. Knowledge Gap: The relationship between green investment and stock returns remains unclear, particularly regarding the influence of Return on Assets (ROA). Aims: This study investigates the effect of green investment on stock returns and examines whether ROA moderates this relationship. Methods: A quantitative approach was applied to panel data from 10 SRI KEHATI-listed companies (2019-2023). Green investment was measured using the PROPER rating system, and panel regression analysis was conducted. Results: Findings indicate that green investment positively influences stock returns, with ROA strengthening this effect. Novelty: This study extends the literature by focusing on an emerging market and integrating ROA as a moderating factor. The use of PROPER ratings adds a novel environmental performance metric. Implications: The results highlight the need for firms to align green investment strategies with financial efficiency, offering insights for investors and policymakers to promote sustainabilitydriven financial growth.

Keywords: Green investment, Stock returns, Return on Assets (ROA)

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\*Correspondence:
Uun Putrika
uunputrika80@gmail.com

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<sup>&</sup>lt;sup>1</sup> Faculty of Economic and Bussiness, Airlangga University, Indonesia,

<sup>&</sup>lt;sup>2</sup> Faculty of Economic and Bussiness, Airlangga University, Indonesia,

#### INTRODUCTION

The capital market is one of the key components of a country's economy as it provides investment opportunities for the public and a source of funding for companies. One indicator of successful investment in the capital market is stock returns. Stock returns reflect the rate of return investors earn on their investments in a company's shares (Tandelilin, 2017). Stock returns serve as a crucial reference for investors to assess the level of profit and risk associated with their investments (Bodie et al., 2018). Stock returns are influenced by various factors, including non-financial factors such as green investment. Green investment represents a company's allocation of funds toward projects that support environmental sustainability, such as renewable energy and waste management. Beyond its sustainability aspect, green investment also has the potential to deliver long-term benefits through more efficient and sustainable resource management (Li et al., 2022; Friede et al., 2015; Su, 2020).

Zhang and Berhe (2022) define green investment as the allocation of funds by governments or companies toward ecofriendly products and services aimed at reducing the impacts of climate change and ecosystem damage. Additionally, green investment is not only part of a company's corporate social responsibility (CSR) but also serves as a strategy to enhance its reputation and long-term value (Chen & Ma, 2021). Research shows that companies investing in sustainability tend to have better stock performance, as they are more effective at managing environmental risks and improving operational efficiency (Nollet et al., 2016; Chen & Ma, 2021). The issues of climate change and environmental sustainability have become major concerns, including in the non-financial sector. Growing worries about the impacts of climate change and increasing interest in eco-friendly investment tools, such as green bonds, have driven the rising popularity of green investments in global financial markets (Friedman & Heinle, 2016; Xu et al., 2023). This phenomenon is increasingly relevant given the significant effects of climate risks, global warming, and pollution on the global economy (Deschênes & Greenstone, 2007; Fisher et al., 2012; Hong et al., 2019).

Environmental issues require solutions that integrate economic and sustainability aspects. The more a company focuses on its environmental activities, the better its reputation will be in the eyes of stakeholders and users of its financial statements (Wijayanto et al., 2021). Green investment offers a relevant approach by directing capital toward environmentally focused projects, such as renewable energy development, waste management, and environmental protection (Tu et al., 2021). The COVID-19 pandemic has accelerated the transition toward a green economy, emphasizing that sustainability and environmental responsibility are now priorities that cannot be overlooked. Many investors, both institutional and individual, have started shifting to green investment portfolios, aiming to achieve financial gains while contributing to addressing urgent environmental issues. This trend has grown rapidly, driven by increasing public and investor awareness of the importance of incorporating environmental, social, and governance (ESG) factors into investment decision-making processes. Consequently, debates have arisen about how investor preferences for green investments influence corporate financial performance and stock returns (Fama & French, 2007). Kabir and Rakov (2023) identify the primary motivation behind investing in green bonds as enhancing a company's legitimacy. Additionally, there are both financial and moral drivers, including the potential for long-term financial gains and risk management. The moral drivers are tied to corporate social responsibility and the commitment to contributing to environmental preservation.

In the context of Indonesia, the commitment to green investment has been strengthened through sustainable economic development strategies. Indonesia has identified key sectors with significant potential to support a green economy, including renewable energy, waste management, and forest conservation (BAPPENAS, 2022). The Indonesian government is committed to increasing the contribution of renewable energy, which reached 11.28% in 2020, and improving waste management, which achieved a 64.87% success rate. This demonstrates that green investment in Indonesia not only supports environmental sustainability but also plays a crucial role in achieving low-carbon development targets and fostering the growth of a green economy.

The impact of green investment on stock returns is closely linked to a company's internal factors, one of which is financial performance, as reflected in Return on Assets (ROA). Using ROA as a moderating variable highlights the importance of efficiency in utilizing company resources to optimize the results of green investments. Wong et al. (2020) found that companies with ESG certification tend to have lower capital costs and higher stock returns. ROA measures a company's efficiency in managing assets to generate profits. Companies with higher ROA are considered more efficient in using their resources, which can enhance their ability to effectively implement and benefit from green investments (Nollet et al., 2016). Therefore, this study aims to examine the impact of green investment on a company's stock returns, considering ROA as a moderating variable. The study shows that green investment has a positive impact on stock returns.

Azhari and Hasibuan (2023) show that green investment can enhance a company's value through better financial performance and a more positive environmental reputation. Similar studies by Zhang et al. 2020) and Li et al. (2022) also indicate that green investment contributes to increased stock returns. Companies committed to sustainability typically show better long-term performance, which ultimately boosts their value. Porter and Van Der Linde (1995) found that environmental responsibility is often linked to better financial performance. For example, the issuance of green bonds not only improves environmental performance but can also increase stock prices ((Tang & Zhang, 2020; Flammer, 2021)). This trend highlights the importance of sustainability in investor portfolios, which, in turn, influences investment decisions and financial outcomes. While much evidence shows a positive impact of green investment on financial performance and stock returns, there are differing views on whether sustainability spending truly provides higher returns. Some studies argue that sustainability expenditures may be seen as additional costs with no clear short-term benefits (Feldman et al., 1997), while others believe that green investments can reduce risks and improve long-term performance (ING Economics Department, 2015). Therefore, this study aims to

fill this gap by analyzing the impact of green investment policies and activities on stock returns and identifying the role of ROA as a moderating variable in this relationship.

Government policies that support green investment also influence companies' decisions to invest in environmentally friendly projects. For example, the Indonesian government supports green economy initiatives through policies and regulations that encourage companies to commit more to sustainability. This aligns with legitimacy theory, which states that companies operating in accordance with environmental norms and values accepted by society will strengthen their legitimacy and enhance their value in the eyes of stakeholders (Tanasya & Handayani, 2020). The increase in a company's profitability is seen positively by investors, as they believe it indicates good future prospects for the business. Investors tend to feel more secure when investing in a company because it ensures business sustainability. Additionally, companies that are committed to environmental management have the potential to attract more investors, leading to higher market capitalization (Sulistivanto & Sigit, 2023). This, in turn, increases the company's value, as reflected in its stock price.

This study provides insights into the contribution of green investment to stock returns in emerging markets like Indonesia, which has unique characteristics compared to developed markets. The findings show that companies with high asset management efficiency, as measured by ROA, are better able to optimize green investments. This discovery offers practical strategies for international companies looking to operate in emerging markets. Moreover, the study indicates that focusing on sustainability can provide significant added value for global investors. Indonesian government policies, such as PROPER, serve as an example of a framework that other countries can adopt to promote sustainability.

This study is unique compared to previous research in terms of sample, period, and methodology. The sample consists of companies listed in the SRI KEHATI index, with environmental performance measured based on PROPER ratings issued by the Ministry of Environment and Forestry (KLHK) for the period 2019–2023. The SRI KEHATI index was chosen because it includes companies committed to sustainability principles, while PROPER is used to assess the companies' environmental performance. The study aims to examine the impact of green investment on stock returns and the moderating role of financial performance, measured by ROA, in this relationship.

#### Theoretical Framework Stakeholder Theory

The stakeholder theory, first introduced by Freeman et al. (2021), states that companies have an obligation to consider the interests of various parties involved, not just shareholders. These parties include employees, customers, suppliers, local communities, and the environment (Freeman et al., 2021). This theory is relevant for understanding how green investments and ESG (Environmental, Social, and Governance) performance affect a company's value. Companies that are able to build strong relationships with their stakeholders tend to be more successful. ESG practices and green investments can enhance a company's reputation, customer loyalty, and relationships

with regulators, which positively impacts the company's value, especially in industries with high concentration and growth. Companies with good performance have greater resources and capacity to implement sustainable business practices that meet the expectations of their stakeholders. Therefore, the positive signals a company sends through green investment are more accepted and appreciated by stakeholders, ultimately increasing the company's value (Jones et al., 2018)

#### **Signaling Theory**

The signaling theory, introduced by Michael Spence in 1973 in the context of asymmetric information, states that parties with more information (such as company managers) can send signals to less-informed parties (such as investors) to reduce uncertainty (Spence, 1973). In the context of this research, signaling theory is used to understand how green investment and ESG performance affect a company's value. Green investments and ESG practices can be seen as positive signals from the company to the market and stakeholders, showing a commitment to sustainability and social responsibility, which in turn can enhance reputation and investor confidence (Connelly et al., 2011). Additionally, this theory explains why company performance can moderate the relationship between green investment and company value, as well as between ESG performance and company value. Companies with strong performance have greater capacity to make green investments and adopt ESG practices, and the signals they send to the market are more likely to be trusted. A solid company performance strengthens the positive signals conveyed through green investments and ESG practices, thus further increasing the company's value (Karasek & Bryant, 2012). In the context of Indonesia, where green investment and ESG practices are still in the development stage, signaling theory provides valuable insights into how these actions can influence a company's value. Public companies in Indonesia that adopt green investments and ESG practices not only contribute to environmental sustainability but also send a strong signal to investors and other stakeholders about their commitment to sustainable business practices, which can ultimately increase the company's value (Bappenas, 2022).

#### Green Investment Has a Positive Impact on Company Stock Returns

Green investment involves allocating funds to projects that support sustainability, such as the development of renewable energy, waste management, and environmental protection (Tu et al., 2021). According to stakeholder theory, companies that focus on sustainability tend to gain benefits in the form of better reputations and stronger relationships with stakeholders, including investors. This, in turn, can improve the company's stock performance (Freeman et al., 2021). On the other hand, signaling theory states that green investment acts as a positive signal to the market, demonstrating a company's commitment to sustainability and social responsibility (Spence, 1973). This signal creates a positive perception among investors, potentially increasing the company's stock value. Previous studies, such as ((Azhari & Hasibuan, 2023); (Li et al., 2022); (Zhang et al., 2020); (Maria & Elisabeth, 2022)) found that companies involved in green investment tend to have higher stock returns.

H1: Green investment has a positive impact on company stock returns

# **Company Performance Moderates the Relationship Between Green Investment and Stock Returns**

A company's financial performance, particularly Return on Assets (ROA), reflects how well the company utilizes its assets to generate profits. Companies with high ROA demonstrate efficiency in managing resources, including implementation of green investments (Nollet et al., 2016). According to signaling theory, strong financial performance serves as a positive signal to the market, indicating that the company not only has strong financial capabilities but also can commit to sustainability without sacrificing financial results (Spence, 1973). This signal creates a positive perception among investors, increasing their confidence in the company's longterm potential. For example, companies with high ROA are better able to allocate funds to green investments, which can enhance their reputation in the market and attract investor interest. Research by Nollet et al. (2016) and Chen & Ma (2021) shows that strong financial performance strengthens the relationship between commitment to sustainability and company stock performance.

H2: ROA moderates the relationship between green investment and stock returns.

#### **Research Framework**

Based on the proposed hypothesis, the framework of this study's hypothesis can be seen in Figure 1.

[Figure 1 about here]

#### **METHODS**

This study adopts a quantitative approach using secondary data from annual reports of companies listed in the SRI KEHATI index during the period 2019-2023, obtained from the Indonesia Stock Exchange (BEI) website and the official websites of each company. The population in this study consists of 25 companies, with 50 samples taken from 10 companies over a 5-year research period. Data analysis was conducted using panel data regression with SPSS 22, with green investment as the independent variable, stock returns as the dependent variable, and company performance as the moderating variable. The data was analyzed through multiple regression analysis and Moderated Regression Analysis (MRA). The goal of this analysis is to identify factors that affect the relationship between independent and dependent variables (Sugiyono, 2019). The moderating variable is used to determine whether it strengthens or weakens the effect of the independent variable on the dependent variable.

The equations used are:

 $Y = \alpha + \beta 1 X 1 + \varepsilon \dots (1)$ 

 $Y = \alpha + \beta 1X1 + \beta 1X1*Z1 + \epsilon$  .....(2)

Where:

Y = Stock Return

 $\alpha$  = Constant value

 $\beta$  = Variable coefficient

X = Green Investment

Z = ROA

(X\*Z) = Moderating variable (Interaction between X and Z)

#### Research Variable

[Table 1 Definitions Operational Variable Study]

Table 1 presents the definitions of the study's operational variables, including Stock Return, Green Investment, and ROA.

#### [Table 2 Sampel Determinations Results]

Table 2 presents the sample determination results, showing the selection process from companies listed in the SRI KEHATI Index to the final sample of 50 companies.

#### [Table 3 Descriptive Statistics]

Table 3 presents the descriptive statistics, summarizing the minimum, maximum, mean, and standard deviation values for Green Investment, Stock Return, and Return on Assets.

#### **RESULTS AND DISCUSSION**

The descriptive analysis results of the provided data show significant variation across the three main variables: Green Investment, Stock Return, and Return on Assets (ROA). For Green Investment, the minimum value recorded is 3.00, held by companies such as PT Indofood Sukses Makmur Tbk., PT Kalbe Farma Tbk., and PT PP London Sumatera Indonesia Tbk., while the maximum value is 5.00, held by companies such as PT Kalbe Farma Tbk., PT Industri Jamu Dan Farmasi Sido Muncul Tbk., and PT Semen Indonesia Tbk. The average Green Investment is 3.76, with a standard deviation of 0.69, indicating a fairly even distribution among the companies analyzed.

In terms of Stock Return, the minimum value recorded is -83.00, observed at PT Unilever Indonesia Tbk, in 2020, while the maximum value is 52.00, also held by PT Unilever Indonesia Tbk. in the same year. The average Stock Return is -5.34, with a very high standard deviation of 24.13, indicating large fluctuations in stock performance across companies. For Return on Assets (ROA), the minimum value recorded is 2.50, held by PT Semen Indonesia Tbk. in 2019, while the maximum value is 49.00, held by PT Unilever Indonesia Tbk, in the same year. The average ROA for the analyzed companies is 12.62, with a standard deviation of 11.98, showing substantial variation in financial performance across these companies. Overall, despite having companies with excellent performance, such as PT Unilever Indonesia Tbk., the high variation in all three variables reflects significant instability and differences in the strategies implemented by each company.

Test Assumptions Classic

### [Table 4 Assumptions Test Result]

Table 4 presents the results of the classical assumption tests. The normality test shows a significance value of 0.200, indicating that the data follow a normal distribution. The multicollinearity test results show tolerance values above 0.10 and VIF values below 10, confirming no multicollinearity. The heteroskedasticity test results show significance values above 0.05, indicating the absence of heteroskedasticity.

#### [Table 5 Results of Simple Regression Analysis]

Table 5 presents the results of the simple regression analysis. The regression coefficient for Green Investment is 0.263 with a significance value of 0.000, indicating a strong positive and significant effect on Stock Return.

# [Table 6 Results of Multiple Regression Analysis with Moderating Variable]

Table 6 presents the results of the multiple regression analysis with the moderating variable. The regression coefficients for Green Investment, Return on Asset, and Invest\_ROA are 0.260, -0.006, and 0.001, respectively, all with significance values of 0.000, indicating significant effects on Stock Return

#### [Table 7 Hypothesis Testing]

Table 7 presents the results of hypothesis testing. Both hypotheses are accepted: H1, stating that Green Investment has a positive effect on stock return (Sig = 0.000 < 0.05), and H2, stating that ROA moderates the influence of Green Investment on Stock Return (Sig = 0.000 < 0.05).

#### **Discussion**

#### The Effect of Green Investment on Stock Return

The results of the regression analysis in this study show that green investment has a positive and significant effect on stock returns. With a regression coefficient of 0.974 and a t-value significance of 0.000 (which is smaller than 0.05), it can be concluded that the higher the green investment made by a company, the higher the stock returns generated. These findings align with previous research by ((Friede et al., 2015); (Clark et al., 2015); (Sembiring & Yanti, 2023; Rakhman et al, 2021)), which also found that companies investing in sustainability tend to have better stock performance. These sustainability efforts help reduce risks and enhance the company's reputation, which ultimately positively impacts stock returns. This finding can be explained through stakeholder theory and signaling theory. According to stakeholder theory, companies that invest in sustainability tend to build stronger relationships with stakeholders, such as customers and investors, which increases their trust and, in turn, improves stock performance. On the other hand, signaling theory suggests that green investment sends a positive signal to the market that the company cares about social responsibility and sustainability, which makes investors more confident in investing. This positive signal helps increase the company's stock price. However, these findings contradict the research by ((Putri & Khomsiyah, 2024); Su, 2020); (Wulandari et al. 2022; Handayani & Haryati, 2023); Qodary & Tambun, 2021)) which found that green investment and sustainability report does not have a positive effect on stock returns.

The Effect of Green Investment on Stock Return with on Asset as a **Moderating** Variable Green investment, which has become a key focus in companies' efforts to reduce environmental impact, has been shown to have a significant effect on stock returns, especially when moderated by Return on Assets (ROA). Previous research findings indicate that green investment moderated by ROA has a positive and significant impact on stock returns. This result was obtained from an analysis showing a tsignificance value of 0.000, which is clearly lower than the significance threshold of 0.05. The regression coefficient of 0.264 indicates that each unit increase in green investment moderated by ROA contributes to a 0.264 unit increase in stock returns. This finding suggests that companies should adopt green investments as these not only benefit the environment but also can enhance their financial performance ((Wong et al., 2020); (Chen & Ma, 2021); (Chariri et al., 2018; Kuncoro & Sudiyatno, 2022)). However, this study's results contradict some other studies, such as those by Purbaningsih (2024) and Jaya et al. (2023), which show that profitability, as measured by ROA, does not moderate the relationship between green accounting and firm value.

#### CONCLUSION

This study concludes that green investment has a positive and significant effect on stock returns, with Return on Assets (ROA) acting as a moderating factor that strengthens this relationship. The results suggest that companies that are more efficient in managing their assets have a greater ability to implement green investments optimally, which ultimately has a positive impact on their stock performance. From a theoretical perspective, this research makes an important contribution by integrating Stakeholder and Signaling theories to explain the relationship between green investment and stock performance in the context of emerging markets like Indonesia. The study also highlights the importance of financial efficiency as a key element in maximizing the benefits of green investment, thus enriching the literature on sustainability and financial management.

Practically, the findings of this study provide recommendations for companies to be more proactive in adopting green investment strategies as part of their business plans. Additionally, investors are advised to consider a company's sustainability practices as an important factor in investment decision-making. Government policies supporting sustainability, such as PROPER, have also proven effective in encouraging corporate commitment to green investments.

However, this study has limitations, such as the relatively small sample size (10 companies) and the limited study period (2019–2023). Future research is recommended to use a larger sample to enhance the generalizability of the findings, adopt other moderating variables, such as corporate governance or technological innovation, to provide more comprehensive insights, and extend the analysis period to observe the long-term effects of green investment on stock performance. Thus, this study not only provides empirical evidence of the importance of green investment in enhancing stock returns but also opens the door for further exploration in efforts to promote sustainability and economic growth.

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- **Conflict of Interest Statement:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.
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## Table 1 / Definitions Operational Variable Study

No	Variable	Definition	Measurement	
Return from the change i calculated by the		Stock return refers to the profit earned by investors from the change in the price of the shares they own, calculated by the difference between the current stock price and the previous stock price (Tandelilin, 2017).	$R = \frac{P_t - P_{t-1}}{P_{t-1}}$ R: Stock Return Pt: Stock price at the end of the period (current price). Pt-1: Stock price at the beginning of the period (previous price). (Wulandari & Fin, 2021)	
2	Green Investment	Green investment is an approach to socially responsible investment (SRI) or a sustainable long-term investment model (World Economic Forum, 2013). Green investment refers to capital investment activities that focus on companies or investment prospects committed to conserving natural resources, producing and discovering new and renewable alternative energy (EBT), implementing clean water and air projects, and engaging in environmentally friendly investment activities (Badan Koordinator Penanaman Modal, 2018).	PROPER RATING  1. Gold = 5 (Very Good)  2. Green= 4 (Very Good)  3. Blue= 3 (Good)  4. Red= 2 (Poor)  5. Black= 1 (Very Poor) (Kementerian Lingkungan Hidup, 2013)	
3	ROA	Profitability refers to a company's ability to generate profit over a specific accounting period (Sanjaya & Rizky, 2016).	ROA = Profit (Loss) Net / Assets Total * 100% <u>Kasmir (2018)</u>	

Source: Simplification by the author (2024)

## Table 2 / Sample Determination Results

Criteria	Number
Companies listed in the SRI KEHATI Index on the IDX during the period 2019-2023	125
Companies that received PROPER awards	-70
Companies that do not have complete data	-5
Total companies used as samples	50

Source: Simplification by the author (2024)

# Table 3 / Descriptive Statistics

Variabel	N	Min	Max	Mean	Std. Deviation
INVESTASI HIJAU	50	03.00	05.00	37.600	0.68690
RETURN SAHAM	50	-83.00	52.00.00	-53.400	2.412.773
RETURN ON ASSET	50	250.00.00	4900.00.00	12.629.200	119.860.000

## Table 4 / Classical Assumption Test

### **Normality Test**

One Kolmogrov- Smirnov	Significance Value	Results
Unstandardized Residual	0.2	Based on Table 4, it can be seen that the residual value is 0.200, which is greater than the alpha value of 0.05. Therefore, the data in this study follows a normal distribution and passes the normality test.

### **Mulcollinearity Test**

Variable	Tolerance	VIF	Results
Green Investment	0.934	1.071	To test for multicollinearity, we look at the VIF values of each
ROA Investment_ROA	0.106	9.428 9.393	variable. If the Tolerance value is greater than 0.10 and the VIF is less than 10, the data can be considered free from multicollinearity. Based on Table 4, the tolerance values are 0.934, 0.106, and 0.106, all of which are greater than 0.1. The VIF values are 1.071, 9.428, and 9.393, all of which are less than 10. Therefore, it can be concluded that the regression model in this study passes the multicollinearity test

**Heteroscedasticity Test** 

Variable	Sig	Results
Green Investment	0.085	To test for heteroskedasticity, we examine whether the significance level is above
ROA	0.368	5% (0.05), which indicates that heteroskedasticity is not present. Based on Table 5, the significance values of the residuals are 0.085, 0.368, and 0.885. All of these
Investment_ROA	0.885	significance values are greater than the alpha level of 0.05. Therefore, it can be concluded that the data in this study pass the heteroskedasticity test.

## Table 5 / Clasical Results of Simple Regression Analysis Test

	Unstandar	dized Coefficients	Standardized Coefficients		
Model	В	Std. Error	Beta	t	Sig.
1 (Constant)	-5,340	0,595		-8,976	0
Green Investment  a. Dependent Variable: Stock Return	0,263	0,007	0,985	39,546	0

## Table 6 / Results of Multiple Regression Analysis with Moderating Variable

		Unstandar	dized Coefficients	Standardized Coefficients		
Model		В	Std. Error	Beta	t	Sig.
1	(Constant)	-0,4698	0,756		-6,212	0,000
	Green Investment	0,260	0,006	0,974	45,271	0,000
	Return On Asset	-0,006	0,001	-0,300	-4,708	0,000
	Invest_ROA	0,001	0,000	0,264	4,718	0,000
a. Depe	ndent Variable: Stock Return					

# Table 7 / Hypothesis Testing

No	Description	Information	Results
$H_1$	Green Investment has a positive effect on stock return	H1: Sig 0.000 < 0.05	Accepted
$H_2$	ROA moderates the influence of Green Investment on Stock Return	H1: Sig 0.000 < 0.05	Accepted

### LIST OF FIGURE

### Figure 1 / Research Framework

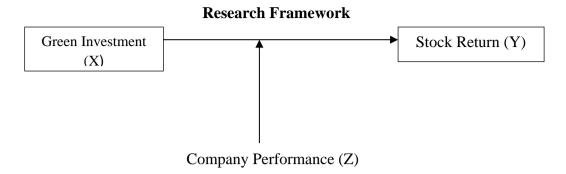


Figure 1 Research Framework