

Stock Returns under Interest Rate and Volatility Pressure with Green Innovation and Exchange Rate Roles: Return Saham di bawah Tekanan Suku Bunga dan Volatilitas dengan Inovasi Hijau dan Peran Nilai Tukar

Ni Ketut Widya Utami

Master of Accounting Program, Universitas Pendidikan Ganesha, Singaraja, Indonesia

Anantawikrama Tungga
Atmadja

Master of Accounting Program, Universitas Pendidikan Ganesha, Singaraja, Indonesia

Lucy Sri Musmini

Master of Accounting Program, Universitas Pendidikan Ganesha, Singaraja, Indonesia

Background: The Indonesian capital market, particularly the property and real estate sector, is highly sensitive to macroeconomic fluctuations, especially during periods of global uncertainty such as 2020–2024. **Specific Background:** External factors like interest rates, inflation, and index volatility influence investor behavior and corporate performance, yet their interaction with sustainability dimensions remains underexplored. **Knowledge Gap:** Prior studies rarely assess the moderating role of green technology innovation and exchange rates in the macroeconomic–stock return relationship. **Aims:** This study investigates the impact of Bank Indonesia’s interest rate, index volatility, and inflation on stock returns, while testing the moderating effects of the Rupiah exchange rate and green technology innovation. **Results:** Interest rates and index volatility significantly reduce stock returns, while inflation is insignificant. The exchange rate shows no moderating effect. However, green technology innovation significantly moderates the relationship between interest rates and stock returns, indicating its buffering potential. **Novelty:** The inclusion of green innovation as a moderating variable presents a novel perspective in sustainable financial research within emerging markets. **Implications:** These findings suggest that adopting green innovations enhances corporate resilience to macroeconomic shocks and supports investor confidence, highlighting its strategic role in policy-making and ESG-oriented investment frameworks.

Highlight :

- Interest rates and index volatility significantly reduce stock returns in the property sector.
- Green technology innovation moderates the impact of interest rates on stock returns.
- Exchange rate and inflation show no significant moderating effect on stock returns.

Keywords : Stock Returns, Interest Rates, Index Volatility, Inflation, Green Technology Innovation, Exchange Rate

INTRODUCTION

The capital market plays a vital role in the modern economy as a mechanism for resource allocation and capital ownership distribution. Market efficiency enables both investors and companies to make informed decisions, positioning the market not only as a transaction platform but also as an instrument in guiding investment directions [1]. In the Indonesian context, the property and real estate sector holds a strategic role in driving economic growth and absorbing labor. However, it remains highly vulnerable to both global and domestic macroeconomic fluctuations. The period from 2020 to 2024 was marked by significant challenges due to the COVID-19 pandemic, global inflationary pressures, and aggressive monetary policies implemented by developed countries. These conditions created uncertainty that directly affected the stock market, including companies within the property and real estate sector. One of the main indicators used to assess market performance is the Indonesia Composite Stock Price Index (IHSG), which reflects aggregate stock price dynamics [2].

Stock returns, as a measure of investment performance, are influenced by both internal and external factors. Externally, stock returns are particularly sensitive to changes in Bank Indonesia's interest rate, inflation, and stock index volatility. These three variables affect the cost of capital, investor expectations[3], and risk perception. According to Effendy [4], interest rates and inflation significantly contribute to stock price movements. Inflation reduces purchasing power and increases companies' operational burdens, while interest rates influence the cost of capital and investor preferences for riskier assets [5], [6]. The Indonesia Composite Stock Price Index (IHSG) exhibited high volatility throughout 2019–2024, with a sharp decline in early 2020 followed by a gradual recovery. This heightened volatility reflects substantial market uncertainty and significantly impacts investment decision-making [7]. In the field of accounting, this relationship is often explained using the earnings–return association theory, which links firm performance—measured through reported earnings—to market returns. Furthermore, disclosures about risk exposure and sustainability, including responses to macroeconomic conditions, are governed by PSAK 1 and IFRS-based sustainability reporting standards. These frameworks require management to present relevant financial and non-financial information that enhances the value relevance of financial reports in the eyes of investors and stakeholders[8].

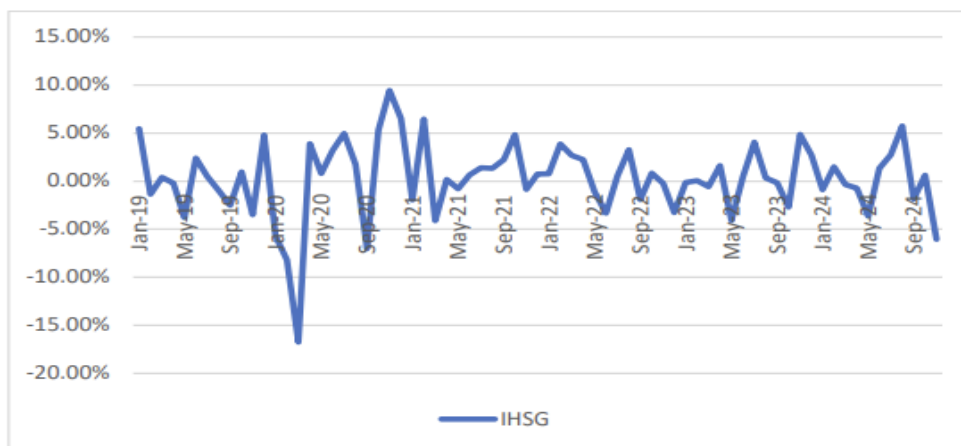


Figure 1. Trends in the Indonesia Composite Stock Price Index (IHSG) from 2019 to 2025
(Source: Investing.com, 2024)

Stock returns, as a measure of investment performance, are influenced by both internal and external factors. Externally, stock returns are particularly sensitive to changes in Bank Indonesia's interest rate, inflation, and stock index volatility. These three variables affect the cost of capital, investor expectations, and risk perception. According to Effendy [4], interest rates and inflation significantly contribute to stock price movements. Inflation reduces purchasing power and increases companies' operational burdens, while interest rates influence the cost of capital and investor preferences for riskier assets [5], [6]. The Indonesia Composite Stock Price Index (IHSG) exhibited high volatility throughout 2019–2024, with a sharp decline in early 2020 followed by a gradual recovery. This heightened volatility reflects substantial market uncertainty and significantly impacts investment decision-making [7]. As shown in Figure 1, IHSG returns fluctuated sharply between –15% and +10% during the observation period. The most extreme negative return occurred in April 2020, coinciding with the outbreak of the COVID-19 pandemic, while subsequent periods saw alternating spikes and contractions[9]. These visible fluctuations underscore the vulnerability of the capital market—particularly the property sector—to macroeconomic shocks, thereby reinforcing the urgency of analyzing how factors such as interest rates, inflation, and market volatility affect stock performance[10].

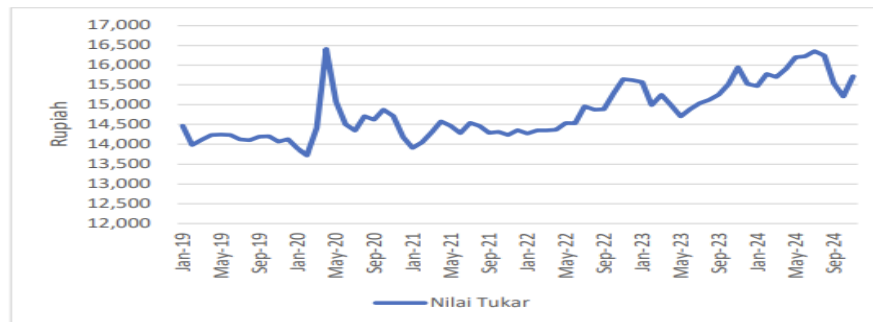


Figure 2. Trends in the Rupiah to USD Exchange Rate, 2019–2024

(Source: Bank Indonesia, 2024)

On the other hand, the exchange rate of the Rupiah against the US Dollar experienced a sharp depreciation in 2020. The aggressive interest rate policy of the Federal Reserve triggered capital outflows and put pressure on the exchange rates of emerging markets, including Indonesia [9]. In this study, the exchange rate is used as a moderating variable because it can strengthen or weaken the influence of macroeconomic factors on stock returns. The US Dollar was chosen as the exchange rate benchmark due to its role as the world's reserve currency and the standard for international transactions.

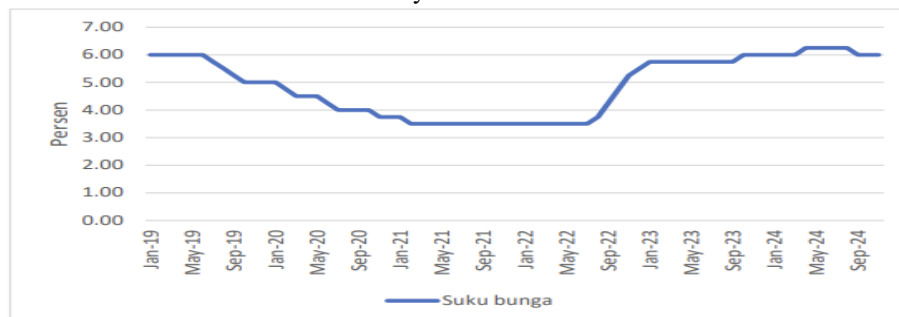


Figure 3. Trends in Bank Indonesia's Interest Rate, 2019–2024

(Source: Bank Indonesia, 2025)

The increase in Bank Indonesia's interest rate from 3.5% to 5.5% throughout 2022 reflects a monetary policy response to inflationary pressures and global conditions. This surge serves as a negative signal for the stock market, as it raises the cost of capital and reduces the attractiveness of equity investments [11]. Beyond macroeconomic factors, sustainability issues have increasingly become a key consideration in capital markets. Green technology innovation is perceived as a means to enhance long-term corporate competitiveness, especially in the property sector, which is closely linked to energy consumption and carbon emissions [12]. Figure 2 illustrates the trend in Bank Indonesia's interest rate over the same period. After a series of cuts from 6% in early 2019 to a historic low of 3.5% by mid-2021 as part of a stimulus response, interest rates rose sharply again beginning in 2022, reaching 6% by early 2023. This shift reflects the central bank's tightening stance to counter inflationary pressures and currency volatility. The abrupt rise in borrowing costs likely contributed to reduced investor appetite for equities, particularly in capital-intensive sectors such as property and real estate.

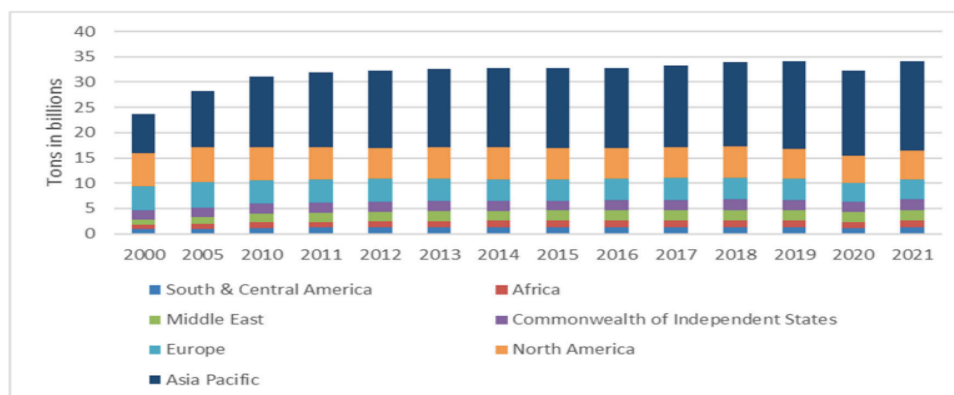


Figure 4. The Green Technology Phenomenon

(Source: Teklie & Yagmur, 2024)

Green technology innovation has the potential to serve as a moderating variable, as it reflects a company's ability to adapt to sustainability demands. In the post-pandemic context, ESG (Environmental, Social, and Governance) aspects have gained

increasing attention from global investors, positioning green innovation as a positive signal for long-term business continuity [14]. A literature mapping using VOSviewer on scientific journals reveals strong linkages between interest rates, inflation, and exchange rates with stock returns. However, there is still a lack of studies that integrate green technology innovation as a moderating variable, particularly in the context of property sector companies in developing countries [15].

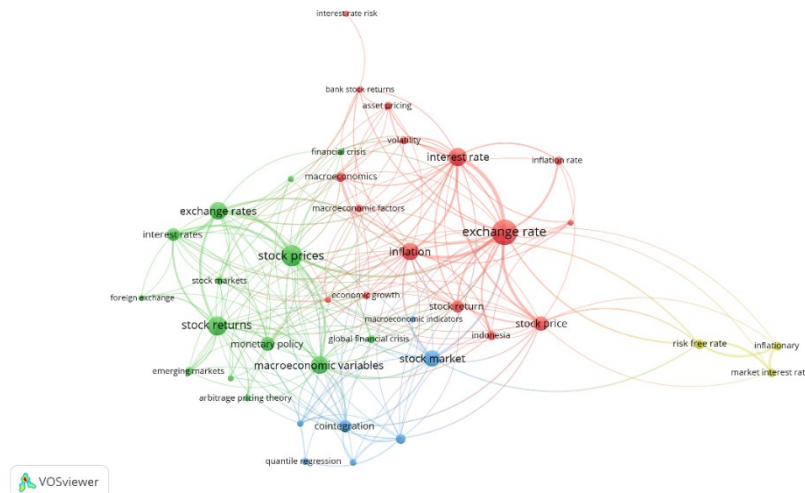


Figure 5. VOSviewer Mapping Results

These findings highlight a research gap that this study seeks to address by offering a novel scientific contribution through the inclusion of the moderating variables—exchange rate and green technology innovation—in the relationship between macroeconomic factors and stock returns. While prior studies have predominantly focused on the direct effects of macroeconomic variables such as interest rates, inflation, and exchange rates [16]–[18], only a few have examined how these relationships may be influenced by moderating variables, particularly those related to sustainability and external shocks. Most existing moderation studies focus on internal company metrics such as profitability [19], with limited attention to broader strategic and environmental considerations such as green technology innovation.

This gap is particularly important for accounting stakeholders—investors require robust models to evaluate macroeconomic risks and sustainability-driven performance, while regulators need empirical evidence to design policies that incentivize green investment behavior. Recent accounting literature also supports the increasing importance of environmental and sustainability factors in shaping corporate performance and market value. For example, Sumayyah et al. [20] emphasize the role of green intellectual capital in enhancing green innovation and financial outcomes. Cheng et al. [21] highlight that green process and product innovations are significantly associated with both financial and environmental performance. Additionally, Taliento et al. [22] find that robust ESG disclosures contribute positively to firm value and profitability, reinforcing the relevance of this study's inclusion of green innovation as a moderating variable. Accordingly, this research aims to analyze the influence of Bank Indonesia's interest rate, index volatility, and inflation on stock returns, while examining the moderating roles of the Rupiah exchange rate and green technology innovation in property and real estate companies listed on the Indonesia Stock Exchange during the 2020–2024 period. This study is novel because it introduces green technology innovation as a moderating variable in the macroeconomic-stock return nexus, offering new insight into sustainable financial decision-making in emerging markets.

METHOD

This study adopts a quantitative approach with an associative research type to examine the effect of Bank Indonesia's interest rate, index volatility, and inflation on stock returns, as well as the moderating roles of the Rupiah exchange rate and green technology innovation. The data used in this study are secondary, both quantitative and qualitative, obtained from official sources such as interest rate and exchange rate reports from Bank Indonesia (www.bi.go.id), inflation data from Statistics Indonesia (www.bps.go.id), index volatility data from Yahoo Finance and Investing.com, and stock prices and company reports from the Indonesia Stock Exchange (www.idx.co.id). Data on green technology innovation were collected from each company's annual reports and sustainability reports. The population of this research consists of all property and real estate sector companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. This period was selected because it captures major economic disruptions and policy shifts—including the COVID-19 pandemic and Indonesia's monetary tightening in response to global inflationary pressure—as well as the implementation of green economy initiatives, such as OJK's Sustainable Finance Roadmap Phase II (2021–2025). The sample was selected using purposive sampling based on the following criteria: (1) companies must have been actively listed during the observation period, (2) complete data must be available for all research

variables, and (3) companies must have exposure to foreign currency transactions. Based on these criteria, a total of 69 companies were selected, resulting in 345 panel observations (69 companies \times 5 years).

To operationalize the variables: the interest rate is measured using the BI Rate; index volatility is measured using the annual VIX value; inflation is measured by the Consumer Price Index (CPI); stock returns are calculated based on capital gains; the exchange rate is measured using Bank Indonesia's middle rate; and green technology innovation is identified through a scoring system based on sustainability disclosures. Specifically, green innovation was coded using a 1–3 scale derived from the presence of initiatives such as renewable energy adoption, green certifications, clean technology R&D, and emission reduction commitments reported in sustainability reports and ESG sections. To ensure reliability, two independent coders performed content analysis and achieved a Cohen's Kappa coefficient of 0.82, indicating substantial agreement. Data analysis was conducted using STATA version 17, including descriptive statistics, classical assumption tests (normality, multicollinearity, heteroscedasticity, autocorrelation), multiple linear regression, and moderation regression analysis with interaction terms. A p-value threshold of < 0.05 was used to determine statistical significance, while the model's explanatory power was assessed using R^2 . STATA was chosen for its robust capability in handling interaction modeling and panel data diagnostics, ensuring accurate interpretation of moderation effects in a multi-year context.

RESULT AND DISCUSSION

A. Descriptive Analysis

Table 1 provides the descriptive statistics for all variables in this study, including the mean, standard deviation, minimum, and maximum values across 345 panel observations. These statistics offer an initial overview of the data distribution and highlight the degree of variability across firms and over time throughout the 2020–2024 period. Think of this table as the first checkpoint on our analytical journey—it helps the reader visualize which variables are stable and which display notable fluctuations, thus laying the foundation for deeper statistical analysis.

Variable	Obs	Mean	Std. dev.	Min	Max
X1	345	.0495	.011016	.035	.06
X2	345	18.288	3.67821	12.45	22.75
X3	345	.02648	.0147842	.0157	.0551
Y	345	.0013962	.4913426	-.88095	3.13265
Z1	345	15131	809.5145	14105	16162
Z2	345	1.466667	.7190649	1	3

Table 1. Descriptive Statistics

Descriptively, variable X1 (Bank Indonesia Interest Rate) remained constant across companies within the same year, with a maximum value of 0.060 in 2023 and a minimum of 0.035 in 2021. The mean value was 0.0495 with a low standard deviation of 0.0110, indicating relative stability. Variable X2 (Index Volatility) also displayed annual uniformity, with the highest value at 22.75 in 2020 and the lowest at 12.45 in 2023. The mean was 18.288, and the standard deviation was 3.6782. Variable X3 (Inflation) showed a similar pattern, with a maximum value of 0.0551 in 2022, a minimum of 0.0157 in 2024, and a mean of 0.02648. In contrast to the three macro variables, Y (Stock Return) showed high variation across companies and years. The maximum return was 3.13265 (UANG, 2021), and the minimum was -0.88095 (TARA, 2020), with an average of 0.0014 and a standard deviation of 0.4913. Variable Z1 (Exchange Rate of Rupiah) also behaved as a macroeconomic variable and did not vary across firms. The highest rate was 16,162 in 2024 and the lowest was 14,105 in 2020, with an average of 15,131. Meanwhile, Z2 (Green Technology Innovation) exhibited moderate variation across firms, with values ranging from 1 to 3. The average score was 1.4667, with a standard deviation of 0.719, reflecting a generally low to moderate level of green technology adoption in the property sector.

B. Classical Assumption Test

1. Normality Test Result

Table 2 displays the results of the Shapiro-Wilk normality test for all variables. With p-values (Prob $> z$) exceeding the 0.05 threshold across all variables, we conclude that the data distributions do not significantly deviate from normality. This result validates the assumption of normality required for subsequent parametric analyses, such as multiple linear regression. Thus, this table serves as an assurance checkpoint that the dataset satisfies one of the key conditions for reliable inferential modeling.

Variabel	Obs	W	V	z	Prob>z
X1	345	0.89793	24.622	7.570	0.06202
X2	345	0.93261	16.256	6.589	0.52000
X3	345	0.73365	64.25	9.837	0.60600
Y	345	0.86364	32.893	8.255	0.13200
Z1	345	0.91577	20.318	7.116	0.08640
Z2	345	0.97580	5.838	4.169	0.21010

Table 2. Normality Test Results

Based on the results, all variables (X1, X2, X3, Y, Z1, and Z2) have Prob > z values greater than 0.05, indicating that the data distribution for each variable does not significantly deviate from a normal distribution.

2. Multicollinearity Test

Table 3 presents the Variance Inflation Factor (VIF) values for the independent variables used in the regression model. All VIF values are well below the critical threshold of 10, with a mean VIF of 1.64, indicating no serious multicollinearity issues. This suggests that the explanatory variables are sufficiently independent from one another, ensuring the stability and reliability of the regression coefficient estimates.

Variable	VIF	1/VIF
X1	1.74	0.575640
X2	1.67	0.598234
X3	1.50	0.666569
Mean VIF	1.64	

Table 3. Multicollinearity Test Results

All independent variables have VIF values less than 5, with an average VIF of 1.64. This indicates that there is no multicollinearity problem present in the regression model.

3. Heteroskedasticity Test

Table 4 displays the results of the heteroskedasticity test using the Breusch–Pagan/Cook–Weisberg approach. The p-value for the heteroskedasticity component is 0.2643, which is greater than the significance level of 0.05. This indicates that the variance of the residuals is constant (homoskedastic), thus fulfilling one of the classical linear regression assumptions. Although the skewness component is significant ($p = 0.0192$), the main heteroskedasticity statistic is not, suggesting that the regression model does not suffer from heteroskedasticity problems.

Source	chi2	df	p
Heteroskedasticity	5.23	4	0.2643
Skewness	9.92	3	0.0192
Kurtosis	3.08	1	0.0792
Total	18.24	8	0.0195

Table 4. Heteroskedasticity Test Results

The test results show a p-value of 0.2643 for the heteroskedasticity component, which is greater than the significance level of 0.05. This indicates that the model does not suffer from heteroskedasticity issues.

C. Multiple Linear Regression Test

Table 6 presents the results of the multiple linear regression analysis examining the effects of macroeconomic variables on stock returns (Y). As a starting point, variable X1, which represents the Bank Indonesia interest rate, shows a statistically significant negative effect on stock returns.

Source	SS	df	MS	Number of obs	=	345
Model	4.65902958	5	.931805916	F(5, 339)	=	4.03
Residual	78.3886156	339	.231234854	Prob > F	=	0.0014
Total	83.0476451	344	.241417573	R-squared	=	0.0561
				Adj R-squared	=	0.0422
				Root MSE	=	.48087

Y	Coefficient	Std. err.	t	P> t	[95% conf. interval]
X1	-32.12172	8.366602	-3.84	0.000	-48.57872 -15.66473
X2	-.0356562	.0101648	-3.51	0.001	-.0556502 -.0156621
X3	.6397512	2.283766	0.28	0.780	-3.852385 5.131887
Z1	.0003622	.0001037	3.49	0.001	.0001583 .0005661
Z2	-.0013393	.0388337	-0.03	0.973	-.0777246 .075046
_cons	-3.252119	1.162197	-2.80	0.005	-5.538144 -.9660929

Table 6. Multiple Linear Regression Results

Based on Table 6, the results of the multiple linear regression analysis show that the model examining the effects of interest rate (X1), index volatility (X2), inflation (X3), Rupiah exchange rate (Z1), and green technology innovation (Z2) on stock returns (Y) is statistically significant overall, with an F-value of 4.03 and a significance level of 0.0014 (< 0.05). This indicates that, collectively, the five variables have a significant influence on stock returns in property and real estate companies during the 2020–2024 period. However, the model's explanatory power is relatively low, with an R-squared value of only 0.0561 and an Adjusted R-squared of 0.0422, suggesting that the model explains only a small portion of the variation in stock returns.

Individually, only three variables exhibit statistically significant effects. X1 (Bank Indonesia Interest Rate) has a significantly negative effect (coefficient = -32.12172 ; $p = 0.000$), indicating that an increase in the interest rate leads to a decline in stock returns, in line with the theory that high interest rates reduce profit margins and investment incentives. X2 (Index Volatility) also shows a significantly negative relationship (coefficient = -0.03557 ; $p = 0.001$), suggesting that high market uncertainty negatively impacts stock returns in the property sector. Z1 (Rupiah Exchange Rate) demonstrates a significantly positive effect (coefficient = 0.0003622 ; $p = 0.001$), implying that Rupiah appreciation potentially boosts stock performance, particularly for firms with import costs or foreign debt obligations. On the other hand, X3 (Inflation) is not statistically significant (coefficient = 0.63975 ; $p = 0.780$), indicating that general inflation does not have a direct impact on stock returns during the observation period. Likewise, Z2 (Green Technology Innovation) is also insignificant (coefficient = -0.00134 ; $p = 0.973$), implying that the adoption of green innovation has not yet been recognized by the market as a direct driver of financial performance. The constant term (-3.2521 ; $p = 0.005$) is statistically significant but is only mathematically relevant, with limited economic interpretation.

D. Moderation Regression Test (Moderating Variable: Rupiah Exchange Rate)

Table 7 displays the moderation regression results testing whether the exchange rate of Rupiah (Z1) moderates the relationship between macroeconomic variables (X1, X2, and X3) and stock return (Y). The interaction terms $x1z1$, $x2z1$, and $x3z1$ represent the moderating effects of the Rupiah exchange rate on interest rate, index volatility, and inflation, respectively.

Source	SS	df	MS	Number of obs	=	345
Model	1.20096512	3	.400321707	F(3, 341)	=	1.67
Residual	81.84668	341	.24001959	Prob > F	=	0.1737
				R-squared	=	0.0145
				Adj R-squared	=	0.0058
Total	83.0476451	344	.241417573	Root MSE	=	.48992

Y	Coefficient	Std. err.	t	P> t	[95% conf. interval]
$x1z1$	-.0000917	.0001525	-0.60	0.548	-.0003916 .0002082
$x2z1$	-1.03e-06	5.86e-07	-1.76	0.078	-2.19e-06 1.18e-07
$x3z1$	-.0000285	.0001398	-0.20	0.839	-.0003036 .0002466
_cons	.3676678	.203737	1.80	0.072	-.0330717 .7684074

Table 7. Moderation Regression Results

Based on Table 7, the results of the moderation regression testing the interaction between the independent variables (interest rate, index volatility, and inflation) and the Rupiah exchange rate (Z1) indicate that the model is not statistically significant overall ($F = 1.67$; $p = 0.1737$). This suggests that the exchange rate does not moderate the relationship between the three macroeconomic variables and stock returns collectively. The R-squared value of 0.0145 and the Adjusted R-squared of 0.0058 further indicate that the model's predictive ability is very low. Partially, the interaction between interest rate and exchange rate ($x1z1$) is not significant ($p = 0.548$), nor is the interaction between inflation and exchange rate ($x3z1$) with $p = 0.839$. However, the interaction between index volatility and exchange rate ($x2z1$) has a p-value of 0.078. While this is not significant at the 5% level, it may be considered marginally significant at the 10% level, indicating a weak moderation effect. Overall, these results suggest that the Rupiah exchange rate is not a strong moderator in the relationship between macroeconomic variables and stock returns, although its influence on market uncertainty remains a relevant topic for further investigation.

E. Moderation Regression Test (Moderating Variable: Green Technology Innovation)

Table 8 presents the moderation regression results to examine the role of Green Technology Innovation (Z2) in moderating the effects of macroeconomic variables (X1, X2, X3) on stock return (Y). The interaction terms (x1z2, x2z2, x3z2) represent the moderation paths between each macroeconomic variable and green innovation.

Source	SS	df	MS	Number of obs	=	345
				F(3, 341)	=	0.58
Model	0.424827	3	0.141609038	Prob > F	=	0.0256
Residual	82.62282	341	0.242295654	R-squared	=	0.4551
Total	83.04765	344	0.241417573	Adj R-squared	=	0.0336
				Root MSE	=	0.49224

Y	Coefficient Std.	Std. Err.	t	P > t	[95% conf. interval]	
x1z2	0.7456886	1.109319	0.67	0.002	1.436281	2.927659
x2z2	0.0007681	0.0030712	-0.25	0.063	.0068088	.0052727
x3z2	-1.361631	1.382485	-0.98	0.325	4.080904	1.357642
_cons	0.0238934	0.0665774	0.36	0.72	.1070607	.1548475

Table 8. Moderation Regression Analysis Results

The moderation regression involving the interaction between green technology innovation (Z2) and macroeconomic variables (interest rate, index volatility, and inflation) shows that the model is statistically significant overall ($F = 0.58$; $p = 0.0256$). This indicates that Z2, collectively, moderates the relationship between the three independent variables and stock returns. Although the R-squared value of 0.4551 appears relatively high, the Adjusted R-squared value is only 0.0336, suggesting that the model's explanatory power decreases as model complexity increases. Partially, the interaction between X1 and Z2 (interest rate \times green innovation) is significantly positive (coefficient = 0.7457; $p = 0.002$), indicating that companies with higher adoption of green innovation are better able to mitigate the negative impact of rising interest rates on stock returns. The interaction between X2 and Z2 (index volatility \times green innovation) is marginally significant at the 10% level ($p = 0.063$), suggesting a weak moderation effect in absorbing market risk. Meanwhile, the interaction between X3 and Z2 (inflation \times green innovation) is not significant ($p = 0.325$), implying that green technology has not yet proven effective in mitigating the impact of inflation. Overall, these findings indicate that green technology innovation acts as a significant moderator in the relationship between interest rates and stock returns and shows potential in stabilizing the effects of market uncertainty. Therefore, it serves as a strategic consideration for property companies in navigating macroeconomic pressures.

F. Discussion

1. The Effect of Bank Indonesia Interest Rate on Stock Returns

The regression results show that the Bank Indonesia interest rate (X1) has a negative and significant effect on stock returns in the property and real estate sector, with a coefficient of -32.12172 and a p-value of 0.000. This implies that for every 1% increase in interest rates, stock returns in the sector decline significantly. This outcome is theoretically supported by the Interest Rate Effect Theory, which posits that rising interest rates lead to higher borrowing costs, thereby reducing corporate profits and investor attractiveness. In addition, Signal Theory explains that increased interest rates are interpreted by market participants as a signal of tighter monetary policy and potential economic slowdown, especially impacting interest-sensitive industries such as property and real estate, where project financing heavily depends on long-term credit facilities. Practically, rising interest rates cause mortgage and corporate loan costs to increase, leading to a decline in property demand, delayed investment projects, and pressure on cash flows—factors that ultimately reduce the appeal of equity in this sector. Investors tend to rebalance their portfolios by moving funds from riskier assets like stocks to more stable instruments such as government bonds, which offer higher yields under rising interest rates, creating downward pressure on stock prices. This finding is consistent with previous studies that confirm the negative influence of interest rates on stock returns in the property and real estate sector [17], [19]. These studies emphasize that higher interest rates reduce investment appetite, purchasing power, and projected revenues, especially in sectors reliant on capital-intensive operations. However, contrasting evidence suggests that in other sectors—such as consumer goods—or during expansionary economic cycles, rising interest rates may signal robust economic conditions and expected earnings growth, leading to increased investor confidence and stock appreciation [20], [22]. This variation highlights the importance of considering sectoral dynamics and macroeconomic context when interpreting the effect of interest rate policies on financial markets.

The analysis confirms that stock returns in the property and real estate sector are highly sensitive to interest rate fluctuations. As Bank Indonesia raises interest rates, borrowing becomes more expensive, reducing property demand and investment appetite—ultimately leading to lower stock performance in the sector. This underscores the importance for investors and policymakers to closely monitor interest rate policies when evaluating equity prospects in interest-sensitive industries.

2. The Effect of Index Volatility on Stock Returns

The regression results indicate that index volatility (X2) has a coefficient of -0.0355662 with a p-value of 0.001 , indicating a negative and statistically significant effect on stock returns at the 5% level. This suggests that higher market uncertainty leads to lower returns for property and real estate companies. Elevated volatility tends to signal instability, triggering increased selling pressure that drives prices downward. According to Signal Theory, such volatility acts as a negative signal for investors, prompting capital withdrawal and portfolio reallocation to safer assets [23]. This finding reinforces the hypothesis that index volatility adversely affects stock returns, especially in the property sector, which is inherently cyclical and highly reactive to market sentiment. Previous studies have also shown that heightened volatility in broad indices such as the IHSG reduces investor interest and stock performance in this sector [24], [25]. Property companies are particularly vulnerable due to their dependence on macroeconomic stability, long-term financing, and consumer purchasing power. From a contextual perspective, the period of 2020–2024 encompassed both pandemic-related shocks and recovery fluctuations, contributing to heightened market volatility and uncertainty in investor behavior. This could have amplified the sensitivity of property stocks to broader market movements. From a managerial standpoint, these results highlight the importance of building investor confidence through transparency, proactive risk disclosure, and strategic communication, especially during volatile market phases. In addition, managers might consider adopting real-time market monitoring tools and stress testing models to better anticipate the impact of volatility on firm valuation and shareholder value. The results affirm that market volatility is a significant risk factor that negatively impacts stock returns in the property and real estate sector. Companies operating in this space must strengthen investor communication and risk management practices to maintain trust and resilience in times of heightened uncertainty.

3. The Effect of Inflation on Stock Returns

The regression results show that inflation (X3) has a positive coefficient of 0.6397512 with a p-value of 0.780 , indicating an insignificant effect on stock returns of property and real estate companies during 2020–2024. This insignificance suggests that inflation fluctuations do not directly impact stock performance, possibly because companies can adjust property prices to offset rising costs and because inflation remained stable during the observation period. This is supported by Wahyudi and Kusumawardani [26] and Ramdani and Siregar [27], who argue that inflation information is often priced in, and the property sector has pricing flexibility. Yuliana and Pratama [28] add that moderate inflation is viewed as acceptable by investors, while Andira [29] shows that inflation does not always have a statistically significant effect. This finding is consistent with prior studies indicating that inflation effects are often already anticipated and priced into asset valuations, particularly in sectors with long project cycles and pricing power [26]–[28]. Moreover, moderate inflation is sometimes viewed positively by investors as a sign of economic activity. The absence of significance in this context contrasts with findings in other sectors, such as manufacturing or consumer goods, where inflation tends to reduce purchasing power and increase operational costs [17], [22]. From a managerial perspective, this result highlights the importance of long-term pricing strategies and cost-passing mechanisms in insulating company performance from macroeconomic shocks. It also suggests that property firms may not need to prioritize inflation as a central concern in their stock performance management, compared to variables like interest rates or market volatility. However, managers should remain vigilant, as inflation may still affect input costs or consumer affordability in the long run, especially if macroeconomic conditions shift. Developing adaptive pricing models and maintaining cost-efficiency are key to sustaining investor confidence even in changing inflationary environments. Although inflation showed no significant impact on stock returns in the property sector during 2020–2024, maintaining adaptive pricing strategies and cost efficiency remains crucial to buffer against future inflationary risks and to preserve long-term investor confidence.

4. The Moderating Role of Exchange Rate on the Relationship Between Interest Rate and Stock Returns

The moderation regression results show that the interaction between Bank Indonesia's interest rate and the Rupiah exchange rate (x1z1) has a coefficient of -0.0000917 with a p-value of 0.548 , indicating a statistically insignificant moderating effect. This suggests that the exchange rate does not significantly alter the relationship between interest rates and stock returns in the property and real estate sector. One plausible explanation lies in the domestic orientation of the Indonesian property industry, which typically relies on local financing, labor, and materials. Consequently, fluctuations in the exchange rate have limited direct impact on cost structures or revenue streams in this sector. This finding is aligned with Agency Theory, which explains that managers tend to prioritize local macroeconomic variables—such as interest rates and domestic credit availability—over international risks in their strategic planning and investment decisions. Prior research also indicates that sectors with low foreign exposure are generally less sensitive to exchange rate volatility [30], [31]. Moreover, in a relatively stable macroeconomic environment, currency risk may have already been factored into market expectations, thereby weakening its role as a moderating variable [25]. From a managerial perspective, this result suggests that while exchange rate monitoring remains relevant—especially for firms with cross-border dealings—it may not be a critical factor in determining stock performance for domestically-focused property firms. Managers should focus more on interest rate movements and domestic demand indicators when formulating risk management strategies. However, if firms plan to expand internationally or begin sourcing inputs from abroad, exchange rate exposure should be re-evaluated as part of comprehensive financial planning. The Rupiah exchange rate does not significantly moderate the effect of interest rates on stock returns, highlighting that domestically-oriented property firms are more influenced by local financial conditions than by currency fluctuations—unless they expand into international markets.

5. The Moderating Role of Exchange Rate on the Relationship Between Index Volatility and Stock Returns

The moderation regression results indicate that the interaction between index volatility (X2) and the Rupiah exchange rate (Z1) has a coefficient of -1.03000 with a p-value of 0.078 . Although not statistically significant at the conventional 5% level, the result is near the 10% threshold, suggesting a weak moderating effect. This implies that property and real estate investors tend to react directly to market uncertainty—captured by the volatility index—regardless of exchange rate fluctuations. In line with Signal Theory, volatility itself serves as a sufficient signal of systemic risk, prompting investor responses without the need for additional external cues such as currency movements [23]. Contextually, this finding reflects the relatively low global exposure of Indonesia's property sector [32]. With limited dependence on foreign capital or international supply chains, the sector's vulnerability to exchange rate shifts is inherently low. In turbulent market conditions, currency depreciation may heighten uncertainty and exacerbate negative sentiment, but in more stable periods, the exchange rate plays a less central role in shaping investor decisions [19], [25]. From a managerial standpoint, the result underscores the importance of prioritizing market sentiment monitoring tools and volatility risk management over currency hedging strategies—particularly for firms operating entirely in the domestic market. However, the proximity of the p-value to 0.1 suggests that exchange rate volatility should not be entirely disregarded, especially under global financial stress. Managers should maintain a flexible risk management approach that allows for rapid adjustment if market conditions shift and currency risk begins to interact more strongly with volatility signals. Although not statistically robust, the weak moderating role of exchange rate suggests that market volatility remains the dominant signal influencing investor behavior, while currency fluctuations play only a marginal role—especially in sectors with low foreign exposure like property and real estate [33].

6. The Moderating Role of Exchange Rate on the Relationship Between Inflation and Stock Returns

The moderation regression reveals that the interaction between inflation (X3) and the Rupiah exchange rate (Z1) has a coefficient of -0.0000285 and a p-value of 0.20 , indicating no statistically significant moderating effect. This result suggests that exchange rate fluctuations neither strengthen nor weaken the relationship between inflation and stock returns in Indonesia's property and real estate sector during the 2020–2024 period. One likely explanation is the domestic orientation of this sector, which is not significantly reliant on imported materials or foreign-denominated financing. Consequently, the inflationary impact on operating costs and pricing strategies is largely decoupled from currency movements. Theoretically, a depreciating exchange rate during periods of inflation could increase input costs and thus amplify negative effects on company performance [19]. However, this transmission mechanism appears weak in this case due to low external exposure. Moreover, previous studies identifying significant exchange rate–return interactions were mostly conducted in sectors with global financial linkages, such as banking and manufacturing [17], which may not be applicable to property firms. In line with this, evidence suggests that in relatively stable macroeconomic environments, exchange rate fluctuations do not significantly alter the effects of inflation on firm value [25]. From a managerial perspective, this finding implies that companies in the property sector may not need to prioritize currency hedging or exchange rate sensitivity analysis in relation to inflation management. Instead, cost control, domestic pricing strategies [34], and inflation forecasting should remain the primary focus. However, for firms considering international expansion or foreign investment, it remains essential to assess whether future business models might introduce currency exposure that could alter the inflation–return dynamic. The absence of a moderating effect confirms that exchange rate fluctuations have minimal influence on how inflation affects stock returns in Indonesia's property sector, reinforcing the predominance of domestic economic variables over international exposure in shaping investor perceptions and firm valuation [35].

7. The Moderating Role of Green Technology Innovation on the Relationship Between Interest Rate and Stock Returns

The moderation regression shows that the interaction between interest rate (X1) and green technology innovation (Z2) has a coefficient of 0.7456886 with a p-value of 0.002 , indicating a statistically significant effect. This demonstrates that green technology innovation positively moderates the relationship between interest rates and stock returns in property and real estate companies. Firms that adopt green innovation tend to better absorb the negative effects of interest rate hikes. Such innovation supports energy efficiency, operational cost reduction, access to green financing, and sustainable incentives, enhancing firm resilience to external pressures [36]. From a signaling theory perspective, green technology adoption serves as a credible indicator of corporate sustainability commitment, thereby boosting investor confidence even amid rising capital costs. This aligns with increasing market emphasis on Environmental, Social, and Governance (ESG) principles, making green firms more attractive in the long term [37]. Hence, green technology innovation empirically weakens the adverse effects of interest rates on stock returns while strengthening corporate strategic competitiveness in a dynamic macroeconomic environment. From the perspective of Signaling Theory, the implementation of green technologies acts as a credible signal of long-term strategic orientation and corporate sustainability, reinforcing investor trust even in periods of high borrowing costs. This is increasingly relevant as investors incorporate Environmental, Social, and Governance (ESG) metrics into their portfolio evaluations. The ability of green firms to attract ESG-oriented capital inflows may help offset potential capital outflows caused by interest rate hikes, thereby stabilizing stock performance. These findings confirm that green technology innovation plays a critical buffering role against the negative impact of rising interest rates, highlighting its strategic value not only for sustainability but also for enhancing financial resilience and investor appeal in volatile macroeconomic conditions [38].

8. The Moderating Role of Green Technology Innovation on the Relationship Between Index Volatility and Stock Returns

The moderation regression indicates that the interaction between index volatility (X2) and green technology innovation (Z2) produces a coefficient of 0.0007681 with a p-value of 0.063. Although not statistically significant at the 5% level, it is close to the threshold and suggests a positive moderating tendency. This implies that green technology innovation may help mitigate the negative impact of market volatility on stock returns, even if the effect is not yet strong enough to be confirmed empirically. Under signaling theory, the presence of green technology innovation provides a positive signal to investors regarding management's risk management capability and long-term resilience [39], [40]. Firms with sustainable strategies are perceived as more efficient and stable, reducing the speculative pressure from market volatility on stock performance. Although not statistically conclusive, the positive trend suggests that green technology innovation has the potential to cushion stock performance against market volatility, signaling organizational stability and long-term value creation to sustainability-minded investors.

9. The Moderating Role of Green Technology Innovation on the Relationship Between Inflation and Stock Returns

The moderation regression shows that the interaction between inflation (X3) and green technology innovation (Z2) has a coefficient of -1.361631 with a p-value of 0.325, indicating no significant moderating effect. The negative and insignificant coefficient suggests that although green innovation theoretically enhances operational efficiency and reduces reliance on inflation-sensitive resources, its impact has not been strong enough to alter or weaken the inflation–return relationship statistically[41]. This may be due to the high upfront investment costs of green technologies and the long-term nature of their benefits, which were not yet realized during the study period. The property sector's sensitivity to rising construction and material costs adds pressure during inflation, and green innovation has not yet effectively offset these burdens. Decreased consumer purchasing power and rising production costs are not easily compensated by green efficiency, as its adoption remains uneven across the industry. While green innovation sends a positive long-term signal [42], [43], it has not yet proven to be a robust moderator of inflation's impact on stock returns in Indonesia's property sector. Despite its long-term strategic promise, green technology innovation has not yet demonstrated a significant moderating role in the inflation–stock return relationship, suggesting that its current adoption in the property sector remains insufficient to buffer against inflationary pressures[44].

SIMPULAN

This study aims to analyze the effect of Bank Indonesia's interest rate, index volatility, and inflation on stock returns, while assessing the moderating roles of the Rupiah exchange rate and green technology innovation in the property and real estate sector during the 2020–2024 period. The analysis employed multiple linear and moderation regression using panel data of 69 IDX-listed companies. The findings empirically reinforce the Interest Rate Effect Theory and Signal Theory by confirming that rising interest rates and heightened index volatility significantly depress stock returns. The insignificant impact of inflation reflects the sector's pricing adaptability and aligns with literature indicating that inflation may be priced in. Moreover, green technology innovation is proven to significantly moderate the interest rate–stock return relationship, offering empirical support to the signaling function of ESG adoption as a financial stabilizer. From a corporate perspective, adopting green technology innovation provides not only environmental benefits but also financial resilience during monetary tightening. Managers should prioritize sustainable innovation to offset negative macroeconomic shocks. Meanwhile, the insignificant moderating role of the exchange rate and inflation suggests that firms can focus more on domestic monetary policy and investor sentiment rather than currency fluctuations. For regulators and policymakers, these findings justify stronger support mechanisms for green innovation adoption—such as green tax incentives, low-interest sustainability-linked loans, or ESG performance disclosures—to enhance corporate sustainability and national financial resilience amid macroeconomic uncertainty. Future studies may explore sectoral comparisons across industries with varying global exposures, use broader ESG scoring frameworks, or apply longitudinal data beyond 2024 to examine the sustained effect of green technology innovation on stock market resilience in emerging economies.

REFERENSI

- [1] Adelia, Khairudin, and Aminah, "Strategies To Improve Financial Performance With A Signaling Theory Perspective," *International Journal of Economics, Business and Innovation Research*, vol. 3, no. 2, pp. 323–341, 2024. [Online]. Available: www.cnbindonesia.com
- [2] A. Amri and Z. Ramdani, "Pengaruh Nilai Tukar, Kebijakan Deviden dan Struktur Modal Terhadap Return Saham Pada Perusahaan Yang Terdaftar di Jakarta Islamic Index," *Jurnal Ilmu Keuangan Dan Perbankan (JIKA)*, vol. 10, no. 1, pp. 1–20, 2020. [Online]. Available: <https://ojs.unikom.ac.id/index.php/jika/article/view/3556>
- [3] W. C. Ananda and A. B. Santoso, "Pengaruh Inflasi, Suku Bunga, dan Nilai Tukar Rupiah terhadap Return Saham pada Perusahaan Perbankan yang Terdaftar Di Bursa Efek Indonesia (2018–2020)," *J-MAS (Jurnal Manajemen Dan Sains)*, vol. 7, no. 2, p. 726, 2022. [Online]. Available: <https://doi.org/10.33087/jmas.v7i2.559>
- [4] I. A. Andira, *Sekolah Tinggi Ilmu Ekonomi Makassar Bongaya STIE Bongaya Makassar*, 2020.

- [5] Andrianto, *Manajemen Bank*. Surabaya: Qiara Media, 2019.
- [6] Arviolda and T. L. Sha, "Faktor-Faktor Yang Mempengaruhi Kinerja Keuangan Pada Perusahaan Manufaktur," *Jurnal Ekonomi*, no. 1, pp. 1–16, 2021. [Online]. Available: <https://ecojoin.org/index.php/EJE/article/view/764/745>
- [7] Asnah and Dyanasari, *Pengantar Ilmu Ekonomi Makro*. Sleman: Deepublish, 2021.
- [8] E. Budiarti and Sulistyowati, *Struktur Kepemilikan dan Struktur Dewan Perusahaan*. Jakarta: PT. Raja Grafindo, 2014.
- [9] M. Budiman, V. Premana, and A. Maryadi, "Pengaruh Suku Bunga, Inflasi, dan Nilai Tukar Terhadap Return Saham," *Margin: Jurnal Lentera Manajemen Keuangan*, vol. 1, no. 1, p. 1, 2023. [Online]. Available: <https://lenteranusa.id/>
- [10] Z. H. Butar-Butar, M. Sisilia, A. P. Purba, and M. M. Tarigan, "Pengaruh profitabilitas, likuiditas dan leverage terhadap return saham," *Akuntabel*, vol. 18, no. 2, pp. 183–190, 2021. [Online]. Available: <http://journal.feb.unmul.ac.id/index.php/AKUNTABEL>
- [11] M. M. Choudhury, "Signaling Theory: An Approach to Organizational Behavior Research," *Journal of Accounting, Business and Management*, vol. 31, no. 2, pp. 98–120, 2024. [Online]. Available: <https://doi.org/10.31966/jabminternational.v31i2.1199>
- [12] N. L. P. S. U. Dewi and I. G. M. Sudiarta, "Pengaruh Profitabilitas, Likuiditas, Leverage, dan Ukuran Perusahaan terhadap Return Saham pada Perusahaan Food and Beverage," *E-Jurnal Manajemen*, vol. 8, no. 2, pp. 7892–7921, 2019. [Online]. Available: <https://doi.org/10.24843/EJMUNUD.2019.v8.i2.p13>
- [13] L. Effendy, "Determinan Return Saham Suatu Pendekatan Fundamental," *JMM*, vol. 2, no. 1, p. 19, 2019. [Online]. Available: www.sahamok.com
- [14] T. W. Erdi, "Pengaruh Struktur Modal, Pertumbuhan Perusahaan, dan Profitabilitas terhadap Nilai Perusahaan pada Perusahaan Infrastruktur di Indonesia," *Jurnal Akuntansi Dan Pajak*, vol. 25, no. 1, pp. 1–6, 2024. [Online]. Available: <http://jurnal.stie-aas.ac.id/index.php/jap>
- [15] M. Faizin, *Buku Ajar Ekonomi Makro Islam*. Pekalongan: PT. Nasya Expanding Management, 2021.
- [16] Febriyanto, K. Ali, and M. W. Azyasa, "Pengaruh Inflasi dan Suku Bunga terhadap Return Saham dengan Profitabilitas sebagai Variabel Moderating pada Perusahaan Industri Barang Konsumsi," *Derivatif: Jurnal Manajemen*, vol. 18, no. 1, pp. 1–7, 2024.
- [17] N. H. Moorcy, M. Alwi, and T. Yusuf, "Pengaruh Inflasi, Suku Bunga, dan Nilai Tukar terhadap Indeks Harga Saham Gabungan di Bursa Efek Indonesia," *Jurnal GeoEkonomi*, vol. 12, no. 1, pp. 67–78, 2021. [Online]. Available: <https://doi.org/10.36277/geoekonomi.v12i1.146>
- [18] Jogiyoanto, *Teori Portofolio dan Analisis Investasi*, Edisi ke-10. Yogyakarta: ANDI, 2019.
- [19] Q. Luo, C. Miao, L. Sun, X. Meng, and M. Duan, "Efficiency evaluation of green technology innovation of China's strategic emerging industries: An empirical analysis based on Malmquist-data envelopment analysis index," *Journal of Cleaner Production*, vol. 238, p. 117782, 2019. [Online]. Available: <https://doi.org/10.1016/j.jclepro.2019.117782>
- [20] W. W. Ningsih and N. K. Maharani, "Pengaruh Kebijakan Dividen, Return on Asset dan Return on Equity Terhadap Return Saham," *Jurnal Papatung*, vol. 5, no. 1, pp. 60–69, 2022. [Online]. Available: <https://ejournal.goacademica.com/index.php/japp/article/download/509/474>
- [21] D. Nur Kholifah, "Pengaruh Tingkat Suku Bunga, Kebijakan Dividen, dan Struktur Modal terhadap Return Saham," *Jurnal Ilmu dan Riset Akuntansi*, vol. 10, no. 7, pp. 1–15, 2021.
- [22] A. Pratiwi, D. R. Herlambang, and F. Nainggolan, "Pengaruh Profitabilitas terhadap Harga Saham," *Jurnal Manajemen dan Akuntansi*, vol. 3, no. 3, pp. 33–39, 2023.
- [23] K. A. S. Pratiwi and D. N. S. Werastuti, "Pengaruh Kinerja Keuangan Perusahaan terhadap Return Saham pada Saat Kenaikan Harga Bahan Bakar Minyak (BBM)," *Jurnal Ilmiah Akuntansi dan Humanika*, vol. 13, no. 13, pp. 427–437, 2024. [Online]. Available: <https://doi.org/10.23887/jiah.v14i3.82722>
- [24] N. T. Putra and I. K. Jati, "Ukuran Perusahaan sebagai variabel Pemoderasi pengaruh Profitabilitas pada Penghindaran Pajak," *E-Jurnal Akuntansi Universitas Udayana*, vol. 25, no. 2, pp. 1234–1257, 2018.
- [25] Z. S. Qatrunnada, "Faktor Yang Mempengaruhi Volatilitas Return Saham di Indonesia: Perusahaan LQ45," *Owner: Riset & Jurnal Akuntansi*, vol. 8, no. 3, pp. 2441–2451, 2024. [Online]. Available: <https://doi.org/10.33395/owner.v8i3.2121>
- [26] L. Qing, D. Chun, A. A. Dagestani, and P. Li, "Does Proactive Green technology innovation Improve Financial Performance? Evidence from Listed Companies with Semiconductor Concepts Stock in China," *Sustainability (Switzerland)*, vol. 14, no. 8, pp. 1–20, 2022. [Online]. Available: <https://doi.org/10.3390/su14084600>
- [27] S. Rahmadini and Idris, "Analisis Volatilitas Indeks Harga Saham Gabungan: Dampak Indeks Saham ASEAN dan Faktor Makroekonomi Indonesia," *Media Riset Ekonomi Pembangunan*, no. 4, pp. 630–641, 2024. [Online]. Available: <https://medrep.ppi.unp.ac.id/index.php/MedREP/login>
- [28] E. Rostiana, *Ekonomi Moneter Internasional*. Bandung: CV. Cendekia Press, 2020.
- [29] P. Sari, "Green Technology Innovation & Kinerja Keuangan Perusahaan: Mediasi Kinerja Lingkungan," *Berkala Akuntansi dan Keuangan Indonesia*, vol. 9, no. 1, pp. 18–48, 2024. [Online]. Available: <https://doi.org/10.20473/baki.v9i1.43565>
- [30] Sopi, "Pengaruh Inflasi, Nilai Kurs dan Suku Bunga terhadap Return Saham pada Perusahaan Perbankan yang Terdaftar di Bursa Efek Indonesia," *Jurnal CAPITAL*, vol. 5, no. 2, pp. 1–13, 2023. [Online]. Available: www.idx.co.id
- [31] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta, 2017.
- [32] Sugiyono, *Metode Penelitian Kuantitatif dan Kualitatif*. Bandung: Alfabeta, 2020.

- [33] Suharno, *Bonus Demografi Sebagai Peluang Indonesia dalam Percepatan Pembangunan Ekonomi*. Cirebon: Yayasan Insan Shodiqin Gunung Jati, 2021.
- [34] E. E. Susanto and Z. Suryani, "Pengaruh Ukuran Perusahaan, Leverage dan Profitabilitas terhadap Nilai Perusahaan," *Jurnal Cakrawala Ilmiah*, vol. 3, no. 9, pp. 1–14, 2024. [Online]. Available: <http://bajangjournal.com/index.php/J>
- [35] E. H. Sutanto, "Signalling Theory," *Jurnal Manajemen dan Akuntansi*, vol. 1, no. 4, pp. 442–445, 2024. [Online]. Available: <https://doi.org/10.62017/wanargi>
- [36] D. K. Teklie and M. H. Yağmur, "The Role of Green Innovation, Renewable Energy, and Institutional Quality in Promoting Green Growth: Evidence from African Countries," *Sustainability*, vol. 16, p. 6166, 2024. [Online]. Available: <https://doi.org/10.3390/su16146166>
- [37] D. Wicaksono, V. Gati, and S. Rahayu, "Perbedaan Harga Saham dan Return Saham Sebelum dan Sesudah Penetapan Calon Presiden dan Wakil Presiden Tahun 2024," *Jurnal Akuntansi AKUNESA*, vol. 12, no. 3, pp. 283–292, 2024. [Online]. Available: <https://doi.org/10.26740/akunesa>
- [38] D. Wijaya, *Manajemen Keuangan: Konsep dan Penerapannya*. Jakarta: PT. Grasindo, 2019.
- [39] X. Xie, J. Huo, and H. Zou, "Green process innovation, green product innovation, and corporate financial performance: A content analysis method," *Journal of Business Research*, vol. 101, pp. 697–706, 2019. [Online]. Available: <https://doi.org/10.1016/j.jbusres.2019.01.010>
- [40] I. A. Yulia, "Pengaruh Return On Asset, Debt To Equity Ratio dan Suku Bunga terhadap Return Saham Perusahaan Property dan Real Estate yang Terdaftar di BEI Tahun 2017–2019," *Jurnal Ilmiah Manajemen Kesatuan*, vol. 9, no. 3, pp. 475–482, 2021. [Online]. Available: <https://doi.org/10.37641/jimkes.v9i3.791>
- [41] Y. Zhang, J. Zhang, and Z. Cheng, "Stock market liberalization and corporate green innovation: Evidence from China," *International Journal of Environmental Research and Public Health*, vol. 18, no. 7, 2021. [Online]. Available: <https://doi.org/10.3390/ijerph18073412>
- [42] S. Sumayyah, R. W. Damayanti, and I. Zahara, "Green innovation, green accounting, and performance: The moderating role of green intellectual capital," *Journal of Accounting and Investment*, vol. 26, no. 1, pp. 273–291, Jan. 2025. [Online]. Available: <http://dx.doi.org/10.18196/jai.v26i1.24362>
- [43] Q. Cheng, A. P. Lin, and M. Yang, "Green process innovation, green product innovation, and firms' financial and environmental performance," *Journal of Accounting & Economics*, Jun. 2024. [Online]. Available: <https://doi.org/10.1016/j.jacceco.2024.101706>
- [44] M. Taliento, C. Favino, and A. Netti, "Impact of environmental, social, and governance information on economic performance: evidence of a corporate 'sustainability advantage' from Europe," *Sustainability*, vol. 11, no. 6, Art. no. 1658, 2019. [Online]. Available: <https://doi.org/10.3390/su11061738>