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THE EFFECT OF NET FOREIGN BUY/SELL, FREE FLOAT, AND STOCK VOLATILITY ON STOCK RETURNS IN COMPANIES THAT ARE CONSISTENTLY LISTED IN THE LQ45 INDEX FOR THE PERIOD 2022–2025

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ABSTRACT

Stock returns in companies that are members of the LQ45 index can be related to investors' trading activities and stock trading characteristics. This study aims to analyze the relationship between Net Foreign Buy/Sell, free float, and stock volatility with stock returns in companies that are consistently incorporated in the LQ45 index during the period 2022–2025. This study uses a quantitative approach with secondary data from 27 companies resulting in 108 company-year observations. Net Foreign Buy/Sell and free float data are obtained from the Indonesia Stock Exchange, while stock price data is obtained from Yahoo Finance. Stock returns are measured based on annual price changes, while stock volatility is measured using the annualized standard deviation of daily stock returns. Data analysis was carried out using panel data regression. The results of the model selection test showed that the Common Effect Model was suitable, while the final estimate used standard errors clustered by company to provide robust statistical inference in the presence of heteroscedasticity. The results showed that Net Foreign Buy/Sell was positively and significantly related to stock returns, while free float was negatively related but not significant. Stock volatility was positively and significantly related to stock returns. Simultaneously, the three independent variables were significantly related to stock returns with an R-squared value of 20.20%. These findings show that net foreign buy/sell activity and stock volatility have a significant relationship with the stock returns of LQ45 companies during the study period, while free float does not show a significant relationship.

Keywords: *Net foreign buy/sell, free float, stock volatility, stock return, LQ45.*

INTRODUCTION

The capital market has a critical function in facilitating investment and financing activities, which makes stock price movements a key issue for investors. Stock returns are widely used to evaluate investment performance because they capture changes in the value of an investment over a given period. In the Indonesian capital market, firms listed in the LQ45 index are important subjects of study since the index includes stocks that are actively traded and relatively liquid. Prior research has demonstrated that stock returns in the Indonesian market, including companies in LQ45, are linked to investor behavior, trading activity, and company or market characteristics (Amalia & Sumantri, 2024; Suryana et al., 2026). The 2022–2025 period is especially relevant because shifts in market conditions during these years may have been accompanied by differences in investors' trading activity, stock ownership characteristics, and stock-price risk.

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One element that has attracted attention in explaining stock returns is foreign investor trading activity. Findings from the Indonesian stock market show that foreign investors' net stock purchases are positively associated with stock returns (Rudiawarni et al., 2024). Likewise, Akram and Fatimah (2025) reported a positive and significant relationship between Foreign Net Buy/Sell and stock returns for firms in the LQ45 index. However, variations across studies in terms of research period, sample, and measurement methods suggest that additional evidence is necessary to determine whether this relationship remains relevant for firms that stayed in the LQ45 index throughout 2022–2025.

Free Float is another stock attribute that may be related to stock returns. Earlier studies have connected higher Free Float with greater stock liquidity and lower liquidity risk (Ding et al., 2016). In Indonesia, Verawati et al. (2025) studied LQ45 firms and found that Free Float is associated with stock-market liquidity, while Hearn et al. (2025) provided evidence that Free Float is linked to return-related characteristics in cross-sectional stock pricing. Even so, the existing evidence does not directly show how Free Float relates to annual stock returns when analyzed together with foreign investor activity and stock volatility. This creates an empirical gap, particularly for firms that consistently remained in the LQ45 index during the 2022–2025 period.

Stock volatility is also an important stock-market characteristic because it represents fluctuations and uncertainty in stock prices. Prior evidence from the Indonesian capital market indicates that volatility matters for stock-return dynamics. Ponziani (2022) examined return volatility in Indonesian stock indices, including LQ45, and Rohim and Wildan (2025) found a positive relationship between stock volatility and stock returns in Indonesian transportation and logistics companies. However, these studies examine different research targets and observation periods and do not assess stock volatility at the same time as Net Foreign Buy/Sell and Free Float among firms that consistently remained in LQ45.

Accordingly, the research gap centers on the scarcity of evidence that examines Net Foreign Buy/Sell, Free Float, and Stock Volatility together within a single empirical model for firms that were continuously listed in the LQ45 index throughout 2022–2025. Prior studies have typically treated these variables separately or tested them under different empirical contexts. For instance, Rudiawarni et al. (2024) concentrated on foreign investors' net purchases, Verawati et al. (2025) analyzed free float in relation to stock-market liquidity, and Rohim and Wildan (2025) studied stock volatility and stock returns within a particular sector. The differences in research focus, study periods, and variable combinations point to the need for further evidence using a consistent sample of LQ45 companies.

The novelty of this study lies in the simultaneous assessment of Net Foreign Buy/Sell, Free Float, and Stock Volatility in companies that consistently remained in the LQ45 index during 2022–2025. By integrating these three factors into one empirical framework, the study jointly considers foreign investor trading activity, stock ownership characteristics, and stock-price risk to explain stock returns. This strategy offers a more

unified view of the factors linked to variations in stock returns among consistently listed LQ45 companies.

Therefore, this study seeks to examine the relationship between Net Foreign Buy/Sell, Free Float, and Stock Volatility and Stock Returns in firms that were consistently included in the LQ45 index over the 2022–2025 period. The results are expected to supply additional empirical evidence regarding stock-return dynamics in the Indonesian capital market and to function as a reference for investors and researchers seeking to understand factors associated with stock returns.

Risk–Return Trade-off Theory states that investment choices depend on a core link between the amount of risk and the return investors anticipate. Typically, investors demand higher expected returns to offset higher levels of investment risk. In the stock market, risk corresponds to the uncertainty surrounding future movements in stock prices and the returns those prices generate, whereas stock return is the benefit investors receive from making the investment. Markowitz (1952) explains that investors evaluate alternatives by taking both expected return and risk into account. Consequently, variations in stock risk can correspond to variations in the returns investors expect. This theoretical framework also supports the study of stock volatility as a driver of stock returns, since greater volatility signals larger swings and more uncertainty in stock returns.

The risk–return relationship also matters for understanding investor behavior in the capital market. Sharpe (1964) contends that investors expect to be compensated for bearing systematic risk, so securities with stronger exposure to risk may provide higher expected returns. In this study, stock volatility serves as a measure of how much stock returns fluctuate. Under the Risk–Return Trade-off Theory, higher stock volatility may coincide with higher stock returns because investors require greater compensation for taking on increased uncertainty. Therefore, the theory offers a theoretical basis for proposing a positive relationship between stock volatility and stock returns.

Stock return is the amount of profit that investors get as a result of investing in a stock. Returns can arise from two sources, namely changes in stock prices and other income components. In this study, stock returns are calculated by looking at the difference in changes in stock closing prices at the end of the year compared to the closing price at the end of the previous year. This measurement method is intended to show changes in the value of stock investment over a period of one year. Stock returns are a very important indicator in the investment decision-making process because they reflect the results obtained by investors due to changes in stock prices. In the context of the capital market, the movement of stock returns is not only influenced by the company's fundamental conditions, but also by investor activities, stock trading characteristics, and the amount of risk inherent in the stock. Therefore, this study assesses stock returns by including net foreign buy/sell, free float, and stock volatility as variables that are suspected to be related to changes in stock returns.

Foreign investor activities are one of the important elements in the dynamics of the Indonesian capital market. Foreign investors can be seen as relatively more sophisticated, because they have stronger resources, experience, and analytical skills in making

investment decisions. Trading activities carried out by foreign investors can also be information that other investors pay attention to when making investment decisions (Hanafi, 2024). Rudiawarni et al.(2024) stated that the net purchase of shares by foreign investors is able to provide positive signals for the market. When foreign investors make net purchases, an increase in demand for stocks can create pressure for stock prices to move up. In addition, foreign investor activities have the potential to reduce information asymmetry, because domestic investors can use foreign investor activities as one of the information references in the investment decision-making process. The study used 1,985 observations of companies in the Indonesian stock market during the period 2016–2021 and found a positive relationship between net purchase of shares by foreign investors and excess stock returns. Conceptually, an increase in net foreign buy indicates that the value of buying shares by foreign investors is greater than the sale, thus illustrating the tendency of stock accumulation by foreign investors. This increase in demand can push stock prices up, which ultimately increases stock returns. Conversely, net foreign sell can put pressure on stock prices and have the opportunity to lower returns. Thus, the larger the net foreign buy/sell, the higher the tendency of stock returns. Based on this description, the first hypothesis is formulated as follows:

H1: Net Foreign Buy/Sell has a positive relationship on stock returns in companies that are consistently included in the LQ45 index of the Indonesia Stock Exchange for the 2022–2025 period. Free float describes the large proportion of shares of a company that can be traded by the public. If the proportion of free float increases, the number of shares available for public investors to transact in the market will also increase. This characteristic is closely related to stock liquidity and liquidity risk. Ding et al. (2016) stated that stocks with higher free float levels tend to have higher liquidity levels. The study, which covered 55 countries, also found that the increase in free float is related to the decrease in liquidity risk. The subsequent decrease in liquidity risk can be related to the decrease in the return required by investors, as investors no longer need large compensation for liquidity risks and costs. Thus, liquidity can be one of the pathways that explain the relationship between free float and expected return. This relationship can be understood through the premium liquidity mechanism. In general, investors require higher returns for assets that bear greater liquidity risks or costs. In contrast, when a stock has better liquidity and lower liquidity risk, the return compensation required by investors may be smaller. Therefore, the increase in free float accompanied by increased liquidity and decreased liquidity risk is theoretically thought to be related to a decrease in stock returns. In the context of the Indonesian capital market, the relevance of free float to the characteristics of stock trading is also apparent. Verawati et al. (2025) examined companies that are members of the LQ45 index during the 2019–2023 period, and placed free float as one of the variables related to stock market liquidity. Although the study did not directly examine the relationship of free float to stock returns, it nevertheless provides an idea that free float is an important characteristic in the stock trading of companies in LQ45. The relationship between the dispersed ownership structure and returns is also supported by Hearn et al. (2025), who show that free float is related to return-based factors

in explaining cross-section stock returns. Based on the theory of liquidity premium and the relationship between free float, liquidity, and liquidity risk, the increase in free float is estimated to have a negative relationship with stock returns. Therefore, the second hypothesis is formulated as follows:

H2: Free Float has a negative relationship on stock returns in companies that are consistently included in the LQ45 index of the Indonesia Stock Exchange for the 2022–2025 period. Stock volatility shows how much the stock price changes or fluctuates in a given time frame. The volatility characteristics of stock prices are also a concern in Indonesian capital market research. As volatility increases, the variation in stock price changes also increases, which indicates a higher level of uncertainty and risk for investors. Stock volatility indicates the level of fluctuations in stock prices or returns in a period. Different levels of volatility between companies can reflect the differences in risk characteristics and market conditions faced by each stock. In the relationship between risk and return, investors generally expect to be compensated in the form of higher returns when faced with investments with higher levels of risk. The relationship between risk and return is an important cornerstone in investment decision-making. Stocks with high volatility present greater potential for price changes, both through increases and decreases. This situation reflects higher uncertainty, so investors can ask for higher returns as compensation for the risks they bear. The positive relationship between volatility and return is also empirically supported in the Indonesian capital market (Angelina et al., 2023; Rohim & Wildan, 2025). Rohim and Wildan (2025) examined companies in the transportation and logistics sectors listed on the Indonesia Stock Exchange during the 2021–2023 period using panel data regression. The results of the study showed that stock volatility had a positive and significant relationship on stock returns. The findings indicate that when volatility increases, stock returns also tend to increase. Based on the theory of the relationship between risk and return and empirical evidence, stocks with higher volatility are estimated to have higher stock returns. Therefore, the third hypothesis is formulated as follows:

H3: Stock volatility has a positive relationship on stock returns in companies that are consistently included in the LQ45 index of the Indonesia Stock Exchange for the 2022–2025 period. Based on the theoretical description and results of previous research, this study places net foreign buy/sell, free float, and stock volatility as independent variables that are suspected to be related to stock returns. Net foreign buy/sell is estimated to be positively related to stock returns because increased net buying activity by foreign investors can drive demand and cause pressure on stock prices. Free float is estimated to be negatively related to stock returns through increased liquidity and decreased liquidity risk. Stock volatility is estimated to be positively related to stock returns because higher risk levels can demand higher return compensation. Thus, the conceptual model of this study examines three main relationships, namely: (1) net foreign buy/sell to stock returns, (2) free float to stock returns, and (3) stock volatility to stock returns. The conceptual framework illustrating these relationships is presented in Figure 1.

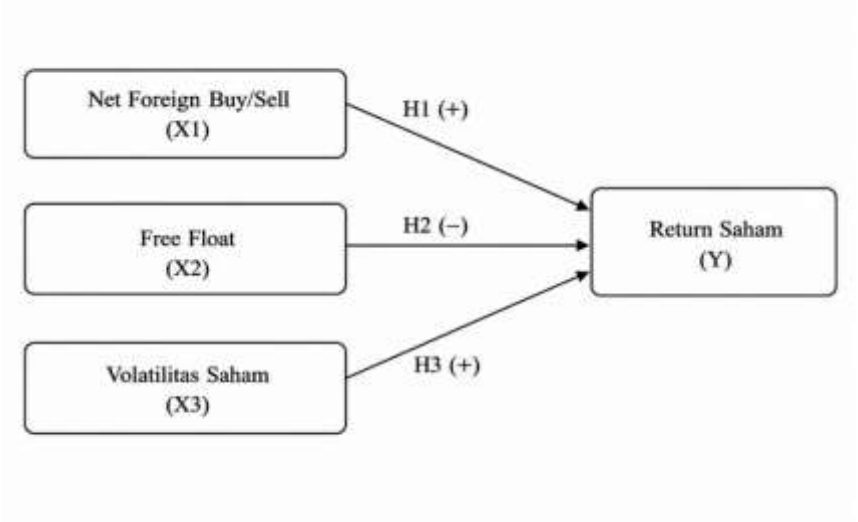


Figure 1. Research Framework

RESEARCH METHOD

Types and Approaches to Research

This study uses a quantitative approach with an explanatory research type. The quantitative approach was chosen because this study examines the relationship between independent variables, namely Net Foreign Buy/Sell, Free Float, and Stock Volatility, and dependent variables in the form of Stock Returns. The research data is in the form of panel data, which is a combination of cross-sectional data representing companies and time series data representing the observation period. The research period covers 2022–2025, while the object of the research is companies that have consistently been constituents of the LQ45 Index during this period. With 27 companies and four years of observations, the research resulted in 108 observations.

Population and Sample

The population in this study includes all companies that are members of the LQ45 Index on the Indonesia Stock Exchange (IDX) during the 2022–2025 period. Samples were taken using the purposive sampling technique, which is the determination of samples based on certain criteria that are in line with the needs of the research. The sample criteria in this study are:

1. Companies listed as constituents of the LQ45 index.
2. Companies that have consistently been constituents of LQ45 during the 2022-2025 period.
3. The company has complete data for all research variables during the 2022–2025 period.

Based on these criteria, 27 companies were obtained as samples for research. With an observation period of four years, the number of observations used was:

27 Companies x 4 years = 108 observations

With this, the data structure in this study is in the form of a balanced panel, because each company has the same number of observation periods.

Data Types and Sources

The data used in this study is secondary data which includes stock prices, Net Foreign Buy/Sell, Free Float, and daily stock price data needed to calculate stock volatility. Free Float and Net Foreign Buy/Sell data are obtained directly from publications and documents published by the Indonesia Stock Exchange (IDX/IDX). The Net Foreign value used is the Net Foreign value displayed by IDX for each company in each observation period. Thus, the study does not recalculate the Net Foreign from foreign investors' buying and selling transactions, but uses the Net Foreign value as reported by IDX. The Free Float data uses the Free Float Ratio published in the evaluation document of the LQ45 Index published by the IDX.

The stock price is obtained from Yahoo Finance by using the closing price (Close) as the basis for measurement. The year-end closing price is used to calculate the annual Stock Return, while the daily closing price is used to form the daily return which is then used in the calculation of Stock Volatility. For the 2022 Stock Return, the 2021 year-end closing price is used as the period's initial price, while the 2023–2025 Stock Return uses the previous year-end closing price as the initial price.

Annual stock return is calculated from the change in year-end closing price through the equation:

$$Return_{it} = \frac{P_{it} - P_{i,t-1}}{P_{i,t-1}}$$

The daily return used for volatility measurement is calculated from the change in the daily closing price:

$$r_{id} = \frac{P_{id} - P_{i,d-1}}{P_{i,d-1}}$$

The daily return is then used to calculate each company's standard daily return deviation in each year. Annual volatility is calculated by multiplying the standard daily return deviation by the annualization factor, assuming there are 252 trading days in a year. $\sqrt{252}$ All data is then compiled as a balanced panel based on the company and year of observation. With 27 companies and the period 2022–2025, 108 company-year observations were obtained. The data processing is then carried out using Stata software.

Variable Operational Definition

The research consists of one dependent variable, namely Stock Return, and three independent variables, namely Net Foreign Buy/Sell, Free Float, and Stock Volatility. The operational definitions and measurement of these variables are presented in Table 1.

Table 1. Operational Definitions of Research Variables

Variabel	Symbols	Measurement	Units
Return Saham	Y	Year-end closing price change to previous year-end closing price	Ratio
Net Foreign	X1	IDX's reported Net Foreign Value	IDR billion
Free Float	X2	Free Float Ratio published by IDX	Ratio
Stock Volatility	X3	Annualized standard deviation of daily stock returns	Ratio

Return Saham

Stock Return describes the change in the value of the investment reflected in the movement of the stock price during the observation period. The annual return is calculated by comparing the current year-end closing price to the previous year-end closing price:

$$Return_{it} = \frac{P_{it} - P_{i,t-1}}{P_{i,t-1}}$$

Description:
Returnit = return of shares of Company I in year t
Pit = the closing price of the stock at the end of the year t
Pi,t-1 = the closing price of the stock at the end of the year

For the 2022 observation, the closing price at the end of 2021 is used as the initial price so that price changes for the full year can be calculated. At the estimation stage, the Return is expressed in decimal form.

Net Foreign Buy/Sell

Net Foreign shows the net value of transactions made by foreign investors, as reported by IDX. This variable is expressed in units of IDR billion and is used according to its original value. The use of Net Foreign in this study is in line with Rudiawarni et al. (2024), which utilizes the net purchase activities of foreign investors as a proxy for foreign investor sentiment and finds a positive relationship with excess stock returns in the Indonesian capital market. The net foreign value is not transformed with a natural logarithm because the research data contains both positive and negative values. Logarithmic transformations cannot be applied directly to values with negative values.

Free Float

Free Float shows the proportion of company shares available for trading by the public based on the provisions and methodology used by the Indonesia Stock Exchange. The Free Float variable is measured using the Free Float Ratio obtained from IDX data. This value is used in the form of a ratio. Thus, the value of 0.4058 represents a Free Float of 40.58%. Free Float is included in the model in the form of a ratio without logarithmic

transformation. The use of this variable is also in line with the research on the LQ45 company which states that Free Float is a characteristic related to stock market conditions and liquidity. However, the research of Verawati et al. (2025) is used as a contextual reference related to LQ45 and Free Float, not as direct evidence of the relationship between Free Float and Stock Return.

Stock Volatility

Stock volatility describes the magnitude of the rate of fluctuation in stock returns during the observation period. Volatility is calculated through the standard deviation of daily stock returns, then analyzed to an annual value with 252 trading days:

$$\text{Volatilitas}_{it} = \text{SD}(\text{Return}_{id}) \times \sqrt{252}$$

Description:

Volatility	= the volatility of the Company's stock i in year t
SD (Daily return)	= standard deviation of the Company's daily stock return i during year t
252	= the assumption of the number of trading days in a year
$\sqrt{252}$	= annualizing factor to convert daily volatility to annual volatility

Stock volatility is measured using the standard deviation of daily stock returns which is then analyzed by a factor, assuming 252 trading days in a year. The measurement results in $\sqrt{252}$ *annualized volatility* for each company and year of observation The volatility value is expressed in the form of an annual ratio. Thus, a value of 0.35 indicates an annual volatility level of 35%.

Research Regression Model

This study uses a panel data regression model to test the relationship between Net Foreign Buy/Sell, Free Float, and Stock Volatility to Stock Returns as follows:

$$Return_{it} = + \alpha\beta_1 NetForeign_{it} + \beta_2 FreeFloat_{it} + \beta_3 Volatilitas_{it} + \varepsilon_{it}$$

Description:

$Return_{it}$	= return of company shares in the year ; it
α	= konstanta;
β_1	= Net Foreign regression coefficient;
β_2	= Free Float regression coefficient;
β_3	= Stock Volatility regression coefficient;
$NetForeign_{it}$	= the company's Net Foreign value in the year in Rp billion; it
$FreeFloat_{it}$	= Free Float Ratio of the company in the year ; it
$Volatilitas_{it}$	= annual volatility of the company's stock in the year ; it

ε_{it} = error term.

The model is used to test the relationship of each independent variable with Stock Return, either partially or simultaneously.

Data Analysis Techniques

Data analysis was carried out in stages. The first stage involved descriptive statistics to describe the characteristics of each research variable based on the minimum, maximum, mean, and standard deviation. The next stage included correlation analysis and multicollinearity testing. Pearson correlation was used to assess the direction and strength of the relationships between variables, while multicollinearity was assessed using the Variance Inflation Factor (VIF). Panel data regression was then estimated using three alternative models, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Model selection was conducted through individual effect testing and the Lagrange Multiplier (LM) test. The final regression estimation employed standard errors clustered by company to provide robust statistical inference in the presence of heteroskedasticity within companies. Hypothesis testing was conducted at a significance level of 5%. A hypothesis was considered supported if the p-value was less than 0.05 and the direction of the coefficient was consistent with the hypothesized relationship.

RESULTS AND DISCUSSION

Results

Descriptive Statistics

Table 2 presents the descriptive statistics of the research variables, including the number of observations, mean, standard deviation, minimum, and maximum values.

Table 2. Descriptive Statistics of Research Variables

Variabel	Obs.	Mean	Std. Dev.	Minimum	Maximum
Return Saham	108	0,0611	0,4152	-0,8772	2,5543
Net Foreign	108	-454,7713	5.189,6390	-35.021,9000	8.946,1000
Free Float	108	0,3707	0,0932	0,1405	0,5553
Stock Volatility	108	0,3530	0,1110	0,1747	0,6970

Source: Data processed by researchers using Stata, 2026.

These results of table 2 show that the Stock Return has an average value of 0.0611 or around 6.11%, with a standard deviation of 0.4152. The minimum value of Stock Return was recorded at -0.8772 or -87.72%, while the maximum value reached 2.5543 or 255.43%. This wide range of values indicates a relatively high variation in returns between companies and throughout the observation period. In addition, the standard deviation that is larger than the average value shows that the movement of stock returns in the study sample is quite diverse.

The Net Foreign variable has an average value of -454.7713 billion rupiah, which shows that on average the net transaction value of foreign investors in the sample is in a net sell condition. The minimum value is -IDR 35,021.9 billion, while the maximum value is IDR 8,946.1 billion. The magnitude of the difference between the minimum value and the maximum value confirms that there is a considerable difference in net foreign activities between companies and between observation periods. This finding is also reflected in the standard deviation of IDR 5,189.639 billion.

The Free Float variable has an average value of 0.3707, so the average proportion of stocks available for trading by the public in the research sample is around 37.07%. A minimum value of 0.1405 indicates the lowest free float of 14.05%, while a maximum value of 0.5553 indicates the highest free float of 55.53%. The standard deviation of 0.0932 or around 9.32 percentage points indicates a variation in the level of free float between companies.

Furthermore, Stock Volatility has an average value of 0.3530 or around 35.30% per year. The minimum value is 0.1747 or 17.47%, while the maximum value is 0.6970 or 69.70%. The standard deviation of 0.1110 or around 11.10 percentage points shows that there is a difference in the rate of fluctuation in stock returns between companies during the research period.

Overall, descriptive statistics show that the characteristics of the companies in the sample vary considerably, especially in Stock Return and Net Foreign. These variations are the basis for further analysis to assess whether the differences in Net Foreign, Free Float, and Stock Volatility are related to changes in Stock Return.

Correlation and Multicollinearity Analysis

Table 3. Correlation Matrix of Research Variables

Variabel	Return Saham	Net Foreign	Free Float	Volatilitas
Return Saham	1,0000	0,2211*	-0,1494	0,3945*
Net Foreign	0,2211*	1,0000	-0,0528	0,0211
Free Float	-0,1494	-0,0528	1,0000	-0,2758*
Volatilitas	0,3945*	0,0211	-0,2758*	1,0000

Source: Data processed by researchers using Stata, 2026.
Ket: significant at the significance level of 5%

As show in table 3, Net Foreign shows a positive correlation with Stock Return of 0.2211 and is significant at the level of 5% (p = 0.0215). This finding indicates a positive relationship with a relatively low level of closeness between net foreign activities and Stock Returns. These results are preliminary evidence that the increase in Net Foreign value tends to be in line with the increase in Stock Return.

Free Float has a negative correlation of -0.1494 to Stock Return, but the relationship is not statistically significant (p = 0.1228). Therefore, at the correlation analysis stage, there is not enough basis to conclude that there is a significant linear relationship between Free Float and Stock Return.

Furthermore, Stock Volatility was positively correlated by 0.3945 with Stock Return and significant at the level of 5% ($p < 0.001$). When compared to the other two independent variables, the correlation between Stock Volatility and Stock Return was the strongest. However, the amount of correlation still showed a moderate level of correlation and did not lead to too high a relationship.

In addition, the independent variables also did not show a high correlation. The correlation between Net Foreign and Free Float was -0.0528, between Net Foreign and Volatility was 0.0211, and between Free Float and Volatility was -0.2758. This condition provides an early indication that the model does not face a high correlation problem between independent variables.

Table 4. Multicollinearity Test Results

Variabel	VIF
Net Foreign	1,00
Free Float	1,08
Stock Volatility	1,08
Mean VIF	1,06

Source: Data processed by researchers using Stata, 2026.

As presented in Table 4, the VIF value of each independent variable was in the range of 1.00–1.08, with a Mean VIF value of 1.06. This value showed that there was no indication of multicollinearity in the research model. Thus, Net Foreign, Free Float, and Stock Volatility can be used together in regression estimation without the problem of high linear correlation between independent variables.

Panel Regression Model Selection

Table 5. Panel Data Regression Model Selection Results

Testing	Probability	Verdict
F test individual effects	0,6988	CEM
Lagrange Multiplier (LM) test	1,0000	CEM

Source: Data processed by researchers using Stata, 2026.

As presented in Table 5, the F test for individual effects showed a probability value of 0.6988, which is greater than the significance level of 5%. These findings indicate that there is insufficient evidence of the existence of systematically different individual effects of firms in the model. Thus, a Fixed Effect Model (FEM) is not required, and the Common Effect Model (CEM) is a more appropriate model choice.

Furthermore, the Lagrange Multiplier (LM) test yielded a probability value of 1.0000, which is also greater than 0.05. These results show that there is no evidence of significant randomness between firms. Therefore, the Random Effect Model (REM) is no more appropriate than the Common Effect Model (CEM).

Based on the two test results, this study establishes the Common Effect Model (CEM) as a regression estimation model used to test the hypothesis. The selection of CEM

confirms that the variation in Stock Return in the research sample is more appropriately analyzed with a model that does not specifically include individual company effects or random effects.

Model Diagnostic Test

After the Common Effect Model (CEM) is established as the estimation model, the next step is to conduct a diagnostic test on the error structure in the model. This test aims to assess whether there are indications of heteroscedasticity and autocorrelation in the regression model.

Heteroscedasticity Test

To detect heteroscedasticity, the Breusch–Pagan/Cook–Weisberg test is used. The null hypothesis states that the residual variance is constant, indicating homoscedasticity, while the alternative hypothesis indicates heteroscedasticity. The results of the heteroscedasticity test are presented in Table 6.

Table 6. Heteroskedasticity Test Results

Testing	Chi-square	Probability	Conclusion
Breusch–Pagan/Cook–Weisberg	50,41	0,0000	There is heteroscedasticity

Source: Data processed by researchers using Stata, 2026.

Based on the test results, a probability value of 0.0000 was obtained, which was smaller than the significance level of 5%. Therefore, the null hypothesis is rejected and it can be concluded that in the research model there is heteroscedasticity. This situation shows that residual variance is not constant in all observations.

Because heteroscedasticity was identified, the final model estimation was carried out using firm-clustered standard errors. This technique was chosen so that statistical inference of regression coefficients is more resistant to heteroscedasticity that occurs in the company group.

Autocorrelation Test

Autocorrelation testing is performed using the Wooldridge test for autocorrelation on panel data. The zero hypothesis states that there is no first-order autocorrelation in residuals.

Table 7. Autocorrelation Test Results

Testing	F-statistic	Probability	Conclusion
Wooldridge test	0,181	0,6738	There is no evidence of autocorrelation

Source: Data processed by researchers using Stata, 2026.

As shown in Table 7, the Wooldridge test showed a probability value of 0.6738 which was greater than the significance level of 5%. Thus, the null hypothesis was not

rejected, so there was no statistical evidence of first-order autocorrelation in the research data. Based on the findings of the diagnostic test, the main problem found in the model is heteroscedasticity. Therefore, the final estimate uses firm-clustered standard errors, while no special adjustments are made based solely on autocorrelation.

Regression Estimation Results

The final regression estimation results and hypothesis testing are presented in Table 8. The estimation uses standard errors clustered by company to provide robust statistical inference in the presence of heteroskedasticity.

Table 8. Regression Estimation Results and Hypothesis Testing

Variabel	Coefficient	Std. Error	t-statistic	Prob.	Verdict
Net Foreign	0,0000169	0,0000060	2,82	0,009	H1 supported
Free Float	-0,1477043	0,4513183	-0,33	0,746	H2 is not supported
Stock Volatility	1,424954	0,4806987	2,96	0,006	H3 supported

Source: Data processed by researchers using Stata, 2026.

As shown in Table 8, Net Foreign Buy/Sell and Stock Volatility have positive and statistically significant coefficients, whereas Free Float has a negative but statistically insignificant coefficient.

Table 9. Summary Statistics of the Regression Model

Model Description	Value
Number of observations	108
Number of companies	27
R-squared	0,2020
F-statistic	5,19
Prob > F	0,0061
Root MSE	0,37626
Standard error	Clustered by company (id)

Source: Data processed by researchers using Stata, 2026.

As presented in Table 9, the regression model estimation, simultaneous testing showed that the research model proved to be significant. This is reflected in the Prob > F value of 0.0061 which is below the significance level of 5%. This means that Net Foreign, Free Float, and Stock Volatility together have a significant relationship to Stock Return.

The R-squared value of 0.2020 indicates that the three independent variables are collectively able to explain approximately 20.20% of the overall variation in Stock Return. The rest, which is 79.80%, is a variation in Stock Return that cannot be explained by the variables contained in the research model.

Discussion

The Relationship of Net Foreign Buy/Sell to Stock Return

The estimation results show that Net Foreign Buy/Sell has a positive and significant relationship on Stock Return. The Net Foreign Buy/Sell variable has a coefficient of 0.0000169 with *a t-value* of 2.82 and a significance value of 0.009, which is below the significance threshold of 5%. Thus, H1 is supported. This finding means that the greater the reported net purchase value of a stock, the higher the return of the stock associated with it, assuming other variables are held constant.

Economically, a coefficient of 0.0000169 shows that the increase in Net Foreign Buy/Sell of IDR 1 billion is related to the increase in Stock Return of 0.0000169 in the form of a ratio. In other words, the increase in Net Foreign Buy/Sell of IDR 1 trillion is related to an increase in Stock Return of around 0.0169, or equivalent to 1.69 percentage points, ceteris paribus. This amount indicates that the net transaction activity of foreign investors has a significant relationship with the movement of stock returns in the companies that are the research sample.

The positive and significant relationship between Net Foreign Buy/Sell and Stock Return is consistent with the findings of Rudiawarni et al. (2024), who found a positive relationship between foreign investors' net stock purchases and excess stock returns in the Indonesian stock market. This finding is also consistent with Akram and Fatimah (2025), who reported a positive and significant relationship between Foreign Net Buy/Sell and Stock Returns among companies included in the LQ45 index. These findings suggest that foreign investor trading activity can contain information that is relevant to stock-price movements and returns. Foreign investors may possess relatively greater resources and access to information, which can make their trading activity relevant to other market participants. When net purchases by foreign investors increase, demand pressure for stocks can also increase, potentially driving up stock prices. The price increase is further reflected in higher stock returns.

In the context of companies that have consistently been constituents of LQ45 during 2022–2025, this linkage is relevant because the stocks in this group have relatively high liquidity and trading activity characteristics. Changes in foreign investors' transaction positions can be one of the information that market participants pay attention to in making investment decisions. Thus, an increase in net foreign purchases can reflect the strengthening of foreign investors' interest in a stock, which is ultimately related to an increase in stock returns (Iwatsubo & Watkins, 2021).

The results of this study provide empirical support that Net Foreign Buy/Sell is one of the relevant variables in explaining the variation in Stock Returns in the study sample. However, the relationship needs to be understood as an empirical relationship based on observational data, so the results of this study cannot be interpreted as the only cause of changes in stock returns. H1 conclusion: H1 is supported, because Net Foreign Buy/Sell is proven to have a positive and significant relationship on Stock Return ($\beta = 0.0000169$; $p = 0.009$).

The Relationship of Free Float to Stock Returns

The estimated results show that Free Float has a negative coefficient for Stock Return, but the relationship is not statistically significant. The Free Float variable has a coefficient of −0.1477043, *a t-value* of −0.33, and a significance value of 0.746, which is above the significance threshold of 5%. Thus, H2 is not supported. Although the direction of the coefficient is in line with the hypothesis proposed, the available empirical evidence is not sufficient to show a significant relationship between Free Float and Stock Return in the study sample.

Economically, the coefficient −0.1477043 indicates that the increase in Free Float of 0.01 or 1 percentage point is related to a decrease in Stock Return of about 0.001477, or about 0.1477 percentage points, assuming that the other variables are constant. However, since the significance value is 0.746, the relationship does not have adequate statistical support. Therefore, the negative direction of the coefficient cannot be used as a basis for concluding that the increase in Free Float is systematically related to the decrease in Stock Return.

Theoretically, the negative relationship between Free Float and Stock Return can be explained through liquidity mechanisms (Rahmiyati & Anggrahito, 2023). Ding et al. (2016) show that an increase in Free Float is related to increased stock liquidity and decreased liquidity risk. An increase in the number of stocks available for trading can reduce trading friction and make it easier for investors to make transactions. In the perspective of liquidity *premium*, more liquid stocks tend to demand lower return compensation as investors face less liquidity risk. The framework provides a foundation for the alleged negative relationship between Free Float and expected returns.

However, the results of this study show that this mechanism has not been seen significantly in the sample of LQ45 companies for the 2022–2025 period. One possibility is the characteristics of the sample consisting of companies that are consistently in the LQ45 index. These stocks are basically actively traded, so the difference in Free Float between companies does not necessarily result in a large enough difference in return to form a statistically significant relationship. In other words, the liquidity benefits associated with Free Float may be less able to differentiate returns between companies when the object of the study is already in a relatively liquid group of stocks.

In addition, the results of the study show that Free Float has a relatively more limited variation than Net Foreign Buy/Sell and Stock Return. The Free Float value in the sample is in the range of 14.05% to 55.53%, with an average of 37.07% and a standard deviation of 9.32%. This condition can make the Free Float variation available in the sample not large enough to explain the significant variation in Stock Return.

The insignificant relationship found in this study can also be considered alongside the findings of Hearn et al. (2025), who examined the relationship between dispersed ownership, free float, and asset-pricing outcomes. Their findings indicate that free float can be associated with return-related characteristics, although the nature and magnitude of the relationship may depend on the market and sample examined. In contrast, the present study does not find sufficient statistical evidence of a significant relationship

between Free Float and Stock Return among companies that consistently remained in the LQ45 index during 2022–2025.

These findings also need to be distinguished from the research of Verawati et al. (2025). The study used the company LQ45 and discussed the relationship between Free Float and market liquidity, rather than directly testing the relationship between Free Float and Stock Return. Therefore, the study is more appropriate to use as a context regarding the characteristics of Free Float in LQ45 companies, while the results of this study show that the direct relationship of Free Float to Stock Return was not proven to be significant in the period and sample used.

Thus, the results of the study provide findings that Free Float has not been a statistically significant factor in explaining the Stock Return of companies that are consistently constituents of LQ45 during 2022–2025. The direction of the negative relationship is indeed in accordance with theoretical assumptions, but the statistical insignificance suggests that the relationship is not strong enough to support the research hypothesis. H2 Conclusion: H2 is not supported, as the Free Float has a negative coefficient direction ($\beta = -0.1477043$), but it is not significant to the Stock Return ($p = 0.746$).

The Relationship of Stock Volatility to Stock Returns

The estimation results show that Stock Volatility has a positive and significant relationship on Stock Return. The Stock Volatility variable has a coefficient of 1.424954, a t-value of 2.96, and a significance value of 0.006, which is below the significance threshold of 5%. Thus, H3 is supported. This finding means that the increase in stock volatility is related to the increase in Stock Return in the company that is the research sample, assuming that the other variables remain the same.

Economically, a coefficient of 1.424954 indicates that an increase in volatility of 0.01 or 1 percentage point is related to an increase in Stock Return of 0.01425, or about 1.42 percentage points. Thus, stocks with higher levels of volatility tend to have higher returns in the study sample.

The findings can be explained through the relationship between risk and return in investments. Volatility describes the rate of change or instability of stock prices. The higher the volatility, the greater the uncertainty investors face regarding stock price movements. These conditions can be related to investors' demands for higher return compensation in exchange for greater risk. Therefore, the positive relationship between volatility and return found in this study suggests that increased stock price risk goes in the same direction as increased stock returns.

The positive relationship between Stock Volatility and Stock Return is consistent with Rohim and Wildan (2025), who found a positive and significant relationship between stock volatility and stock returns in transportation and logistics companies listed on the Indonesia Stock Exchange. This finding is also consistent with the broader evidence that stock-price volatility is an important characteristic of return dynamics in the Indonesian capital market (Angelina et al., 2023; Fithriyana et al., 2025). However, the present study

extends this evidence by examining consistently listed LQ45 companies over the 2022–2025 period.

In the context of this study, the average stock volatility during the 2022–2025 period is 0.3530 or 35.30%, with a minimum value of 17.47% and a maximum value of 69.70%. This range shows that there is a considerable difference in the level of volatility between companies and between observation years. This variation provides room for volatility to explain the difference in stock returns in the research model.

This positive relationship can also be attributed to the characteristics of LQ45 stocks. Although the companies in the sample are companies that are consistently constituents of LQ45, the volatility level of each stock remains different. Changes in market conditions, company information, investor sentiment, and trading dynamics can cause differences in the rate of price changes between periods. Stocks with higher volatility have greater price changes, so the chances of earning high returns can also increase, although at the same time investors also face greater possible losses.

Thus, the results of the study show that Stock Volatility is one of the significant factors in explaining the Stock Return in companies that are consistently a constituent of LQ45 during 2022–2025. However, this positive relationship does not mean that volatility definitely causes returns to increase, but rather shows a positive empirical relationship in the research model. H3 conclusion: H3 is supported, as Stock Volatility has been shown to have a positive and significant relationship on Stock Return ($\beta = 1.424954$; $p = 0.006$).

The Relationship of Net Foreign Buy/Sell, Free Float, and Stock Volatility Simultaneously to Stock Returns

The results of the simultaneous testing showed that Net Foreign Buy/Sell, Free Float, and Stock Volatility were jointly significantly related to Stock Return. Based on the regression estimation, an F-statistic of 5.19 was obtained with a significance value of 0.0061, which is below the 5% significance level. Thus, the overall research model is statistically significant. Thus, the overall research model is significant, so that the three independent variables used together have the ability to explain the variation in Stock Return in the company that is the research sample.

The R^2 value of 0.2020 shows that 20.20% of the variation in Stock Return can be explained by Net Foreign Buy/Sell, Free Float, and Stock Volatility in the research model. Meanwhile, the remaining 79.80% of the variation in Stock Returns is not explained by the variables included in the research model. This indicates that Stock Returns may also be associated with other factors outside the variables examined in this study.

Partially, the results showed that each variable contributed differently. Net Foreign Buy/Sell had a positive and significant relationship with Stock Return ($\beta = 0.0000169$; $p = 0.009$), while Free Float had a negative but insignificant relationship direction ($\beta = -0.1477043$; $p = 0.746$). Meanwhile, Stock Volatility has a positive and significant relationship with Stock Return ($\beta = 1.424954$; $p = 0.006$). The difference in results shows that Although the overall regression model is statistically significant, the statistical

significance of the individual variables differs. Net Foreign Buy/Sell and Stock Volatility are significantly related to Stock Return, whereas Free Float is not statistically significant.

The significance of the simultaneous testing also shows that the combination of investor activity factors, shareholding characteristics, and price risk can be used as one approach to understand the variation in Share Returns in companies that are consistently constituents of LQ45 during the 2022–2025 period. However, the relatively limited R^2 value indicates that the model still has room to develop, among other things through the addition of other theoretically relevant variables.

Thus, the overall results provide empirical evidence that Net Foreign Buy/Sell, Free Float, and Stock Volatility are jointly associated with Stock Returns, although the individual relationships differ across variables: Net Foreign Buy/Sell and Stock Volatility show significant positive relationships, whereas Free Float does not show a statistically significant relationship.

This study's novel contribution is that it evaluates Net Foreign Buy/Sell, Free Float, and Stock Volatility together within a single model for firms that consistently remained in the LQ45 index during 2022–2025. Recent studies have examined these factors in different empirical contexts. Rudiawarni et al. (2024) document a positive relationship between foreign investors' net stock purchases and stock returns in the Indonesian stock market. Recent research has also linked free float to stock-return characteristics and asset pricing (Hearn et al., 2025), while Verawati et al. (2025) examined free float, stock return, and market liquidity among LQ45 firms. Stock volatility has likewise been examined in relation to stock returns in Indonesian firms (Ponziani, 2022; Rohim & Wildan, 2025). However, these studies do not examine Net Foreign Buy/Sell, Free Float, and Stock Volatility simultaneously within a single model for firms that consistently remained in LQ45 throughout 2022–2025. By bringing these factors together, this study offers a unified empirical view that considers investor trading behavior, stock ownership characteristics, and stock-price risk in explaining Stock Return. The findings further indicate that these factors do not operate in the same manner: Net Foreign Buy/Sell and Stock Volatility show significant positive relationships with Stock Return, whereas Free Float does not show a statistically significant relationship.

From a wider capital-market standpoint, these results provide additional empirical evidence for understanding stock-return dynamics in the Indonesian capital market. Previous evidence indicates that foreign investor trading activity is relevant to stock returns, with net purchases by foreign investors associated with higher excess returns in the Indonesian stock market (Rudiawarni et al., 2024). Recent research also highlights the relevance of free float to stock-return characteristics and asset pricing (Hearn et al., 2025), while evidence from LQ45 companies demonstrates the importance of considering free float alongside stock-market characteristics such as liquidity (Verawati et al., 2025). In this study, the evidence suggests that foreign investor trading activity and stock-price volatility are linked to differences in stock returns within the sample studied, whereas free float has no statistically significant relationship. While the analysis is based on consistently listed LQ45 companies over 2022–2025 and therefore should not be

generalized directly to all listed firms, the findings can nevertheless serve as an additional point of reference for investors and researchers assessing stock-market dynamics in Indonesia's capital market.

CONCLUSION

This study shows that Net Foreign Buy/Sell has a positive and significant relationship with Stock Returns in companies that are consistently listed in the LQ45 index during the 2022–2025 period. The increase in net foreign buy/sell activity appears to be related to an increase in stock returns. Free Float does not show a significant relationship with Stock Return, so the second hypothesis is not supported. The Stock Volatility actually has a positive and significant relationship with the Stock Return, so the third hypothesis is supported. These results confirm that the level of volatility is one of the factors related to the variation in stock returns during the study period. Simultaneously, Net Foreign Buy/Sell, Free Float, and Stock Volatility are significantly related to Stock Return, with a value of R^2 of 20.20%. This indicates that the variation in stock returns is not only explained by these three variables, but is also influenced by other factors outside the research model.

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