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The Role of Non-Fundamental Information in Significant Stock Returns: an Empirical Analysis of Non-LQ45 Stocks on the Indonesian Stock Exchange for the Period 2021–2025

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Abstract
This study examines the effect of investor sentiment, illiquidity, and stock volatility on the returns of non-LQ45 stocks listed on the Indonesia Stock Exchange (IDX) during 2021 to 2025, with firm size as a control variable. Using a purposive sample of 375 non-LQ45 stocks from a population of 958 IDX-listed stocks as of December 2025, the study yields 22,500 firm-month observations over 60 months and estimates a Fixed Effect Model with White diagonal robust standard errors, following Chow and Hausman specification tests. None of the three non-fundamental variables has a significant partial effect: sentiment is negative, illiquidity is positive and correctly signed, and volatility is positive but contrary to the hypothesized direction; none reaches significance. Firm size shows a significant positive effect and is the only variable stable across robustness checks. Jointly, the four variables significantly explain returns, though explanatory power is low (R-squared = 2.49%). Winsorizing confirms that the volatility coefficient is highly sensitive to extreme observations, while other results remain stable. These findings suggest that non-fundamental factors, taken individually, do not reliably explain non-LQ45 return formation over this period, even though their joint contribution is significant and consistent with a market that is not fully efficient.

INTRODUCTION

The capital market plays an important role in supporting economic activities through its intermediation function between companies seeking funding and investors pursuing returns through capital gains and dividends. In Indonesia, the Indonesia Stock Exchange (IDX) classifies stocks based on specific characteristics, one of which is the LQ45 index, which consists of 45 stocks with the highest liquidity and market capitalization (Indra et al., 2025; Malini, 2019; Mujib & Candraningrat, 2021; Rudianto, 2023). Meanwhile, more than 900 other listed stocks are categorized as non-LQ45 stocks, which generally have lower liquidity and market capitalization levels, making them more vulnerable to the influence of nonfundamental factors in stock price formation (KSEI, 2025).

In recent years, the Indonesian stock market has exhibited a phenomenon in which stock price increases have not always corresponded with companies' fundamental conditions. Several non-LQ45 stocks experienced price increases of hundreds or even thousands of percent during the

2021–2025 period despite relatively low profitability levels (Megasyara, 2021). For example, DAAZ shares increased by 2,082% with a return on equity (ROE) of only 2.01%, while BUVA shares increased by 2,796% with an ROE of 0.97%. These conditions indicate potential deviations between market prices and intrinsic values, suggesting that stock price formation cannot be fully explained by assumptions of market rationality alone (Biondi & Giannoccolo, 2015; Charron, 2017; Leins, 2022; Ndrecaj et al., 2025).

This phenomenon has become increasingly relevant following changes in investor composition after the COVID-19 pandemic. Based on KSEI data (2025), the number of stock investors in Indonesia increased to 8.6 million, with retail investors accounting for 49.9% of total IDX transaction activity. However, asset ownership remains dominated by institutional investors. This condition creates information asymmetry, in which retail investors have a substantial influence on trading activity but remain more vulnerable to limitations in financial literacy and behavioral biases (Tan et al., 2024). Consequently, investor sentiment may influence stock price movements and cause prices to deviate from their fundamental values (Yulianto et al., 2023).

In addition to investor sentiment, the characteristics of non-LQ45 stocks make liquidity and volatility important factors in explaining stock returns. Stocks with smaller market capitalization tend to have lower liquidity levels and higher information asymmetry (Widianingsih & Setiawan, 2022). These conditions may generate abnormal returns as compensation for liquidity risk exposure (Budiarso & Pontoh, 2025). On the other hand, increased market volatility does not necessarily produce higher returns, as suggested by the Capital Asset Pricing Model (CAPM), but may instead have a negative relationship with stock returns in emerging markets (Saraf & Kayal, 2023; Çam et al., 2024).

Theoretically, CAPM explains that stock returns are influenced by systematic risk measured through beta. However, several studies have shown that CAPM does not fully explain variations in stock returns, particularly in emerging markets characterized by high uncertainty and information asymmetry (Chahuán-Jiménez et al., 2025; Beyaztas et al., 2025). Therefore, incorporating nonfundamental factors, such as investor sentiment, illiquidity, and volatility, is important for achieving a more comprehensive understanding of stock return dynamics (Gao et al., 2025; Maurya et al., 2026; Sakariyahu et al., 2024). Previous studies have examined these factors individually; however, limited research has integrated all three factors within a single research model, particularly in the context of non-LQ45 stocks listed on the IDX.

Based on these research gaps, this study aimed to analyze the effects of investor sentiment, illiquidity, and stock volatility on the returns of non-LQ45 stocks listed on the Indonesia Stock Exchange during the 2021–2025 period, with firm size included as a control variable. This research contributes empirically by expanding the study of stock return determinants in emerging markets and providing insights into how behavioral factors and market characteristics influence stock price formation beyond traditional fundamental explanations. The findings are expected to provide empirical evidence regarding the relevance of nonfundamental factors in explaining non-LQ45 stock returns in the Indonesian capital market, thereby contributing to academic literature and practical investment decision-making in emerging market contexts.

METHOD

Types of Research

This study employed a quantitative research approach with an explanatory research design. The study aimed to examine the causal relationships between nonfundamental factors, namely investor sentiment, illiquidity, and volatility, and stock returns in the Indonesian capital market. The quantitative approach was selected because it enabled the analysis of relationships among variables using measurable financial data. This approach was also appropriate for examining financial market dynamics through empirical data analysis.

Research Time and Place

This research aims to examine stocks that are listed on the Indonesia Stock Exchange (IDX) during the 2021-2025 period, and are not listed in the LQ45 index. IDX was chosen as a research place, because as a capital market in developing countries there is a tendency for inefficient information (Indra et al., 2025; Widianingsih & Setiawan, 2022). This makes stocks listed on the IDX potentially more influenced by non-fundamental factors. This research period was chosen by the researcher to be able to represent market conditions after the COVID-19 pandemic which was characterized by an increase in the number of retail investors and sharply increased stock trading activities. This is supported by information obtained from the IDX on December 30, 2025. The reason for choosing non-LQ45 stocks for this study is due to their characteristics that tend to have lower liquidity and market capitalization than stocks listed in the LQ-45 index, making them more susceptible to the influence of non-fundamental factors such as investor sentiment, illiquidity, and price volatility that occur on the IDX. This research will use secondary data, for 375 non-LQ45 stocks during the 2021-2025 period.

Sample Collection Techniques and Research Samples

The sample collection technique used is *purposive sampling* based on the population of stocks listed on the Indonesia Stock Exchange during the 2021-2025 period, and is not listed in the LQ45 index. The size of the company is used as a control variable, and is calculated based on the market capitalization of the stock, with sampling classified accordingly into stocks with large, medium, and small market capitalization. The criteria used for the determination of samples in this study include the following:

1) The company was listed on the Indonesia Stock Exchange (IDX) for the period 2021-2025 consecutively and did not undergo *delisting*.
2) The company's shares are actively traded on the Indonesia Stock Exchange during the 2021-2025 period.
3) The company's shares are not included in the LQ45 index for the period 2021-2025.
4) The company has complete daily stock price data for the period 2021-2025.
5) The company has complete available trading volume data for the period 2021-2025.

The data used for this research is secondary data, obtained from verifiable sources such as the IDX, capital market data platforms, and other official financial data providers. The data collected includes information related to stock *returns* calculated from the daily closing price of shares, daily trading volume, stock volatility measured by measuring stock return deviation

standards, trading frequency, and the size of the stock issuer will be measured through market capitalization.

The market capitalization grouping consists of stocks with *large-cap* caps above IDR 10 trillion, stocks with *mid-caps* between IDR 1 trillion to IDR 10 trillion, and stocks with *small-cap (small-cap*) below IDR 1 trillion. Of the 958 stocks listed on the IDX as of December 2025, 375 stocks met all five criteria and were retained in full as the research sample, consisting of 35 *large-cap* stocks (9,3%), 205 *mid-cap* stocks (54,7%), and 135 *small-cap* stocks (36%). All the data needed for the sampling process will be taken from verifiable sources such as Yahoo Finance or IDX Data Center. Through the sample collection method carried out, this study is expected to represent the relationship between the selected independent variables to the *return* of stocks outside the LQ45 index selected as the sample, to show the influence of non-fundamental variables that occur on the IDX.

Data Analysis Techniques

The data analysis method used in this study is the quantitative data analysis method. This method is used because the variables in this study are in the form of values that can be measured on a numerical scale (Hossain, S., 2024:12). The statistical tests used for this study include descriptive statistical tests, stationarity tests, panel data regression model selection, classical assumption tests (multicollinearity, normality, heteroscedasticity, and autocorrelation), and hypothesis tests.

Descriptive Statistical Test

Descriptive statistical tests were used in this study to provide an overview of the distribution of data from each variable to be tested. This test includes mean values, maximum values, minimum values, and standard deviations. Data processing in this test will be carried out using the EViews application.

Stationarity Test

The stationarity test was carried out with the aim of ensuring that the data used for this study had a constant mean and variance to avoid pseudo-regression. Since the research was conducted using panel data, the test was carried out using the root test of the panel unit (Hossain, 2024:682). This test was applied to all research variables, with criteria based on probability values. If the probability value is less than 0.05, then the data used is stated to be stationary. On the other hand, if the probability value is greater than 0.05, then the data is not stationary and needs to be adjusted. This test was carried out with the EViews application.

RESULTS AND DISCUSSION

Descriptive Statistical Test

Descriptive statistical tests were conducted to provide a general overview of the characteristics of the data used for this study. Descriptive statistics include the mean value, median value, maximum value, minimum value, and standard deviation of each research variable, namely stock *return*, investor sentiment, illiquidity, stock volatility, and company size. The details of the descriptive statistics obtained through the EViews application, are as follows:

Table 1 Descriptive statistics of the study (population = 22,500).

Variable	*Red*	*Median*	Max	Min	*Std. Dev.*
Return	0.0000766	0.000000	0.300105	-0.285447	0.035883
Sentiment	0.000000	-0.104195	2.618107	-1.511722	1.000022
Illiquidity	0.004806	0.0000814	1.064248	0.0000000	0.024252
Volatility	0.028106	0.022286	0.164673	0.000681	0.020378
Size	27.974381	28.044095	34.205632	23.558682	1.571996

Source: Data processed by the author, 2026.

The dependent variable of stock return has an average value that is close to zero (0.0000766) with an exact median of zero. This indicates that the majority of stocks selected as samples experience relatively small monthly price changes. However, the range between the maximum value (0.300105) and the minimum value of the samples (-0.285447) also indicates that in certain months there are extreme price movements for some stocks.

The first independent variable, namely investor sentiment, has a *mean* amount close to zero. This happens because the numbers used for sentiment measurement are the result of the *Principal Component Analysis* (PCA) method which is mathematically standardized so that it has an average of zero, with a maximum value range of 2.618107 and a minimum value of -1.511722. These conditions reflect the variation in market sentiment conditions during the 2021-2025 period, where there are periods with low to high trade intensity.

The second independent variable, namely illiquidity has a *mean* value (0.004806) that is greater than the *median* value (0.0000814). This condition indicates a very *right-skewed* distribution, where a small percentage of stocks with a very high level of illiquidity pull the overall average upwards, while the majority of stocks selected as samples, have relatively good liquidity levels. The volatility variable has a *mean* value (0.028106) and *a median value* (0.022286) that are relatively close to each other or not much different. This shows that the distribution of stock volatility on a monthly basis is not too extreme, with a range between a minimum value of 0.000681 and a maximum value of 0.164673.

Finally, the control variable, namely the size of the company, as measured by the natural logarithm of market capitalization, has a *mean* value (27.97) and *a median* value (28.04) that are close to each other. As with the volatility variable, it indicates a relatively symmetrical distribution, with a range between a minimum value of 23.56 to a maximum value of 34.21. This condition reflects the diversity of the size scale of the company in the selected samples. This is consistent with the *purposive sampling* criteria applied in this study, from which the *big cap*, *mid cap*, and *small cap* composition follows.

Analysis Prerequisites Test

Root *Test*

The stationarity test is carried out to ensure that the *time series* data on each variable does not contain a unit *root*, as a prerequisite for the panel data to be estimated without the risk of *spurious regression*, which is a condition in which the regression results show a significant

coefficient and a high determination coefficient, even though there is no cause-and-effect relationship between these variables and resulting in incorrect conclusions (Hossain, S., 2024:493). This test was conducted using four methods using the EViews application, namely Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), ADF-Fisher Chi-square, and PP-Fisher Chi-square:

Table 2 Stationariness test results.

Variable	LLC	Prob.	IPS	Prob.	ADF-Fisher	PP-Fisher
Return	-141.47	0.000	-135.44	0.000	0.000	0.000
Sentiment	5.158*	0.9999999*	-9.984	0.000	0.000	0.000
Illiquidity	-165.49	0.000	-91.81	0.000	0.000	0.000
Volatility	-81.05	0.000	-81.61	0.000	0.000	0.000
Size	-3.71	0.000	-5.89	0.000	0.000	0.000

Source: Data processed by the author, 2026.

Table 2 shows that the research variables are generally stationary at the level (I(0)), reflected in probability values below 0.05 across most test methods, so the data can be entered directly into the regression model without differentiating. Sentiment was the only variable to show a slightly different result: its LLC test deviated from the other three. This is explained methodologically, since the LLC test assumes a homogeneous autoregressive coefficient across cross-sections, an assumption not fully applicable here because sentiment is constructed as a single market-level index that takes the same value for every stock each month, leaving little cross-sectional variation for the test to exploit. IPS, ADF-Fisher, and PP-Fisher, by contrast, accommodate heterogeneity in root unit processes between individuals, making them more suitable for sentiment and consistently confirming its stationarity. On this basis, sentiment's stationarity is maintained using the three test methods more appropriate for its data characteristics.

Multicollinearity Test

A *multicollinearity* test was performed in this study to ensure that there is no high correlation between the three independent variables (sentiment, illiquidity, and volatility) and the control variable (firm size) that can cause instability in the estimated *regression coefficient estimate*. *Multicollinearity testing* was carried out through two stages, namely Pearson correlation matrix analysis and *Variance Inflation Factor* (VIF). Both tests were carried out using the EViews application. The test results obtained are as follows:

Table 3 Pearson correlation matrix between independent variables.

Variable	Sentiment	Illiquidity	Volatility	Size
Sentiment	1.000	-0.040	0.065	0.039
Illiquidity	-0.040	1.000	0.073	-0.144
Volatility	0.065	0.073	1.000	-0.169
Size	0.039	-0.144	-0.169	1.000

Source: Data processed by the author, 2026.

Table 4 Results of *the Variance Inflation Factor* (VIF) test.

Variable	*R-squared*	VIF = 1/(1-R²)	Conclusion
Sentiment	0.008229	1.008	Secure
Illiquidity	0.024648	1.025	Secure
Volatility	0.036237	1.038	Secure
Size	0.048028	1.050	Secure

Source: Data processed by the author, 2026.

Table 3 shows that the entire correlation value between the three independent variables and the control variable was below the 0.17 mark, well below the general threshold of 0.8. This means that there is no indication of serious *multicollinearity* in pairs between the four variables. This conclusion is also strengthened by the results of the VIF test in Table 4, where all test values range from 1.008 to 1.050, well below the thresholds of 5 and 10 which are signs of multicollinearity (Hossain, S., 2024:300). These two test results together confirm that the regression model for this study is free from the problem of multicollinearity, both in pairs and in multiple linear combinations between the three independent variables and the control variables.

Panel Data Estimation Model Selection

Chow Test

The Chow test determines the more precise panel estimation model between the Common Effect Model (CEM) and the Fixed Effect Model (FEM) (Baltagi, B.H., 2021). In Table 5, both the Cross-section F probability (0.000012) and Cross-section Chi-square probability (0.000007) are below 0.05, meaning there is only a 0.0007% to 0.0012% probability that all stocks share the same intercept. This indicates the need for the model to allow each stock its own time-invariant characteristics, such as differences in business structure or corporate governance, that affect returns but are not captured by the independent variables. FEM accommodates these differences (Hossain, S., 2024), making it more appropriate than CEM for this study.

Table 5 Chow test results.

Statistical Test	Value	D.F.	Probability
Cross-section F	1.342880	(374, 2212)	0.000012
Cross-section Chi-square	505.12927	374	0.000007

Source: Data processed by the author, 2026.

Hausman Test

The Hausman test determines the more precise estimation model between the Fixed Effect Model (FEM) and the Random Effect Model (REM) (Baltagi, B.H., 2021 and Hossain, S., 2024), by testing whether each stock's unique characteristics correlate with the independent and control variables. If there is no correlation, REM is sufficient, since individual effects can be treated as random error; if there is correlation, REM produces biased estimates, making FEM the appropriate choice, as it directly accounts for each sampled stock's individual effects.

Based on the results of the test conducted using the Eviews application, the *Chi-Sq. Statistic* in Table 6 was obtained as 48.859613, with a probability value of 0.0000. The value is less than 0.05, so H0 is again rejected. This means that the individual effects between stocks

selected as samples do correlate with independent variables in the model, so FEM is confirmed as a more appropriate model to be used in this study than REM. This is in line with the results of the Chow Test that has been carried out previously. Based on the results of both tests, FEM is more appropriate to use for this study as an estimation model.

Table 6 Hausman test results.

Statistical Test	Chi-Sq. *Statistic*	Chi-Sq. d.f.	Prob.
Cross-section random	48.859613	4	0.0000

Source: Data processed by the author, 2026.

Regression Model Estimation Results

The panel data regression model used for this study is formulated as follows, with sentiment, illiquidity and volatility as the main independent variables hypothesized to affect *stock returns, and the size of the company acting as the control variable.*

$$\mathbf{RETURN}_{it} = \beta 0 + \beta 1 SENT_{it} + \beta 2 ILLIQ_{it} + \beta 3 VOLT_{it} + \beta 4 SIZE_{it} + \varepsilon_i$$

Testing on the EViews application was carried out using *the Fixed Effect Model* (FEM) with *White diagonal standard errors*, which functions to correct the standard *error* level for each coefficient without changing the value of the coefficient itself. Thus the results of the significance of the research model obtained are more reliable.

Table 7 FEM estimation results with *White diagonal standard errors*.

Variable	Coefficient	*Std. Error*	t-*Statistic*	Probability
C	-0.109334	0.017743	-6.1622	0.0000
Sentiment	-0.000305	0.000245	-1.2470	0.2124
Illiquidity	0.014935	0.015324	0.9746	0.3298
Volatility	0.035620	0.024647	1.4452	0.1484
Size	0.003873	0.000636	6.0903	0.0000

Source: Data processed by the author, 2026.

Based on 7, the constant is at -0.109334. Every increase in one unit of sentiment (SENT), is associated with a decrease in *return* of 0.000305. Every increase in one unit of illiquidity (ILLIQ) is associated with an increase in the *return* of 0.014935. Meanwhile, an increase in volatility (VOLT), can increase *returns* by 0.035620. For the control variable, namely company size (SIZE), the increase was associated with an increase in stock return of 0.003873.

To find out which variables, whose influence can be statistically trusted, the information is presented in the probability column. Based on the information obtained in the column from the test results, only one variable; the control variable namely *company size*, was below the significance threshold of 5% (0.05). The three main independent variables all exceeded the threshold: *sentiment* at 0.2124, *illiquidity* at 0.3298, and *volatility* at 0.1484. Therefore, only company size is confirmed to have a significant influence on stock *returns*, while none of the three hypothesized non-fundamental variables shows a statistically reliable effect.

Table 8 Model feasibility statistics.

Statistics Model	Value
R-squared	0.024912

Adjusted R-squared	0.008250
F-statistic	1.495149
Prob(F-statistic)	0.0000000020
Durbin-Watson stat	2.015597

Source: Data processed by the author, 2026.

Testing was also carried out to ascertain how the research model used could explain the overall movement *of stock returns*. Based on the model statistics shown in Table 8, the *R-squared* value of 0.024912 indicates that sentiment, illiquidity and volatility, with company size as the control variables, were only able to explain 2.49% of the variation in stock returns, while the other 97.51% were driven by other factors not included in the scope of this study. Meanwhile, the *F-statistic* test result of 1.495149, with a probability of 0.0000000020, is well below the 5% threshold. This means that overall this model remains significant overall. Lastly, the *Durbin-Watson stat* value was obtained at 2.015597. This number is used to find out if there is an indication of autocorrelation between variables, which can result in the test's statistical value being invalid or biased. Because this value, very close to the number 2 which is the ideal reference for the existence or absence of autocorrelation, (Hossain, S., 2024:253), it can be concluded that the research model used is free from autocorrelation problems.

Classic Assumption Test on Selected Models

Normality Test

The results of the normality test presented in Table 9 show that the value of Jarque-Bera is 169,881.90 with a probability of 0.000000. This value is well below the threshold of 0.05, so H0 is rejected and the residual is declared not to be normally distributed. To understand the cause, it can be seen from two supporting measures, namely *skewness* of 1.569945 which indicates a residual distribution that tends to be right-skewed, while kurtosis of 16.090010, far above the value of 3 which is the reference for the normal distribution, indicates the presence of a *fat tail*, which is a condition in which there are more extreme values than should occur in the normal distribution. These findings are in line with the results of the identification *of outliers* in the research data with the Eviews application, where 417 out of 22,500 observations (1.853%) had standard residual that was outside the range ±3, and these conditions were spread across 213 of the 375 stocks selected for the sample. In other words, this residual abnormality reflects the presence of a number of extreme observations spread across the various stocks that were the study sample, and not just concentrated on a few specific stocks.

Although the assumption of normality is not met, this does not mean that the results of the study are unreliable. The principle *of the Central Limit Theorem*, which states that the greater the amount of data used, the closer the resulting estimate will be to the ideal condition (Hossain, S., 2024 and Baltagi, B.H., 2021), regardless of the form of data distribution itself. This study used 22,500 observations throughout the 2021-2025 period, which is relatively large for panel data, so based on this principle, the results of the estimated coefficient are still statistically reliable even though the residue is not normally distributed. In other words, this violation of the assumption of normality is more due to the large-scale financial data used, and does not reduce the validity of the research conclusions.

Table 9 Normality test results.

Statistics	Value
Jarque-Bera	169,881.90
Probability	0.000000
Skewness	1.569945
Kurtosis	16.090010

Source: Data processed by the author, 2026.

Heteroscedasticity Test

The heteroscedasticity test for this study uses the Glejser Test which is run on the EViews application, which is a method that regresses the absolute value of the residual to each independent variable in the research model (Hossain, S., 2024). If the residual variation can be significantly explained by one of the independent variables, it is a sign that the error variance in this research model is not constant (heteroscedastic), and the variable is the main source of driving the dependent variable. If a model that assumes constant variance remains run on data containing heteroscedastis, the conclusions produced by the research model become unreliable.

Based on the results obtained in Table 10, of the five variables tested, illiquidity and volatility had probability numbers below 0.05 (0.0396 and 0.0000, respectively), while sentiment (0.0555), company size (0.1523), and constant (0.8858) were all above these thresholds. From these results, it can be concluded that of all the independent variables and one control variable in the model, illiquidity and volatility can significantly explain the absolute residual variation, so that heteroscedasticity in this model can be concluded to be sourced from these variables.

This condition is due to the nature of stock volatility which is naturally a large prediction deviation compared to stocks that tend to be stable, and to the wide variation in illiquidity levels across market capitalization categories. This finding is in line with the nature of these two variables. To overcome the heterokedasticity condition found from the tests carried out, this study has applied *White diagonal robust standard errors* to the final model estimation. The purpose of this application is so that *standard errors* (uncertainty of the value of the coefficient) and *p-value* (probability that determines the significance of a variable) can be corrected more accurately, without changing the value of the coefficient that determines the direction of the influence of independent variables on the dependent variables in this study.

Table 10 Results of heteroscedasticity test (Glejser test).

Variable	Coefficient	Prob.	Significant?
C	-0.000456	0.8858	No
Sentiment	-0.000329	0.0555	No
Illiquidity	0.014693	0.0396	Yes
Volatility	0.606368	0.0000	Yes
Size	0.000160	0.1523	No

Source: Data processed by the author, 2026.

Autocorrelation Test

The autocorrelation test was carried out using the EViews application. In general, a result is considered ideal when it is close to 2, while a value far from 2 (close to 0 or close to 4) indicates a positive or negative autocorrelation. Based on the results of the model estimation test in Table 8,

a Durbin-Watson value of 2.015597 was obtained, which is very close to the value of 2. This shows that there are no significant indications of positive or negative autocorrelation in the residual model. Therefore the assumption of non-autocorrelation has been fulfilled (Hossain, S., 2024:231).

Robustness Test

Due to the extreme observations identified in the normality test, this study conducted a *robustness* test to ensure that the estimated results obtained were not driven by a small amount of data with unreasonable values. This test is done by *winsorizing*, which is a process that converts extreme values, both at the upper and lower end of the distribution, into values at a specific percentile limit (in this study the 1% and 99% percentiles), so that extreme observations are not removed from the data, but are adjusted so that they do not become too extreme, and still retain the information that the observations are among the highest or lowest in the sample. *Winsorizing* was chosen as a *robustness method* for two reasons, the first is to prevent the disproportionate influence *of outliers* on the results of statistical analysis, and the second is to keep parameter estimation (such as regression coefficients) stable and consistent when the study is repeated with other samples. Before conducting *the winsorizing* process, this study first ensured that the extreme observations identified (417 out of 22,500 observations and spread across 213 out of 375 stocks taken as samples) were not created due to data recording errors, but real representations of the phenomenon of stock price movements that can produce extreme values.

Table 11 Comparison of the results of the estimation of the winsorizing *process*.

Variable	Original Coefficient	*Winsorized Coefficient*	Prob. (Original)	Prob. (Winsorized)
Sentiment	-0.000305	-0.000470	0.2124	0.0255
Illiquidity	0.014935	0.012398	0.3298	0.5813
Volatility	0.035620	0.004616	0.1484	0.8047
Size	0.003873	0.003752	0.0000	0.0000

Source: Data processed by the author, 2026.

Table 11 shows that the winsorizing process leaves the model's overall conclusions intact, although the direction and significance pattern do not remain fully consistent across all variables. Sentiment was not significant in the original estimation (coefficient -0.000305, probability 0.2124), but became significant after winsorizing, with the coefficient increasing in magnitude from -0.000305 to -0.000470, an increase of about 54%, and the probability decreasing from 0.2124 to 0.0255. Illiquidity remained not significant in either condition, with the coefficient's magnitude decreasing by about 17%, from 0.014935 to 0.012398 while retaining its positive sign, and the probability increasing from 0.3298 to 0.5813. Volatility also remained not significant, with the coefficient decreasing from 0.035620 to 0.004616, a sharp decrease of about 87%, and the probability increasing from 0.1484 to 0.8047. Finally, size as a control variable still had a significant positive effect, with the coefficient decreasing from 0.003873 to 0.003752, a decrease of about 3%, and the probability remaining close to 0.0000. The consistency of direction and significance for size, together with the stability of the null result for illiquidity, indicates that these two estimates are not artifacts of extreme observations. The volatility result, by contrast, appears highly sensitive to extreme observations, and the sentiment result should be treated cautiously

given that its significance only emerges after winsorizing rather than being present in the primary specification. Thus, the robustness testing confirms that firm size remains the most reliable estimate in the model, while none of the three hypothesized non-fundamental variables proves statistically robust.

Hypothesis Testing

Simultaneous Test (F Test)

The simultaneous test (F test) was carried out to test the influence of the three independent variables (sentiment, illiquidity, and volatility), along with the control variable (company size), simultaneously on the dependent variable in this study, namely stock returns. Based on the results of the tests carried out with the EViews application, an *F-statistic* number of 1.495149 was obtained with a probability of 0.0000000020. The probability value is well below the 5% threshold, so it can be concluded that H0, i.e. that the three independent variables and the control variable have no effect on returns, is rejected.

Table 12 Results of simultaneous test (F test).

Statistics Model	Value
F-statistic	1.495149
Prob(F-statistic)	0.0000000020

Source: Data processed by the author, 2026.

Partial Test (t-test)

Partial testing was conducted using the EViews application on three main independent variables that are hypothesized to affect the *return of* non-LQ45 stocks for this study, namely sentiment, illiquidity, and volatility. These three hypotheses are formulated in a specific direction. Sentiment and illiquidity are predicted to have a positive effect on the return of non-LQ45 stocks, while volatility is predicted to have a negative effect on the return of non-LQ45 stocks. A hypothesis is acceptable if it meets two conditions at once, namely statistically significant (probability below 0.05) and the direction of the coefficient is in accordance with the predicted. If the direction of the coefficient turns out to be the opposite of the prediction, the hypothesis is declared rejected, even though it is statistically significant.

Table 13 Summary of partial hypothesis test results.

Hypothesis	Variable	Results	Coefficient	Probability
H1	Sentiment	Negative	-0.000305	0.2124
H2	Illiquidity	Positive	0.014935	0.3298
H3	Volatility	Positive	0.035620	0.1484

Source: Data processed by the author, 2026.

Table 13 shows that none of the three hypothesis test results was both correctly signed and statistically significant, though the pattern differs by variable. Sentiment (H1) was predicted to be positive, but the results obtained were negative and not significant (coefficient -0.000305; probability 0.2124), so H1 was rejected on both direction and significance. Illiquidity (H2) was predicted to have a positive effect, and the test results obtained were indeed positive, but the effect was not significant (coefficient 0.014935; probability 0.3298), so H2 was rejected on significance alone. Volatility (H3) is predicted to have a negative influence on stock returns, but the test results

obtained are positive and not significant (coefficient 0.035620; probability 0.1484), so H3 is also rejected on both direction and significance.

Table 14 Results of estimation of control variables.

Control variable	Coefficient	Probability	Significance
Size	0.003873	0.0000	Significant (Positive)

Source: Data processed by the author, 2026.

In addition to the three independent variables that have been tested, company size is also included in the model, but it acts as a control variable, not an independent variable that is hypothesized to affect stock returns. The role of the control variables here is to ensure that the influence of sentiment, illiquidity and volatility on *the returns* of non-LQ45 stocks is not biased due to differences in company size between stocks, which are measured using market capitalization. Table 14 shows that the size of the firm has a positive and significant effect on *returns* (coefficient 0.003873; probability 0.0000).

The Effect of Sentiment on *Non-LQ45 Stock* Returns

Sentiment has not been proven to have a significant effect on the return of non-LQ45 stocks, with a coefficient value of -0.000305 and a probability value of 0.2124. Because H1 is formulated with a positive direction, while the test results show a negative and insignificant direction, H1 is rejected on both direction and significance. This H1 rejection does not completely contradict prior empirical evidence on investor sentiment. Gebka (2025), using quantile regression on U.S. stock market data from 1973 to 2018, found that investor sentiment and informed-trading intensity are the primary factors explaining the causal pattern between trading volume and returns, with high trading volumes triggered by investor sentiment consistently followed by price reversals in subsequent periods. Similarly, Li et al. (2024), studying U.S. stocks from 1970 to 2020, found that extreme abnormal trading volumes produced positive returns in the short term but turned negative in the long term as mispricing was corrected. Krystyniak et al. (2025), studying 3,955 U.S. companies from 2015 to 2017, added that this reversal effect is strongest in small and young stocks that are difficult to assess, characteristics relevant to the non-LQ45 stocks targeted here. Since the sentiment variable in this study is measured through a PCA composite of trading volume and turnover, a proxy for transaction intensity rather than market optimism, the spike in sentiment value likely reflects episodes of high trading activity that tend to be followed by price corrections. Thus, although not statistically significant, the negative relationship found here is directionally consistent with the overreaction and price reversal mechanism, rather than the bull market argument underlying H1's positive prediction.

The Effect of Illiquidity on Non-LQ45 Stock Returns

Illiquidity was not proven to have a significant effect on the return of non-LQ45 stocks (coefficient 0.014935; probability 0.3298). H2 is rejected due to statistical insignificance, even though the coefficient's direction matches the hypothesis. Amihud (2002), whose illiquidity ratio underlies the ILLIQ proxy used here and who examined the illiquidity-return relationship on NYSE data from 1963 to 1997, argues that investors demand higher compensation for illiquidity risk, an argument this study's positive coefficient is consistent with. However, this pattern is not always consistent across markets. Closer to this study's setting, Widianingsih & Setiawan (2022)

using fixed-effect panel regression on 499 IDX-listed stocks from 2017 to 2019, find that high illiquidity in the Indonesian market is more closely tied to a poor information environment than to a liquidity risk premium compensated linearly through returns. The 2021 to 2025 period examined here also spans differing market conditions, from post-pandemic recovery in early 2021 to the sharp shock of April 2025. Paul et al. (2025), using time-series regression with endogenous structural break tests on U.S. data from July 1999 to June 2022, find that illiquidity's effect can reverse with market conditions: unexpected illiquidity is significantly negative throughout, while anticipated illiquidity is negative during crises but positive in normal periods. Mixing these regimes within a single estimation window may cause the illiquidity effect to average out toward insignificance rather than reflecting the absence of any underlying relationship.

The Effect of Volatility on Non-LQ45 Stock Returns

Volatility shows the same direction as illiquidity, positive, but contrary to the hypothesized direction. Based on the tests carried out, volatility was not proven to have a significant effect on stock returns, with a coefficient value of 0.035620 and a probability value of 0.1484. Because H3 is formulated with a negative direction, while the test results show a positive and insignificant direction, H3 is rejected on both direction and significance.This rejection is not without theoretical grounding. The literature identifies two opposing directions for the volatility-return relationship, and the positive coefficient obtained here, though insignificant, points toward one of them. Çam et al. (2024), using Fama-MacBeth two-stage cross-sectional and dynamic panel regressions with GARCH/EGARCH volatility measures on 202 Borsa Istanbul stocks from January 2010 to June 2023, find that idiosyncratic risk has a positive and significant effect on returns, while aggregate market volatility has a negative effect. Because VOLT in this study is measured as the monthly standard deviation of daily returns per stock, a measure conceptually closer to idiosyncratic risk at the individual-stock level than to aggregate market volatility, Çam et al.'s idiosyncratic-risk finding offers a more relevant benchmark for the direction obtained here.

Saraf & Kayal (2023) reinforce this argument through quintile sorting across multiple risk proxies on 362 NIFTY500 constituents in India for 2010-2020, finding that while the volatility-return relationship is generally negative, downside semi-variance-based risk measures produce a positive relationship. This indicates that the sign of this relationship is sensitive to how risk is measured. Volatility in this study can be viewed as reflecting trading intensity and stock-specific risk among the sampled non-LQ45 stocks, and the weak positive direction obtained may point to a pattern similar to the idiosyncratic-risk findings above. In the Indonesian context, Widianingsih & Setiawan (2022) examine whether idiosyncratic volatility reflects price informativeness or mispricing, using fixed-effect panel regression on 499 IDX-listed firms for 2017-2019, and find that idiosyncratic volatility is linked to the quality of the information environment and the degree of information asymmetry in the market. In emerging markets such as Indonesia, individual stock volatility does not always signal higher risk but can also reflect price adjustment to available information, a pattern consistent with the characteristics of the non-LQ45 stocks examined here and offering one explanation for the insignificant positive coefficient obtained. The Glejser test (Table 10) identifies volatility as the model's dominant source of heteroskedasticity, alongside

illiquidity, which contributes significantly but to a smaller degree. Consistent with this, volatility's result is also the most sensitive to robustness correction. Its coefficient falls sharply under winsorizing, from 0.035620 to 0.004616, about 87 percent, with the probability moving further from significance, from 0.1484 to 0.8047 (Table 11).

The Role of Company Size as a Control Variable

Firm size was included in this model as a control variable rather than a main independent variable hypothesized to affect non-LQ45 stock returns. It is proxied by the market capitalization of the sampled stocks, with the goal of controlling firm size's potential influence on returns so that the estimated effects of sentiment, illiquidity, and volatility are not biased by differences in company scale across the sample. The estimation results show that firm size has a positive and significant effect on non-LQ45 stock returns, with a coefficient of 0.003873 and a probability close to zero (Table 7). Pasaribu & Nugroho (2023), using multiple regression with a moderation test on 46 IDX issuers from 2018 to 2021, similarly find a positive effect of firm size on stock returns, consistent with this result. However, other studies suggest the relationship is not always consistent in direction. Diantimala et al. (2021), using fixed-effect panel regression on 234 non-financial IDX firms (1,638 firm-year observations) from 2012 to 2018, find that firm size negatively moderates the effect of capital structure on firm value: smaller, more indebted firms show higher firm value, while larger, more indebted firms show lower value, a contrasting pattern to this study's result. Wybawa et al. (2026), combining Data Envelopment Analysis with Generalized Estimating Equations on 27 Indonesian stocks from 2019 to 2023, find a significant negative effect of firm size on stock returns during crisis periods, the opposite direction from what is found here. These differing findings suggest the size-return relationship is sensitive to market context, study period, and interaction with other variables, so the consistent positive result here should be understood as specific to non-LQ45 stocks on the IDX during 2021 to 2025, rather than universal. This is reinforced by the robustness test: winsorizing (Table 11) leaves firm size's direction and significance unchanged, with the coefficient declining only slightly, from 0.003873 to 0.003752, and the probability remaining close to zero, indicating a genuinely consistent pattern. As a control variable, this consistency strengthens the model's validity in isolating the effects of sentiment, illiquidity, and volatility.

Discussion of Simultaneous Results

The results of the F test presented in Table 12 show that sentiment, illiquidity and volatility, together with company size as control variables, simultaneously have a significant effect on the return of non-LQ45 stocks with an F-statistic of 1.495149 and a probability value of 0.0000000020. The significance of the simultaneous test that was maintained even though the partial results showed a pattern that did not match the prediction indicates that non-fundamental factors, as discussed above, did play a role in shaping the return of non-LQ45 stocks on the IDX. This condition is consistent with the argument that the assumption of the Efficient Market Hypothesis does not fully apply on the IDX. Faisal et al. (2022), using unit root (ADF) tests, serial correlation tests, and linear regression on daily IHSG closing prices from 2011 to 2021, find mixed

evidence: unit root tests support weak form efficiency, while serial correlation and regression tests show higher partial inefficiency before the COVID-19 pandemic than during it. Budiarso and Pontoh (2022), using runs tests and variance ratio tests on 755 IDX firms across the first half of 2022, similarly find that portfolio return movements are not random, rejecting weak form market efficiency on the IDX during that period. Together, these findings confirm that the price movements of non-LQ45 stocks are influenced by a combination of several factors that are more complicated than can be explained by a few variables alone. The low R-squared value (2.49%) also confirms that although the three independent variables, namely sentiment, illiquidity, and volatility, with company size as the control variable, do contribute to explaining the movement of non-LQ45 stock returns in the 2021-2025 period, but the portion of variation explained through these variables tends to be relatively small compared to other factors outside the research model, such as macroeconomic conditions, market sentiment that was not fully captured by the proxy used to measure sentiment, or the specific characteristics of individual stocks that were not observed in this study.

Research Limitations

This study has several limitations to consider when interpreting the findings. First, the residual model does not fully satisfy the normality assumption: 417 of 22,500 observations (1.853%) were identified as outliers due to extreme values, spread across 213 of the 375 sampled stocks. While the large number of observations keeps coefficient estimates consistent, these extreme observations indicate that some non-LQ45 stocks experience price movements difficult to explain through a simple linear model.

Second, the R squared value obtained from this model is low, at 2.49%. Most of the variation in non-LQ45 stock returns is explained by factors outside the model, such as macroeconomic conditions, government policy, market maker decisions, or unobserved firm specific characteristics that this study did not identify or test. Third, the sentiment variable is measured only through a composite of trading volume and share turnover ratio, excluding other sentiment sources that also influence stock movements, such as media coverage or social media discussion, which could help shape investor perception of non-LQ45 stocks. A related limitation applies to volatility: although not proven to have a significant effect in this study, its coefficient shows high sensitivity to robustness correction, shrinking sharply by 87% under winsorizing. This indicates that the volatility finding should be understood as preliminary and in need of further testing in future research.

Finally, the 2021 to 2025 study period spans fairly diverse market conditions, from the post pandemic recovery phase in early 2021 to the sharp shock to IDX stability in April 2025. Mixing these varied conditions within a single study period may have prevented the effects of sentiment, illiquidity, and volatility from being captured with precision. The results obtained likely reflect an average across differing market conditions rather than a pattern that holds consistently under any single specific condition, a factor that may have contributed to the insignificance of all three independent variables at the partial level in this study.

Conclusion

Based on the results of the testing and discussion, this study concludes that non-fundamental factors played a role in shaping the returns of non-LQ45 stocks listed on the Indonesia Stock Exchange during 2021 to 2025, using 375 stocks as the final sample, although none of the three hypothesized variables showed a significant partial effect. Investor sentiment (SENT) was not significant, with a negative coefficient contrary to the hypothesized positive direction, so H1 is rejected on both direction and significance; the negative direction is nonetheless directionally consistent with an overreaction mechanism, though too weak to be detected significantly across the sample. Illiquidity (ILLIQ) was also not significant, so H2 is rejected on significance alone, though its positive coefficient matches the hypothesized direction and Amihud's (2002) theory, consistent with studies finding the illiquidity premium inconsistent across market conditions. Stock volatility (VOLT) was not significant either, with a positive coefficient contrary to the hypothesized negative direction, so H3 is rejected on both grounds; its coefficient also shrinks sharply under winsorizing, indicating the result is fragile and substantially driven by extreme observations rather than simply insignificant. Based on the simultaneous test, sentiment, illiquidity, and volatility, together with firm size, jointly and significantly affect non-LQ45 stock returns, so H4 is accepted even though none of the three independent variables is significant individually. Firm size itself shows a significant positive effect and is the only variable that remains stable across all robustness tests. Overall, non-fundamental factors do play a role in shaping non-LQ45 returns collectively, but the influence of each factor individually, given the proxies used, is weak and requires a more contextual explanatory framework tailored to the Indonesian capital market.

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