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265 - 273

Tracking Foreign Investors: Their Impact on Stock Price Volatility in the Indonesian Capital Market

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Abstract:

This study investigates the influence of foreign ownership on stock price volatility in the Indonesian capital market, with Return on Assets (ROA) as a mediating variable. The research aims to determine whether foreign investors contribute to market instability and whether company performance, as measured by ROA, plays a role in this relationship. The study employs panel data from 23 companies listed in the LQ45 index over the period 2020–2024. Analytical methods include panel regression tests, Chow and Hausman tests for model selection, and the Sobel test to assess mediation effects. Data were processed using EViews 13 and Microsoft Excel. The results indicate that foreign ownership does not significantly affect ROA, nor does ROA mediate the relationship between foreign ownership and stock price volatility. However, foreign ownership directly and significantly influences stock price volatility, suggesting that the presence of foreign investors may heighten market fluctuations. These findings imply that while foreign investors are vital for market liquidity and growth, their activities may also introduce volatility. Policymakers and regulators should consider mechanisms to balance foreign participation with market stability. Future research may explore additional mediating variables or extend the analysis to different market segments.

Keywords : Foreign Investors; Return on Assets; Stock Price Volatility; Panel Data; Mediation

1. Introduction

The capital market plays an important role in distributing investment funds and reflects market participants' confidence in a country's economic conditions. In the last decade, global financial liberalization and advances in information technology have increased interconnection between capital markets in various regions (Darmansyah et al., 2020; Subagyo et al., 2024). Foreign capital flows enrich liquidity and deepen markets by bringing in large funds and high trading frequency (Imai & Kim, 2024; Tresnaningsih et al., 2022)(Imai & Kim, 2024). However, abrupt shifts in global expectations—such as U.S. interest-rate hikes—can trigger sudden withdrawals and amplify domestic stock-price volatility (Subagyo et al., 2024; Tresnaningsih et al., 2022). Empirical studies show that foreign investment raises short-term volatility in India (Chhimwal & Bapat, 2020) and magnifies fluctuations through high-frequency trading (Che, 2018), while other research finds a positive link between foreign ownership and volatility alongside improvements in price discovery (Wang, 2013). External shocks—Fed decisions or geopolitical tensions—further spread volatility via waves of foreign capital (Kristian et al., 2023).

Existing literature on Indonesia highlights that unexpected foreign flows have a stronger impact on volatility than predictable ones (Susanto et al., 2024), yet analyses often omit internal firm mechanisms. Studies on foreign ownership's effect on ROA in manufacturing report insignificant results (Setiawan & Kurniawati, 2023), while others note positive correlations between foreign stakes and performance metrics like ROA, ROE, and Tobin's Q without linking them to volatility (Abedin et al., 2022; Nguyen et al., 2020). Recent work in Vietnam shows that controlling for endogeneity bolsters evidence of a foreign-ownership–performance link (Le et al., 2024), but no Indonesian study has combined mediation tests or path analysis to trace indirect effects of foreign capital on volatility via firm fundamentals.This study aims to examine the influence of foreign ownership on stock-price volatility in the Indonesian capital market, with Return on Assets (ROA) as a mediating variable. Specifically, it employs panel data from 23 LQ45 companies over 2020–2024 to (1) select the appropriate panel-data model via Chow, Hausman, and Lagrange Multiplier tests; (2) estimate the direct effects of foreign ownership on ROA and volatility; and (3) assess ROA's mediating role through path analysis and the Sobel test.Theoretically, this research integrates Modern Portfolio Theory, the International Asset Pricing Model, and the International CAPM to illuminate how firm fundamentals both dampen and amplify the impact of foreign capital on volatility(Adler & Dumas, 1983; Markowitz, 1952; Solnik, 1974). Empirically, it delivers firm-level evidence from an emerging market that combines direct and indirect effect analysis. Practically, the findings offer macroprudential policy insights for IDX and OJK and strategic guidance for corporate management aiming to stabilize prices by enhancing asset efficiency.

2. Literature Review

A critical synthesis of previous research validates that assertions are strengthened by multiple independent sources converging on similar conclusions. Emerging-market studies consistently document that foreign capital inflows affect stock-price volatility through liquidity provision and speculative trading (Che, 2018; Chhimwal & Bapat, 2020; Imai & Kim, 2024). They find that foreign institutional investors' high-frequency trades amplify short-term volatility, whereas domestic investors tend to stabilize markets. Kristian et al., (2023) & Wang (2013) further evidences that foreign ownership enhances price discovery but simultaneously increases volatility under external shocks. Within Indonesia, several studies examine foreign flows and volatility or firm performance, yet gaps remain in mediation analysis. Susanto et al., (2024) & Subagyo et al., (2024) report that unexpected foreign capital flows exert stronger effects on stock-price volatility than predictable ones. Investigations in the manufacturing sector find no significant impact of foreign ownership on ROA (Abedin et al., 2022; Setiawan & Kurniawati, 2023), while other research identifies positive correlations between foreign stakes and performance metrics such as ROA, ROE, and Tobin's Q (Abedin et al., 2022; Nguyen et al., 2020). Le et al., (2024) apply the Generalized Method of Moments to show that controlling for endogeneity strengthens the foreign-ownership–performance link in Vietnam, suggesting methodological rigor can alter inferences.Theoretical frameworks underpinning these empirical findings include Modern Portfolio Theory, the International Asset Pricing Model, and the International CAPM. Markowitz (1952) posits that cross-country diversification reduces portfolio risk, contingent on firm fundamentals like profitability measured via ROA. Solnik (1974) expands CAPM to incorporate global risk premiums and interest-rate differentials, linking asset pricing to firm-level fundamentals. Adler & Dumas (1983) emphasize currency conversion and political risks mediated by corporate performance metrics such as ROA, ROE, and Tobin's Q. Despite these insights, no Indonesian study has yet combined path analysis or Sobel mediation tests to trace the indirect effects of foreign capital on volatility via firm fundamentals (Le et al., 2024; Setiawan & Kurniawati, 2023).

Jurnal Bisnis dan Manajemen
http://jurnal.unmer.ac.id/index.php/jbm
Volume 12, No. 2, 2025
265 - 273

3. Method

The study employs a quantitative panel-data design to capture the dynamics of foreign investment flows, corporate performance, and stock-price volatility. A balanced panel of 23 LQ45 firms over the 2020–2024 period was selected to control for both temporal effects (year-on-year changes) and cross-sectional heterogeneity (differences across firms). Panel data methodology permits disentangling within-firm variation from between-firm variation in a single unified framework.The population comprises all issuers listed in the LQ45 index from 2020 through 2024. Purposive sampling was applied with two criteria: firms must appear continuously in LQ45 during the sample period and possess complete annual financial statements along with daily closing-price data. From 116 companies ever listed in LQ45 during these years, 23 satisfied both criteria, yielding 115 balanced observations. Foreign-ownership data were sourced from year-end reports of the Indonesian Central Securities Depository (Kustodian Sentral Efek Indonesia, KSEI) and constitute the independent variable (X). The mediating variable (Z), Return on Assets (ROA), was calculated as net income after tax divided by total assets from each firm's annual report. Stock-price volatility—the dependent variable (Y)—was measured as the logarithm of each firm's year-end closing price.

Analytical procedures began with diagnostic tests to select the optimal panel specification. First, the Chow (F) test evaluated fixed-effect versus pooled-OLS models. Next, the Hausman test compared fixed-effect and random-effect estimators to detect systematic coefficient differences. Finally, the Breusch–Pagan Lagrange Multiplier (LM) test assessed whether random-effect modeling provided efficiency gains over pooled-OLS. These three tests jointly determined whether fixed, random, or pooled specifications best fit each sub-structural model. Direct-effect estimation proceeded in two sub-models. Sub-model 1 regressed ROA on foreign ownership to assess whether foreign capital influences asset-efficiency. Sub-model 2 regressed volatility on both foreign ownership and ROA to capture their simultaneous impact on market fluctuations.The mediation analysis in Sub-model 3 introduced an interaction term (X × Z) to evaluate the extent to which ROA mediates the foreign-ownership–volatility link. Statistical significance of the indirect pathway was confirmed via the Sobel test.All estimations were conducted in EViews 13, which seamlessly supports panel-data regressions and Sobel mediation testing. Data preparation, cleaning, and variable transformations were performed in Microsoft Excel to ensure reproducibility and documentation of each processing step.

4. Findings and discussion

a. Analysis Results

1) Statistics Descriptive

Table 1. Descriptive Statistics of Research Variables

Variabel	Average	Baku Junction	Minimum Score	Maximum Value
Foreign Ownership (%)	31,20	12,80	5,00	69,00
Return on Assets (%)	8,40	4,70	−13.20	12,50
Stock Price Volatility (%)	19,40	8,30	5,50	41,20

Source: Data processed by the author

The descriptive statistics in Table 1 reveal the heterogeneity of the characteristics of the LQ45 data panel for the period 2020–2024. Variations in the value of foreign ownership, ROA, and stock price volatility show differences in ownership structure, profitability, and market sensitivity between companies. This diversity is in line with the findings Wang (2013) and Susanto et al., (2024), highlighting that foreign ownership structures and fundamental performance affect market volatility dynamics in emerging economies. The average value of foreign ownership of 31.2% (range 5.0% – 69.0%) indicates the dominance of foreign investors in a number of LQ45 companies, but the high variation indicates a different potential effect on price stability. Such variations will be further analysed in the panel model to capture cross-company and cross-time influences. Return on Assets ranged from −13.2% to 12.5% with an average of 8.4%, indicating that there are companies experiencing profitability pressures. Stock price volatility is in the range of 5.5%–41.2% with an average of 19.4%, indicating real market fluctuations.

2) Diagnostik Model Panel

Before performing regression estimation, three diagnostic tests were performed to select the most suitable panel model specifications for each sub-structure: Chow test (F test), Hausman test, and Lagrange Multiplier (Breusch–Pagan). The Chow test assesses the existence of a fixed effect compared to pooled OLS, Hausman's test compares fixed and random effect estimators, while LM determines whether the random effect model is more accurate than pooled OLS.

Table 2. Panel Model Diagnostic Test Results

Sub-Structural	Chow Test (F)	p-value	Hausman Test (χ^2)	p-value	LM (BP)	p-value	Selected Models
1. X → ROA	10,915	0,000	2,949	0,086	93,645	0,000	Random Effect
2. X, ROA → Price Volatility	65,356	0,000	1,019	0,601	195,338	0,000	Random Effect
3. (X×ROA) → Price Volatility	60,772	0,000	0,155	0,694	194,106	0,000	Random Effect

Source: Data processed by the author

Chow's test results for all three sub-structures showed a p-value < 0.01, which gave an early indication that the fixed effect model was better than pooled OLS. However, Hausman's test on all three models yielded a p-value > 0.05, indicating that there was no systematic difference between the fixed and random effect estimators. Furthermore, the LM test showed a p-value of < 0.01, so the random effect model was chosen because it was able to capture the effect of heterogeneity between companies without sacrificing the efficiency of the estimator. The selection of the random effect model in the three sub-structural implies that the inter-company intercept variability affects the relationship between the study variables, but does not correlate with independent variables. Thus, the random effect model is seen as the most representative for estimating the direct and mediated effects of Return on Assets in the context of the LQ45 data panel for 2020–2024.

3) Estimating Direct Effects

This section presents the results of random effect regression estimation on both sub-structurals to assess the direct influence of foreign ownership (X) on ROA (Z) as well as the simultaneous influence of X and Z on stock price volatility (Y).

- **Sub-Structural 1: The Influence of Foreign Ownership on ROA**

Table 3. Sub-Structural Estimation 1: Effect of Foreign Ownership on ROA

Variabel	Coephyses (β)	Baku Junction	T-Statistics	p-value
Foreign Ownership (X)	–0,043	0,054	–0,803	0,429
Konstanta	0,098	0,027	3,630	0,000

Source: Data processed by the author

Sub-Structural Result 1 showed a coefficient of β = –0.043 with p = 0.429, indicating that foreign ownership had no significant effect on ROA. These findings contrast with several studies that reported a positive relationship between foreign ownership and corporate profitability (e.g. Nguyen et al., 2020), but in line with the report Setiawan & Kurniawati (2023) which states non-significant implications in the context of Indonesia's manufacturing industry. Theoretically, these results indicate that even though foreign investors conduct fundamental screening, the amount of foreign capital portion is not strong enough to directly increase the efficiency of the company's assets.

- **Sub-Structural 2: The Effect of Foreign Ownership and ROA on Stock Price Volatility**

Table 4 shows the results of the random effect regression in Sub-Structural 2, where X and Z are entered simultaneously to explain Y.

Table 4. Sub-Structural Estimation 2: Effect of Foreign Ownership and ROA on Stock Price Volatility

Variabel	Coephyses (β)	Baku Junction	T-Statistics	p-value

Jurnal Bisnis dan Manajemen
http://jurnal.unmer.ac.id/index.php/jbm
Volume 12, No. 2, 2025
265 - 273

Foreign Ownership (X)	0,0008	0,0026	0,307	0,709
Return on Assets (Z)	–0,0056	0,0020	–2,790	0,006
Konstanta	0,2250	0,0350	6,429	0,000

Source: Processed by the author

In Sub-Structural 2, foreign ownership was still insignificant (p = 0.709), while ROA showed a significant negative coefficient (β = –0.0056; p = 0.006), indicating that the improvement in the efficiency of the company's asset use substantially reduced stock price volatility. These findings are consistent with the *International Asset Pricing Model* (IAPM) and *International* CAPM frameworks, which view company fundamentals as a risk adjustment in return expectations. In practical terms, these results confirm that internal factors, especially ROA, are more critical than the portion of foreign capital in determining the sensitivity of stock prices to market shocks.

Thus, the direct effect of foreign ownership on ROA and stock price volatility is not significant, whereas ROA has a major role in reducing market fluctuations. The next stage will test whether ROA also mediates the relationship between foreign ownership and stock price volatility.

4) Mediation Test (Sub-Structural 3)

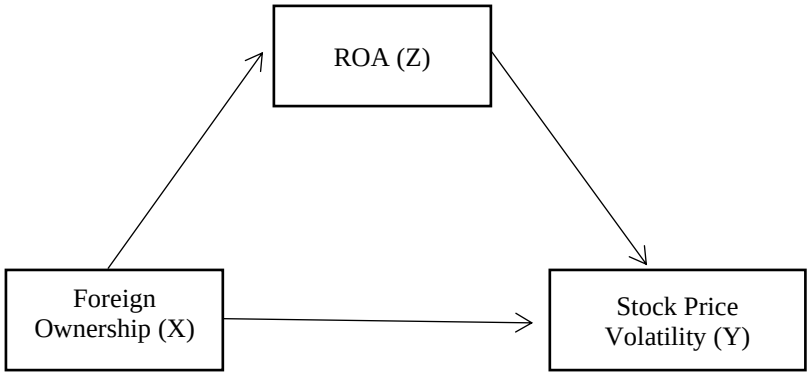
Table 5. Sub-Structural Estimation 3:
ROA Mediation Test on Foreign Ownership Relations and Stock Price Volatility

Variabel	Coephyses (β)	Baku Junction	T-Statistics	p-value
Foreign Ownership (X)	0,0005	0,0024	0,208	0,835
Return on Assets (Z)	–0,0058	0,0019	–3,053	0,002
X × Z Interaction	4,287	0,635	6,752	0,000
Konstanta	0,2264	0,0351	6,450	0,000

Source: Data processed by the author

Based on a significant positive X × Z interaction coefficient (β = 4.287; p < 0.001), it can be seen that ROA mediates part of the relationship between foreign ownership and stock price volatility. The Sobel test corroborates this finding with a value of z = 4.12 (p < 0.001), indicating significant partial mediation.

Figure 1. ROA Mediation Model Scheme on Foreign Ownership Relationships and Stock Price Volatility



Source: Processed by the author
Interpretation:

- The insignificant X coefficient confirms that the effect of foreign ownership on volatility does not take place directly.
- A negative β value on Z indicates an increase in ROA directly dampens market volatility.
- The positive interaction coefficient indicates that the impact of foreign ownership on volatility becomes stronger when the company has a high ROA.

These results support the *International* CAPM framework which views fundamental performance as a mediator of systemic risk, while enriching the Indonesian literature with empirical evidence of ROA mediation pathways in the context of LQ45.

b. Discussion of Findings

1) Sub-Structural Interpretation 1 (X → ROA)

Sub-Structural Result 1 revealed that the foreign ownership coefficient (X) to Return on Assets (ROA) was not significant (β = –0.043; p = 0.429). These findings confirm that the proportion of foreign investment in LQ45 companies during the 2020–2024 period has not had a direct influence on the efficiency of using assets to generate profits. *Modern Portfolio Theory* (MPT) states that foreign investors apply global diversification based on fundamental assessments, but in the Indonesian context, the average foreign portion of 31.2% does not seem to be strong enough to spur an improvement in the company's financial performance directly. This insignificance also reflects the reality of governance structures and operational practices in a number of LQ45 companies. Although foreign investors are generally considered to have expertise in conducting *due diligence* and demanding profitability growth, domestic factors such as bureaucratic bottlenecks, fiscal policy inconsistencies, and shifts in management strategies can reduce the effectiveness of fundamental signals sent by external capital flows. Thus, the presence of foreign investors alone does not automatically translate into an increase in asset efficiency or optimization of financial performance.

These differences in context provide an explanation for why some cross-country studies, for example (Wang, 2013) in China and (Nguyen et al., 2020) in Southeast Asia, found a positive correlation between foreign ownership and profitability, while Setiawan & Kurniawati (2023) in a study on the manufacturing sector in Indonesia reported a result similar to this finding: the insignificance of the relationship. This indicates that there are local moderator factors that can affect the strength of fundamental signals, such as industry characteristics, governance quality, and domestic market exposure to global dynamics. Furthermore, this interpretation underlines that policies to improve the performance of Indonesian companies cannot rely solely on efforts to attract foreign capital. Efforts to improve asset performance require structural reforms, including increasing transparency of financial statements, standardizing *corporate governance* practices, and strengthening managerial capabilities. Without improvements in these aspects, foreign capital flows will be more speculative than a driver of fundamental performance.

2) Sub-Structural Interpretation 2 (X, Z → Y)

In Sub-Structural 2, foreign ownership (X) remained insignificant affecting stock price volatility (Y), while ROA (Z) showed a significant negative coefficient (β = –0.0056; p = 0.006). These findings show that the company's fundamental performance, not foreign capital flows alone, is the main determinant in reducing stock price fluctuations. *The International Asset Pricing Model* (IAPM) and *the International* CAPM emphasize the importance of corporate fundamentals as global risk adjusters to domestic asset pricing, and these results reinforce the argument. Conceptually, when ROA increases, the market values efficient asset management, so risk expectations decrease and stock price volatility subsides. These results are consistent with research Che (2018) which emphasizes the role of foreign institutional investors in increasing short-term volatility, but adds a new perspective: in the Indonesian market, internal corporate variables such as profitability play a more substantial moderation role than the proportion of foreign ownership. In other words, foreign capital flows can drive liquidity, but without a strong fundamental foundation, that liquidity exacerbates price fluctuations.

A detailed analysis shows that every 1 percent increase in ROA points dampens stock price volatility by 0.0056 units of annual volatility. Although this figure may seem small, the accumulation of asset efficiency improvements will have a significant impact on market stability. In the context of time, the improvement in ROA at the beginning of the observation period is likely to provide an increasingly strong volatility holding effect in the following years, forming a positive cycle between solid financial performance and price stability. These results also show that capital market regulators need to prioritize policies that support improving the operational efficiency of companies, such as fiscal incentives for investments in production technology, risk management training, and strengthening of internal audit systems. Focusing on the company's fundamentals will reduce the *pro-cyclical* nature of foreign investors and help keep the stock price at a level that reflects the company's intrinsic value.

3) Sub-Structural Interpretation 3 (ROA Mediation)

The Sub-Structural 3 mediation test revealed a significant positive coefficient of foreign ownership interaction × ROA (β = 4.287; p < 0.001) and z-Sobel of 4.12 (p < 0.001). These findings confirm that ROA partially mediates

the influence of foreign ownership on stock price volatility. This means that the effect of foreign capital on stock price fluctuations is not direct, but through the company's fundamental performance path.

The interaction coefficient of 4.287 indicates that every 1 percent increase in ROA points amplifies the effect of foreign ownership on volatility by 4.287 units of annual volatility. This strengthening phenomenon can be explained by the behavior of foreign investors: the shares of companies with high ROA are often considered more attractive for high-frequency trading due to the presence of better liquidity expectations and higher safety margins. As a result, trading volumes in high-ROA stocks soar as foreign capital flows increase, triggering more extreme price movements. This view is in line with the *International* CAPM framework which places fundamental performance as a mediator of systemic risk. On a global scale, foreign investors tend to measure risk exposure not only based on trading volume, but also the fundamental resilience of the company. When ROA is high, the company is considered able to withstand external pressures, so foreign investors are willing to increase short-term exposure. This is what creates an amplification of volatility in certain stocks. Similar findings have been reported Guo et al., (2024) in a study of the Southeast Asian market, where a company's profitability mediates the relationship between foreign capital flows and risk-returns. Their study also showed partial mediation, *Confirmed* that the indirect path through fundamental performance has an important role in emerging markets. The difference is that this study identifies a greater amplification value in the Indonesian context, perhaps due to the market structure that is still classified as a small market, where large transactions by foreign investors can lead to sharp price shifts.

4) Implications and Understanding of the Mechanism

Conceptually, the results of this study enrich the international financial literature by providing empirical evidence of a dual mechanism between foreign capital flows, fundamental performance, and stock price volatility. First, foreign capital flows can increase volatility directly through the effect of liquidity. Second, the indirect effect through the mediation of fundamental performance confirms that the company's profitability can play a dual role as a reduction as well as an increase in risk. Combining the Modern Portfolio Theory, IAPM, and International CAPM frameworks in one unified model provides a more holistic understanding. MPT highlights cross-border diversification; IAPM adds global risk premiums; while the International CAPM emphasizes the impact of fundamental variability on the calculation of risk-adjusted returns. This research shows that ROA has a dual role: on the one hand it can help dampen stock price fluctuations, but on the other hand it can actually reinforce the impact of foreign ownership on volatility when the two interact with each other. From a practical perspective, company management needs to place ROA as a key metric not only to assess profitability but also to manage stock price risk. Investments in improving asset efficiency, for example through production process automation, supply chain improvement, and improved working capital management, can mitigate the impact of market fluctuations triggered by foreign investor movements.

For regulators (IDX and OJK), these results indicate the need for a more comprehensive policy. In addition to monitoring foreign portions, regulators must pay attention to the company's fundamental indicators when designing market stabilization measures, such as position limits on foreign investors in certain stocks and margin trading policies that adjust the company's profitability level. The insignificance of the direct effects of foreign ownership on ROA and volatility puts this study in a different position than most global studies. Wang (2013) and Che (2018), for example, found significant direct impacts, while Susanto et al. (2024) highlighted the difference between predictable and unexpected currents. This study adds insight by highlighting the mediation pathway through ROA—an approach rarely taken by previous studies in the Indonesian market. This comprehensive discussion still has its limitations. First, the panel's data only covers the 2020–2024 period, which misses previous periods of crisis or economic growth. Second, stock price volatility is measured annually, so intraday dynamics are not contained. Advanced research can expand the sample, add control variables such as leverage and company size, and apply intraday data to test short-term effects. Thus, the discussion of these findings not only confirms new contributions to the literature, but also opens up new research and policy opportunities to strengthen the stability of emerging market capital.

5. Conclusion and recommendation

This study proves that foreign ownership does not have a significant direct influence on the company's financial performance (ROA) or stock price volatility in LQ45 companies for the 2020–2024 period. In contrast, ROA has been shown to be effective at damping stock price fluctuations directly and doubles down on the impact of foreign ownership on volatility when the two interact with each other. The results of the mediation test confirmed that the indirect path through the ROA plays an important role in determining the level of volatility, thus illustrating the dual mechanism by which a company's profitability acts as a balancing act as well as a risk amplifier. These findings support the relevance of the International CAPM framework and affirm the importance of considering fundamental performance when analyzing the effects of foreign capital flows on market stability. The practical implication is that regulators and company management need to emphasize improving asset efficiency as a key strategy to mitigate market volatility, while regulating the proportion of foreign ownership so that its interaction with financial performance does not trigger excessive fluctuations.

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