International Journal of Economic, Finance and Business Statistics (IJEFBS)
Vol. 3 No. 6 2025: 327-334

Predictive Model of the Impact of BI Rate Cuts on LQ45 Stocks in the Indonesia Stock Exchange

Efron Manik
Universitas HKBP Nommensen
Corresponding Author: Efron Manik efmanik@gmail.com

A R T I C L E I N F O

Keywords: BI Rate, LQ45, Stock Market, Delta Gradient, Linear Regression, Exponential Model

Received: 19, October
Revised: 20, November
Accepted: 30, December

A B S T R A C T

This study aims to analyze the response of LQ45 stock prices to four announcements of BI Rate cuts made by Bank Indonesia during the period of May to September 2025 and to develop a prediction model for stock price movements following those announcements. The data consist of daily closing prices observed one week before and one week after each announcement, which were then normalized using the Z-score method. Linear regression gradients before and after the announcements were calculated to obtain the delta gradient as an indicator of the impact of interest rate changes. The results show that the May 2025 announcement generated mixed responses, whereas during the July, August, and September announcements, all LQ45 issuers recorded negative delta gradients. The financial sector emerged as the most sensitive to BI Rate changes, leading to the selection of two issuers with the most stable response patterns as the basis for modeling. The model comparison indicates that the exponential model has lower prediction error than the simple linear regression model, making it more representative in describing stock price responses after the announcements. This study highlights the importance of market expectations in interpreting monetary policy and demonstrates the potential of exponential modeling as a short-term predictive tool in the Indonesian capital market.

DOI: https://doi.org/10.59890/ijefbs.v3i6.239
ISSN-E: 3025-9959
https://dmimultitechpublisher.my.id/index.php/ijefbs

INTRODUCTION

The global financial market is a highly sensitive arena, particularly to monetary policy decisions such as changes in central bank benchmark interest rates. Numerous international studies indicate that interest rate changes directly affect capital market volatility. Flannery and Protopapadakis (2002) emphasize that macroeconomic variables, especially interest rates, play a significant role in influencing aggregate market returns. This finding is reinforced by the study of Huang et al. (2016), which shows that the U.S. stock market experiences a shift in volatility patterns both before and after interest rate announcements, making central bank decisions a key indicator of market direction.

Diverse market responses to interest rate policy have been observed across various countries. The study by Vaz, Ariff, and Brooks (2008) in Australia shows that banking stocks exhibit high sensitivity to interest rate changes. However, the direction of the response varies depending on interest margin structures and investor expectations. A similar pattern is found in the study by Grau-Vera et al (2025), which reports that highly leveraged firms in Spain tend to be more pressured when interest rates rise due to increased funding costs.

In Asia, research on Japan also indicates that interest rate changes significantly affect capital-intensive sectors such as technology and manufacturing. Investor response patterns across countries suggest that interest rate cuts often generate stronger positive reactions compared to the negative impact of rate hikes, a phenomenon known as the asymmetric interest rate response (Flannery & Protopapadakis, 2002).

In the Indonesian context, the dynamics between the BI Rate and the stock market have become increasingly relevant alongside the growth of the national capital market. Astuti and Nugroho (2020) found that interest rates significantly influence banking stock returns in the Indonesia Stock Exchange (IDX), primarily through investor risk perception and the profitability of the banking sector. Meanwhile, Safriati (2025) observed that the sensitivity of the manufacturing sector to BI Rate changes is relatively higher than that of the financial sector due to its reliance on loan-based financing. Dewi (2025) also demonstrated that BI Rate changes affect the LQ45 index through capital flow adjustments and shifts in risk perception.

LITERATURE REVIEW

Although several studies have examined the relationship between interest rates and stock indices at the aggregate level, there remains a shortage of in-depth analysis focusing on the individual responses of LQ45 constituents. Each issuer has unique characteristics, such as capital structure, risk exposure, and sensitivity to macroeconomic conditions. This research gap highlights the need for a more granular analysis of issuer-level responses to BI Rate announcements.

Therefore, this study aims to contribute to the literature by developing a prediction model for individual LQ45 stock price movements following interest rate announcements, based on empirical data and mathematical modeling. The

model incorporates data scaling principles inspired by Taghipour-Gorjikolaie et al. (2025), who emphasize the importance of data standardization (such as Z-score normalization) in ensuring prediction model stability.

METHODOLOGY

This study employs a quantitative approach based on an event-based analysis framework. Daily stock price data for LQ45 constituents were obtained from the Indonesia Stock Exchange (IDX), while information regarding BI Rate announcements was sourced from official publications of Bank Indonesia. Observations were conducted one week before and one week after each announcement date.

All stock prices were normalized using the Z-score method to ensure that the analytical results across issuers were measured on a standardized scale. Simple linear regression was applied to construct price trend equations for the periods before and after each announcement. The difference between the two regression gradients, referred to as the delta gradient, served as the primary indicator for measuring the impact of monetary policy changes on stock price movements.

Issuers from the financial sector were selected for further analysis due to their consistently high sensitivity to BI Rate changes. Two issuers with the smallest delta gradient range across the last three announcements were chosen as subjects for modeling. Subsequently, two mathematical models—linear regression and exponential regression—were compared based on their total prediction error to determine the model with the highest predictive accuracy.

RESULT AND DISCUSSION

The findings of this study indicate that the responses of LQ45 stock prices to BI Rate cuts from May to September 2025 do not align with classical theoretical predictions. According to fundamental macroeconomic theory, such as that discussed by Flannery and Protopapadakis (2002), a reduction in interest rates should increase stock prices by lowering the cost of capital and enhancing the attractiveness of equity investments. However, the empirical results in Indonesia show consistently negative responses during the last three announcements.

This phenomenon is consistent with the concept of policy surprise described by Huang et al (2016), which refers to situations in which central bank decisions deviate from market expectations, prompting stronger market reactions. During the July to September 2025 period, most economists did not anticipate further rate cuts, leading the series of reductions to be perceived as a signal of economic slowdown.

The dominance of negative responses also aligns with the findings of Vaz et al. (2008), who emphasize that the financial sector is the most sensitive to interest rate changes, especially when the policy is viewed as reflecting heightened economic risks. The Indonesian results further support the conclusions of Grau-Vera et al. (2025), who state that firms with high-risk exposure or significant leverage tend to experience greater price pressure under conditions of monetary uncertainty.

The mathematical modeling conducted in this study also confirms that the pattern of stock price declines following interest rate announcements follows an exponential shape. This is consistent with the market behavior described in the event-study literature, wherein market reactions are strong initially and gradually taper off as the market approaches a new equilibrium. The exponential model proved to be more accurate than the linear model—a finding that is in line with modeling practices for growth or decay patterns, as discussed by Taghipour-Gorjikolaie et al. (2025).

The observation period covering four BI Rate cuts in May, July, August, and September 2025 reveals an interesting pattern of market responses. During the first announcement in May, the responses of LQ45 issuers were still mixed. As shown in Table 1, 17 issuers recorded positive delta gradients, while the remaining 28 issuers recorded negative delta gradients. This variation in responses is consistent with the findings of Zerilli and Smith (2010), who noted that markets tend to react more moderately when the policy decision aligns with short-term expectations.

However, the three subsequent announcements show a very different pattern. Table 1 indicates that all LQ45 issuers recorded negative delta gradients in July, August, and September. This uniform negative response suggests that the series of BI Rate cuts was interpreted by investors as a signal of increasing economic risk rather than as a stimulus for growth. This phenomenon aligns with the findings of Flannery and Protopapadakis (2002), who emphasized that stock markets are more strongly influenced by investor interpretations of the macroeconomic conditions underlying monetary policy than by the policy change itself.

Table 1. LQ45 Issuers and Delta Gradient Values After BI Rate Announcements

Delta Gradient Value	Number of Issuers Increasing/Decreasing After BI Rate Change			
	21 May 2025	16 July 2025	20 August 2025	19 September 2025
Positive / Increase	17	0	0	0
Negative / Decrease	28	45	45	45

The financial sector emerged as the most negatively affected sector, consistent with the findings of Vaz et al. (2008) and Astuti and Nugroho (2020), who assert that the profitability of the financial sector is highly dependent on the interest rate structure. Based on the stable range of delta gradients from July to September, two financial issuers were selected as the basis for the price modeling process.

Table 2. Prediction Errors of Simple Linear Regression and Exponential Regression Models

No.	BI Rate Change Period	Issuer	Prediction Error of Models	
			Y = a + bX	Y = a Exp(bX)
1	16 July 25	A	5.332	5.521
2	16 July 25	B	1.560	1.495
3	20 August 25	A	1.555	1.561
4	20 August 25	B	1.606	1.597
5	19 September 25	A	0.808	0.274
6	19 September 25	B	1.469	1.494
Total Error			12.330	11.942

The prediction error analysis presented in Table 2 shows that the exponential model yields more accurate results than the linear model. The superiority of the exponential model is also evident visually in Figure 1, which shows that the shape of the curve more closely matches the actual data. This finding is consistent with the principles of data scaling and exponential modeling demonstrated by Taghipour-Gorjikolaie et al. (2025), who noted that datasets exhibiting gradual decay patterns are more appropriately modeled using exponential functions.

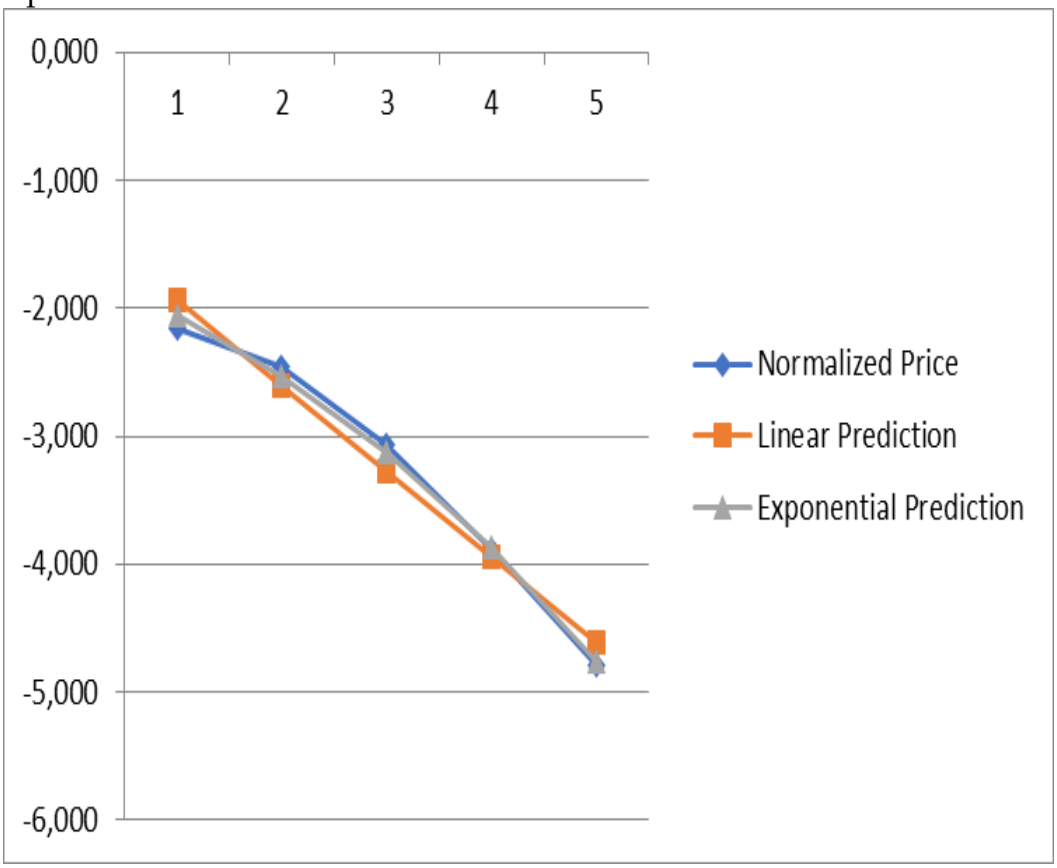

Figure 1. Prediction Curves of the Linear Regression Model and the Exponential Model

The discussion of the research results reveals that the dynamics of market response to the BI Rate announcement are largely determined by expectations and risk perceptions, rather than simply the direction of interest rate changes. At the first announcement, the market still showed a mixed reaction, reflecting the view that a 25-basis point interest rate cut was still within the range of investor expectations. This is consistent with the efficient market hypothesis and Huang's (2016) findings that information shocks are the main factor triggering volatility.

Conversely, in the July to September announcements, the uniform negative response reflects the market's interpretation that successive interest rate cuts indicate the central bank's concerns about economic conditions. These findings confirm Flannery and Protopapadakis' (2002) argument that macroeconomic factors play a dominant role in stock price formation, especially in periods of uncertainty. The financial sector showed the most stable decline, in line with the findings of Vaz et al. (2008) regarding the sensitivity of banking to interest rate policy. Research by Kusumaningtyas et al. (2021) also shows that the Indonesian banking sector is directly affected by changes in the BI Rate through the interest margin mechanism. This explains why two financial issuers were chosen as the basis for stock price modeling.

The choice of an exponential model proved to be appropriate because the pattern of stock price declines following the announcement showed a gradual decay. This finding is consistent with the characteristics of the data described by Taghipour-Gorjikolaie et al. (2025), which confirms that the exponential model excels at modeling gradual changes. With smaller prediction errors, as shown in Table 2, the exponential model is considered more suitable as a short-term prediction model.

CONCLUSIONS AND RECOMMENDATIONS

The discussion of the research findings reveals that the dynamics of market responses to BI Rate announcements are largely determined by investor expectations and risk perception, rather than merely the direction of interest rate changes. During the first announcement, the market exhibited mixed reactions, reflecting the view that the 25-basis-point rate cut was still within investors' expected range. This is consistent with the efficient market hypothesis and the findings of Zerilli and Smith (2010), which emphasize that information shocks are the primary triggers of market volatility.

In contrast, the uniform negative responses observed during the July to September announcements reflect the market's interpretation that consecutive interest rate cuts signal underlying concerns from the central bank regarding economic conditions. This finding reinforces the argument of Flannery and Protopapadakis (2002) that macroeconomic factors play a dominant role in shaping stock prices, particularly during periods of heightened uncertainty.

The financial sector, which exhibited the most stable decline, aligns with the findings of Vaz et al. (2008) concerning the sensitivity of banking stocks to interest rate policy. The study by Astuti and Nugroho (2020) also highlights that Indonesia's banking sector is directly affected by BI Rate changes through

interest margin mechanisms. This explains why two financial issuers were selected as the basis for price modeling in this research.

The choice of the exponential model is justified, as the pattern of declining stock prices following the announcement demonstrates a gradual decay form. This finding is consistent with the characteristics of data described by Taghipour-Gorjikolaie et al. (2025), who emphasize that exponential models outperform linear models in capturing gradual, non-linear changes. With the lower prediction error shown in Table 2, the exponential model is considered more suitable as a short-term predictive model for stock price movements.

FURTHER STUDY

This study still has limitations, so further research on this topic is needed.

REFERENCES

Dewi, N. K. S., Widnyana, I. W., & Sukadana, I. W. (2025). LINKING INFLATION, INTEREST RATES, AND BOOK VALUE TO SHARE PRICES: AN EMPIRICAL STUDY OF LQ45 INDEX COMPANIES ON THE INDONESIA STOCK EXCHANGE. EMAS, 6(11), 2568-2583.

Flannery, M. J., & Protopapadakis, A. A. (2002). Macroeconomic factors do influence aggregate stock returns. The Review of Financial Studies, 15(3), 751–782. https://doi.org/10.1093/rfs/15.3.751

Grau-Vera, D., Rubio, G., & Sogorb-Mira, F. (2025). Time-varying risk aversion and capital Structure: An overlooked effect. International Review of Economics and Finance, 102(10426), 6.

Huang, W., Mollick, A. V., & Nguyen, K. H. (2016). US stock markets and the role of real interest rates. The Quarterly Review of Economics and Finance, 59, 231-242.

Kusumaningtyas, N., Widagdo, B., & Nurjannah, D. (2021). The effect of interest rate, inflation, and exchange value on stock returns with profitability as intervening variables. Jurnal Manajemen Bisnis dan Kewirausahaan, 1(02), 97-108.

Taghipour-Gorjikolaie, M., Ghavami, N., Papini, L., Badia, M., Fracassini, A., Bigotti, A., & Tiberi, G. (2025). AI-based hierarchical approach for optimizing breast cancer detection using the MammoWave device. Biomedical Signal Processing and Control, 100, 107143.

Vaz, J. J., Ariff, M., & Brooks, R. D. (2008). The effect of interest rate changes on bank stock returns. Investment Management and Financial Innovations, 5(4), 221–236.

Safriati, S., Zulfan, Z., Darmawati, D., & Nurlela, N. (2025). Pengaruh Tingkat

Suku Bunga, Kurs Valuta Asing Dan Investment Opportunity Set Terhadap Return Saham Perusahaan Manufaktur Yang Terdaftar Di BEI. Jurnal Intelek Insan Cendikia, 2(9), 16356-16366.