Can technical Analysis Indicators Predict Future Stock Prices? Evidence from Elliot Wave and Fibonacci Retracement

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ABSTRACT

Investors often find it challenging to track stock price fluctuations, especially when making decisions about buying and selling stocks. This study confirms and validates the Elliott wave scenario in analyzing the patterns of future stock price movements for PT Bank Central Asia Tbk and PT Bank Rakyat Indonesia Tbk. The primary focus is on the effectiveness of technical analysis in measuring medium-term price changes from 2020 to 2025, utilizing the Elliott wave oscillator and Fibonacci retracement tools. The findings indicate that BBCA's stock price in 2025 is likely to undergo a correction pattern, with a potential support area at the 50.00% retracement level of IDR 7,600. Meanwhile, BBRI's stock price movement in 2025 is expected to exhibit a bearish trend, with a support area at the 61.80% retracement level of IDR 3,770. Looking ahead, further research into stock price forecasting techniques would significantly contribute to the existing literature and provide valuable insights for investors and traders in predicting stock price movements.

***Keywords**: Elliot Wave; Fibonacci Retracement; Stock Price; Technical Analysis*

ABSTRAK

Investor seringkali mengalami kesulitan dalam mengikuti fluktuasi harga saham, terutama dalam mengambil keputusan untuk membeli dan menjual saham. Penelitian ini mengkonfirmasi dan membuktikan skenario Elliot wave terhadap pola pergerakan harga saham di masa depan pada PT Bank Central Asia Tbk dan PT Bank Rakyat Indonesia Tbk. Topik utamanya adalah validitas analisis teknikal untuk mengukur perubahan harga jangka menengah pada tahun 2020-2025 dengan menggunakan Elliot wave oscillator dan Fibonacci retracement. Dalam penelitian ini, harga saham BBCA pada tahun 2025 akan mengalami pola koreksi dengan potensi area support di level 50.00% retracement di Rp7.600. Sementara itu, pergerakan harga saham BBRI pada tahun 2025 menunjukkan pola bearish dengan area support pada level 61,80% retracement di Rp3.770. Kedepannya, penelitian lebih lanjut mengenai teknik peramalan harga saham akan sangat bermanfaat bagi literatur dan berguna bagi para investor dan trader dalam memprediksi harga saham.

***Kata kunci**: Elliot Wave; Fibonacci Retracement; Harga Saham; Analisis Teknikal*

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INTRODUCTION

The stock market is a central component of any growing economy, with the primary goal of stock investments being to maximize returns while minimizing risks over the long term. In Indonesia, investor growth has been significant, marked by a 1.30% increase in early January 2024, reflecting a strong interest in stocks and other financial markets (KSEI, 2023). The growing appeal of investing lies in the potential to earn profits through both capital gains and dividends, while also offering the flexibility to buy or sell assets to optimize returns (Patil et al., 2023). Consequently, investors focus on analyzing stock price fluctuations to make well-informed decisions. To achieve this, they rely on two main approaches: fundamental analysis and technical analysis. Fundamental analysis evaluates a company's intrinsic value by examining its financial statements, whereas technical analysis predicts price movements based on market data, such as stock prices, trading volumes, and economic indicators (Yudha et al., 2024).

While fundamental analysis focuses on the underlying value of companies, technical analysis plays a crucial role in evaluating stock prices. It often involves the use of various indicators and patterns. Technical analysis helps investors make informed decisions by identifying past price trends and volumes, which can aid in predicting future price movements (Moghaddam & Momtazi, 2021). These price patterns can vary in profitability depending on specific market conditions (Ananthi & Vijayakumar, 2021). Key technical indicators used in stock analysis include the Relative Strength Index, Elliott Wave Oscillator, Golden Cross, Moving Average Crossover, Fibonacci Retracement, and Bollinger Bands (Forbez, 2013). However, despite its utility, technical analysis is not without challenges. Investors often make errors when applying technical analysis, which can lead to incorrect conclusions and unexpected losses. These errors may arise from false signals, subjective biases, limited historical data, and overfitting, all of which can negatively impact investment performance (Xie et al., 2022).

Technical analysis is widely employed in the stock market, particularly for forecasting stock prices and determining entry and exit points for trades. However, the effectiveness of these techniques often depends on the timeframe used for analysis. Some research has explored the application of technical analysis in stock price forecasting, especially in major sectors like banking, which tends to have high market capitalization (Day et al., 2023). This study specifically examines the use of the Elliott Wave Oscillator and Fibonacci Retracement models to predict stock price volatility during the period from 2020 to 2025, focusing on two prominent Indonesian banks: PT Bank Central Asia Tbk (BBCA) and PT Bank Rakyat Indonesia Tbk (BBRI). These banks are notable for their large market capitalizations, with BBCA holding the highest value at 1,067,870,121 IDR, followed by BBRI at 709,705,337 IDR (Mulyana et al., 2022; Sebrina et al., 2023). Previous studies suggest that both BBCA and BBRI stocks are considered undervalued, presenting an opportunity for investors to apply technical analysis to predict future price movements (Sari et al., 2023).

Fibonacci Retracement and the Elliott Wave Oscillator are essential tools in technical analysis, offering distinct insights into market movements. Fibonacci Retracement is particularly useful for identifying key support and resistance levels, aiding in effective risk management. Meanwhile, the Elliott Wave Oscillator provides a deeper understanding of market cycles and investor behavior. When combined, these tools offer a more comprehensive and accurate evaluation of market conditions, enhancing the reliability of stock price predictions. Given the volatility of the market, especially in the banking sector, these tools can deliver valuable insights into potential price trends for stocks like BBCA and BBRI in the coming years. This research underscores the importance of recognizing both the strengths and limitations of technical analysis in guiding investment decisions, particularly within the context of Indonesia's dynamic stock market.

Our research aims to address the challenging problem investors face when determining buy and sell strategies by analyzing future chart development patterns to maximize portfolio profitability. The use of time series analysis for prediction has advanced significantly in the field of capital markets, with many studies employing this technique

for stock price prediction. For instance, Michańków et al. (2022) utilized the Long Short-Term Memory (LSTM) model on Bitcoin (BTC) and S&P 500, while Avramov et al. (2021) applied Moving Average Distance (MAD) to predict equity returns. The primary benefit of this research is to understand how investors assess and anticipate future stock price volatility. Furthermore, it can serve as a valuable consideration in making informed decisions regarding stock purchases and sales.

LITERATURE REVIEW

Capital Market

Indonesia's capital market has been experiencing a positive trend, marked by a steady increase in the number of individual investors. As of February 2024, there were 12.43 million individual investors, driven primarily by millennials and Gen Z retail investors (Supriono, 2022). The capital market serves as a platform for companies and institutions, including governments, to raise funds for business development, expansion, and working capital (Widnyana et al., 2021). It plays a critical role in the economy by allowing companies or institutions to issue shares or debt securities, which investors purchase either directly or through mutual funds. While individual investors have actively participated in trading and investing in active funds for decades, they often achieve poorer net performance compared to passive strategies, such as holding market indices (Han et al., 2022). Indonesia's capital market offers a wide range of investment options, including stocks, bonds, mutual funds, and securities derivatives. Transactions take place in two main markets: the primary and secondary markets (Sebrina et al., 2023). In the primary market, the price of securities is determined through agreements between issuers and underwriters, as outlined in the prospectus (Abbas et al., 2022). Following the primary market, the secondary market enables investors to buy or sell securities through trading platforms provided by brokers after an initial public offering (IPO) (Gradojevic et al., 2023). This dual-market structure facilitates continuous trading and investment activities on the Indonesia Stock Exchange.

Stock Market

The Indonesian stock market is significantly influenced by major stocks such as PT Bank Central Asia Tbk (BBCA), PT Bank Rakyat Indonesia Tbk (BBRI), and PT Bank Mandiri Tbk (BMRI) (Rusliana et al., 2023). It is a dynamic market with substantial growth potential. Common stockholders hold voting rights and participate in company decisions but face higher risks and potential losses compared to preferred stockholders (Vasista, 2022). In cases of liquidation, common stockholders are paid after debt holders and preferred stockholders (Kasim & Cornelia, 2023). Preferred stockholders, on the other hand, have greater claims on company assets during liquidation and are compensated before common stockholders (Balcarek, 2022). The Indonesia Stock Exchange (IDX) regularly publishes index reports to evaluate company performance (Hansun & Young, 2021). The composite stock price index, which tracks the price movements of both common and preferred stocks, reflects the average performance of stocks listed on the IDX (Nasution et al., 2023). One notable index is the LQ45 Index, which measures the performance of the 45 most liquid stocks on the IDX, including BBCA and BBRI (Pinem & Ariani, 2023). Previous studies have shown that the movement of the IHSG is positively influenced by the LQ45 Index (Thakkar & Chaudhari, 2021).

Technical Analysis

Technical analysis is a method for evaluating stocks, commodities, or other securities by analyzing statistics from past market activity to predict future price movements. It is based on three key principles: market action discounts everything, prices move in trends, and history repeats itself (Adam, 2024). Economic theory states that when prices rise, demand exceeds supply. Conversely, when prices fall, supply exceeds demand (Anenberg & Ringo, 2022). In this context, technical analysis identifies the phenomenon of rising prices over a certain period as a bullish trend (Gao et al., 2023). Meanwhile, the

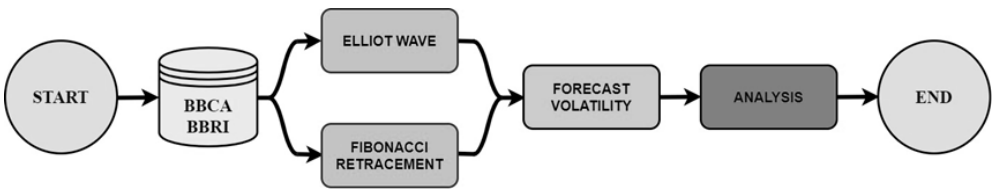
phenomenon of falling prices over a certain period is referred to as a bearish trend (Oelschläger & Adam, 2023). Traders and investors often take advantage of bullish market conditions to profit from rising stock prices, while bearish market conditions create opportunities for short selling (Caporali, 2023). They typically use technical analysis to determine whether a market trend is bullish or bearish (Dongrey, 2022). Technical indicators play a crucial role in influencing stock buy and sell decisions (Kumbure et al., 2022). These indicators are among the most widely used input variables in studies that aim to predict prices (Kothapalli et al., 2023). Numerous technical indicators are employed for forecasting stock performance or evaluating trading decisions, including Moving Averages, the Relative Strength Index, Bollinger Bands, Elliott Wave Oscillators, and Fibonacci Retracement (Ji et al., 2022).

Elliot Waves Oscillator

In 1938, Ralph Nelson Elliott, a professional accountant, proposed that stock market dynamics are influenced by crowd psychology, with human emotions driving fluctuating patterns of optimism and pessimism (Dogra et al., 2021). These emotional patterns manifest as measurable movements in stock and commodity prices across varying time scales (Chen et al., 2019). Elliott's observations led to the development of the wave principle, a concept traders use to predict market trends (Tabar et al., 2021). This principle integrates ideas such as trends, market fractality, and support and resistance, culminating in the Elliott Wave Oscillator (Jan et al., 2022). Elliott identified nine wave degrees, ranging from the grand supercycle to the sub-minuette (Adam, 2024). According to the wave principle, stock and commodity prices move in waves composed of five sub-waves (Gündüz, 2021). The Elliott Wave Oscillator pattern consists of five waves aligned with the main trend, followed by three corrective waves, labeled 1, 2, 3, 4, 5, A, B, and C (Adam et al., 2023). Waves 1, 2, 3, 4, and 5 represent impulses, while A, B, and C signify corrections (Seif et al., 2021). This pattern, known as the 5-3 movement (Ribeiro, 2019), is divided into two parts, leading to a higher wave movement in subsequent patterns, although the time span of each wave varies (Manjunath & Sekhar, 2022). The fractal nature of the Elliott Wave Oscillator suggests that wave patterns can emerge at different time levels (Westland, 2024). Common Fibonacci ratios, such as 0.382, 0.618, and 1.618, are often applied to determine wave lengths and durations (Fernández & Crespo, 2022). Understanding Elliott degrees, which classify waves by size and temporality, enhances the graphical representation of these patterns (Blackledge & Lamphiere, 2021).

Fibonacci Retracement

The Fibonacci retracement is a tool used to identify the main trend in a price chart by drawing horizontal lines at levels predicted by the Fibonacci ratio (Khan et al., 2022). It serves as an indicator for forecasting future market movements to guide investment decisions (Gurrib et al., 2022). In the stock market, prices typically retrace, allowing traders to enter or exit positions. This golden ratio is considered the strongest retracement level, with many traders placing entry orders here because prices tend to reverse after reaching it (Lee & Shi, 2021). In addition, Fibonacci retracements help set stop-loss levels and price targets. Stop-losses can be set when the stock price falls below the golden ratio, while selling can occur above this level to maximize profits (Velmurugan & Indhumathy, 2020). The research flowchart used in this study is shown in Figure 1.



Source: Researcher Data Processing
Figure 1. Research Flow Chart

METHODS

This research employs qualitative methods with natural observation to analyze data and answer the research questions. Qualitative research was chosen for its descriptive approach, which integrates naturalism, anthropology, phenomenology, and case studies, offering a broad scope (Hameed, 2020). The study uses secondary data obtained from stock price trading charts via the TradingView platform. The research follows three main steps: selecting a sample of stocks, collecting historical data, and testing trading strategies through technical analysis. A purposive sampling method is applied, focusing on stocks included in the LQ45 index with the largest market capitalization on the Indonesia Stock Exchange (IDX). PT Bank Central Asia Tbk (BBCA) and PT Bank Rakyat Indonesia Tbk (BBRI) were chosen due to their prominence in the banking sector, significant roles in Indonesia's economy, and high market liquidity and volatility. As of May 2024, BBCA holds the largest market capitalization in Indonesia, while BBRI ranks 6th. The methodology relies on logical conceptual reasoning regarding buying, selling, and forecasting strategies for stock price volatility for BBCA and BBRI. Technical analysis indicators, such as the Elliott waves oscillator and Fibonacci retracement, are used to forecast future stock prices. Data from 2020 to 2025 are collected to examine the impact of post Corona Virus Disease 2019 (COVID-19) economic recovery. The study interprets the results to assist traders and investors in predicting future stock prices based on chart patterns formed in previous trades.

RESULTS

Stock Price Forecasting of PT Bank Centra Asia Tbk (BBCA)

Based on technical analysis, The BBCA stock experienced movement and strengthening in a long uptrend and managed to achieve a breakout from its highest level at 10,500 IDR (Amin et al., 2023). The bullish trend potential of the stock was signaled by the stock split action carried out four times with a ratio of 1:2 in 2001, 2004, and 2008. This statement is supported technically by the Fibonacci retracement where the price movement has shown a position above the golden ratio and is trying to break the percentage retracement at the 0.00% level in March 2024. The more important fact is that the highest level of violation on the BBCA stock price movement occurred at the 61.8% retracement level during the bullish trend (Gurrib et al., 2022). In addition, figure 4 below shows the gold ratio Fibonacci retracement points presented by the researcher.

Source: Processed from trading view platform

Figure 2. Fibonacci Retracement on BBCA Stock Price

Based on Figure 2, shows that there is a strong and clear support line at the 78.60% level. The price movement pattern of the BBCA stock in May and September 2021 tried to break the 78.60% retracement. When the chart pattern touches the retracement, buying is highly recommended before BBCA continues its bullish pattern. In October 2021,

BBCA stock managed to enter the 61.80% retracement area (golden ratio limit) after successfully breaking out of the sideways phase from May to September 2021. The previous studies show that stocks will retreat or retrace a portion of their move before reversing. Typically, this Fibonacci retracement occurs at three levels 38.2%, 50%, and 61.8% (Miranda et al., 2023). In this regard, the price movement of BBCA stock on July 14th, 2022 gave a signal to return or retreat in the golden ratio area at 61.80% retracement. Not long after, the BBCA stock price movement pattern began to reverse direction and showed an uptrend signal towards the 0.00% retracement area at the price of 10,500 IDR.

There was a short period without a clear trend from May to September 2021. This made it difficult for traders or investors to understand the market structure and prepare a stock-buying strategy. Previous research shows that a clear rule of thumb is to buy stocks only in a downtrend market and sell stocks only in an uptrend market. However, if the predicted trend is sideways, no decision will be made. In this case, investors and traders must understand the current and future stock price movement patterns before deciding to buy or sell. Therefore, researchers use the Elliott Wave Oscillator indicator to provide strategies for difficult-to-predict stock chart movement patterns, such as trendless patterns, and for determining future buy and sell actions.

Source: Processed from trading view platform

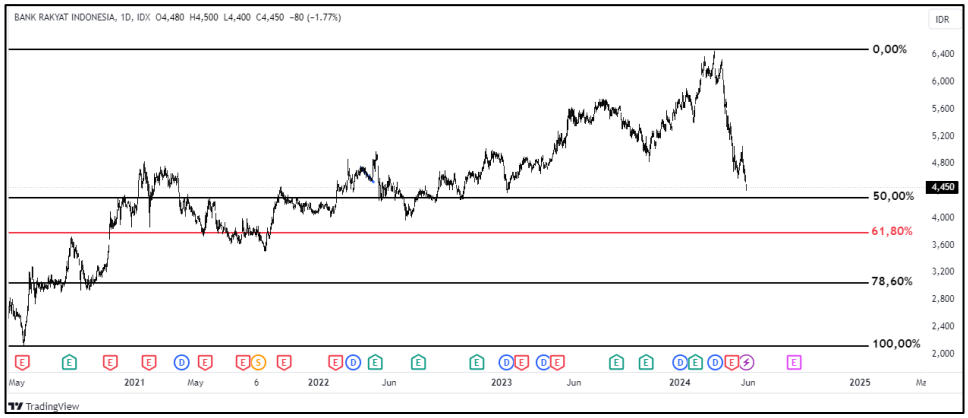
Figure 3. Elliot Wave Oscillator on BBCA Stock Price

Based on Figure 3, the BBCA stock trend appears to follow the wave principle for the current year. The current trend seems to be moving in the direction of a correction. The BBCA stock completed the first wave of the Elliott cycle from May to August 2020, the second wave from August to September 2020, the third wave from September 2020 to January 2021, the fourth wave from January to April 2021, the fifth wave from April to October 2021, the wave A cycle from October to December 2021, the wave B cycle from December 2021 to March 2022, and the wave C cycle from March to July 2022. Subsequently, the Elliott wave oscillator formed again from November 2022 to May 2024. Wave 1 represents the initial impulse, wave 2 represents the correction, and wave 3 represents the extended impulsive wave, which consists of five smaller subwaves (subwaves i, ii, iii, iv, and v). At the moment, waves B and C are still not visible. However, the Elliott wave oscillator follows the principle that waves A, B, and C are part of a corrective wave (Seif et al., 2021). Therefore, there is a possibility that the BBCA stock price movement in 2025 will fall within the 50.00% retracement area at 7,575 IDR. This refers to the next wave journey of waves B and C.

Stock Price Forecasting of PT Bank Rakyat Indonesia (BBRI)

Over the past four years, BBRI stock has been technically in a bullish phase. However, between March and May 2024, the BBRI stock experienced a drastic decline, correcting by approximately 32.80%. This correction was caused by Bank Indonesia's (BI) decision to raise the BI Rate to 6.25% and the sale of 3.5 trillion shares distributed by foreign investors. Many previous studies suggest that history repeats itself in stock price patterns

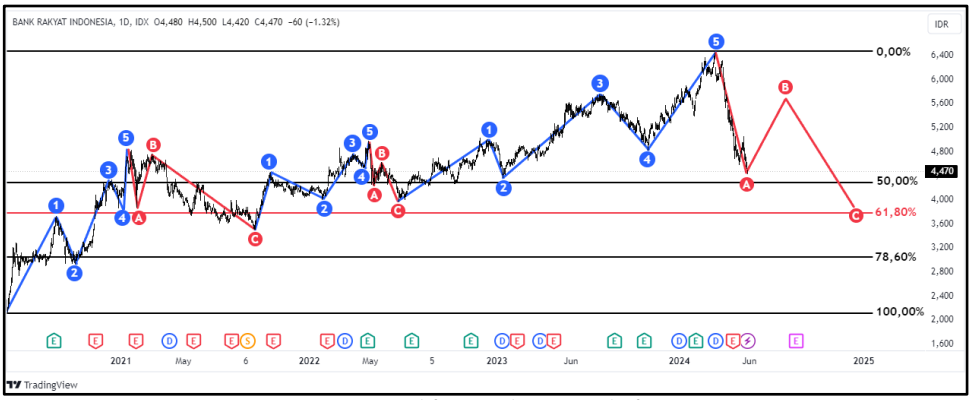
(Hui et al., 2023). By comparing these results, we can conclude that this correction represents a significant decline, similar to the massive correction during the COVID-19 pandemic. It is likely that the stock price will retrace one of the listed ratios, and the previous trend will likely continue. In this context, Fibonacci retracement plays a crucial role in identifying the support level that the next pattern will follow. The researcher presents several retracement ratios in Figure 6 below, while determining the support and resistance lines for BBRI stock price movements.



Source: Processed from trading view platform

Figure 4. Fibonacci Retracement on BBRI Stock Price

Based on Figure 4, the uptrend condition of BBRI stock is shown. Currently, the Fibonacci Retracement Indicator indicates that BBRI's stock price has the potential to break the 50.00% retracement level on May 28th, 2024. Together, the present findings confirm that the trend is headed for a strong decline. The current price is 4,450 IDR, which corresponds to the 50.00% retracement level. A potential reversal could occur if the price stabilizes and holds above this level. The lowest and highest price movements will be shown in the next price movement. Importantly, the current sharp decline signals a strong downtrend (bearish pattern). BBRI's stock price is expected to reach and test the 50.00% retracement level. If the price breaks below this level, the next important support level is at the 61.8% retracement level, often referred to as the "golden ratio," which can serve as strong resistance or support. We speculate that in the worst-case scenario, if the price drops further below 4,450 IDR, it could continue its decline towards the 61.8% retracement level at 3,850 IDR, followed by the 78.6% level at 2,950 IDR if the bearish momentum persists.



Source: Processed from trading view platform

Figure 5. Elliot Wave on BBRI Stock Price

Based on Figure 5, the trend of BBRI stock each year seems to follow the wave principle. Several impulsive waves are visible in this figure, showing a strong bullish trend from May 2020 to January 2021, with a percentage increase of 130.17%. BBRI stock broke

through the golden ratio area of 61.80% in November 2020. Research suggests that the 61.80% retracement level is considered a strong support level, as the price tends to bounce back upward when it touches this retracement area (Miranda et al., 2023; Xie et al., 2022). When we compare our results to those of previous studies, BBRI's stock price appears to have started forming an impulsive wave or reversal wave in September 2021, after staying at the 61.80% retracement level for a sufficient period. The impulsive waves formed wave 1, wave 2, wave 3, wave 4, and wave 5, with an accumulated increase of 71.95%.

The BBRI stock price movement pattern in wave 5 appreciated until it reached a 0.00% retracement. This was the highest price increase in history before the BBRI stock finally reached the overbought phase at 6,400 IDR and showed a significant decline in March 2024. This correction aligns with the signals detected in wave A, wave B, and wave C. According to this prediction, the BBRI stock price movement pattern that will occur in 2025 shows a correction wave pattern (waves A, B, C) based on the Elliott wave principle. It is predicted that wave C will remain within the 0.00% retracement area, with wave C having the potential to experience a stronger drop in the golden ratio or 61.80% retracement area at 3,770 IDR.

CONCLUSION

The main conclusion of the analysis is that the Fibonacci retracement indicator shows a significant reversal in BBCA stock. When BBCA stock reached the golden ratio area (61.80%) at 7,000 IDR, its price continued to rise until it hit the 0.00% retracement level at 10,500 IDR. Forecasting for BBCA stock in 2025, using the Elliott wave oscillator indicator, suggests a correction in the B and C wave patterns, potentially bringing the stock price to the 50.00% retracement level at 7,600 IDR. A similar pattern is observed with BBRI stock, which also saw a significant reversal as indicated by Fibonacci retracement. After the BBRI stock price approached the 61.80% retracement at 3,770 IDR, it surged, forming an impulsive wave at 6,475 IDR. The 2025 forecast for BBRI using the Elliott wave oscillator also shows a bearish pattern in waves B and C, indicating a potential depreciation to the 61.80% retracement level at 3,770 IDR. The analysis suggests that more work is needed to determine the future price of BBCA and BBRI stocks using additional technical indicators. Further research into stock price forecasting techniques could be valuable for investors and traders. However, there are limitations to the accuracy of forecasting stock price movements, primarily due to the lack of integration with fundamental analysis. It is recommended to expand the use of theories related to stock forecasting, considering time analysis, sentiment, and financial statements. Future studies should explore and validate accurate price movement patterns to improve forecasting accuracy.

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