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Technical Analysis of Stock Price Movements Using Fibonacci Retracement and Moving Average Convergence Divergence Approaches (Study on Banking Stocks in the LQ45 Index)

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Abstract. *This study aims to evaluate the accuracy of the Fibonacci Retracement and Moving Average Convergence Divergence (MACD) technical indicators in analyzing the movement of banking stock prices listed on the LQ45 index in the 2020 period. Based on data from PT Kustodian Sentral Efek Indonesia (KSEI) in 2023, there was a significant increase in the number of investors in the Indonesian stock market by 103.6 percent in 2020. This study uses a quantitative descriptive approach with a census method for sampling, which resulted in 5 banking companies as samples: BBCA, BBNI, BBRI, BBTN, and BMRI. Data analysis was carried out using the Fibonacci Retracement indicator to identify potential support and resistance levels, and the MACD indicator to evaluate the strength, direction, and momentum of stock price movements. The results showed that 11 of the 11 signals generated by the Fibonacci Retracement were proven to be accurate, while 43 of the 53 signals generated by the MACD were also proven to be accurate. In conclusion, the buy and sell signals generated by the Fibonacci Retracement and MACD indicators are reliable and effective for use in banking stock trading.*

Keywords*: LQ45 Index, Banking Stocks, Technical Analysis, Fibonacci Retracement, MACD*

1. INTRODUCTION

Investment is an economic action that involves the distribution of funds, either directly or indirectly, with the aim of obtaining potential profits in the future. (Jayati & Wiksuana, 2023). Investment has various investment instruments that can be traded, including stocks, bonds, mutual funds, property, and currencies. Stock investment is one of the preferred instrument choices in Indonesia, which is reflected in the growth in the number of investors in the Indonesian stock market.

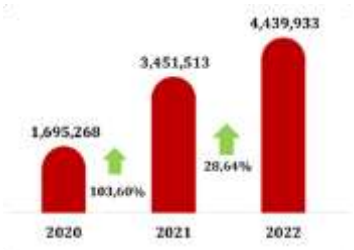

Figure 1. Data on the Increase in the Number of Investors

Source: Ksei.co.id, 2023

PT Kustodian Sentral Efek Indonesia (KSEI) published data in 2023 showing an increase in the number of investors in Indonesia. In 2021, the number of active investor accounts on the Indonesia Stock Exchange (IDX)reached around 3.4 million, an increase of 103.60 percent from the previous year which was only around 1.7 million accounts. In 2022, the number of active investor accounts reached 4.4 million with an increase of 28.64 percent

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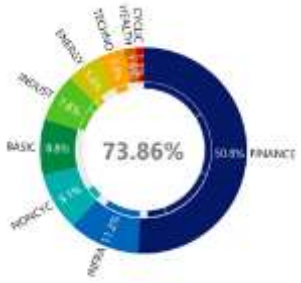
from 2021. This increase is believed to be triggered by certain factors, one of which is the ease of access to technology and information. The development of technology and the increasing availability of information in the current digital era have facilitated individuals to more easily engage in investment activities in the capital market.

The capital market is a place where parties who need funding meet with parties who are interested in investing in financial products, with the aim of efficient allocation of funds so that investors can choose investments with optimal returns.(Mumpuni & Darmawan, 2017; Arditya wati & Candraningrat, 2023). One of the popular investment options in the capital market is shares, which conceptually are a sign of a person's or entity's capital participation in a company. (Cahyani & Mahyuni, 2020). According toCandy & Winardy (2019)Stocks can be explained as proof of stock ownership, investors become partial holders of the company they invest in. Stock indexes play an important role in stock investment because they reflect the price movements of a group of stocks selected based on certain criteria. (www.idx.co.id, nd). Investors can monitor the overall performance of the capital market and make better investment decisions by following the movement of stock indexes. For example, the LQ45 stock index, which consists of 45 leading companies on the Indonesia Stock Exchange.

The LQ45 index is a collection of 45 selected stock issuers which are an important reference for investors, traders, brokers and stock analysts in monitoring capital market developments.(Karamoy & Tasik, 2019). Shares in the LQ45 index are selected based on a number of criteria, such as stable prices, relatively low risk, high liquidity, and good company fundamentals.(Candy & Winardy, 2019; Tenaya & Ramantha, 2022). The LQ45 index covers various sectors such as industry, banking, manufacturing, consumption, mining, and technology sectors.



Picture 1.LQ45 Sector Weight Index data

Source: idx.co.id

The Indonesia Stock Exchange in 2024 published data showing that the banking sector dominates the LQ45 Index, with a weighting of 50.8 percent, indicating the important role of the banking sector in the capital market, especially in the LQ45 index. This large influence can affect investors in making investment decisions.

Investment decisions are important steps taken by investors after evaluating various factors that affect the potential profit and risk of an investment. Investment decisions are often made amidst the uncertainty of complex stock price movements. Complex factors such as economic, political and social conditions, as well as investor perceptions of company performance. Therefore, investors often rely on investment analysis tools, consisting of fundamental analysis, technical analysis and macroeconomic analysis, to overcome market uncertainty and make investment decisions. (Soeini et al., 2012; Hartono, 2021).

Fundamental analysis is an approach to stock analysis that is based on the economic fundamentals of a company. This approach relies on the concept of intrinsic value, which indicates that stock prices reflect both quantitative and qualitative information. In the long run, fundamental analysis adopts the Efficient Market Theory (EMH), which assumes that prices reflect all available information. However, in the short run, this methodology recognizes the possibility of market inefficiencies.(Prabhata, 2012; Ayala et al., 2021). Fundamental analysis analyzes data and information related to company performance, with financial reports being the main source. (Sanjaya & Afriyenis, 2018). Fundamental analysis helps investors understand a company's performance and predict future stock price movements by considering factors such as company development, balance sheets and financial statements, business projections, and cooperation and expansion plans. (Choiriyah et al., 2023).

Technical analysis is the process of observing past market movements to predict future stock values and address the impact of market movements through stock price series analysis(Fisichella & Garolla, 2021; Mustafa et al., 2022). Technical analysis has three principles, namely all information available in the market is already contained in stock prices, stock prices generally move in trends, and the last is that history repeats itself. (Jain et al., 2022).

Technical analysis has advantages over fundamental analysis in the context of stock price movements. Technical analysis tends to be more accessible to retail investors because its use is simpler and focuses directly on stock price charts, allowing investors to quickly understand trends and patterns of stock price movements without requiring an in-depth understanding of financial statements or company fundamentals. Stock price movement patterns formed in the chart can reflect market perceptions and attitudes towards a stock or the

market as a whole. Technical analysis can provide faster and more direct signals in identifying trading or investment opportunities. Technical indicators that can be used to predict stock price movements include Fibonacci Retracement and Moving Average Convergence Divergence.

Fibonacci Retracementis a method of analysis used in stock trading and financial markets to identify potential support and resistance levels. The process involves identifying the trend of a stock price chart (uptrend or downtrend), then calculating vertical differences using the key ratios of the Fibonacci sequence, namely 23.6 percent, 38.2 percent, 50 percent, 61.8 percent, and 100 percent, which are used to determine support and resistance levels on a stock chart. Typically, when prices approach these levels, resistance often occurs, which can cause prices to stall or reverse, that is, move in the opposite direction from the previous trend. If prices manage to break through one of the Fibonacci ratios, they are likely to stall at the next Fibonacci ratio. Using Fibonacci Retracements helps traders determine areas where prices may bounce or change trend after a correction, providing a guide to determining potential entry and exit points in trades.

Research conducted by Lusi ndah & Sumirat (2021) shows that the Fibonacci projection technique is effective in recognizing trends and providing a basis for making trading decisions on the Indonesia Stock Exchange (IDX).Alalaya & Almahameed (2018)in his research he stated that the combination of Fibonacci Retracement with Elliot wave theory can be used to predict the direction of the trend. Meanwhile,Gurrib et al. (2022)found that the use of the Fibonacci Retracement technical analysis tool can be effective in predicting price movements of energy sector stocks, but is less effective when applied to energy sector crypto assets.

Moving Average Convergence Divergenceis a trading analysis tool used to evaluate the strength, direction, and momentum of stock prices. This indicator is calculated by subtracting the exponential moving average with a longer period from the shorter period. MACD can identify whether a stock price is moving up or down, how strong the price movement is in terms of value, and can also provide clues about potential changes in trend direction. MACD is one of the simple and effective technical analysis tools to help stock traders in decision making by converting these two moving averages into an indicator that measures the speed and change of price movements.

Research conducted byKulkarni & More (2014)found that all trading decisions that relied on the MACD indicator resulted in profits. Meanwhile, research conducted byLeong & Mohamad (2022)conclude that all technical tools, such as SMA, EMA, RSI, Stochastic, MACD, and Fibonacci Retracement, provide buy and sell signals, however, the signals generated are not always accurate.

Research on technical analysis using the Fibonacci Retracement and MACD indicators on banking stocks indexed in LQ45 in 2020 was conducted with the main objective of evaluating the accuracy of the Fibonacci Retracement and MACD technical analysis in analyzing the price movements of banking stocks in the LQ45 index in 2020. This research is expected to gain a deeper understanding of the effectiveness of the two indicators in the context of banking stock price movements, as well as provide valuable contributions to investment decision making in the banking sector and the development of more optimal investment strategies.

2. RESEARCH METHODS

This research is a quantitative descriptive research. According toSugiyono (2017: 208)Quantitative descriptive analysis is a statistic used to analyze data by describing or depicting the data that has been collected. Quantitative descriptive analysis will be used to analyze the movement of banking stock prices in the LQ45 Index using two technical indicators, namely the Fibonacci Retracement ratio and Moving Average Convergence Divergence (MACD). This study aims to develop a strategy to identify buy and sell signals in the Stock Market using technical analysis with Fibonacci Retracement and Moving Average Convergence Divergence (MACD).

This study uses a quantitative descriptive approach with a census method for sampling, which produces 5 banking companies as samples: BBCA, BBNI, BBRI, BBTN, and BMRI. Data analysis was carried out using the Fibonacci Retracement indicator to identify potential support and resistance levels, and the MACD indicator to evaluate the strength, direction, and momentum of stock price movements.

3. RESULTS AND DISCUSSION

Company Overview

The LQ45 index is a stock market index consisting of 45 selected companies listed on the Indonesia Stock Exchange (IDX). This index reflects the performance of stocks with high liquidity and large market capitalization. Some banking companies included in the LQ45 index are Bank Central Asia (BBCA), Bank Negara Indonesia (BBNI), Bank Rakyat Indonesia (BBRI), Bank Tabungan Negara (BBTN) and Bank Mandiri (BMRI).

In general, banking companies included in the LQ45 index have prominent characteristics, namely high liquidity, large market capitalization, strong fundamentals, and digital innovation. Banking stocks are often traded with high volumes on the Indonesia Stock

Exchange (IDX), reflecting good market liquidity. Bank Central Asia (BBCA), Bank Negara Indonesia (BBNI), Bank Rakyat Indonesia (BBRI), Bank Tabungan Negara (BBTN) and Bank Mandiri (BMRI) have large market capitalizations, making them major players in the Indonesian banking industry. Solid financial performance with consistent growth in revenue and net profit indicates that these banks are well managed and have effective business models. Banking companies in the LQ45 Index are important pillars in the Indonesian banking sector, contributing significantly to the national economy and capital markets.

Description of Research Result Data

The data to be analyzed in this study is daily data on banking stock prices on the LQ45 Index, namely with the following stock codes.

Table 1. Banking Stock Codes on the LQ45 Index

Stock Code	Stock Name
BBCA	Bank Central Asia Tbk.
BNI	Bank Negara Indonesia Tbk.
BBRI	Bank Rakyat Indonesia Tbk.
BBTN	State Savings Bank Tbk.
BMRI	Bank Mandiri Tbk.

Source: Idx.co.id, secondary data processed, 2024

The stock codes in Table 1 will be inputted into the tradingview.com platform and analyzed using two indicators, namely the Fibonacci Retracement and Moving Average Convergence Divergence indicators.

Fibonacci Retracement Indicator

Fibonacci Retracement is a technical analysis indicator used to identify potential support and resistance levels in stock price movements. Fibonacci Retracement uses horizontal lines to indicate key retracement levels before price resumes its initial direction of movement. Common levels used in Fibonacci Retracement are 23.6 percent, 38.2 percent, 50 percent, 61.8 percent, and 100 percent.

1) A sell signal is said to be successful if the stock price moves up to approach one of the retracement levels (for example 61.8 percent) and then experiences a significant decline, indicating that the level is a strong resistance.
2) A sell signal is said to be unsuccessful if the stock price manages to break through the retracement level identified as resistance and continues to rise without returning to the retracement level.
3) A buy signal is said to be successful if the stock price falls close to one of the retracement levels (for example 38.2 percent) and then experiences a significant increase, indicating that the level is strong support.

4) A buy signal is said to be unsuccessful if the stock price breaks through the retracement level identified as support and continues to fall without returning to the retracement level.

Figure 3. Analysis of BBCA Stock Movements Throughout 2020 with the Fibonacci Retracement Indicator
Source: Tradingview.com, 2024

Figure 3 shows the movement of Bank BCA shares from February 2020 to January 2021. During this period, there was a change in trend from a bearish trend to a bullish trend which can be seen from the trend line displayed. The Fibonacci Retracement indicator on BCA shares uses the lowest point (level 1 retracement) at a price of IDR 4,330 and the highest point (level 0 retracement) at a price of IDR 6,600.

A strong buy signal appeared on October 5, 2020 at a price of Rp 5,475, which is located in the 50 percent retracement level area. The 50 percent area is an important support level that indicates that the stock price has the potential to continue its increase. This was proven when the stock price managed to pass the 38.2 percent retracement level at the price (Rp 5,725) and continued to move up until it reached the 0 percent retracement level at a price of Rp 6,600, after previously breaking through the 23.6 percent retracement level at a price of Rp 6,075.

Investors can make a purchase decision when the buy signal appears on October 5, 2020 at a price of Rp 5,475. Investors can then add a purchase position when the price reaches the 38.2 percent retracement level at a price of Rp 5,725, and make a purchase again at the 23.6 percent retracement level at a price of Rp 6,075, with a sales target at the 0 percent retracement level at a price of Rp 6,600.

Tradercan make a purchase decision on October 5, 2020 at a price of Rp 5,475 and consider selling the stock when the price touches the 38.2 percent retracement level at a price of Rp 5,725. After that, traders can return to trading when the stock price manages to break through the 23.6 percent retracement level at a price of Rp 6,075, and sell when the price reaches the 0 percent retracement level at Rp 6,600.

Figure 4. Analysis of BBNI Stock Movements Throughout 2020 with the Fibonacci Retracement Indicator
Source: Tradingview.com, 2024

Figure 3 shows the movement of Bank BCA shares from February 2020 to January 2021. During this period, there was a change in trend from a bearish trend to a bullish trend which can be seen from the trend line displayed. The Fibonacci Retracement indicator on BNI shares uses the lowest point (level 1 retracement) at a price of IDR 1,485 and the highest point (level 0 retracement) at a price of IDR 2,710.

A strong buy signal appeared on October 5, 2020 at a price of Rp 2,240, which is located in the 38.2 percent retracement level area. The 38.2 percent level is an important support level that indicates that the stock price has the potential to continue its increase. This was proven when the stock price managed to pass the 23.6 percent retracement level at a price of Rp 2,420 and continued to move up until it reached the 0 percent retracement level at a price of Rp 2,710.

Investors can make a purchase decision when the buy signal appears on October 5, 2020 at a price of Rp 2,240. Then they can add a purchase position on November 6, 2020 when the price reaches the 23.6 percent retracement level at a price of Rp 2,420 with a sales target at the 0 percent retracement level at a price of Rp 2,710.

Tradercan make a purchase decision on October 5, 2020 at a price of Rp 2,240 and consider selling the stock when the price touches the 23.6 percent level at a price of Rp 2,420. After that, traders can return to trading when the stock price manages to break through the 23.6 percent retracement level at a price of Rp 2,240, and sell when the price reaches the 0 percent retracement level at Rp 2,710.

Figure 5. Analysis of BBRI Stock Movements Throughout 2020 with the Fibonacci Retracement Indicator
Source: Tradingview.com, 2024

Figure 5 shows the movement of BRI shares from February 2020 to January 2021. During this period, there was a change in trend from a bearish trend to a bullish trend which can be seen from the trend line displayed. The Fibonacci Retracement indicator on BRI shares uses the lowest point (level 1 retracement) at a price of IDR 2,110 and the highest point (level 0 retracement) at a price of IDR 3,730

A strong buy signal appeared on September 30, 2020 at a price of Rp 2,920, which is located in the 50 percent retracement level area. The 50 percent level is an important support level that indicates that the stock price has the potential to continue its increase. This was proven when the stock price managed to pass the 38.2 percent retracement level at a price of Rp 3,110 and continued to move up until it reached the 0 percent retracement level at a price of Rp 3,730 after successfully passing the 23.6 percent retracement level at a price of Rp 3,340.

Investors can make a purchase decision when the buy signal appears on September 30, 2020 at a price of Rp 2,920. Then they can add a purchase position on October 13, 2020 when the price reaches the 38.2 percent retracement level at a price of Rp 3,110 and on November 5 at the 23.6 percent level at a price of Rp 3,340 with a sales target at the 0 percent retracement level at a price of Rp 3,730.

Tradercan make a purchase decision on September 30, 2020 at a price of Rp 2,920 and consider selling the stock when the price touches the 38.2 percent level at a price of Rp 3,110. After that, traders can return to trading when the stock price manages to break through the 23.6 percent retracement level at a price of Rp 3,340, and sell when the price reaches the 0 percent retracement level at Rp 3,730.

Figure 6. Analysis of BBTN Stock Movements Throughout 2020 with the Fibonacci Retracement Indicator
Source: Tradingview.com, 2024

Figure 6 shows the movement of BTN shares from February 2020 to January 2021. During this period, there was a change in trend from a bearish trend to a bullish trend which can be seen from the trend line displayed. The Fibonacci Retracement indicator on BRI shares

uses the lowest point (level 1 retracement) at a price of IDR 695 and the highest point (level 0 retracement) at a price of IDR 1,565.

The first arrow shows a buy signal on September 25, 2020. The buy position is a strong signal because it is in the Fibonacci Retracement level area, namely the 50 percent area as a strong support level at a price of IDR 1,130. This indicates that the price will reverse direction and increase. The next buy signals appeared on October 13, 2020 and November 6, 2020 when the stock price managed to penetrate the 38.2 percent retracement level at a price of IDR 1,230 and 23.6 percent at a price of IDR 1,360.

Investors can make a decision to buy Bank Tabungan Negara shares on September 25, 2020 at a price of Rp 1,130, October 13 at a price of Rp 1,130, and November 6, 2020 at a price of Rp 1,130 with a sales target at the 0 percent retracement level at a price of Rp 1,565.

Tradercan make a purchase decision on September 25, 2020 at a price of Rp 1,130 and consider selling the stock when the price touches the 38.2 percent level at a price of Rp 1,230. After that, traders can return to trading when the stock price manages to break through the 23.6 percent retracement level at a price of Rp 1,360, and sell when the price reaches the 0 percent retracement level at Rp 1,565.

Figure 7. Analysis of BMRI Stock Movements Throughout 2020 with the Fibonacci Retracement Indicator
Source: Tradingview.com, 2024

Figure 7 shows the movement of Bank Mandiri shares from February 2020 to January 2021. During this period, there was a change in trend from a bearish trend to a bullish trend which can be seen from the trend line displayed. The Fibonacci Retracement indicator on Bank Mandiri shares uses the lowest point (level 1 retracement) at a price of IDR 1,830 and the highest point (level 0 retracement) at a price of IDR 3,180.

The first arrow shows a buy signal on October 1, 2020 at a price of Rp 2,500. The buy position is a strong signal because it is in the Fibonacci Retracement level area, namely the 50 percent level as a strong support level. This was confirmed when the stock price only moved around the 50 percent retracement level. The next buy signal appeared on November 2, 2020

when the stock price managed to break through the 23.6 percent retracement level at a price of Rp 2,860.

Investors can make a decision to buy Bank Mandiri shares on October 1, 2020 at a price of IDR 2,500 and November 2, 2020 when the share price successfully penetrates the 23.6 percent retracement level at a price of IDR 2,860 with a sales target at the 0 percent retracement level at a price of IDR 3,180.

Tradercan make a purchase decision on October 1, 2020 at a price of Rp 2,500 and consider selling the stock when the price touches the 23.6 percent level at a price of Rp 2,660. After that, traders can return to trading when the stock price is at the 23.6 percent retracement level at a price of Rp 2,660 and sell when the price reaches the 0 percent retracement level at Rp 3,180.

Moving Average Convergence Divergence Indicator

Moving Average Convergence Divergence is a technical analysis indicator that consists of three main components: MACD Line, Signal Line, and Histogram.

1) The sell signal is said to be successful if the MACD Line breaks below the Signal Line, then the stock price decreases and the histogram turns negative.
2) The sell signal is said to be unsuccessful if the MACD Line breaks below the Signal Line but the stock price continues to rise and the histogram remains positive.
3) The buy signal is said to be successful if the MACD Line penetrates above the Signal Line, then the stock price increases and the histogram turns positive.
4) The buy signal is said to be unsuccessful if the MACD Line breaks above the Signal Line but the stock price continues to fall and the histogram remains negative.

Figure 8. Analysis of BBCA Stock Movements throughout 2020 with the MACD Indicator
Source: Tradingview.com, 2024

Figure 7 shows a graph of Bank Central Asia's stock price movements using the MACD indicator throughout 2020. This graph focuses on the crossing between the MACD line and the signal line, which provides buy and sell signals. The buy and sell signals generated by the MACD indicator on Bank Central Asia shares are as follows.

Table1.Buy and Sell Signals on BCA Stocks

No	Date	Signal	Success
1	February 13, 2020	Sell	Succeed
2	May 27, 2020	Buy	Succeed
3	April 22, 2020	Sell	Succeed
4	May 4, 2020	Buy	Succeed
5	May 14, 2020	Sell	Succeed
6	May 27, 2020	Buy	Succeed
7	June 19, 2020	Sell	Not successful
8	July 1, 2020	Buy	Succeed
9	July 20, 2020	Sell	Not successful
10	September 3, 2020	Sell	Succeed
11	October 5, 2020	Buy	Succeed
12	November 25, 2020	Sell	Succeed
13	December 11, 2020	Buy	Succeed
14	December 22, 2020	Sell	Not successful

Source: Tradingview.com, secondary data processed, 2024

Table 2 shows that there are fourteen signals generated from the use of the MACD indicator, consisting of 6 buy signals and 8 sell signals. Of the fourteen signals, there are 3 signals that are unsuccessful. The unsuccessful signals indicate that there is an intersection between the MACD line and the signal line, but it is not followed by a corresponding price movement.

Figure 9. Analysis of BBNI stock movements throughout 2020 with the MACD indicator
Source: Tradingview.com, 2024

Figure 9 shows a graph of Bank Negara Indonesia's stock price movements using the MACD indicator throughout 2020. This graph focuses on the crossing between the MACD line and the signal line, which provides buy and sell signals. The buy and sell signals generated by the MACD indicator on Bank Negara Indonesia shares are as follows.

Table 2.Buy and Sell Signals on BNI Stocks

No	Date	Signal	Success
1	February 13, 2020	Buy	Succeed
2	February 26, 2020	Sell	Succeed
3	April 1, 2020	Buy	Succeed
4	May 15, 2020	Sell	Not successful
5	May 20, 2020	Buy	Succeed
6	June 30, 2020	Sell	Not successful
7	August 11, 2020	Buy	Succeed
8	September 7, 2020	Sell	Succeed
9	October 6, 2020	Buy	Succeed
10	November 2, 2020	Sell	Not successful
11	November 5, 2020	Buy	Succeed
12	December 14, 2020	Sell	Succeed

Source: Tradingview.com, secondary data processed, 2024

Table 3 shows that there are twelve signals generated from the use of the MACD indicator, consisting of 6 buy signals and 6 sell signals. Of the twelve signals, there are 3 signals that are unsuccessful. The unsuccessful signals indicate that there is an intersection between the MACD line and the signal line, but it is not followed by a corresponding price movement.

Figure 10. Analysis of BBRI Stock Movement throughout 2020 with the MACD Indicator
Source: Tradingview.com, 2024

Figure 10 shows a graph of Bank Rakyat Indonesia's stock price movements using the MACD indicator throughout 2020. This graph focuses on the crossing between the MACD line and the signal line, which provides buy and sell signals. The buy and sell signals generated by the MACD indicator on Bank Rakyat Indonesia shares are as follows.

Table 4. Buy and Sell Signals on BRI Shares

No	Date	Signal	Success
1	March 31, 2020	Buy	Not successful
2	May 14, 2020	Sell	Succeed
3	May 20, 2020	Buy	Succeed
4	June 23, 2020	Sell	Not successful
5	August 11, 2020	Buy	Succeed
6	September 3, 2020	Sell	Succeed
7	October 6, 2020	Buy	Succeed
8	December 4, 2020	Sell	Succeed

Source: Tradingview.com, secondary data processed, 2024

Table 4 shows that there are eight signals generated from the use of the MACD indicator, consisting of 4 buy signals and 4 sell signals. Of the eight signals, there are 2 signals that are unsuccessful. The unsuccessful signals indicate that there is an intersection between the MACD line and the signal line, but it is not followed by a corresponding price movement.

Figure 11. Analysis of BBTN stock movements throughout 2020 with the MACD indicator
Source: Tradingview.com, 2024

Figure 11 shows a graph of Bank Tabungan Negara's stock price movements using the MACD indicator throughout 2020. This graph focuses on the crossing between the MACD line and the signal line, which provides buy and sell signals. The buy and sell signals generated by the MACD indicator on Bank Tabungan Negara shares are as follows.

Table3.Buy and Sell Signals on BTN Shares

No	Date	Signal	Success
1	February 18, 2020	Buy	Succeed
2	February 28, 2020	Sell	Succeed
3	April 3, 2020	Buy	Succeed
4	July 15, 2020	Sell	Succeed
5	August 10, 2020	Buy	Succeed
6	September 4, 2020	Sell	Succeed
7	October 5, 2020	Buy	Succeed
8	November 30, 2020	Sell	Not successful
9	December 15, 2020	Buy	Succeed
10	December 23, 2020	Sell	Succeed

Source: Tradingview.com, secondary data processed, 2024

Table 5 shows that there are ten signals generated from the use of the MACD indicator, consisting of 5 buy signals and 5 sell signals. Of the eight signals, there is 1 signal that is unsuccessful. The unsuccessful signal indicates that there is an intersection between the MACD line and the signal line, but is not followed by a corresponding price movement.

Figure 12. Analysis of BMRI stock movements throughout 2020 with the MACD indicator
Source: Tradingview.com, 2024

Table4.Buy and Sell Signals on Bank Mandiri Stocks

No	Date	Signal	Success
1	February 12, 2020	Buy	Succeed
2	February 25, 2020	Sell	Succeed
3	April 2, 2020	Buy	Succeed
4	June 29, 2020	Sell	Not successful
5	July 22, 2020	Buy	Succeed
6	August 10, 2020	Buy	Succeed
7	August 28, 2020	Sell	Succeed
8	October 5, 2020	Buy	Succeed
9	December 14, 2020	Sell	Succeed

Source: Tradingview.com, secondary data processed, 2024

Table 6 shows that there are nine signals generated from the use of the MACD indicator, consisting of 5 buy signals and 4 sell signals. Of the nine signals, there is 1 signal that is unsuccessful. The unsuccessful signal indicates that there is a crossover between.

Discussion of Research Results

Fibonacci Retracement Indicator Analysis in Predicting Banking Stock Price Movements

Based on the description of the research data that has been described, the following is a discussion of the effectiveness of the Fibonacci Retracement indicator in predicting the movement of banking stock prices on the LQ45 index:

1) Bank Central Asia (BBCA) Stocks

BCA shares showed a strong buy signal on October 5, 2020 at a price of IDR 5,475. This signal is located at the 50 percent retracement level, which functions as an important support level, indicating that the stock price has the potential to continue to rise. After the buy signal, the stock price managed to break through the 38.2 percent retracement level at IDR 5,725 and then the 23.6 percent retracement level at IDR 6,075, before finally reaching the 0 percent retracement level at IDR 6,600. This provides an opportunity for investors to buy when the buy signal appears and add positions when the price passes these retracement levels.

2) Shares of Bank Negara Indonesia (BBNI)

BNI shares showed two buy signals on October 5, 2020 at the 38.2 percent retracement level with a share price of Rp 2,240 and on November 6, 2020 at the 23.6 percent retracement

level with a share price of Rp 2,420. Both retracement levels functioned as support points, and after that, the price managed to continue its increase towards the 0 percent retracement level at Rp 2,710. This investment strategy shows that investors can buy shares when a buy signal appears and add positions when the price reaches key levels, indicating potential price increases.

3) Shares of Bank Rakyat Indonesia (BBRI)

BRI shares showed three buy signals on September 30, 2020 at a price of Rp2,920 (50 percent retracement level), October 13, 2020 at a price of Rp3,110 (38.2 percent retracement level) and November 5 at a price of Rp3,340 (23.6 percent retracement level). The three retracement levels functioned as support points, and then the price managed to experience a significant increase towards the 0 percent retracement level at Rp3,730. Investors can take advantage of this opportunity by making purchases on buy signals and adding positions at important levels, so that they can gain profits when the price reaches the target.

4) State Savings Bank (BBTN) Shares

Bank Tabungan Negara shares showed three buy signals on September 25, 2020 at a price of Rp1,130, which is the 50 percent retracement level. The next buy signals appeared on October 13, 2020 and November 6, 2020, when the stock price broke through the 38.2 percent retracement level at Rp1,230 and the 23.6 percent retracement level at Rp1,360. The sales target was set at the 0 percent retracement level at a price of Rp1,565. The success in breaking through the retracement levels shows that technical analysis can be relied on in formulating investment decisions.

5) Bank Mandiri Shares (BMRI)

Bank Mandiri shares showed two buy signals on October 1, 2020 at a price of IDR 2,500 (50 percent retracement level) and on November 2, 2020, the stock price managed to break through the 23.6 percent retracement level at IDR 2,860, indicating that the upward momentum is still ongoing. The sales target at the 0 percent retracement level at a price of IDR 3,180 provides an opportunity for traders to take advantage of the price movement. Success in breaking through retracement levels shows that technical analysis can be relied on in formulating investment decisions.

Moving Average Convergence Divergence Indicator Analysis in Predicting Banking Stock Price Movements

Based on the description of the research data that has been described, the following is a discussion of the effectiveness of the Moving Average Convergence Divergence indicator in predicting the movement of banking stock prices on the LQ45 index:

1) Bank Central Asia (BBCA) Stocks

The MACD indicator generated fourteen signals throughout 2020, consisting of 6 buy signals and 8 sell signals. Of the fourteen signals, 3 were unsuccessful. The success of the buy and sell signals indicates that the MACD is quite effective in identifying profitable trading opportunities. However, the presence of three unsuccessful signals indicates that not all crossings between the MACD line and the signal line are always followed by appropriate price movements, indicating a potential error in the interpretation of the MACD signal.

2) Shares of Bank Negara Indonesia (BBNI)

The MACD indicator generated twelve signals throughout 2020, consisting of 6 buy signals and 6 sell signals. Of the twelve signals, 3 were unsuccessful. The high success rate of buy and sell signals indicates that MACD can provide a good indication of trading opportunities. However, the presence of unsuccessful signals indicates that the interpretation of MACD signals should be done with caution, as they are not always followed by corresponding price movements.

3) Shares of Bank Rakyat Indonesia (BBRI)

The MACD indicator generated eight signals throughout 2020, consisting of 4 buy signals and 4 sell signals. Of the eight signals, 2 were unsuccessful. The high success of the buy and sell signals indicates that the MACD is quite effective in identifying profitable trading opportunities. However, the presence of two unsuccessful signals indicates that not all crossings between the MACD line and the signal line are always followed by appropriate price movements.

4) State Savings Bank (BBTN) Shares

The MACD indicator generated ten signals throughout 2020, consisting of 5 buy signals and 5 sell signals. Of the ten signals, only 1 signal was unsuccessful. The high success of the buy and sell signals shows that MACD is very effective in identifying profitable trading opportunities in Bank Tabungan Negara shares. However, one unsuccessful signal shows that the interpretation of MACD signals should be done with caution.

5) Bank Mandiri Shares (BMRI)

The MACD indicator generated nine signals throughout 2020, consisting of 5 buy signals and 4 sell signals. Of the nine signals, only 1 signal was unsuccessful. The high success of the buy and sell signals indicates that MACD is effective in identifying profitable trading opportunities in Bank Mandiri shares. However, one unsuccessful signal indicates that not all crossings between the MACD line and the signal line are always followed by corresponding price movements.

4. CONCLUSION

The conclusions from the results of the analysis and discussion of this research are as follows.

1) The Fibonacci Retracement indicator has proven effective in predicting the price movement of banking stocks in the LQ45 Index in 2020. There were eleven successful buy signals that appeared on banking stocks in the LQ45 Index. These buy signals were formed at the retracement levels of 23.6 percent, 38.2 percent, and 50 percent, which are strong support areas. The success of these signals shows that Fibonacci Retracement is a useful tool for investors and traders to identify potential trend reversals and assist in making better investment decisions.
2) The MACD indicator has proven effective in predicting the movement of banking stock prices in the LQ45 Index in 2020. There are a total of 53 buy and sell signals generated by MACD, 43 of which were successfully followed by the corresponding price movement, indicating the potential for significant profits from using the MACD indicator. However, the existence of 10 unsuccessful signals indicates that the interpretation of MACD signals needs to be done carefully to avoid potential errors in decision making.

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