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Technical Analysis Using Moving Average and Stochastic Oscillator Indicators to Determine Buy and Sell Signals of PT. Bank Syariah Indonesia, Tbk (BRIS) in the 2022 Period

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Abstract. This study aims to analyze the stock price movements and determine the total capital gain and loss of PT Bank Syariah Indonesia Tbk (BRIS). The research employs a descriptive quantitative method with time-series data obtained from the Indonesia Stock Exchange (IDX) for the 2022 period. The sampling technique used is purposive sampling with monthly data. The technical analysis applies the Moving Average Convergence Divergence (MACD) and Stochastic Oscillator (SO) indicators through the TradingView platform to identify buy and sell signals. The results show that during 2022, the MACD indicator generated seven buy signals and seven sell signals, while the Stochastic Oscillator produced six buy signals and six sell signals. Using the MACD indicator, a capital gain of 106% and no loss were recorded, while the Stochastic Oscillator yielded a capital gain of 98% with no loss. These findings indicate that both indicators can effectively assist investors in identifying profitable trading opportunities in BRIS stocks.

Keywords: Stock Movement, Capital Gain and Loss, Moving Average Convergence Divergence (MACD), Stochastic Oscillator (SO).

INTRODUCTION

Investment is an essential activity to anticipate future economic uncertainties (Irawati et al., 2019). Although people generally prefer savings and deposits, investing in capital market instruments such as stocks offers higher potential returns. However, stock price fluctuations require investors to conduct careful analysis before making investment decisions.

In investment decision-making, analysis plays a crucial role in minimizing risk and determining the optimal timing of transactions. Generally, there are two main analytical approaches: fundamental analysis and technical analysis (Tandelilin, 2017). Fundamental analysis evaluates a company's financial performance and economic condition to estimate its intrinsic value, while technical analysis focuses on historical price movements and trading volumes to predict future market trends.

The Indonesian capital market has shown growth, reflecting the increasing public interest in investment, particularly in the banking sector, which plays a vital role in the national economy (Navirinurani, Abubakar, & Kartikasari, 2018). One of the banking stocks that has attracted investor

attention is PT Bank Syariah Indonesia Tbk (BRIS), given its rapid growth and adherence to Islamic financial principles.

In technical analysis, two commonly used indicators for identifying market trends and momentum are the Moving Average Convergence Divergence (MACD) and the Stochastic Oscillator (SO). MACD helps detect trend reversals, while SO indicates overbought and oversold conditions (Cahyadi, 2012; Izzah et al., 2021). The combination of these indicators is believed to enhance the accuracy of buy and sell signals.

Based on this background, this study aims to analyze buy and sell signals and the capital gain and loss of PT Bank Syariah Indonesia Tbk (BRIS) during 2022 using the MACD and Stochastic Oscillator indicators. The findings are expected to provide valuable insights for companies, investors, and future researchers in making more effective investment decisions.

LITERATURE REVIEW

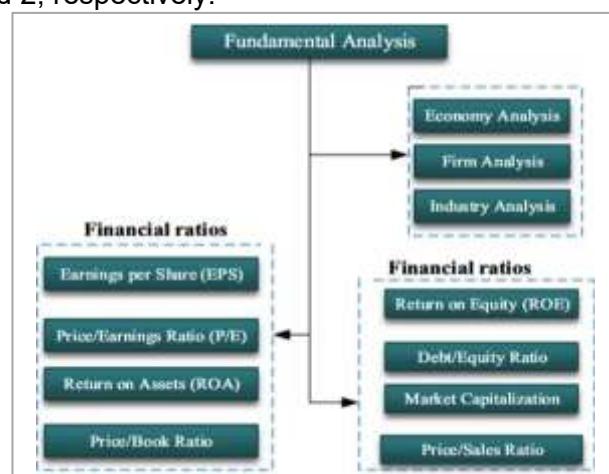
Capital Market

According to the Indonesia Stock Exchange (IDX, 2019), the capital market is defined as a marketplace for various long-term financial instruments that can be traded, including debt securities (bonds), equities (stocks), mutual funds, derivatives, and other instruments. The capital market serves as a funding channel for companies and other institutions (such as the government), as well as an investment vehicle for investors. Thus, the capital market facilitates the infrastructure and mechanisms necessary for trading and related activities. Generally, the financial instruments traded in the capital market are long-term instruments (with maturities of more than one year), such as stocks, bonds, warrants, rights, mutual funds, and various derivative instruments such as options and futures. The financial instruments (products) traded in the Indonesian Capital Market typically include stocks, bonds, mutual funds, exchange-traded funds (ETFs), and derivatives.

The development of the capital market in Indonesia has experienced rapid growth, particularly following the government's issuance of various regulations in the financial and banking sectors, including those governing the capital market. Market participants have increasingly recognized that securities trading can provide attractive returns while simultaneously contributing significantly to the growth of the Indonesian economy (Naviri Nurani, Abubakar, & Kartikasari, 2018). The development of the capital market largely depends on the confidence and trust of investors or capital owners who invest in securities issued by companies or issuers. This dependency arises because investors serve as the primary actors in the capital market and represent a crucial source of funds for publicly listed companies.

Fundamental and Technical Analysis

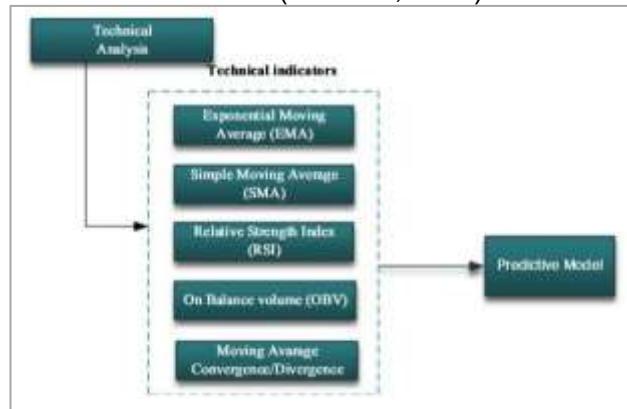
The fundamental and technical analysis as decision-making tools for stock market decisions. The approaches of fundamental and technical analysis used for stock market prediction are illustrated in Figures 1 and 2, respectively.



Source: (Nti et al., 2019)

Fundamental analysis is an approach used to evaluate the intrinsic value of a company by examining various economic, financial, and qualitative factors (Nti et al., 2019). This method assumes that each security has a true underlying value that can be estimated through an analysis of financial statements, profitability ratios, market conditions, and macroeconomic indicators such as interest rates, inflation, and gross domestic product. Investors employing this approach aim to determine whether a stock is undervalued or overvalued relative to its intrinsic worth, thereby making long-term investment decisions based on the company's overall financial health and growth potential.

Source: (Nti et al., 2019)



Technical analysis, according to Nti et al. (2019), focuses on analyzing historical market data, primarily price and volume, to identify patterns and trends that can be used to predict future price movements. It operates on the premise that all relevant information is already reflected in the market price, and that price movements tend to follow identifiable and recurring patterns. Technical analysts employ various tools, including moving averages, relative strength index (RSI), and chart patterns, to determine the timing of buying and selling decisions. While fundamental analysis emphasizes what to buy, technical analysis emphasizes when to buy or sell, providing a complementary perspective for investors and traders in financial markets.

Data Analysis Technique

Data analysis in this study involves examining and reviewing the collected data to ensure accuracy, as well as classifying and organizing it for comparison with relevant theories. The analysis begins with data input, which includes stock price movement charts of PT Bank Syariah Indonesia, Tbk (BRIS) covering the 2018–2022 period. The data were obtained from idx.co.id, TradingView, and Investing.com. Subsequently, the study applies two technical analysis indicators, the Moving Average Convergence Divergence (MACD) and the Stochastic Oscillator (SO) to analyze stock price trends, identify momentum changes, and generate signals to buy or sell and support investment decision-making.

Moving Average Convergence Divergence (MACD)

The Moving Average Convergence Divergence (MACD) indicator is used to show the direction of stock price trends and to determine overbought or oversold conditions (Prabhata, 2012). The MACD provides a buy signal when the MACD line crosses the signal line from below to above, and a sell signal when the MACD line crosses the signal line from above to below. In addition, the centerline (zero line) can also be used as a tool to interpret trend direction. When the MACD line crosses the zero line from below to above, it indicates a strong buy signal, as a bearish condition may shift to a bullish one. Conversely, when the MACD line crosses the zero line from above to below, it indicates a strong sell signal because a bullish condition may turn into a bearish one (Siswoyo, 2011).



Source: slideshare.net/technichal analysis of fmfg sector

The Moving Average Convergence Divergence (MACD) is a highly useful indicator for traders and serves to identify the prevailing market trend (Wira, 2012). The MACD consists of two lines: the MACD line and the signal line. The MACD can generate both buy and sell signals. A buy signal occurs when the MACD line crosses above the signal line, while a sell signal appears when the MACD line crosses below the signal line.

Stochastic Oscillator (SO)

The Stochastic Oscillator is a leading indicator used to identify market momentum and potential trend reversals by comparing a security's closing price to its price range over a specific period (Ong, 2012). It consists of two lines, %K and %D, which move within a scale of 0–100 (Sulistiani & Liliana, 2017). Values below 20 indicate an oversold condition, signaling a potential bullish reversal, while values above 80 indicate an overbought condition, signaling a potential bearish reversal (Nur et al., 2021; Raharjo, 2009). A buy signal occurs when the %K line crosses the %D line upward (Golden Cross), whereas a sell signal occurs when the %K line crosses the %D line downward (Death Cross). The simplicity and interpretability of this indicator make it widely used among traders for identifying optimal entry and exit points in stock trading.



Source: slideshare.net/technichal analysis of fmfg sector

RESEARCH METHODS

This study employs a qualitative descriptive research design with a case study approach to analyze and compare the Moving Average Convergence Divergence (MACD) and Stochastic Oscillator (SO) indicators in assessing the stock price movements of PT Bank Syariah Indonesia, Tbk (BRIS) to identify accurate buy and sell signals for optimal investment decisions. The research uses secondary data obtained from the Indonesia Stock Exchange (IDX) and analyzed through TradingView using historical stock prices, including opening, highest, lowest, and closing prices for the 2022 period. The population consists of banking sector stocks listed on the IDX, with purposive sampling applied to select BRIS stock data as the study sample. Data is analyzed using technical analysis methods, focusing on the MACD and SO indicators, where MACD

identifies trend direction and momentum based on the crossover of EMA lines, and SO measures market momentum and overbought or oversold conditions to determine potential price reversals.

RESULTS AND DISCUSSION

1. Buy and Sell Signals Based on the Moving Average Convergence Divergence (MACD) Indicator

During the first quarter of 2022, the stock price of PT Bank Syariah Indonesia, Tbk (BRIS) experienced a sharp correction at the beginning of the year, followed by an upward movement from mid-January to early March before declining again by the end of March. The MACD indicator detected two buy signals (January 18 and February 24) and two sell signals (February 9 and March 1), indicating a fluctuating sideways trend toward the end of the quarter.

In the second quarter of 2022, BRIS shares declined in early April but generated a buy signal on April 7 through a golden cross, followed by a short-term uptrend until mid-April. Another buy signal appeared on May 12 before a sell signal on June 3, triggered by a death cross that marked a strong bearish reversal. Overall, two buy and two sell signals were recorded during April–June 2022.

In the third quarter, the stock declined from June to early July before a golden cross on July 5 triggered a buy signal and an upward movement until late July. A death cross on July 28 generated a sell signal, followed by a sideways trend through September. Hence, one buy and one sell signal were observed during July–September 2022.

In the fourth quarter, BRIS shares dropped sharply in early October before forming a golden cross on October 17, signaling a bullish reversal. However, a death cross appeared on November 2, followed by a downward trend until mid-December. Another buy signal emerged on December 20, lasting briefly before another signal on December 26. Overall, the October–December period recorded two buy and two sell signals.

Total Capital Gain and Loss of PT Bank Syariah Indonesia, Tbk Using MACD Indicator

GAIN AND LOSS PADA SAHAM PT BANK SYARIAH INDONESIA TBK					
TANGGAL	BELI	TANGGAL	JUAL	GAIN & LOSS	GAIN & LOSS (%)
18/01/2022	1495	09/02/2022	1675	180	12%
24/02/2022	1615	01/03/2022	1795	180	11%
07/04/2022	1485	18/04/2022	1615	130	9%
12/05/2022	1410	03/06/2022	1490	80	6%
05/07/2022	1205	28/07/2022	1675	470	39%
17/10/2022	1295	02/11/2022	1425	130	10%
20/12/2022	1100	26/12/2022	1310	210	19%
				1380	106%

Source: Author's processing (2025)

2. Buy and Sell Signals Based on the Stochastic Oscillator (SO) Indicator

In the first quarter of 2022, the Stochastic Oscillator (SO) indicated a downtrend at the beginning of January, followed by an uptrend after entering the oversold zone in mid-January. A subsequent overbought condition on February 8 triggered a sell signal, while another buy signal appeared at the end of February, followed by a sell signal in early March. Thus, two buy and two sell signals occurred during January–March 2022.

In the second quarter, BRIS stock entered the oversold area (0–20) in mid-April, producing a buy signal, followed by an overbought condition (80–100) later that month, indicating a sell signal. One buy and one sell signal were observed from April to June 2022.

During the third quarter, the stock reached the oversold zone in early July and generated a golden cross on July 4, signaling a buy opportunity. The uptrend continued until late July, when

a death cross on July 29 signaled a sell opportunity. Hence, one buy and one sell signal were recorded between July and September.

In the fourth quarter, the SO indicator showed an oversold condition in early October, triggering a golden cross and buy signal on October 17, followed by a death cross on October 25 that indicated a sell signal. After a brief sideways movement in November, the stock declined until mid-December, before another buy signal appeared on December 20 and a sell signal on December 26. In total, two buy and two sell signals were detected in the October–December 2022 period.

Total Capital Gain and Loss of PT Bank Syariah Indonesia, Tbk Using SO Indicator

GAIN AND LOSS PADA SAHAM PT BANK SYARIAH INDONESIA TBK					
TANGGAL	BELI	TANGGAL	JUAL	GAIN & LOSS	GAIN & LOSS (%)
18/01/2022	1495	09/02/2022	1675	180	12%
24/02/2022	1615	01/03/2022	1795	180	11%
06/04/2022	1485	18/04/2022	1615	130	9%
04/07/2022	1205	28/07/2022	1675	470	39%
17/10/2022	1295	25/10/2022	1395	100	8%
20/12/2022	1100	26/12/2022	1310	210	19%
				1270	98%

Source: Author's processing (2025)

3. Overall Analysis and Implications

The findings demonstrate that the combination of Moving Average Convergence Divergence (MACD) and Stochastic Oscillator (SO) indicators is effective for identifying optimal buy and sell signals in stock trading, particularly for PT Bank Syariah Indonesia, Tbk (BRIS). The MACD indicator provides valuable insights into short-term and long-term trends (bullish or bearish), while the SO indicator captures market momentum by identifying overbought and oversold conditions.

When used together, these indicators help investors determine the appropriate timing to buy in oversold conditions and sell in overbought conditions, thereby improving decision accuracy. This combined method proves effective in reducing risk and maximizing profit opportunities in the capital market. The study also offers practical implications for investors, securities analysts, and portfolio managers, providing a data-driven framework for designing technical trading strategies based on historical stock price movements.

CONCLUSION AND RECOMMENDATION

Based on the results of the analysis, it can be concluded that the Moving Average Convergence Divergence (MACD) and Stochastic Oscillator (SO) indicators are effective tools for analyzing stock price movements and serve as a solid foundation for investment decision-making in PT Bank Syariah Indonesia, Tbk (BRIS) during 2022. The MACD indicator generated a total of 7 buy signals and 7 sell signals, while the Stochastic Oscillator produced six buy signals and six sell signals throughout the same period. Based on the calculation, BRIS stock achieved a 106% gain with 0% loss using the MACD indicator and a 98% gain with 0% loss using the SO indicator.

The findings further demonstrate that the combination of both indicators is highly effective in identifying optimal buy and sell signals for stock trading. The MACD indicator provides valuable insights into short-term and long-term trends (bullish or bearish), while the SO indicator captures market momentum by identifying overbought and oversold conditions. When applied together, these indicators enable investors to determine the most appropriate timing to buy during oversold conditions and sell during overbought conditions, thereby enhancing decision-making accuracy. This combined approach has proven effective in reducing risk and maximizing profit opportunities in the capital market. Moreover, the study provides practical implications for investors, securities analysts, and portfolio managers by offering a data-driven framework for developing more systematic and evidence-based technical trading strategies.

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