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Moving Average Investigation in Optimizing Entry and Exit on IDX Sharia Growth

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ABSTRACT

This study aims to evaluate the effectiveness of the Moving Average indicator in determining entry and exit times on stocks listed on IDXSHAGROW. This is a reference for sharia stock investors in making investment decisions.

This study uses a quantitative approach using the Mann-Whitney test to analyze data from May 2023 to May 2024. The population in this study were companies listed on IDXSHAGROW. The purposive sampling method was used in sampling, as many as 7 companies were consistently listed on the index. Data was obtained through the Profits application. The MAs were compared were MA10 and MA50 with the breakout and breakdown methods to determine signals. The results showed that MA10 produced 154 optimal signals out of 202 signals, while MA50 recorded 52 optimal signals out of 68 signals. Both indicators have the same level of accuracy, which is 76%. However, MA10 is more responsive to price changes.

The findings emphasize the importance of understanding analysis for investors in making better investment decisions in the sharia capital market.

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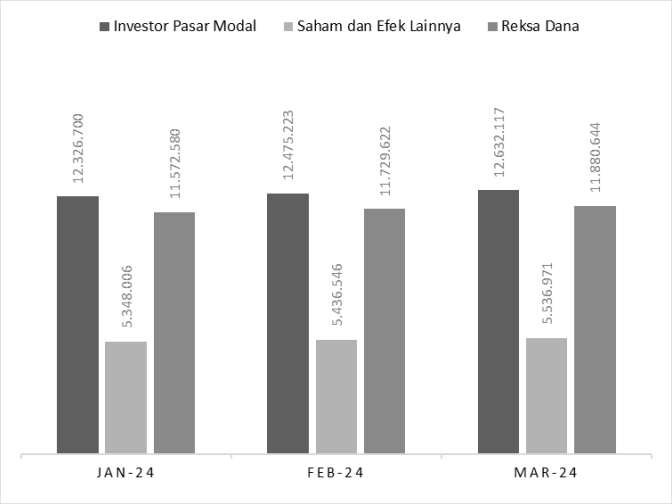
Introduction

Facing global economic turmoil, the performance of the Indonesian capital market continues to show positive developments throughout 2023 to 2024. This can be seen from several indicators including market stability, trading activity, the number of fund raisers, and the number of retail investors continues to increase (*OJK*, 2023). The Indonesia Stock Exchange (IDX) noted that the number of capital market investors in Indonesia has exceeded 13 million Single Investor Identification (SID) throughout 2024 with new SID growth of more than 863 thousand. In addition, in Indonesia, the growth of new SIDs in stock investors has reached 5.7 million. Capital market investors include stock investors, mutual funds, and bonds (government securities). As of January 31, 2024, there were 12,326,700 capital market investors, an increase of 1.3% since the end of 2023. In the month Meanwhile, the number of capital market investors was recorded to have grown by 18.01% throughout 2023 (KSEI, 2024). Until August 2024, domestic investors still dominate stock ownership on the IDX with a portion of ownership of 51.5% compared to foreign investors of 48.5%.

Figure 1
Capital Market Investor Growth (January – March 2024)



Source: Processed data, KSEI News 2024

KSEI data from January to March shows a positive trend in Indonesia's capital market activity. The increase in the number of retail investors indicates increasing public interest in stock investment. Along with the increase in transaction value, this indicates increasing market liquidity. The dominance of technology stocks in trading shows investor optimism about the prospects of the technology sector in the future. This condition is likely influenced by several factors, such as monetary policy easing, global economic recovery, and rapid development of digital technology.

The development of the Islamic capital market in Indonesia has recorded a significant increase in recent years. According to A. Ifayani Haanurat (2013), Sharia stocks are stocks from companies that comply with Islamic sharia principles, both in terms of products and management. According to the Financial Services Authority (OJK), in Indonesia the number of investors in the sharia capital market has increased by around 25% over the past

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year, reflecting increasing awareness of the importance of investing in accordance with sharia principles. However, despite the significant growth potential, many investors still have difficulty in determining the right time to buy (entry) and sell (exit) which can affect overall investment results. Limited knowledge of technical analysis is one of the main obstacles in making optimal investment decisions in this market.

The Indonesia Stock Exchange consists of 44 listed indexes. Seeing the needs of capital market industry players, the Indonesia Stock Exchange (IDX) is developing a sharia stock index. In the Indonesian capital market, there are currently 5 (five) types of sharia stock indexes, namely ISSI, JII, JII70, IDX-MES BUMN 17, and IDX Sharia Growth (IDXSHAGROW). On October 31, 2022, the Indonesia Stock Exchange (IDX) released the latest sharia stock index, namely the IDX Sharia Growth stock index (IDXSHAGROW). IDX Sharia Growth is an index designed to measure the performance of 30 sharia stock companies that have good profit and revenue growth and high liquidity (Mursyidah et al., 2023). These companies are selected periodically twice a year in May and November following OJK regulations. The method used in calculating these stocks is the adjusted market capitalization weighted method (Bursa Efek Indonesia, 2022). For investors looking for sharia stocks with high growth potential, IDX Sharia Growth can be a reference, in other words, IDX Sharia Growth provides an overview of the performance of the most prospective sharia stocks in the market.

Based on the literature review, many studies have shown the effectiveness of analysis indicators. There are two stock analysis models, namely the technical analysis method and the fundamental analysis method (Prasetyo et al., 2019). The fundamental analysis method measures the overall performance of a company, while the technical analysis method measures by looking at historical data on stock prices and connecting it with the resulting trading volume and various economic considerations that are currently occurring (Harith Santoso, 2023). Stock pattern or trend movements can be identified using indicators, to provide information about stock trends and volumes and are used to identify entry and exit signals. Stock trends include uptrends, downtrends, and sideways trends (Martia & Yasmine, 2021).

In relation to investment, there are several technical analysis indicators that are often used by traders to analyze stocks in the capital market. Technical indicators such as *moving average* often used to determine optimal entry and exit times, moving averages help traders identify price trends by filtering out short-term fluctuations. By using the MA indicator, investors can make more informed decisions, especially in volatile markets such as the Islamic capital market. Moving Average is divided into 3 parts of the indicator, namely SMA (Simple Moving Average), WMA (Weighted Moving Average), and EMA (Exponential Moving Average) (Simuru et al., 2021). The easiest way to use the moving average method is to understand that if the moving average line crosses the price line on the stock from below, then the estimated price trend on the stock is down or bearish, and vice versa if the moving average line crosses the price line on the stock from top to bottom, then the estimated price trend on the stock is up or bullish. Although widely used, the effectiveness of MA in determining entry and exit times in stock trading still needs to be studied further in

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accordance with sharia principles. The time period for estimating the moving average, namely the 10-day moving average (MA10) is a short-term moving average period often used by investors because it tends to be fast in seeing stock price movements, the 20-day moving average (MA20) is a medium-term period, and the 50-day moving average (MA50) is a long-term period (Czubatinski & Schlotmann, 2019). The longer the MA period, the less accurate the line is, and vice versa. The shorter the MA line determinant period, the higher the accuracy or sensitivity. Therefore, in testing the level of optimization of entry and exit signals on the Moving Average indicator, researchers used the MA10 (10 days) and MA50 (50 days/3 months) time periods to determine which period is most effective in providing entry and exit signals on stocks on IDX Sharia Growth.

Some studies related to indicator analysis *moving average*. Where in the research Cahyani & Mahyuni (2020) stated that the moving average in predicting the direction of stock price movements has proven its accuracy. In the study Pangaribuan (2020) stated that stock price prediction using the moving average (MA) method is 80.11% more accurate compared to the Neural Network Backpropagation Algorithm with an accuracy level of 78.91%. Research Simuru et al. (2021) proves that the moving average indicator is accurate for predicting stocks in the future. Research Mazumder et al. (2023) also states that the Simple Moving Average (SMA) can be an effective tool in identifying buy and sell signals. Research from Risaldi et al. (2024) suggests that MA is accurate in predicting stock prices. Raudys & Pabarškaitė (2018) studied moving averages using traditional methods concluded in his study that Custom Moving Average was more accurate than other moving averages in 99.5% of cases on synthetic data and in 91% of cases on real-world stock data. In contrast, in his study Chaddha & Yadav (2022) shows that MA has limited ability to predict stock market movements.

Various research results regarding the accuracy of indicators *moving average*, previous studies have used various methods to broaden insight into the advantages and disadvantages of this indicator. However, it still needs to be developed further by using Breakout and Breakdown techniques to determine entry and exit moments on MA10 and MA50.

Based on the background and research gaps that have been described, the aim of this research is to evaluate the effectiveness of the Moving Average indicator in determining entry and exit times for shares listed on IDX Sharia Growth. This research provides benefits for investors in the form of understanding technical analysis, evidence of the effectiveness of the MA indicator, solutions to difficulties in determining entry and exit points in investing, as well as providing analytical understanding for investors in making better investment decisions in the Islamic capital market.

Literature review

Behavioral Finance Theory

According to Agustini et al. (2022) Behavioral Finance is a study that looks at how investors make investment decisions based on psychological aspects. Behavioral Finance uses the term psychology to explain investor behavior in filtering information when making investment decisions. There are four general principles in Behavioral Finance, namely Overconfidence, Financial Cognitive Dissonance, Theory of Regret and Prospect Theory

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(Agustini et al., 2022). Sukandani et al. (2019) In his research, he stated that Behavioral Finance is a theory that pays attention to how investor psychology influences financial and market decisions, sometimes investors make decisions when market conditions are uncertain. For the past forty years, traditional finance has been the dominant theory in the academic community. However, traders start studying alternative theories in finance called behavioral finance. Behavioral finance provides literacy on emotional factors to increase public awareness and individual psychology in investing in the stock market (Yasa et al., 2020). Using Behavioral Finance in the stock market explains how humans behave in making decisions with three interdisciplinary namely psychology, sociology and finance (Sisbintari, 2017).

Efficient Market Hypothesis

*Efficient Market Hypothesis*is a theory put forward in 1965 by (Fama, 1965) who is an economist who is famous for his role in developing this theory. The financial concept known as the efficient market theory is a concept that states that the price of an asset fully reflects all information available in the market.

According to Fama (1970) Market forms can be classified into three groups, known as efficient market hypotheses. The three forms of efficient markets are (1) the weak form of the efficient market hypothesis, (2) the semi-strong form of the efficient market hypothesis, and the strong form of the efficient market hypothesis. Each type of stock market has different information absorption characteristics. In other words, the prices in the market are "correct" and there is no opportunity for investors to consistently earn higher profits than the market average using only existing information. This theory states that competitive markets produce many intelligent investors who can quickly respond to new information based on the prices reflected in the assets (Yenni et al., 2015). This efficient market hypothesis is more specifically directed at technical analysis.

Technical Analysis

According to Mahendra et al. (2022) Technical analysis method is a technique to understand price movements in stocks to read historical stock price data graphs. In general, technical analysis is divided into two, namely modern technical analysis and classical technical analysis (Riyanto' & Astuti, 2024). The use of chartists, or often referred to as classical technical analysis, describes the movement of stock prices following certain patterns that can be seen from the stock price chart. Meanwhile, modern technical analysis relies on complex algorithms, artificial intelligence, and large amounts of data to analyze market patterns in depth. This allows traders to identify trends and investment opportunities more accurately (Vicky, 2024).

Moving Average

Moving Average is an indicator commonly used by retail investors when trading in the stock or financial markets.(Alvior, 2021). This method uses the average price of a stock over a certain period of time to provide smoother information about how prices fluctuate (Santoso & Sukamulja, 2020). According to Ajisaputra (2019), moving average is a method that is placed directly on the stock chart. Its function is as a tool to help identify trends that are important for traders and investors in determining Entry and Exit times accurately.

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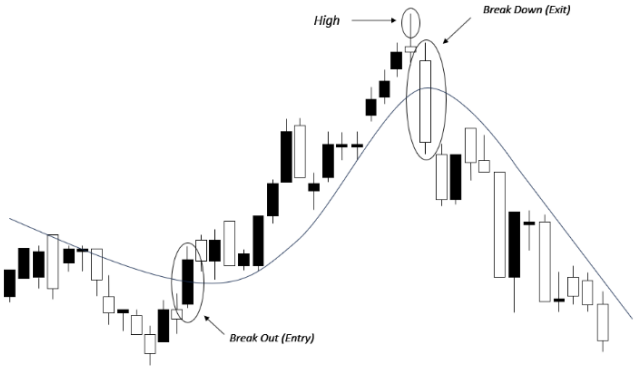
Figure 2
Using Breakout and Breakdown Techniques on Moving Average Indicators



Source: Author

In this study, the analytical technique method was used.*Breakout*and Breakdown which is used to determine the optimal entry and exit time on the Moving Average indicator. Breakout is used when the stock price breaks through the resistance level, while the Breakdown technique is used when the price breaks through the support level and High is the highest price in a stock market trade (Julian & Pribadi, 2021).

Research methods

To answer the hypothesis in this study, the type of research used is quantitative research and uses the Mann-Whitney test which can be used to test the optimization of moving average indicators in determining entry and exit times in several companies. The object of this study is stocks listed on IDX Sharia Growth, data was obtained through the Profits Anywhere application to view charts and graphs of stock price movements, in the period from May 2023 to May 2024. The population in this study were all companies included in IDX Sharia Growth listed on the Indonesia Stock Exchange (IDX) totaling 30 companies, using a sampling technique, namely purposive sampling with the criteria of stocks that were consistent at the beginning of the IDX Shariah Growth index during the period October 31, 2022 to May 31, 2024. The following is a list of stocks that are consistent as listed stocks on the IDX Sharia Growth Index, namely AKR Corporindo Tbk (AKRA), Global Mediacom Tbk (BMTR), Vale Indonesia Tbk (INCO), Indosat Tbk (ISAT), Matahari Department Store Tbk (LPPF), Pakuwon Jati Tbk (PWON), and Industri Jamu and Pharmaceutical Sido Muncul Tbk (SIDO).

Then a test was carried out to compare the accuracy of the moving average using the formula to calculate the accuracy percentage, namely:

$$\frac{Total\ Sinyal\ Sukses}{\text{Total Keseluruhan Sinyal}} \times 100$$

This study compares the accuracy of using moving averages with the Breakout and Breakdown methods. Breakout indicates momentum to buy (entry), while Breakdown indicates momentum to sell (exit) (Risaldi et al., 2024). The moving average indicators that will be compared in this study are Moving Average (MA) 10 and Moving Average (MA) 50.

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Results and Discussion

The first analysis conducted in this study was to identify data on the Moving Average indicator on AKRA, BMTR, INCO, ISAT, LPPF, SIDO, and PWON stocks using MA10 as follows:

Figure 3
Use of Entry and Exit on the MA10 indicator

Source: Profits, 2024

Table 1
Entry signal data on the Moving Average indicator (MA10)

No	Stock	Entry	Signal	
			Optimal	Not Optimal
1	AKRA	16	11	5
2	BMTR	14	8	6
3	INCO	15	6	9
4	ISAT	13	13	0
5	LPPF	13	8	5
6	SIDO	11	8	3
7	PWON	19	15	4
Total Overall Signal		101	69	32

Source: Analysis Results

From the analysis that has been done to determine the entry point on several stocks above using the MA10 indicator, there are 101 signals that appear where 69 signals are optimal (68%) and 32 signals are not optimal. These results make the MA10 indicator optimal in determining the entry point on AKRA, BMTR, INCO, ISAT, LPPF, SIDO, and PWON stocks.

Table 2
Exit signal data on the Moving Average indicator (MA10)

No	Stock	Exit	Signal	
			Optimal	Not Optimal
1	AKRA	16	12	4
2	BMTR	14	13	1
3	INCO	15	12	3
4	ISAT	13	9	4

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5	LPPF	13	11	2
6	SIDO	11	11	0
7	PWON	19	17	2
Total Overall Signal		101	85	16

Source: Analysis Results

From the analysis that has been done to determine the exit point on several stocks above using the MA10 indicator, there are 101 signals that appear where 85 signals are optimal (84%) and 16 signals are not optimal. These results make the MA10 indicator optimal in determining the exit point on AKRA, BMTR, INCO, ISAT, LPPF, SIDO, and PWON stocks.

The second analysis conducted in this study used the MA50 indicator, as follows:

Figure 4
Use of Entry and Exit on the MA50 indicator

Source: Profits, 2024

Table 3
Moving Average (MA50) indicator Entry signal data

No	Stock	Entry	Signal	
			Optimal	Not Optimal
1	AKRA	5	3	2
2	BMTR	6	3	3
3	INCO	5	4	1
4	ISAT	6	5	1
5	LPPF	2	1	1
6	SIDO	3	3	0
7	PWON	7	5	2
Total Overall Signal		34	24	10

Source: Analysis Results

The results of the analysis that has been done to determine the entry point on several stocks above using the MA50 indicator, there are 34 signals that appear where 24 signals are optimal (71%) and 10 signals are not optimal. These results make the MA50 indicator optimal in determining the entry point on AKRA, BMTR, INCO, ISAT, LPPF, SIDO, and PWON stocks.

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Table 4
Exit signal data of Moving Average indicator (MA50)

No	Stock	Exit	Signal	
			Optimal	Not Optimal
1	AKRA	5	5	0
2	BMTR	6	6	0
3	INCO	5	3	2
4	ISAT	6	4	2
5	LPPF	2	2	0
6	SIDO	3	2	1
7	PWON	7	6	1
Total Overall Signal		34	28	6

Source: Analysis Results

The results of the analysis that has been done to determine the entry point on several stocks above using the MA50 indicator, there are 34 signals that appear where 28 signals are optimal (82%) and 6 signals are not optimal. These results make the MA50 indicator optimal in determining the entry point on AKRA, BMTR, INCO, ISAT, LPPF, SIDO, and PWON stocks. In order to see which moving average indicator is optimal and accurate, a comparison is made as follows:

Table 5
Comparative data for MA 10 and MA 50

No	Moving Average Indicator	Entry/Exit Signal	Number of Signals	Total Overall Signal
1	MA10	Optimal	154	202
		Not optimal	48	
2	MA50	Optimal	52	68
		Not optimal	16	

Source: Analysis Results

From the results of data analysis on the MA10 indicator, 154 optimal signals can be obtained from 202 entry and exit signals that appear, with an accuracy of 76%. On the other hand, the MA50 indicator obtained 68 entry and exit signals that appeared and as many as 52 optimal signals, with an accuracy of 76%. These results indicate that the MA10 and MA50 indicators are very optimal in helping investors determine the entry and exit times on IDX Shariah Growth stocks.

Mann Whitney Test

Table 6
Mann Whitney Test Results

No	Comparison	Mann Whitney Asymp.Sig
1	Moving Average (MA 10)	0.161
2	Moving Average (MA 50)	0.545

Source: Analysis Results

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Based on the results of the first hypothesis, the results of the significant value are 0.161 > 0.05. It can be concluded that H1 is rejected and Ho is accepted. This means that there is no real difference between estimates and reality. The moving average indicator using the MA 10 method indicates that this method is accurate and optimal in predicting the direction of stock movements in the future.

The results of the second hypothesis obtained a significant value of 0.545 > 0.05. It can be concluded that Ho is accepted and H1 is rejected. This means that there is no real difference between estimates and reality. With this, the moving average indicator using the MA 50 method indicates that it is accurate or optimal in predicting the direction of stock movements in the future.

Based on the analysis results of the Moving Average (MA) 10 and MA 50 indicators, they show optimal performance in determining entry and exit signals on AKRA, BMTR, INCO, ISAT, LPPF, SIDO, and PWON stocks that have been analyzed. MA 10 produces a total of 202 entry and exit signals with 154 of them classified as optimal, providing an accuracy rate of 76%. On the other hand, MA 50 produces 68 entry and exit signals that appear with 52 of them classified as optimal, providing the same accuracy rate of 76%. However, MA 10 is more appropriate for investors to use for short-term investment purposes. Showing that this indicator is more sensitive to price changes, so it can provide more opportunities for investors to make faster and more responsive decisions to market movements. Meanwhile, MA 50 is good for medium-term use to help investors maximize profits in making investment decisions.

In addition, seen from the signal distribution, MA 10 produces more optimal signals, both entry 69 out of 101 signals that appear and exit producing 85 out of 101 signals that appear. Compared to MA 50 which produces optimal entry signals of 24 out of 34 signals that appear and exit as many as 28 out of 34 signals that appear. This shows that MA 10 tends to be more stable and detects profitable opportunities on both sides of the stock movement. Although MA 50 still provides the same level of accuracy, the fewer signals can limit opportunities in investor decision making to buy and sell, especially in dynamic markets such as stocks on IDX Sharia Growth.

From the results of the Maan-Whitney test, no significant difference was found between the predicted and actual results for both MA 10 ($p = 0.161$) and MA 50 ($p = 0.545$). This shows that both indicators are equally reliable. However, when considering the higher sensitivity and the greater number of optimal signals, MA 10 is proven to be more optimal in helping investors take advantage of opportunities in the stock market. Thus, the MA 10 moving average indicator is more recommended for finding more responsive and flexible entry and exit strategies, while MA 50 can be used by investors who prioritize stability and prefer less frequent but still accurate signals.

The results of this study strengthen previous research (Cahyani & Mahyuni, 2020; Mazumder et al., 2023; Risaldi et al., 2024; Simuru et al., 2021) which analyzes the advantages and effectiveness of technical analysis of moving average indicators in predicting the movement of stock direction on the Indonesian Stock Exchange. This study also supports several previous studies (Raudys & Pabarškaitė, 2018) proves that technical

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analysis with the moving average method is superior to other analysis methods. On the other hand, the superiority in predicting the accuracy of the moving average indicator compared to the neural network backpropagation algorithm is also proven in other studies (Pangaribuan, 2020).

Several previous studies have successfully proven the superiority of the moving average indicator, in line with this study. However, there are several studies that are not in line with this study, Chaddha & Yadav (2022) revealed that the moving average indicator has limited ability to predict stock movement direction.

Various research results on the accuracy of the moving average indicator indicate that the effectiveness of the moving average indicator cannot be assumed to be applicable to different stock market conditions and different observation periods. The alignment of previous studies shows that this study is not only relevant but also provides additional contributions by testing new techniques (Breakout and Breakdown) on the MA 10 and MA 50 indicators. This study found that the real moving average method is proven to be statistically significant in accurately predicting changes in the situation and direction of price fluctuations in the Indonesian stock market, especially stocks listed on IDX Sharia Growth which are observed in the short term (MA 10) and medium term (MA 50).

In Behavioral Finance theory, it is concluded that investment decisions using Moving Average are not only influenced by historical price data, but also by investor psychological factors. Cognitive biases such as overconfidence and herd mentality can affect the interpretation of signals given by Moving Average, thus impacting the decision to buy and sell stocks (Hanum Pertiwi & Panuntun, 2023). Therefore, it is important for investors to not only rely on technical analysis, but also understand the psychological aspects of investment decision making (Aji & Astuti, 2023).

Conclusion

This study explores the use of Moving Average (MA) indicators to help investors determine the right time to buy (entry) and sell (exit) stocks on IDX Sharia Growth. There are two types of moving average methods used in the analysis, namely MA 10 which calculates the average over a period of 10 days and MA 50 calculates the average period of 50 days. The results of this study indicate that MA 10 and MA 50 provide accurate trading signals. Of the total signals generated, MA 10 recorded 154 optimal signals from 202 signals that appeared, while MA 50 produced 52 optimal signals from 68 signals. Both indicators have the same level of accuracy, namely 76%. However, MA 10 is more responsive to short-term price changes so it is recommended for use by investors. This study also highlights the importance of understanding technical analysis for retail investors in the sharia capital market, considering that many of them still have difficulty in determining the right entry and exit points. With this, the use of the Moving Average indicator becomes a valuable tool in making investment decisions.

This study recommends further development on the use of Breakout and Breakdown techniques in technical analysis to improve the accuracy of future stock price predictions. In addition, it is recommended for traders or investors in analyzing and viewing stock price movements to use other technical analysis methods such as William fractals, Bollinger

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bands, stochastics, and so on. These indicators can be combined with the moving average method which can help traders obtain more accurate optimal points.

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