

Trading LQ45 Energy Sector Stocks on the Indonesia Stock Exchange: Technical Analysis as a Basis

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ABSTRACT

The purpose of this study is to determine the right stock sell signals and buy signals using technical analysis. The indicators used are Candlestick, Bollinger Bands, Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Stochastic Oscillator (SO), and Parabolic SAR. This research is a descriptive qualitative research using tradingview.com software to obtain secondary data from 8 energy sector companies that were sampled by purposive sampling. The results showed that in the June-December 2023 period, the pattern of stock price movements in the LQ45 energy sector with candlestick indicators often fluctuated and there was a reversal in the stock price trend. The Bollinger Bands indicator shows that the average share price is uptrend then downtrend. MACD and Parabolic SAR indicators show the formation and change in the trend of stock price movements and can show sell signals and stock buy signals. RSI and SO show overbought levels and oversold levels.

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INTRODUCTION

Investment will provide benefits and also definitely has risks. The higher the profit from an investment, the higher the risk, therefore it is necessary to take action to avoid investment risk (Choirotul Mafula, n.d, 2023). Stocks are financial instruments that are traded in the Capital Market and are the most in demand by investors. Before deciding on an investment, investors need to analyze stocks in order to reduce risk by using several tools. Technical analysis is a tool for investors to analyze a stock. Through technical analysis investors can easily and quickly predict future stock price movements presented in a graph. Indicators used in technical analysis Candlesticks, Bollinger Bands, Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Stochastic Oscillator (SO), and Parabolic SAR. Technical analysis is also used by investors to forecast future stock price movements and market behavior. To find out, investors must observe the stock price chart, trading volume, and the composite stock price index. Furthermore, technical analysis can identify buy signals and signals to sell stocks or hold stocks. In the short term, technical analysis is most often used by investors because the return on investment can be easily and quickly calculated (Farild et al., 2023).

On the Indonesia Stock Exchange (IDX) the application of technical analysis in making stock trading decisions has become the concern of many investors. It is proven that the ability of technical analysis to provide buy and sell signals is faster and more accurate than fundamental analysis which focuses more on the company's financial performance. Through technical analysis, investors can optimize stock trading strategies, manage risks, and maximize expected potential returns. However, the application of technical analysis is not without its challenges. Market complexity, stock price volatility and market sentiment dynamics can affect the accuracy and effectiveness of technical indicators. Therefore, an in-depth understanding of technical analysis concepts and techniques as well as the ability to interpret data appropriately is required.

On the IDX, energy sector LQ45 stocks in the middle to end of the year were in high demand by investors. This was a consequence of the energy sector's upward trend driven by a number of favorable factors. Positive sentiments included the possibility of rising oil prices as a result of the conflict or war between Russia and Ukraine as well as the war between Palestine and Israel. Increased demand due to conflicts leads to higher oil prices. The increase in oil prices was a factor in the strengthening of the energy sector stock market. Demand for the commodity increased as many countries needed it. Furthermore, due to high temperatures in July in several countries, coal prices also continued to rise. This led to an increase in electricity usage, resulting in an increased demand for coal. Throughout 2023, investment growth in the energy sector increased compared to the previous year, as shown in the following graph.

Figure 1. Development of IDX Energi 2022-2024



Source: Trading View App

Several previous studies have proven the accuracy of technical analysis through comparison of the closest closing price of a stock with indicator signals used to identify trends, momentum, and potential turning points in stock price movements. Technical analysis research with Candlestick indicators, Bollinger Bands, Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Stochastic Oscillator (SO), and Parabolic SAR, several researchers have done. Most of the results of these studies state that the use of several technical analysis indicators helps investors in optimizing returns, but there are some studies that state that there are errors in interpreting the results of technical analysis.

Research that supports the use of technical analysis indicators includes Abdul Chotib and Siti Ridhoah (2021) who examine the comparative use of MACD, Moving Average, and Stochastic Methods in Profit Optimization; Revo Gilang Firdaus (2021) on Stock Technical Analysis Using the RSI and Bollinger Bands Indicators on Construction Stocks; Dina Yeni Martia and Nur Indriana Yasmin (2021) on Simple Moving Average and Relative Strength Index Indicators to Determine Buy and Sell Signals for Stocks in the Infrastructure Sector; Miftha Farild, Muh. Izzulhaq Sawaji, and Paramita Poddala (2023) on Technical Analysis as a Basis for Decision Making in Stock Transactions. Furthermore, research by Benny and Tomy G. Soemapradja (2010) on Simulation of Trading Shares of PT Tambang Batubara Bukit Asam, Tbk. with MACD and Williams % Range states that several technical analysis indicators show erroneous interpretation.

Although investors more often use technical analysis to invest in the capital market, little research has been done on technical analysis. Therefore, researchers feel the need to re-examine this technical analysis. Candlestick indicators, Bollinger Bands,

Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Stochastic Oscillator (SO), and Parabolic SAR are used as references in investment decisions. The reason for choosing all these indicators is because some previous researchers only used a few indicators, while each indicator predicts from a different angle, so it is necessary to use all these indicators in this study.

The object of this research is LQ45 energy sector stocks on the IDX for the period June-December 2023. The LQ45 index measures the price performance of 45 stocks of companies that have high liquidity and large market capitalization. Shares of LQ45 companies are one of the active stocks so that they can constantly experience price changes. Even so, LQ45 stocks are safe stocks to invest in because they perform well, so when viewed in terms of risk, the LQ45 group of stocks has the lowest or small risk of loss compared to other stocks listed on the Indonesia Stock Exchange (IDX). The eight energy sector companies included in LQ45 from June 2023 - December 2023 that will be studied are Adaro Energy Indonesia Tbk (ADRO), AKR Corporindo Tbk (AKRA), Harum Energy Tbk (HRUM), Indika Energy Tbk (INDY), Indo Tambangraya Megah Tbk (ITMG), Medco Energi Internasional Tbk (MEDC), Perusahaan Gas Negara Tbk (PGAS), and Bukit Asam Tbk (PTBA).

LITERATURE REVIEW

Technical Analysis

Technical analysis uses historical market price data to forecast or estimate price movements. Price data is the most widely used type of data during this technical analysis process, just like transaction volume data. Tandelilin in the journal (Prasetyo et al., 2019) explains technical analysis as a method for predicting the direction of movement of stock prices and other market indicators using previous market data, such as price and volume information. Adherents of technical analysis believe that prices actually move in a certain trend and will continue to occur. (Farild et al., 2023)

Candlestick is a modification of the bar chart with the formation of candle bodies with colors to make it easier for traders to determine the position of the opening point, closing point, highest price, and lowest price. Each candle bar with its upper and lower wicks represents the stock price at a certain period of time (Farild et al., 2023).. Bollinger Bands are useful for identifying whether a stock price is relatively high or low. The stock price is considered high when it touches the upper band, and low when it touches the lower band. If the stock price breaks the upper band line, it becomes overbought, which indicates a bearish signal. Meanwhile, if it breaks the lower limit of the lower band line, it becomes oversold which indicates a bullish signal. Determining the high or low stock price is useful for market entry and exit strategies. (Firdaus, 2021).

MACD is generally used to give buy and sell signals, indicate trends, and show the difference between bullish and bearish. This technique consists of two lines and a histogram: signal line, MACD line, MACD histogram. Buy and sell signals are generated by the shift between the MACD line and the signal line. A buy signal occurs when the

MACD line crosses the signal line from bottom to top, which produces a stronger signal if the shift occurs above the zero line. A sell signal occurs when the MACD line crosses the signal line from top to bottom, which produces a stronger signal if the shift occurs further below the zero line (Prasetyo et al., 2019).

The RSI is a momentum oscillator indicator that measures the speed and change of price movements. The RSI oscillates between 0 and 100. One of the popular uses of RSI is to determine overselling and overbought. Traditionally, the RSI is considered to be oversold if it is below 30 and overbought if it is above 70. When the RSI is at the level of 70, it is overbought, which is a condition when prices are overvalued and investors who already own stocks below this price should realize their profits. At levels 45-50 can be used as a trading range for the short term (Rosyidah & Hafi, 2021).

The Stochastic Oscillator (SO) is leading and is used to determine market momentum or market conditions. This analytical tool was created by George C Lane in the late 1950s. The value range of this indicator is 0-100 (oscillator). Closing positions are shown in relation to the range of transactions over a certain period using the Stochastic Oscillator. The two lines on the Stochastic Oscillator indicator, %K and %D, indicate whether the price is going up or down. (Farild et al., 2023). The overbought zone is when it is above the 80 level and below the 20 level is declared as oversold. If the %K line cuts above the %D line in the oversold zone, it will generate a buy signal, while if the %K line cuts below the %D line in the overbought zone, it will generate a sell signal. (Damayanti et al., 2020)

Parabolic SAR is an indicator that was invented by J. Welles Wilder in 1978. This indicator is used to determine the direction of movement of an issuer. This indicator is considered quite good when the price movement is experiencing a strong trend. The word "SAR" in this indicator means Stop and Reverse. That is, this indicator not only shows the direction of the trend but also provides a signal when the trend stops and reverses. While the meaning of Parabolic is to illustrate the Parabolic SAR line which is patterned like a parabolic shape. (Muis et al., 2021). Parabolic SAR is used to determine the direction of movement of an issuer. This indicator is considered quite good when price movements experience a strong trend. On the chart, the position of the Parabolic SAR indicator is at the top or bottom of the stock price movement candlestick. If the parabolic point is below the candlestick, this indicates a bullish trend. Conversely, if the parabolic dot is above the candlestick, this indicates a bearish trend.

METHODOLOGY

This type of research is descriptive qualitative research. Researchers used secondary data, namely taking historical data on the share prices of LQ45 energy sector companies

on the Indonesia Stock Exchange during the period June - December 2023 from the IDX official website, namely www.idx.co.id and from the tradingview application.

The population in this study were 45 companies listed on the LQ45 index. The sample in this study were all energy sector companies listed on the LQ45 index for the period June - December 2023, totaling 8 companies. The sampling technique in this study was purposive sampling. The data collection technique in this study used internet research. Data collection is done by downloading from www.idx.co.id to find data on stock price movements for seven months and from the tradingview application which can be updated daily.

The data analysis steps begin with data input in the form of a graph of energy sector stock price movements listed on the LQ45 index for the period June 2023-December 2023. Next, determine the Technical Analysis Indicators. There are six indicators used in this analysis, namely Candlestick, Bollinger Bands, Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Stochastic Oscillator, and Parabolic SAR. All of these indicators are already available on the TradingView app.

Analyze stock price movements and see patterns with the Candlestick method with the Trading View application. Then analyze and see the stock trend using the Bollinger Bands method. Analyze to determine decisions on when to sell and buy shares using the Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Stochastic Oscillator, and Parabolic SAR methods.

RESULTS AND DISCUSSION

1. Stock Price Movement Patterns of LQ45 Energy Sector Companies for the Period June - December 2023 with Candlestick



On December 29, 2023, ADRO's share price experienced a price correction due to the influence of market conditions or when a company had just distributed its dividend which resulted in the candle being slightly lower than the previous price candle. The current recommendation is the right time to buy shares where currently the ADRO share price is bearish, which means that the share price has decreased and the possibility of forming a share price in early January 2024 to be bullish and experience an uptrend.

From December 18 - 27, AKRA shares experienced a downtrend but then on December 29 a bullish doji pattern appeared which resulted in the stock from the downtrend going into an uptrend so it was recommended to buy shares. At the end of December 2023 HRUM shares began to experience a slight increase for the uptrend. The last 2 candle patterns have not been able to swallow up the bullish candle on the 27th which results in interest or trading in HRUM shares will still be strong which results in HRUM shares may continue to uptrend. Likewise for INDY shares.

From the results of researchers' observations of ITMG stock candlestick patterns, researchers can state that at the end of December 2023 ITMG shares experienced a strong uptrend. Researchers recommend buying ITMG shares on December 29, 2023 due to the shooting star and doji patterns in a bullish state on December 27 and 28 because ITMG shares will experience a strong uptrend for a while in January 2024. MEDC stock went from uptrend to slight downtrend at the end of December 2023. Even so, this period is a good time to buy stocks because there are indications of a bullish hammer which means that a trend reversal will occur, from downtrend to uptrend and vice versa. Likewise, the candlestick pattern of PGAS shares, there will be an upward trend that will occur in January 2024. PTBA shares at the end of December experienced an uptrend and are recommended to buy. PTBA stock candles are bearish and experiencing a significant uptrend and the patterns are bullish, making researchers believe that the upward trend will continue until early January 2024.

2. Trend Movement of LQ45 Energy Sector Company Share Prices June - December 2023 Period with Bollinger Bands (BB)



The period from June to September ADRO shares experienced a significant increase. When the BB peak continues to rise from the previous peak and its movement is above the center line, the stock is uptrend and the beginning of its decline (downtrend) starts from October - December. Currently a buy signal can be recommended because ADRO stock candles touch or cross the lower band which usually results in the stock price or the next candle will move up.

AKRA shares are experiencing an uptrend. July - August AKRA shares experienced a downtrend and experienced an uptrend in September but then continued the sideways trend, which means that the stock movement does not continue to go up or down, but moves steadily up and down within a limited range. Judging from the previous pattern, if a candle has touched the upper band, for a while the price continues to rise and is in or over the upper band and does not immediately experience a trend reversal (such as from up to down). If the investor is too afraid of a downtrend next time, then the investor can refrain from buying the stock first.

Analysis of the bollinger bands of HRUM shares, recommends buying shares on December 29, 2023 because the candle is above the middle band (center line), which means that the volatility or buying and selling of HRUM shares is still strong which can result in HRUM stock prices continuing to rise. Likewise, for INDY shares, the tail of the candle had crossed the middle band, which means there is a possibility that INDY's share price will increase. Next ITMG, MEDC, PGAS and PTBA shares.

3. Sell and Buy Moments Using the Moving Average Coverage Divergence (MACD) Indicator on LQ45 Energy Sector Companies for the Period June - December 2023



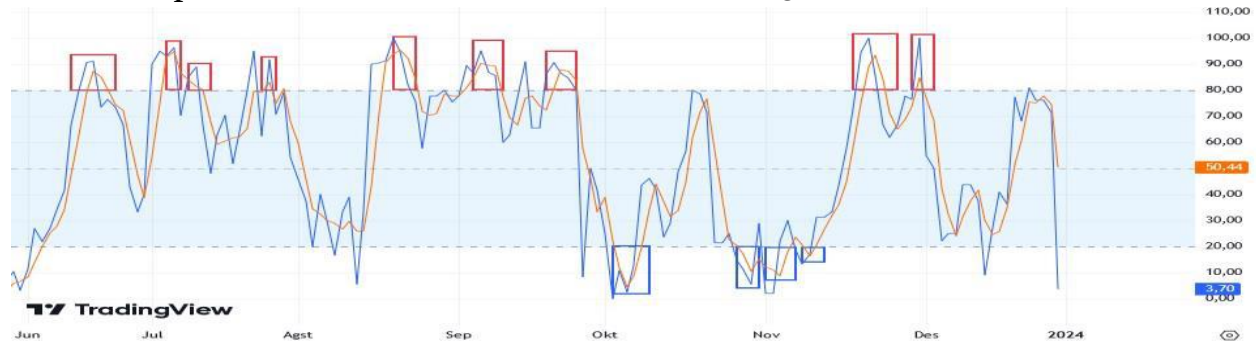
From the results of researchers' observations of ADRO stock MACD, researchers advise investors to refrain from buying shares on December 29, 2023 because right on December 28 a sell signal occurs, which means that according to this MACD method the stock price starts to fall and experience a downward trend. It is different for AKRA shares, you should buy shares on December 29, 2023 because judging from the MACD histogram which is getting higher, it means that the upward trend will continue and in the near future there will be no sell signal or signal a downward trend. The MACD histogram is getting higher, meaning that the upward trend will continue and in the near future there will be no sell signal or signal a downward trend. Investors will benefit for a few days before a sell signal finally occurs. This also applies to HRUM, INDY, ITMG, MEDC, PGAS, and PTBA stocks.

4. Sell and Buy Moments Using the Relative Strength Index (RSI) Indicator in LQ45 Energy Sector Companies for the Period June - December 2023



ADRO stock is recommended to hold or buy shares on December 29, 2023. Because usually the trading range for the short-term RSI method is from the 45-50 level. Because ADRO shares on December 29 have touched the level of 33.65, the researcher recommends buying the shares and then keeping them until the ADRO stock RSI line touches the level 50 and above. Likewise for MEDC shares at the level of 53.16 AKRA stock is recommended to buy shares on December 29, 2023 because the RSI is still at the level of 59.05 and previously the RSI line had touched a buy signal and at this time it still did not cause a sell signal. AKRA shares will experience an increase until it will then touch the level 70 which causes investors to sell their shares. Likewise, HRUM shares are at the 44.61 level, which means that the RSI line can still increase. Investors can sell it when the HRUM stock RSI line passes the 50 or 70 level. INDY shares at 42.57. ITMG shares, researchers advise traders to buy shares on December 29, 2023 because although the level is 63.00, the sell signal has not yet occurred. The same advice also applies to PGAS and PTBA stocks.

5. Sell and Buy Moments Using the Stochastic Oscillator (SO) Indicator on LQ45 Energy Sector Companies for the Period June - December 2023



From the results of the researcher's observation of ADRO's SO shares, the researcher recommends that investors hold back from buying shares on December 29, 2023 because even though the %K line has crossed the 20 line, it has not intersected with %D. Investors can wait to buy shares in the next few days. This also applies to AKRA, HRUM, INDY, ITMG, MEDC, PGAS and PTBA stocks. Wait until the buy signal occurs then the uptrend will occur and traders will get more profits.

6. Sell and Buy Moments Using the Parabolic SAR Indicator on LQ45 Energy Sector Companies for the Period June - December 2023



From the researcher's observation of the Parabolic SAR of ADRO stock, the researcher advises investors to refrain from buying shares on December 29, 2023 because a sell signal has just occurred. If the parabolic point is above the candle, it means that a downtrend is occurring. Therefore, traders can wait until the parabolic point is below the candle then an uptrend will occur.

AKRA stock has shown a buy signal on December 29, 2023 as it appears that the uptrend is still happening and will likely last for a while. The uptrend lasted long enough to be reinforced by the bullish AKRA stock candle on the 29th. The same goes for HRUM, INDY, ITMG, MEDC, PGAS and PTBA.

7. Capital Gain of LQ45 Energy Sector Stocks for the Period of June - December 2023

If an investor buys shares in June on June 5, 2023 and sells them on December 29, 2023. The formula used is:

Capital Gain = Selling Price - Purchase Price x Number of Share Sheets

1. ADRO = Rp. 2,380 - Rp. 2,100 = Rp. 280 x 100 = Rp. 28,000
2. AKRA = Rp. 1,475 - Rp. 1,360 = Rp. 115 x 100 = Rp. 11,500
3. HRUM = Rp. 1,335 - Rp. 1,440 = (Rp. 105) x 100 = (Rp. 10,500)
4. INDY = Rp. 1,435 - Rp. 1,780 = (Rp. 345) x 100 = (Rp. 34,500)
5. ITMG = Rp. 25,650 - Rp. 22,750 = Rp. 2,900 x 100 = Rp. 290,000
6. MEDC = Rp. 1,155 - Rp. 920 = Rp. 235 x 100 = Rp. 23,500
7. PGAS = Rp. 1,130 - Rp. 1,440 = (Rp. 310) x 100 = (Rp. 31,000)
8. PTBA = Rp. 2,440 - Rp. 3,150 = (Rp. 710) x 100 = (Rp. 71,000)

Capital Gain Percentage = Sales Price - Purchase Price / Purchase Price X 100%

1. ADRO = $2.380 - 2.100 / 2.100 \times 100\% = 13,33\%$
2. AKRA = $1.475 - 1.360 / 1.360 \times 100\% = 8,45\%$
3. HRUM = $1.335 - 1.440 / 1.440 \times 100\% = (7,29\%)$
4. INDY = $1.435 - 1.780 / 1.780 \times 100\% = (19,38\%)$
5. ITMG = $25.650 - 22.750 / 22.750 \times 100\% = 12,74\%$
6. MEDC = $1.155 - 920 / 920 \times 100\% = 25,54\%$
7. PGAS = $1.130 - 1.440 / 1.440 \times 100\% = (21,52\%)$
8. PTBA = $2.440 - 3.150 / 3.150 \times 100\% = (22,53\%)$

From the calculation of capital gains in energy sector stocks listed on the LQ45 index for the period June - December 2023 above, it can be seen that the biggest one that produces profits or capital gains in rupiah is ITMG shares with a return of around Rp. 290,000 / lot. While the PTBA company in rupiah calculations produces the largest loss (capital loss), which is around Rp. 71,000. In percentage calculations, MEDC company shares produce the highest percentage, which is around 25.54%. While the company's shares that result in capital loss are PTBA shares around 22.53%.

From the calculation of the 2 capital gain methods above, it can be seen that the shares of ADRO, AKRA, ITMG, and MEDC generate profits for investors who invest from June - December 2023 and have better performance or investment performance than the shares of HRUM , INDY, PGAS, and PTBA.

CONCLUSION

The stock price movement pattern of the LQ45 energy sector for the period June - December 2023 appears to fluctuate frequently. With Candlestick can see the pattern of stock price movements from the opening, closing, highest and lowest prices of a stock. Bollinger Bands indicator the movement pattern of energy sector stock prices has increased uptrend in a row then in the next month downtrend along with the decline in commodity prices such as coal which tends to be flat (sideways). On the MACD indicator, the right time to buy is when the MACD line (blue) cuts the signal line (red) from top to bottom and sell when the MACD line cuts the signal line from top to bottom. Investors can buy energy sector stocks on December 29, 2023. If from the MACD histogram all energy sector stocks are green and large enough in size, it means that the upward trend will occur at the beginning of 2024 and the trend will last long enough. If investors buy stocks on that day, they will benefit in early 2024. This is also indicated by the RSI, SO and Parabolic SAR indicators.

Suggestions for investors who make technical analysis as the basis for investment decisions should wait for the right oversold moment, which is a good moment to buy shares. In addition, it is also recommended that investors also conduct fundamental analysis. For further researchers it is recommended to use more powerful indicators to analyze stock prices, such as Fuzzy Logic and Fibonacci Retracement in stock investment decisions.

REFERENCES

- Aladini College of Economics Bima, A., & Nurulrahmatia College of Economics Bima, N. (n.d.). The Effect Of Capital Gain And Division Of Dividends On Share Trading Volume In Pt. Unilever Indonesia Tbk. In *Balance: Journal of Economics* (Vol. 17).
- Cahyadi, Y. (n.d.). Candlestick Chart Pattern Analysis..... (Yoyo Cahyadi) Candlestick Chart Pattern Analysis on Eur/Usd Movement.
- Choirotul Mafula, L. (n.d.). Technical Analysis as a Basis for Decision Making in Stock Trading on the Indonesia Stock Exchange (Study on IDX30 Index Period August 2014-January 2015).
- Damayanti, M., Rizki, W., & Perdana, H. (2020). Technical Analysis of Online Gold Trading Investment with Stochastic Oscillator. In *Scientific Bulletin of Math. Stat. and its Applications (Bimaster)* (Vol. 09, Issue 1).
- Farild, M., Izzulhaq Sawaji, M., & Poddala, P. (2023). Technical analysis as a basis for decision making in stock transactions (Vol. 25).
- Firdaus, R. G. (2021). Technical Analysis of Stocks Using the RSI and Bollinger Bands Indicators on Construction Stocks. *Journal of Capital Markets and Business*, 3(1), 15-26. <https://doi.org/10.37194/jpmb.v3i1.60>
- Haibah, N. N., & Susilo, E. (n.d.). Journal of Islamic Economic Recognition Analysis of Islamic Stock Investment with Fibonacci Ratio and Fuzzy Logic. 2(1), 73-85. <https://doi.org/10.34001/jrei.v2i01.506>
- Mahendra, K., Satyahadewi, N., & Perdana, H. (2022). Technical Analysis of Stocks Using the Moving Average Convergence Divergence (Macd) Indicator. In *Scientific Bulletin of Math. Stat. and its Applications (Bimaster)* (Vol. 11, Issue 1).
- Martia, D. Y., & Yasmine, N. I. (2021). Simple Moving Average and Relative Strenght Index indicators to determine buy and sell signals for stocks in the infrastructure sector. *Journal of Capital Markets and Business*, 3(1), 27-38. <https://doi.org/10.37194/jpmb.v3i1.67>
- Muhamad Aldin Hidayat. (2022). Technical Analysis of Stock Price Movements with Candlestick Indicators, Moving Average, and Stochastic Oscillator. *Journal of Management and Business Research*, 36-42. <https://doi.org/10.29313/jrmb.v2i1.906>
- Muis, I. S., Prajawati, M. I., & S, B. (2021). Technical Analysis of Stock Returns with Bollinger Band, Parabolic SAR, and Stochastic Oscillator Indicators. *Samudra Journal of Economics and Business*, 12(2), 143-153. <https://doi.org/10.33059/jseb.v12i2.2467>
- Nafis, A. A., Lestari, D. S., & Amaroh, S. (n.d.). Journal of Islamic Economic Recognition Analysis of Share Price Valuation of PT Bank Syariah Indonesia Tbk Based on Technical Analysis. 2(02), 17-26. <https://doi.org/10.34001/jrei.v2i02.637>
- Nasih, A. C., & Ridloah, S. (2021). Comparative Analysis of the Use of MACD, Moving Average, and Stochastic Methods in Profit Optimization. *Journal of Capital Markets and Business*, 3(1), 123-132. <https://doi.org/10.37194/jpmb.v3i1.61>

- Nuzula Agustin, I., Hesniati, H., Nopry, N., Alvin, A., Steven, A., Tri Sagiato, I., & Devin, D. (2023). Comparison of Accuracy of Technical Analysis, SMA and Bollinger Band in Estimating USDIDR Forex Market. *JAMBURA*, 6(2). <http://ejurnal.ung.ac.id/index.php/JIMB>
- Prasetyo, P., Laely, N., & Subagyo, H. (2019). Comparative Analysis of the Use of Stochastic, Moving Average and MACD Methods in Obtaining Optimal and Shar'i Profits (Study on the Jakarta Islamic Index 2016 - 2018). *JIMEK: Scientific Journal of Economics Students*, 2(1), 52. <https://doi.org/10.30737/jimek.v2i1.414>
- Rosyidah, N., & Hafi, R. U. (2021). Technical Analysis of MACD, RSI, SO, and Buy and Hold to Achieve Optimal Return on JII30 Stocks on the Indonesia Stock Exchange. *Journal of Capital Markets and Business*, 3(1), 75-88. <https://doi.org/10.37194/jpmb.v3i1.66>
- Soemapradja, T. G. (2010). Simulation of Stock Trading Pt Tambang Batubara Bukit Asam, Tbk. With Macd and Williams % Range. In *Binus Business Review* (Vol. 1, Issue 2).
- Suryanto, S., Padjadjaran, U., Soekarno, J. K., Sumedang, J., & West Indonesia, J. (2021). Technical Analysis Using Moving Average Convergence-Divergence and Relative Strength Index on Banking Stocks Management Study Program Faculty of Economics and Business, Universitas Komputer Indonesia Bandung. In *Journal of Finance and Banking Science (JIKA)* (Vol. 11, Issue 1).

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www.tradingview.com