

OPTIMIZATION OF STOCK INVESTMENT STRATEGY WITH THE FIBONACCI RETRACEMENT METHOD TO DETERMINE TAKE PROFIT AND STOP LOSS

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ABSTRACT

This research aims to assess the effectiveness of Fibonacci retracement in establishing take profit and stop loss levels for stocks within the LQ45 Index. The study utilizes a quantitative approach with a descriptive method, analyzing daily stock price data from January 2021 to December 30, 2021, through the Fibonacci retracement indicator. The research sample comprises 10 companies listed in the LQ45 Index, selected based on specific criteria. The results demonstrate that Fibonacci retracement is effective in pinpointing significant levels for determining take profit and stop loss, achieving an effectiveness rate of 74%. Fibonacci levels such as 38.2% and 61.8% have proven to be crucial references in establishing take profit and stop loss positions. These findings endorse the use of Fibonacci retracement as a technical analysis tool capable of maximizing profit potential while minimizing losses, particularly in markets experiencing an uptrend or downtrend

KEYWORDS *Fibonacci Retracement, LQ45 index, take profit, stop loss*



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INTRODUCTION

A developing economy is one of the important benchmarks in the progress and economic growth of a country (Haibah and Susilo 2023; Reeves, Saerang, and Maramis 2019). According to Chishti (2022), the capital market has an important role as an intermediary for economic growth. The capital market in the Economic Law dictionary is a meeting place between parties who need funds (issuers) and parties who have funds (investors) to conduct transactions through financial instruments (Rachmadini 2020). Placing funds or assets in a financial instrument that is expected to provide income or increase in value in the future is called investment (Gregory 2016; Sartini and

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Purbawangsa 2014). One of the instruments that is familiar to hear is stocks which are proof of capital ownership in a company (Nurcahyo and Susliyanti 2024; Syaiful, Haanurat, and Aarsal 2020). Shareholders have rights to a certain part of the company's capital, but shareholders do not have direct rights to the company's assets or management because the assets are owned by the company as a separate legal entity. Shareholders have certain rights such as electing directors, receiving dividends and selling and transferring their shares (Sikka and Stittle 2019). Stock investment offers two main types of profits, namely dividends, namely the distribution of the Company's profits to shareholders and capital gains, which are profits obtained from the positive difference between the purchase price and the selling price of shares (Risaldi, Haanurat, and Jaya 2024).



Picture 1. IHSB Index Movement in 2020-2021

Source: TradingView

Figure 1 illustrates the drastic decline in the Jakarta Composite Stock Price Index (IHSB) in March 2020 due to the COVID-19 pandemic from 6,235 to 3,911 which shows a decrease of 38.42%. After the decline, IHSB began to show a gradual recovery and moved steadily until October 2020, which reflected the cautious attitude of investors amid economic uncertainty. In November 2020, IHSB experienced a significant increase driven by optimism for the development of COVID-19 vaccines and global economic recovery, so that IHSB again reached a price of 6,720 or an increase of 71.85%. until the end of 2021, IHSB continues to show positive sentiment that supports domestic and global economic recovery.

Research conducted by Doubles T. & Malau, (2022), in 2020 the IHSB experienced a decline caused by several negative sentiments such as the weakening of the rupiah exchange rate and low investor confidence during the COVID-19 pandemic.

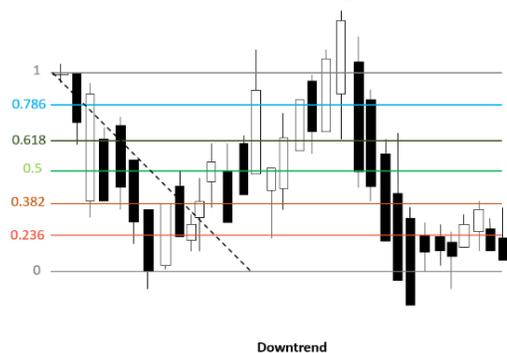
According to Cape (2022), IHSG's recovery was driven by expansionary monetary policies such as interest rate cuts, and public vaccination in 2021. During the pandemic, investor sentiment showed a significant change in trading volumes which was a positive factor, while pessimism reflected in the low consumer confidence index created high volatility (Ernawati et al. 2022). On a global scale, some pandemic-related news includes the death rate and the impact on the economy that triggers market fluctuations. On the other hand, some investors take advantage of market volatility to trade more actively. This shows that despite the weakening of the stock market, the stock market remains an attractive investment option (Murhadi et al. 2023).

While it can be an attractive investment option, investors should conduct an in-depth analysis before making an investment decision that includes considering the company's financial condition, liquidity, and capitalization in a volatile stock market (Cahyani & Mahyuni, 2020; Ramadhani et al., 2023). To make it easier to choose stocks in volatile stock market conditions, you can start by choosing a list of stocks that are members of the LQ45 Index that has been published by the Indonesia Stock Exchange (Reeves et al. 2019). In the LQ45 Index, there are several leading stocks that have high liquidity, active trading, and strong corporate fundamentals. The LQ45 Index is updated every six months to ensure that the list of stocks remains relevant (Cahyani and Mahyuni 2020). Although the LQ45 stock list is reliable, investors still need advanced analysis to understand the investment potential and risks in more depth (Darman, Nanda, and Ningsih 2023).

Traders utilize technical and fundamental analysis to generate profits through a variety of proven strategies. Although some of these approaches work in markets such as stocks, bonds, and other capital markets. However, market uncertainty makes the use of these two methods further test the abilities of investors and traders (Shynkevich 2016; Sikka and Stittle 2019). Technical analysis is an approach to evaluate stock price movement patterns with the aim of identifying the optimal time to buy or sell stocks, as well as targeting profits and determining loss limits to maximize profits and minimize risks (Meiliza and Prasajo 2019; Sumantyo and Saputro 2019). Technical analysis is also useful for determining take profit and stop loss. Take profit and stop loss are strategies to set a specific price level in realizing profits before the market reverses, while stop losses aim to limit losses by automatically closing positions if the price moves against the previous forecast (Hidayati 2023). According to Vezeris, Kyrgos, and Schinas (2018), take profit allows investors to ensure that the profits they have earned are locked at a predetermined price level thus avoiding potential losses if they start to reverse. On the other hand, stop losses are a very important tool in risk management because they ensure that losses remain under control and do not magnify

due to unexpected market fluctuations. The application of these two strategies provides a systematic and orderly framework for traders to manage and maximize profits and minimize risks.

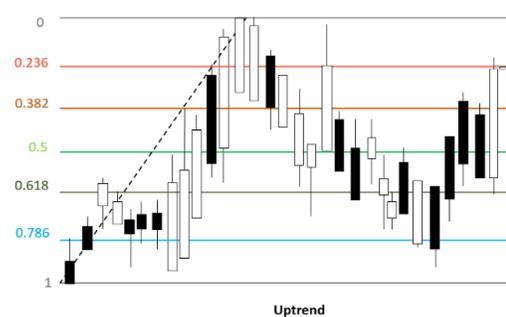
One of the indicators that is often used in technical analysis is the fibonacci retracement (Sethi et al. 2020). Fibonacci helps determine important levels in stock price movements. According to Khattak (2024), the Fibonacci series is developed through a series of numbers with a ratio of 61.8% which is often called the golden ratio which is used to identify important levels in stock price movements.



Picture 2 Fibonacci Retracement

Downtrend

Source: Author



Picture 3 Fibonacci Retracement Uptrend

Fibonacci retracements utilize swing high and swing low positions to identify important areas in stock price trends (Maretha and Prasetya 2021). In figure 2, Fibonacci levels apply to a downtrend by drawing the line of the highest point to the lowest point. In figure (3), Fibonacci levels are applied to an uptrend by drawing the lows to the highs. In its application, Fibonacci is often used to identify potential price reversal points around support and resistance levels (Tsinaslanidis et al., 2022 ; Haibah & Susilo, 2023). According to Malkiel (2019), Maretha & Prasetya (2021), the Dow Theory developed by Charles Dow is also a framework in stock price trend analysis that identifies major, medium, and minor trends as well as price direction changes through support and resistance levels. The combination of technical analysis using the Fibonacci retracement and the Dow theory can provide broader insights, especially in investment decision-making (Arief and Dwi 2019). According to Reeves (2019), the Fibonacci retracement indicator shows that predictions regarding support and resistance cannot be considered accurate. Contrary to opinion Reeves (2019), Octasylya (2022) states that the support and resistance levels of the Fibonacci Retracement indicator produce different variations. It is different from the research

from Hartono (2020) which combines Fibonacci and MACD to determine buy and sell signals that are proven to be accurate, however, from these combinations are only effective if the stock is in a trend, be it an uptrend or a downtrend.

According to Abouloula (2019), that the importance of avoiding mistakes and reducing distractions when using Fibonacci retracements to improve decision-making in investing. Meanwhile, Ramli, Wahab, and Wan Muhamad (2020) Applying the pattern recognition method to the Fibonacci retracement in the Forex market and using linear discrimination analysis resulted in a classification accuracy rate of 99.43%. The study found that the level of 38.2% is the most effective level for predicting the movement of the GBP/USD currency pair. Various studies related to fibonacci retracements have proven to be an effective tool in analyzing stock movements. Banik (2022) shows that Fibonacci retracement levels can identify price reversals, providing significant benefits for swing traders for short-term strategies as well as long-term decisions in maximizing profits. Zafarullah Shaker & Zulfiqar (2018) It also confirms that the effectiveness of Fibonacci retracements in helping investors make buy and sell decisions. Moreover Maloumian (2024) argues that Fibonacci is effective in predicting the price movements of the developing market where volatility is high and efficiency is low. However, effectiveness tends to decline in more efficient developed markets but is still useful in identifying support and resistance levels.

Previous research has generally focused on identifying price reversal points (Banik et al. 2022; Maloumian 2024; Octasyilva 2022; Ramli et al. 2020; Reeves et al. 2019) as well as making decisions to buy and sell shares (Abouloula et al. 2019; Arief and Dwi 2019; Hartono 2020; Zafarullah Shaker and Zulfiqar 2018). However, the study of the use of Fibonacci Retracement in setting take profit and stop loss is still limited in the literature. Therefore, this study aims to further explore the potential of Fibonacci Retracements in optimizing investment decision-making. By examining the effectiveness of Fibonacci Retracements in determining take profits and stop losses, researchers seek to maximize profits and minimize the risk of losses in Fibonacci Retracement-based stock trading strategies.

RESEARCH METHOD

This study uses a quantitative method with a descriptive approach to test the effectiveness of fibonacci retracements in determining take profit and stop loss points in analyzing stocks. The data used is secondary data in the form of daily stock prices during the period from January 1, 2021 to December 30, 2021 obtained through official

sources, namely <https://www.idx.co.id/> and the Profits Anywhere application. The population of the study includes all companies in the LQ45 Index. The selection of samples in this study includes several criteria. First, companies listed in the LQ45 Index during 2021. Second, the company is consistent and has never been out of the LQ45 Index list during 2021. Third, the company must have a debt-to-equity ratio (DER) that does not exceed one (<1) during 2021. Fourth, the company is included in the 50 issuers with the largest market capitalization during the 2021 period. Fifth, the company's stock activity did not show a sideways pattern during the study period.

Based on the criteria presented, the 10 companies that meet the criteria to be used as a research sample are H.M. Sampoerna Tbk (HMSP), Kalbe Farma Tbk (KLBF), Astra International Tbk (ASII), Merdeka Copper Gold Tbk (MDKA), Chandra Asri Pacific Tbk (TPIA), Charoen Pokphand Indonesia Tbk (CPIN), Semen Indonesia (Persero) Tbk (SMGR), Indah Kiat Pulp & Paper Tbk (INKP), Indocement Tunggal Prakarsa Tbk (INTP), and United Tractors Tbk (UNTR).

In this study, the researcher used a quantitative approach with a descriptive method that collected buy, sell, take profit and stop loss movements from the intersection of the generated charts during the period of January 2021 to December 2021 with observation three days after the buying action through Profits Anywhere Software. The data analysis method in this study uses an effectiveness test to determine how effective the application of fibonacci retracements is in determining take profit and stop loss in this study data.

RESULT AND DISCUSSION

The data description of the research object reflects a quantitative profile that describes the main characteristics of each object studied. The following table is presented that contains the quantitative profile of each research object. This table aims to provide a detailed and measurable overview of the parameters relevant to the research study.

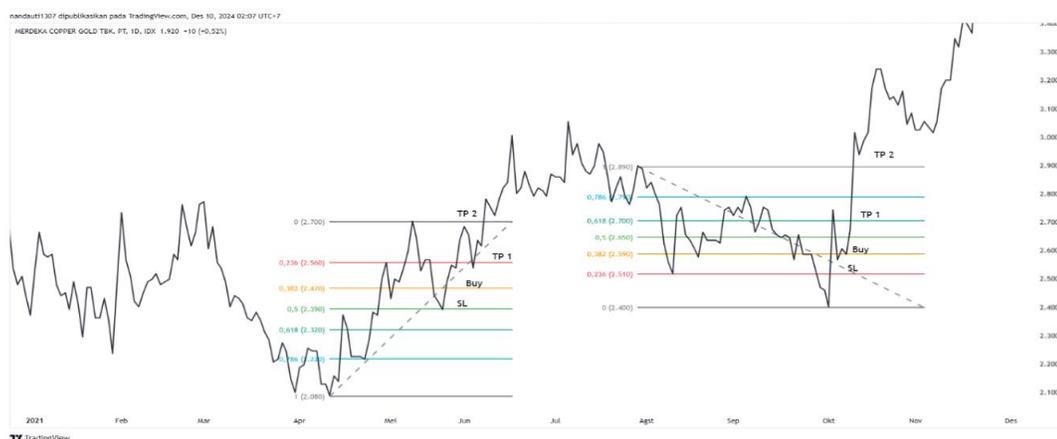
Table 1. Descriptive Company

It	Stock Code	Last Price (December 2021)	Last Volume (December 2021)	Last Market Cap (December 2021)
1	HMSP	965	8 million	116.3 billion
2	KLBF	1.615	24 million	46.9 billion
3	ASII	5.700	17 million	40.5 billion

4	MDKA	3.890	63 million	22.9 billion
5	TPIA	7.325	2 million	21.6 billion
6	CPIN	5.950	2.5 million	16.4 billion
7	SMGR	7.250	8.9 million	5.9 billion
8	INKP	7.825	7.6 million	5.5 billion
9	INTP	12.100	3.8 million	3.7 billion
10	UNTR	22.150	2.2 million	3.7 billion

Source: Analysis Results

Based on table 1 which shows that the market capitalization, H.M. Sampoerna Tbk (HMSP) is recorded to have the highest market capitalization of IDR 116.3 billion, which reflects the greatest profit potential among other companies. The next companies are PT Kalbe Farma Tbk (KLBF) with a market capitalization of IDR 46.9 billion and Astra Internasional Tbk (ASII) of IDR 40.5 billion, which shows significant financial strength and investment opportunities. In addition, Merdeka Copper Gold Tbk (MDKA) showed an attractive performance with a market capitalization of IDR 22.9 billion, while Chandra Asri Petrochemical Tbk (TPIA) recorded a market capitalization of IDR 21.6 billion. Other companies, such as Chaeron Pokphand Indonesia (CPIN), Indocement Tunggal Prakarsa Tbk (INTP), and United Tractors Tbk (UNTR) also showed competitive market capitalization to reflect significant profit potential. Overall, this analysis underlines that the companies with large market capitalizations in the LQ45 Index have strong stock price growth potential in providing an attractive picture of investment opportunities for investors and traders alike.



Picture 4. MDKA Stock Price Movement in 2021

Source: TradingView

Figure 4 shows how Fibonacci Retracements can be used to identify important areas that can be used as a reference in setting profit and stop loss targets, as well as providing a clearer picture of the potential future movements of MDKA's stock price. Table 2 presents an evaluation of seven Fibonacci retracement levels showing that levels such as 23.6%, 38.2%, 61.8% and 78.6% are often used as a reference for determining profit targets (TP) and stop losses (SL).

Table 2. Evaluation of the Effectiveness of Fibonacci Retracements

Stock Code	Period	Trend	Open Buy	TP1	TP2	Stop Loss	Day 1	Day 2	Rope 3
ASII	Feb - Apr	Down	50%	23.6%	0%	61.8%	TP 1 touched	TP 1 touched	does not touch SL/TP
	Oct - Nov	Up	61.8%	38.2%	0%	78.6%	TP 1 touched	does not touch SL/TP	TP 1 touched
CPIN	Jan - Mar	Down	23.6%	50%	61.8%	0%	does not touch SL/TP	TP 1 touched	TP 1 touched
	May-Jul	Up	61.8%	50%	38.2%	78.6%	does not touch SL/TP	TP 1 touched	Touching TP 1 and Stop Loss
	Aug - Oct	Up	61.8%	23.6%	0%	78.6%	does not touch SL/TP	TP 1 touched	TP 1 touched
HMSP	Jan - Apr	Down	38.2%	61.8%	100%	23.6%	TP 1 touched	TP 1 touched	TP 1 and TP2 are touched
	Jul - Oct	Down	38.2%	50%	61.8%	23.6%	TP 1 touched	TP 1 and TP2 are touched	TP 2 touched
INKP	Jan - Apr	Up	61.8%	38.2%	23.6%	78.6%	does not touch SL/TP	does not touch SL/TP	does not touch SL/TP
	Jul - Oct	Down	38.2%	61.8%	78.6%	23.6%	TP 1 touched	TP 1 and	does not touch SL/TP

								TP2 are touched	
INTP	Mar - May	Down	38.2%	61.8%	100%	23.6%	TP 1 touched	does not touch SL/TP	SL touched
	Aug - Oct	Up	38.2%	23.6%	0%	50%	TP 1 touched	TP2 touched	TP2 touched
KLBF	Feb - Apr	Up	61.8%	38.2%	23.6%	78.6%	TP 1 and TP2 are touched	TP2 touched	TP 1 and TP2 are touched
	Aug - Oct	Up	38.2%	23.6%	0%	50%	TP 1 touched	TP 1 touched	TP 1 touched
MDKA	Apr - Jun	Up	38.2%	23.6%	0%	50%	does not touch SL/TP	TP 1 touched	TP 1 touched
	Aug - Oct	Down	38.2%	61.8%	100%	23.6%	does not touch SL/TP	TP 1 touched	TP 1 touched
SMGR	Jan - Mar	Down	38.2%	61.8%	78.6%	23.6%	TP 1 touched	does not touch SL/TP	does not touch SL/TP
	Aug - Oct	Up	61.8%	38.2%	23.6%	78.6%	TP 1 touched	TP 1 and TP2 are touched	TP 1 touched
TPIA	Jan - Apr	Up	61.8%	50%	23.6%	78.6%	TP 1 touched	TP 1 touched	TP 1 touched
	Sept - Nov	Down	61.8%	78.6%	100%	50%	does not touch SL/TP	TP 1 touched	TP 1 touched
UNTR	Mar - May	Up	61.8%	38.2%	23.6%	78.6%	TP 1 touched	TP 1 touched	does not touch SL/TP
	Jul - Sep	Down	38.2%	61.8%	100%	23.6%	TP 1 and TP2 are touched	TP2 touched	does not touch SL/TP

Source: Analysis Results

From the analysis that has been carried out where there are 65 Fibonacci retracement signals in determining take profit and stop loss. There were 48 successful signals and 17 signals that failed to reach the profit target (TP) and stop loss (SL) within three days after the buying action was made. This analyst results in an effectiveness rate of 74%. Where these results make fibonacci retracements very effectively used to increase profits in investing and avoid risks when investing.

Table 3. Fibonacci Retracement Comparative Data

Indicators	Signal	Number of Signals
Fibonacci Retracement	Successful	48
	Fail	17

Source: Analysis Results

From the data above, the Fibonacci retracement obtained 48 successful signals out of 65 signals that occurred, so the effectiveness level was obtained at 74%.

Mann Whitney Test

Mann Whitney in order to see a significant influence when the stock experiences an uptrend or downtrend for take profit and stop loss.

Table 4. Mann Whitney Test Results

Comparison	Mann Withney Asymp. Sig
Fibonacci Retracement with Real Results	0,176

Source : Analysis Results

Based on the table, A significant value of $0.176 > 0.005$ shows no significant difference. Thus, the H_0 is accepted and the H_1 is rejected, which means that there is no real difference in the effectiveness of the Fibonacci Retracement for determining the take profit and stop loss on the stock conditions of the uptrend and downtrend. This shows that Fibonacci Retracements are effective in anticipating stock price movements.

Discussion

In this study, it can be seen that there is no difference in determining take profit and stop loss during downtrend or uptrend using the Fibonacci retracement method which proves that Fibonacci retracement is effective in stop loss and take profit strategies.

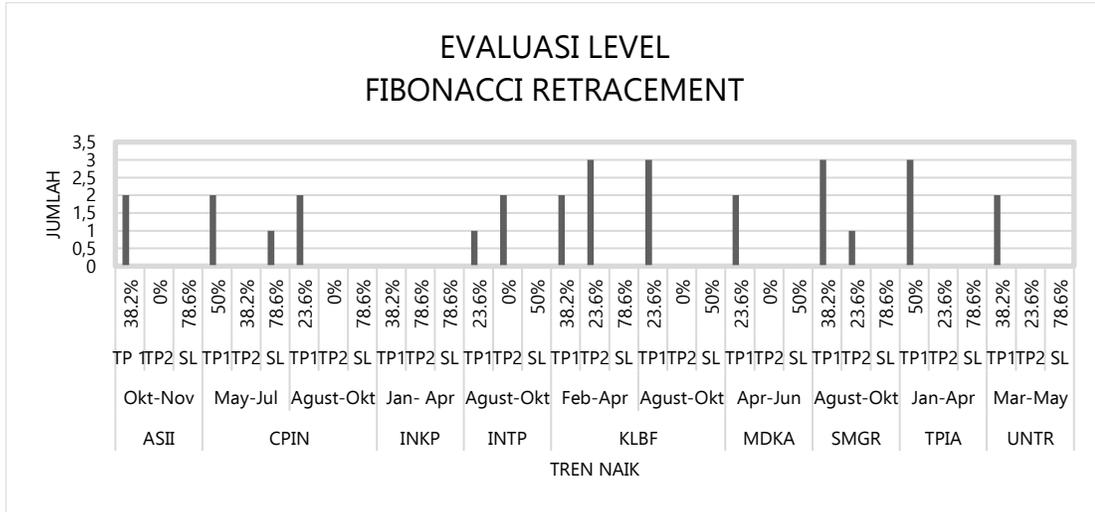


Chart 1. The Effectiveness of Fibonacci Retracement Uptrend

Source: Analysis Results

The 10 companies that have been studied, it can be seen in Chart 1 that KLBF and SMGR stocks are the stocks that have achieved the most profit targets when the market is on an uptrend, while during a downtrend, HMSP is the stocks that often reach profit targets which can be seen in Chart 2. In KLBF shares, the potential profit that can be obtained in TP1 is IDR 65, while in TP2 it reaches IDR 125. The risk/reward ratio on the first target is 2 and on the second target is 4, which indicates that the potential profit is significantly greater than the risk covered. For example, controlling the risk of loss in KLBF stock, the Fibonacci Retracement level is able to improve the stock investment strategy by setting take profit and stop loss

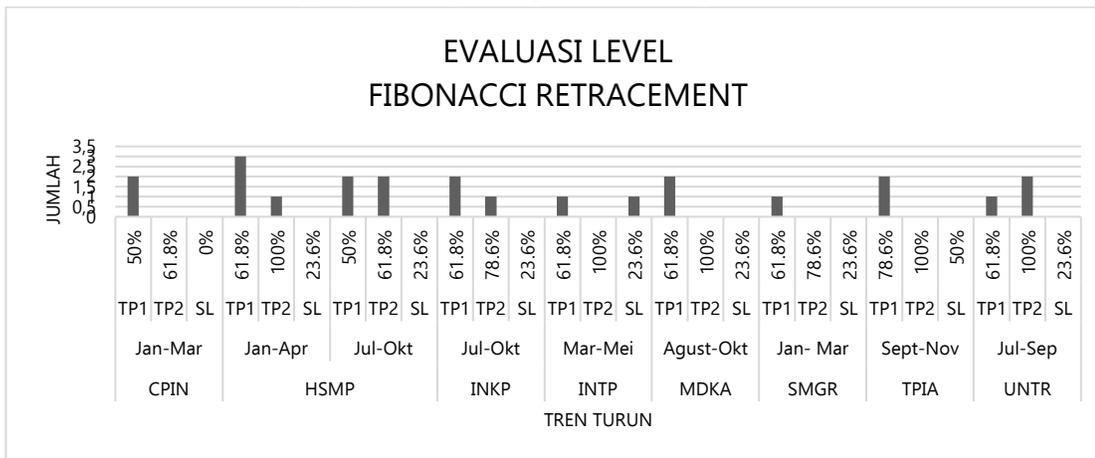


Chart 2. Effectiveness of Fibonacci Retarcement Downtrend

Source: Analysis Results

In charts 1 and 2, the evaluation of the effectiveness of the Fibonacci retracement shows that the profit target is very prominent compared to the stop loss during the 3 days of observation after the buying action. This indicates that Fibonacci Retracements not only help in setting realistic profit targets but also in optimizing the risk/reward ratio to improve the efficiency of trading strategies. With a consistent risk/reward ratio of more than 1 as seen in KLBF stock, traders can manage risk more regularly while maximizing potential profits.

The results of the analysis on both charts prove that Fibonacci Retracements are effective in supporting the take profit (TP) strategy and minimizing the risk of stop loss (SL). In an uptrend, the levels of 23.6% and 38.2% have often proven to be the success points of achieving TP1 and TP2 which shows that these levels are relevant to maximize profits. Similarly, there is a downtrend, the level of 61.8% is more dominant in achieving the profit target which shows the consistency of Fibonacci patterns in predicting price reversals. Meanwhile, the occurrence of stop losses at various levels tends to be low which identifies that Fibonacci Retracement helps in setting the right level of protection thereby reducing the risk of loss. This confirms that Fibonacci Retracements are a reliable tool in setting profit targets and risk limits in trading.

The Dow Theory states that prices tend to change direction when they reach a level of *Support* and *resistance*. If the price bounces off the support point it is recommended to buy, if it bounces off the resistance level, then it is recommended to sell because it will experience a decline (Malkiel 2019). This is in line with research that looks at stock movements for 3 days after the buying action. If TP1 is reached and bounces at that level, the price will bounce down. Likewise, the price that breaks through the TP1 level will continue the trend that can reach the second profit target. Similar to the support level, if the level is broken, the stop loss must be set to reduce the risk even more.

This research is in line with Khattak (2024), which states that the conjugate ratio of gold is at 61.8% which helps identify important levels of fibonacci in price action. In this study, the most profit target was achieved at the level of 61.8%. Research conducted by Zafarullah Shaker & Zulfiqar (2018) It is also in line with this research which states that Fibonacci helps buy and sell decisions in accordance with this research to set take profit and stop loss. This research is also in line with Maretha & Prasetya (2021) That utilizing swing high and swing low positions to identify important areas on the price trend also helps in determining targets and stop losses.

This research has a number of limitations that need to be considered. First, this analysis is only carried out in certain periods, so the results obtained do not fully reflect the dynamics of the stock market in the long term. Second, the study only includes a few specific stocks whose results cannot be generalized to other stocks with different volatility or market characteristics. The results of this study also depend on the application of Fibonacci retracement indicators that are more effective in markets that are experiencing an uptrend or downtrend and in this study only focuses on Fibonacci retracements without looking at other indicators. Another limitation of this study is that observations are only made for three days after the buying action which may not be enough to evaluate the long-term performance of the strategy used.

Despite its limitations, this study still provides significant benefits. Fibonacci retracements help in developing an understanding of the use of fibonacci retracements to identify important levels of price movement, such as swing highs, swing lows, profit targets and stop losses. The results of this study support accurate investment decisions, especially in setting profit targets and stop losses. In addition, the research contributes to the technical analysis literature and can serve as a reference for further research as well as a practical guide for both beginner and professional traders.

If the momentum of a drastic decline in stock prices occurs again, investors are advised to apply a technical analysis-based approach to make rational and measurable decisions. Fibonacci Retracements can be used in taking rational and measurable decisions. Fibonacci Retracements can be used to identify important retracement levels such as 38.6% or 61.8%, which are often significant support areas and potential price reversal points. In this situation, investors are expected to be able to take advantage of the retracement area as a guide in determining a gradual entry strategy by setting a profit target to optimize profits and being disciplined in setting stop loss levels to minimize loss risks.

CONCLUSION

Based on the research conducted, it can be seen that fibonacci retracements have proven to be effective in determining take profit and stop loss with an effectiveness rate of 74%. This indicator helps in maximizing profits and minimizing losses by identifying important levels in price movements. This finding is also reinforced by previous research showing that fibonacci retracements can be helpful in determining the right buy and sell decisions, as well as in taking advantage of swing high and swing low positions. However, there are some limitations, such as a limited analysis period and only analyzing certain stocks. The use of fibonacci retracements can be an effective

strategy in markets that experience both upward and downward trends, but in-depth analysis is still needed in its application.

In this study, it is recommended to combine the Fibonacci retracement with additional analysis such as moving averages, RSI, or MACD to get a more complete picture of the market and minimize the risk of errors. More in-depth research by testing different time periods and more financial instruments can strengthen the validity of the results and understand the effectiveness of the Fibonacci retracement indicator in different markets. Despite the effectiveness obtained, strict risk management including the use of stop losses and proper position management is still necessary. It is also important to consider volatile market conditions as well as markets that experience sideways. Further testing using more extensive historical data can confirm the accuracy of the application of Fibonacci Retracements in determining optimal positions, making Fibonacci retracements a more effective indicator in decision-making in the market.

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