

# TECHNICAL ANALYSIS IN COMPANIES LISTED ON LQ45 ON THE INDONESIA STOCK EXCHANGE 2011–2018

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Received on 7 May 2023

Accepted on 23 June 2023

**Abstract-** Technical analysis is an investment strategy known by investors to reduce the risks that occur in stock investments. The assumption of technical analysis that uses past data contradicts the efficient market hypothesis, where technical analysis cannot obtain abnormal returns in an efficient market, and not all markets are efficient because there are things that can interfere with market efficiency, namely behavioral finance and Indonesia is an emerging market capital. This study aims to compare how significant is the difference between return obtained through a technical analysis applying simple moving average strategy and return obtained from the buy hold strategy in the sideways period, bullish period, and also during the all period of both sideways and bullish. This will imply whether or not the market in Indonesia has been efficient. To compare the differences in returns in this study, t test was conducted with SPSS 23 for companies listed on LQ45 on the Indonesia Stock Exchange. From the results of the difference in returns in this study, it was found that the market in Indonesia was efficient in the weak form because of the non-significant difference of return of the simple moving average strategy and buy-hold-startegy. This result will provide a reference for investors to choose the best investment strategy in Indonesia. Research focuses on weak form efficient markets during the bullish and sideways periods. Further researchers can also examine the bearish market.

**Keywords:** Technical Analysis; Efficient Market Hypothesis; Behavioral Finance; Emerging Market Capital; Simple Moving Average; Indonesia Stock Exchange

## 1. INTRODUCTION

### 1.1 Background

Stocks are one of the most popular investment tools in Indonesia because they offer higher returns compared to other investments such as bonds, deposits. But behind the high returns, stocks also have a high risk for investors. To minimise these risks, knowledge of investment strategies is required (Kusumawardana, 2016). According to (Tandelilin, 2001) there are two investment strategies that investors can do, namely an active strategy where investors actively buy and sell shares using certain strategies, and a passive strategy which is a very conservative strategy where a stock is purchased and then held for a long period of time or until the end of the period, which is called a buy hold strategy.

This research focuses on technical analysis because it is an active strategy that is quite simple to use. Technical analysis is done by anticipating future prices using historical data.

In this study, the results of applying a specific trading strategy will be compared with the results of the buy-and-hold strategy; in addition, it is very important to compare two different time periods, namely returns during the turbulent or sideways conditions of the stock market in Indonesia, and during good conditions that make the stock market in bullish conditions. Based on the above statement, this study was made to find out how effective technical analysis is used in Indonesia, in the sense of whether the application of trading strategies can outperform the application of buy-and-hold strategies, based on the rules of the efficient market hypothesis. In conducting technical analysis, the possibility of inadequate returns may occur because technical analysis theory contradicts the efficient market hypothesis. Therefore, this study was made to find out how effectively technical analysis is used by investors to invest in Indonesia.

## 1.2 Literature Review

According to (Masry, 2017) market inefficiency can be influenced by behavioral finance and emerging market theory. (Ardani et al., 2012) argue that the efficiency of the market can be analyzed by comparing technical analysis with the buy-and-hold strategy, which, by using moving averages with the right rules, can prove the difference between technical analysis and the random walk hypothesis. A weakly efficient market can be fulfilled if the price moves randomly random walk (Gumanti & Utami, 2002).

According to (Malkiel, 2003), random walk theory is the most appropriate theory for stock prices because prices will always move randomly, so it cannot be used to predict future prices in line with the efficient market hypothesis. In other words, the chance of going up is equal to the chance of going down. So the best strategy, according to Malkiel (2003), is a passive strategy (a buy-and-hold strategy) because, in the long run, the stock market has a tendency for prices to always rise.

In a weakly efficient market, the price reflected in the market has been formed based on past information. According to (Sturm, 2013), the weakly efficient market is contrary to technical analysis; returns in technical analysis are obtained by analyzing past prices to predict future prices.

The results of another study conducted in Indonesia by (Hase & Haryono, 2018) which examined the return of the JCI index on daily, weekly, and monthly returns, obtained the result that the Indonesian capital market is efficient in weak form. The same results were also obtained from research (Ardani et al., 2012), which compared the return of the LQ45 index to the return of the S&P index by comparing the results of technical analysis and buy-and-hold strategy. The results showed that in bullish periods, the market becomes efficient and prices cannot be predicted based on past information, so buy-and-hold strategy is more appropriate to use, but in bearish conditions, the market becomes more predictable, so technical analysis will be superior.

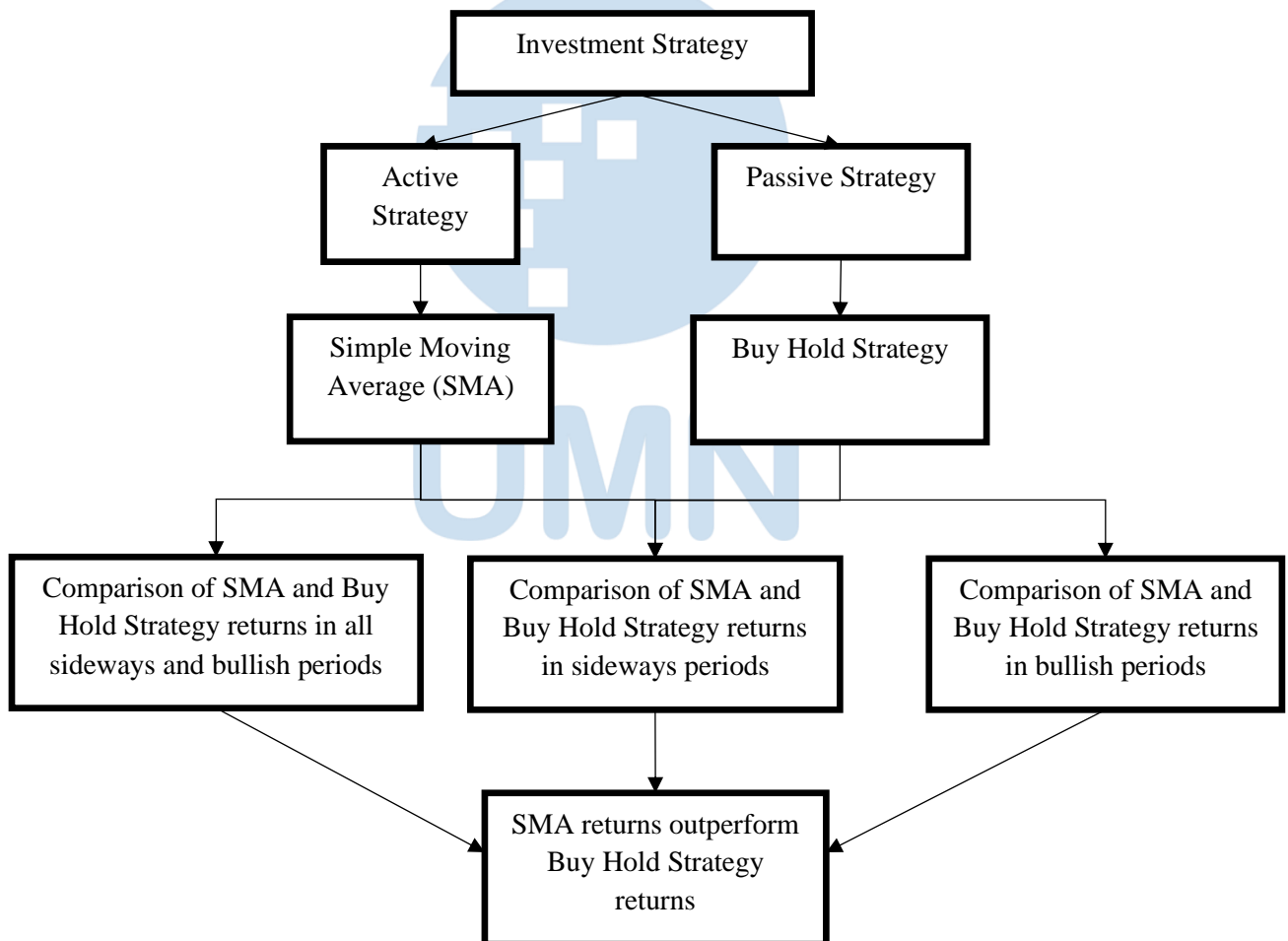
The study of technical analysis seeks to encompass behavioral finance theory, which disrupts the efficient market hypothesis (Masry, 2017). Furthermore, behavioral theory covers several aspects of irrational behavior by investors. These behaviors are psychological biases in the way investors react to new information offered. Some of the behaviors referred to by Masry in his research are overreaction, overconfidence, and optimism; asymmetrical information; herding models; and emerging capital market (ECM) assumptions that are seen in some of the methods used by technical analysis containing trading systems based on moving averages.

Overreaction is an excessive reaction to information that occurs (De Bondt & Thaler, 1985). Investors tend to set prices too high for good information, and conversely, they tend to set prices too low for bad information because investors always try to get abnormal returns (Murtini & Widyatmadja, 2011). Dramatic changes in prices due to overreaction in response

to outstanding information. In these conditions, the price does not reflect the real value. Sooner or later, the price will return to its proper value (Masry, 2017).

Indonesia is one of the emerging markets that is a good investment place for foreign investors (Desrosiers et al., 2006). According to (Chandra, 2011), the contribution of foreign investors in the Indonesian capital market has always been greater, meaning that they enjoy many benefits from Indonesia's high economic growth. Emerging markets have several characteristics, namely high market volatility, high expected returns because emerging market growth is very high, and a low correlation between emerging market stock markets and developed stock markets (Endri, 2011). Because of this, emerging markets allow investors to get higher abnormal returns than in developed markets, but proportional to the risk offered. Therefore, emerging markets can confound efficient market strategies. Market inefficiencies can offer the possibility of abnormal returns for investors (Masry, 2017).

According to (Nti et al., 2020) there are many studies that use simple moving averages. In this study, moving averages technical analysis will be used with the simple moving averages (SMA) strategy, with the consideration that simple moving averages are the most basic of the moving averages strategies and also the easiest to understand and use.



Picture 1. The Conceptual Framework  
Source: Data Processed, (2021)

According to (Ady, 2016), historical information will not generate abnormal returns in a weakly efficient market, historical information is a strategy of technical analysis. Based on research conducted by (Ardani et al., 2012), in good economic conditions (bullish), the efficient market hypothesis is proven, and vice versa, in bad economic conditions (sideways), the market will be inefficient. From this statement, the following hypothesis is obtained:

- H1: There is a significant difference between the return on the results of the application of the moving average technical and the return on the buy hold strategy in all sideways and bullish periods.
- H2: There is a significant difference between the return on the results of applying the technical moving average and the return of the buy hold strategy in the sideways period.
- H3: There is a significant difference between the return on the results of applying the moving average technique and the return buy hold strategy in bullish periods.

## 2. RESEARCH METHODOLOGY

This study will examine the annual average return variable of the moving average technical analysis strategy compared to the annual average return of the buy-hold strategy on companies listed on the LQ45. The results of the comparison will provide an overview of whether the technical moving average strategy can outperform the buy-hold strategy so that implications can be obtained about whether the efficient market hypothesis in the weak sense applies in the Indonesian stock market. Due to different market sentiment, the comparison is carried out both in bullish and sideways periods, using a t-test between the moving average annual return and the buy-hold strategy annual return on companies listed in LQ45 on 1 August 2011–29 March 2018. Sampling is done by the purposive sampling method, which means that the sample is taken based on predetermined criteria. Samples were selected from the population of companies listed in LQ45. There are 45 companies listed in LQ45, selected again based on criteria, namely that the company data must have stock price data and shares must always be actively traded every day starting from 2011–2018. Based on these criteria, 37 companies fulfilled all the predetermined criteria.

## 3. RESULT AND DISCUSSION

H1: There is a significant difference between the return on the results of the application of the moving average technical and the return on the buy hold strategy in all sideways and bullish periods.

**Table 1. t-test Results of Buy Hold Strategy Period 1 and Period 2**

Rules	Mean	Standar deviasi	t test	P value	Decision
Buy Hold	13.29	96.9767	-3.612	0.002	significant

Source: Processing Data

From the results of Table 1, it is found that all strategies have a significant difference between buy-hold strategy period 1 and buy-hold strategy period 2. From this, the assumption of differences in trends in period 1, namely the sideways market, and period 2 of the bullish market can be accepted. The negative t-test results prove that period 1 has a smaller average annual return than period 2.

**Table 2. t-test Results for MA and Buy Hold Strategy All Periods**

Rules	Mean	Standar deviasi	t test	P value	Decision
MA (1,50,0)	0.1498	0.3165	-0.254	0.799	not significant
MA (1,50,1)	0.7887	1.3801	-0.038	0.97	not significant
MA (5,50,0)	0.8315	1.3238	-0.557	0.578	not significant
MA (5,50,1)	0.8144	1.3276	-0.416	0.677	not significant

Source: Processing Data

From table 2, it is found that all moving average strategies have insignificant annual returns to the annual return of the buy hold strategy. This means that the market is efficient in weak form. From the descriptive statistics in this study, the moving average strategy provides a greater number of annual returns than the annual return of the buy hold strategy but is not significant so that the results cannot illustrate for sure that the moving average really gets abnormal returns.

H2: There is a significant difference between the return on the results of applying the technical moving average and the return of the buy hold strategy in the sideways period.

**Table 3. t-test Results for MA and Buy Hold Strategy Period 1**

Rules	Mean	Standar deviasi	t test	P value	Decision
MA (1,50,0)	0.09184	0.3493	-0.719	0.472	not significant
MA (1,50,1)	0.2386	0.9468	-0.957	0.339	not significant
MA (5,50,0)	0.2567	0.9531	-1.205	0.228	not significant
MA (5,50,1)	0.2614	0.9739	-0.978	0.328	not significant

Source: Processing Data

From the results of Table 3, it is found that all moving average strategies have insignificant annual returns against the annual return of the buy-hold strategy, meaning that the market is efficient in weak form because there is no MA strategy that can beat the return of the buy-hold strategy. From descriptive statistics, the results are the same between the MA and buy-hold strategies. Period 1 is a period during the sideways period or during the turmoil in Indonesia when the market moves flat.

H3: There is a significant difference between the return on the results of applying the moving average technique and the return buy hold strategy in bullish periods.

**Table 4. t-test Results for MA and Buy Hold Strategy Period 2**

Rules	Mean	Standar deviasi	t test	P value	Decision
MA (1,50,0)	13.4818	96.9559	-1.562	0.118	Not significant
MA (1,50,1)	1.0016	2.6	-1.249	0.212	Not significant
MA (5,50,0)	1.0195	2.5759	-0.859	0.390	Not significant
MA (5,50,1)	0.9951	2.5699	-1	0.317	Not significant

Source: Processing Data

From the results of Table 4, it is found that all moving average strategies have insignificant annual returns compared to the annual return of the buy-and-hold strategy. This means that the market is efficient in a weak form, as marked by the annual return of none of the moving average strategies in this study that can beat the annual return of the buy-and-hold strategy. Period 2 is a bullish period, and this study found that in this period the market is efficient.

## 4. CONCLUSION AND LIMITATION

### 4.1 Conclusion

1. Based on the results of research that has been conducted in all periods, it is found that the market in Indonesia has been efficient in weak form in 2011–2018. This result proves that investors using technical analysis cannot obtain persistently significant abnormal returns. This means that it will be more profitable for investors to make long-term investments in the existing market conditions in Indonesia, whether the JCI trend is sideways or bullish.
2. Based on the research conducted in period 1, it is found that the Indonesian market was efficient in weak form in 2011–2018. This result proves that it will be more profitable for investors to invest in the Indonesian stock exchange with a long-term investment strategy when the market is sideways.
3. Based on the results of research conducted in period 2, it is found that the Indonesian market has been efficient in weak form in 2011–2018. These results prove that it will be more profitable for investors to invest in the Indonesian stock exchange with a long-term investment strategy when the market is sideways. Indonesian stock exchange with a long-term investment strategy when the market is bullish.

As the technical approach proved unable to provide persistent abnormal returns, investors and investment managers need to consider the results of this study in determining the most appropriate investment strategy for the Indonesian market. A long-term investment strategy that includes macroeconomic analysis and fundamental analysis in stock selection will help investors better manage risk.

### 4.2 Limitation

This study only tests technical analysis with moving average strategies on sideways and bullish trends. For further research, it is hoped that this research can complement this research on bearish trends as in (Masry, 2017), so that it can be seen whether active strategies can outperform passive strategies. Future researchers can also examine the half-strong, efficient market in the Indonesian market.

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