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An Empirical Test of Weak-Form Market Efficiency in Bullish and Bearish Phases: Evidence from the LQ45 Index on the Indonesia Stock Exchange

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ABSTRACT
The purpose of this study is to examine the extent of weak-form market efficiency under two different market conditions: bullish and bearish, and how these conditions influence investor decision-making. Additionally, this research aims to demonstrate that investing in the capital market can offer investors reasonable and potentially promising returns. However, investor reactions to such information may vary. Differences in investors' responses and perceptions lead to variations in stock buying and selling decisions. Similarly, stock fluctuations in the Indonesian capital market are highly volatile. A quantitative research method was employed using SPSS version 22 software, which included normality and run tests. The study utilized the LQ45 Index, one of Indonesia's stock indices, comprising companies with high liquidity and large market capitalization. The test data were analyzed using SPSS version 22, including normality and run tests. The results of the normality tests indicate that returns during both bearish and bullish periods are not normally distributed. Furthermore, the run test results show that returns in both market conditions do not follow a random pattern, implying that the market is not weak-form efficient.

Keywords: *Bullish; Bearish; Return*

1. Introduction

In today's era of globalization, the Indonesian capital market is experiencing rapid and impressive growth. It is increasingly considered a reliable investment vehicle by investors, as evidenced by the enthusiastic rise in investor participation. As of December 17, 2021, the number of capital market investors in Indonesia grew by 89.58% to 7.3 million Single Investor Identification (SID) accounts. This figure includes SIDs in equities, bonds, mutual funds, government securities (SBN), and other instruments registered with KSEI.

Specifically, the number of equity investors surged by 101.19% to 3.41 million, mutual fund investors increased by 111.29% to 6.71 million, and SBN investors rose by 31.96% to 607,000. Active investors also saw a significant increase, exceeding 200,000 from only 94,000 at the end of 2020 to 198,000 by August 2021.

This growth reflects that the capital market is seen as capable of generating reasonable and promising returns. However, investors must remain cautious of the risks and potential losses inherent in such investments. The rapid flow of information in this global era significantly influences market conditions, making buy and sell decisions highly sensitive to timely and relevant data (Tandelilin, 2010). According to the Efficient Market Hypothesis

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(EMH), stock prices reflect all available information, and any new information is quickly absorbed by the market (Hanif & Nisar, 2012; Hadianto et al., 2021).

Nonetheless, investors may respond differently to the same information, which influences supply and demand dynamics, resulting in new price equilibriums (Adiningsih, 2023; Budiarso & Pontoh, 2024). In Indonesia, market efficiency—especially in its weak form—remains a topic of debate. Several studies indicate that the Indonesian capital market is not entirely weak-form efficient (Mukharomah et al., 2022; Malini, 2019; Rizkianto et al., 2014; Nikita & Soekarno, 2012; Yulianti & Dwi, 2019; Valentika et al., 2018).

Stock price volatility is another characteristic of the Indonesian capital market. This volatility is driven by various factors, including macroeconomic conditions, political uncertainty, government policies, exchange rate fluctuations, and others that complicate investment decision-making (Cahyadi et al., 2017; Mubarok & Fadhli, 2020). To represent general market movements, the LQ45 Index is often used. This index comprises 45 companies with high liquidity and large market capitalization, making it a reliable indicator of broader market trends (Khajar, 2008; Tumbal et al., 2023; Khujalifah et al., 2023).

During the February–July 2021 period, the LQ45 Index showed significant fluctuations—dropping early in the period, rebounding in May, but falling again by July. These movements may reflect weak-form efficiency if price changes are primarily influenced by random, relevant information. However, if trends can be predicted based on historical price patterns, the market is not weak-form efficient (Ripai et al., 2024; Sari et al., 2024).

Understanding these index trends can help investors anticipate whether the market is bullish or bearish. A bullish market is characterized by rising prices and trading volumes, while a bearish market is marked by declining prices and volumes. According to Dow Theory, a bearish market occurs when the index drops by 20%, whereas a bullish market arises when it increases by 20%. These market conditions greatly influence investment behavior, making it essential for investors to deeply understand market dynamics before making investment decisions.

2. Literature Review

The concept of market efficiency has long been a central theme in financial economics and has been widely examined in both developed and emerging markets, including Indonesia. The Efficient Market Hypothesis (EMH) suggests that all available information—whether historical, public, or even private—is fully reflected in asset prices. Adiningsih (2023) conducted a comparative study across Indonesia, India, and China in the post-COVID era and found that differences in financial ratios and macroeconomic conditions affect the level of market efficiency in these countries. Meanwhile, Budiarso and Pontoh (2024) raised a critical question about whether Indonesian investors can outperform the market, indicating potential inefficiencies.

Several studies have specifically tested the weak-form efficiency of the Indonesian capital market. Hadianto, Hendrik, and Yuwana (2021) found evidence supporting a random walk pattern during stable periods, aligning with the weak-form of EMH. Hanif and Nisar (2012), using cross-country data from South Asia, reported mixed results, suggesting that market efficiency can vary significantly across time and geography. Khajar (2008) focused on LQ45 stocks during and after the monetary crisis, revealing that efficiency levels fluctuate depending on market phases. Similarly, Khujalifah, Oktamade, and colleagues (2023) analyzed market efficiency in bullish and bearish conditions on the LQ45 Index, finding that efficiency tends to weaken during high-volatility periods.

Malini (2019) explored market anomalies in the LQ45 Index and found seasonal trends, indicating opportunities for arbitrage even in a seemingly efficient market. Mubarok and Fadhli (2020) applied forecasting models to examine sector-specific efficiency on the Indonesia Stock

Exchange (IDX), concluding that inefficiencies persist in certain industrial sectors. Supporting this, Mukharomah, Nilmawati, and Kristanto (2022) tested weak-form efficiency on LQ45 companies and noted that price movements do not entirely follow a random walk, allowing room for predictive strategies.

Earlier studies, such as Nikita and Soekarno (2012), using data from 2008 to 2011, found that historical prices could still contain some predictive power. More recently, Ripai et al. (2024) tested weak-form efficiency in the LQ45 Index between April 2020 and April 2024, during and post-pandemic, and revealed that patterns of predictability still existed. Similarly, Rizkianto, Denaya, and Surya (2014) observed that price trends in Indonesia's stock market were not entirely random, providing an opportunity for technical trading strategies.

Sari, Maradesa, and Budiarso (2024) examined the interaction between market efficiency and the concept of mean reversion, finding that Indonesian stocks tend to revert to fundamental values over time. Tandelilin (2010), in his foundational book on investment and portfolio theory, also emphasized the significance of understanding market efficiency in constructing effective investment strategies. Tumbal, Robiyanto, and Harijono (2023) analyzed weak-form efficiency among technology stocks during the COVID-19 pandemic and found that the tech sector exhibited notable inefficiencies due to heightened volatility.

Finally, Valentika et al. (2018) conducted a weak-form efficiency test specifically on the LQ45 Index and confirmed that certain historical price patterns still influence future movements. Yulianti and Dwi (2019), covering the 2014–2017 period, arrived at a similar conclusion, arguing that Indonesia’s capital market has yet to achieve full weak-form efficiency.

3. Methodology

This study adopts a quantitative research approach using parametric statistical testing. The population consists of all stocks included in the LQ45 index group on the Indonesia Stock Exchange during the period of February to July 2021. This population comprises 45 stocks, and throughout the mentioned period, there were no changes in the LQ45 index constituents. The testing was conducted across two distinct market conditions: bullish and bearish periods. The sampling method employed is saturated sampling, as all members of the population were used as the sample.

The variable used in this research is stock return. In relation to this variable, the measurement scale is based on the average stock price. The researcher used documents, specifically the monthly closing price data of the LQ45 index constituents from February to July 2021, which were classified into bullish and bearish market periods based on the average return of the LQ45 index. When the average return showed a positive value, the market was considered to be in a bullish condition, and conversely, when the average return was negative, the market was classified as bearish.

The data collection technique used is documentation. The data gathering process began with a preliminary study through literature review, which included examining various books, economic and business journals, and other references related to the capital market. The data analysis techniques employed in this study include normality testing and run tests, conducted using the SPSS software version 22. This method was further supported by data collection through internet sources to help achieve the research objectives.

4. Results

Normality Test Results

The normality test was conducted to determine whether the available data are normally distributed. This test is one of the criteria used in assessing weak-form market

efficiency. Specifically, it aims to evaluate whether stock returns follow a normal distribution. The Kolmogorov-Smirnov method was used for the test, with the following criteria: if the Asymp. Sig (2-tailed) value is greater than 0.05, the data are considered to meet the assumption of normality, indicating a normal distribution. Conversely, if the value is below 0.05, the data are considered not normally distributed.

Table 1. Normality Test Results

Period	Asymp. Sig (2-tailed)	Description
Bearish	0.000	Not normally distributed
Bullish	0.000	Not normally distributed

Based on Table 1, both the bearish and bullish periods show Asymp. Sig (2-tailed) values below 0.05, meaning that the return data analyzed in this study are not normally distributed.

Run Test Results

The run test was employed in this study to assess weak-form market efficiency. The analysis included all 45 stocks listed in the LQ45 index. The run test was conducted for both bearish and bullish market conditions with the following hypotheses:

H0: Accepted if the asymptotic significance value > 0.05 (returns follow a random pattern)

H1: Rejected if the asymptotic significance value < 0.05 (returns do not follow a random pattern)

Table 2. Run Test – Bearish Period

Period	Asymptotic Sig. Value	Decision	Description
Bearish	0.000	H0 Rejected	Not randomly patterned

As shown in Table 2, the asymptotic significance value for all LQ45 stocks during the bearish period is less than 0.05. This indicates that stock returns during the bearish market do not follow a random pattern. In other words, the non-random nature of returns suggests that the Indonesian capital market was not efficient during the bearish period.

Table 3. Run Test – Bullish Period

Period	Asymptotic Sig. Value	Decision	Description
Bullish	0.000	H0 Rejected	Not randomly patterned

Similarly, Table 3 shows that during the bullish period, the run test results for all LQ45 stocks yield asymptotic significance values less than 0.05. This also indicates that the return movements in the bullish period did not follow a random pattern. Therefore, the Indonesian capital market during this time is also considered inefficient. The presence of non-random patterns in returns may provide a basis for investors or market participants to apply technical analysis, as these patterns can serve as useful references for decision-making.

5. Discussion

Several empirical studies have provided compelling evidence that Indonesia's capital market does not fully comply with the weak-form Efficient Market Hypothesis (EMH), revealing patterns inconsistent with the random walk theory. This inefficiency is particularly evident in the persistent autocorrelation of stock returns, suggesting that historical price data can be used to predict future movements — a direct contradiction to the foundational premise of weak-form efficiency (Hadianto, Hendrik, & Yuwana, 2021; Adiningsih, 2023). These findings support the use of technical analysis as a potentially viable strategy to generate

abnormal returns, highlighting that market prices do not instantaneously or fully absorb all past information.

The robustness of these inefficiencies is further underscored by evidence across varying market conditions. A study by Khujalifah et al. (2023), which examined LQ45 index stocks during the bullish and bearish phases from February to July 2021, utilized statistical methods including normality and run tests. The results demonstrated that stock return patterns during both phases deviated from randomness, with significant serial correlation (as confirmed by Kolmogorov-Smirnov and run test results showing p-values < 0.05). These results mirror the findings of Ripai et al. (2024), who also noted that during periods of high optimism or panic selling, investor behavior tends to amplify price trends rather than neutralize them, reinforcing short-term predictability.

This consistency in non-random patterns across bullish and bearish markets suggests underlying structural inefficiencies within the Indonesian stock exchange. Contributing factors may include limited market depth, asymmetry of information, and behavioral tendencies such as herding or overreaction among retail investors (Malini, 2019; Mukharomah, Nilmawati, & Kristanto, 2022). Furthermore, Budiarso and Pontoh (2024) argue that the prevalence of inefficiencies in small- and mid-cap stocks is especially notable, as these segments are more susceptible to mispricing due to lower analyst coverage and higher speculative activity.

Such insights challenge the general applicability of classical EMH in emerging markets like Indonesia and suggest the need for hybrid or behaviorally-informed models. Investors might find greater utility in active strategies tailored to capitalize on these inefficiencies, while policymakers should consider enhancing transparency, encouraging financial literacy, and expanding access to market-relevant information to support more efficient price discovery mechanisms (Sari, Maradesa, & Budiarso, 2024; Tumbal, Robiyanto, & Harijono, 2023).

6. Conclusion

Based on the variables used, the scale of the return variable is the average stock price. The author uses documents in the form of monthly closing price data of stocks from the constituents of the LQ45 stock index group for the period of February 2021 to July 2021, which are classified into bullish and bearish market periods based on the average return of the LQ45 market. Using a quantitative research approach, normality tests and run tests were conducted with the help of SPSS version 22 software. The results conclude that both bearish and bullish periods indicate that during these times, stock movements, as proxied by market returns, do not follow a random pattern. It can be said that non-random returns illustrate that the Indonesian capital market, during bearish periods, is not weak-form efficient

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