

Market Efficiency and Investment Feasibility of PT Telkom Indonesia Tbk (TLKM) Stock for the Month of May

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Abstract. The purpose of this research is to analyze the stock of PT Telkom Indonesia Tbk (TLKM) during the month of May, and to examine whether the TLKM stock falls under the category of a weak-form efficient market. To determine this, the researchers used several methods such as the run test, autocorrelation, and unit root test (ADF). These methods are expected to reveal whether TLKM stock price movements are truly influenced by historical data. Furthermore, the results of this testing are expected to provide prospective investors with insight and help determine the right investment strategy—whether short-term or long-term. This study investigates whether the market is already weak-form efficient, meaning the current stock price reflects past information. TLKM stock was selected as the object of this research because it is considered a blue-chip stock with high liquidity and significant contribution to the movement of the Composite Stock Price Index (IHSG) on the Indonesia Stock Exchange. Through this research, it is expected that investors will better understand how stock price movements occur and make investment decisions more wisely and based on data, not just speculation.

Keywords: Market Efficiency, Run Test, Autocorrelation, ADF Test.

1. INTRODUCTION

Currently, the capital market has become one of the main options for the public in making capital investments, mainly due to its potential for significant profit. However, in practice, only some individuals can immediately understand how stock prices work and what factors influence them. One important factor that investors must pay attention to is whether stock prices in the market reflect available data or facts, especially past information. This condition is directly related to what is known as market efficiency.

Based on data from the Indonesian Central Securities Depository (KSEI), the number of capital market investors in Indonesia reached 12.16 million as of December 2023, a significant increase from previous years, signaling the high enthusiasm of the public for stock investment. One of the favorite stocks is PT Telkom Indonesia Tbk (TLKM) because it is known to be stable, often included in the LQ45 index, and regularly distributes dividends. But behind its popularity comes the phenomenon that many investors - especially beginners - still use technical analysis based on past price patterns to predict profits, without realizing that this will not be effective if the market is already weakly efficient. In other words, if TLKM's price already reflects all historical information and moves randomly, then strategies based on past data become irrelevant. The main issue that arises is whether or not TLKM's stock price movements, especially in the May period, have shown the characteristics of a weakly efficient market, and how this affects the investment strategy that should be used.

The concept of market efficiency itself is divided into three types: weak-form efficiency, semi-strong efficiency, and strong-form efficiency. In weak-form efficiency, it is assumed that the current stock price already reflects all past information, such as historical price data. Thus, if the market is indeed efficient in this form, analysis based on past data cannot be used to gain above-average profits, since prices move randomly and cannot be predicted.

PT Telkom Indonesia Tbk (TLKM) is one of the top stock picks on the Indonesia Stock Exchange. This stock is known to be consistent and is often favored by both short-term and long-term investors. However, the question is whether the TLKM stock price—especially during the month of May—already shows weak-form efficiency. That is the main focus of this research. In addition to historical data, stock price movements are also influenced by macroeconomic conditions. Tanjung et al. (2022) showed that during and after the COVID-19 vaccination period, the Indonesian stock market reacted significantly to changes in monetary policy, particularly interest rates. These external factors are essential to consider when analyzing the efficiency of TLKM stock during specific periods like May. Similarly, Iradilah and Tanjung (2022) found that interest rates have a significant

negative impact on stock prices in the banking sector, while inflation showed no significant effect. Although the study focuses on banks, the findings highlight how macroeconomic indicators can still influence stock behavior, including that of TLKM, especially when assessing market efficiency.

To explore this, the research uses three analytical tools: the run test, autocorrelation, and the Augmented Dickey-Fuller (ADF) test. One of the objectives is to determine whether TLKM stock prices move randomly or show certain identifiable patterns from past data. If the price moves randomly, it means the market is efficient. However, if certain recurring patterns are found, the market may not yet be fully efficient.

Previous studies have shown varying results. Research by Puput Oktavia (2022) on the efficiency of the Sharia market before and after earnings announcements found no significant market reaction, indicating a tendency toward weak-form efficiency. Gilang Pratama (2019) also found that during election periods, Indonesian stock prices moved irregularly or randomly, supporting weak-form efficiency. Armand Hermansyah (2020) analyzed TLKM stock price movements and found them to be consistent and stable using technical analysis, but did not test for actual market efficiency. In contrast, Noviarti and Melkisedek (2019) found abnormal returns before and after dividend announcements in manufacturing stocks, suggesting inefficiency due to delayed price adjustments. A similar opinion was expressed by Fudji Sri Mar'ati (2012), who stated that a market cannot be considered efficient if prices do not quickly respond to information. Previous studies in the context of the Indonesian capital market also reinforce the urgency of analyzing the efficiency and feasibility of stock investment from various approaches. Siregar et al. (2024) found that profitability, tangibility, and uniqueness have a significant effect on the capital structure of manufacturing companies, which in turn has an impact on investor decisions and long-term stock valuations. Meanwhile, Tanjung et al. (2024) examined the tourism sector and found high volatility in some stocks using the ARCH-GARCH model, which indicates a diverse level of risk and is important for investors to consider. Furthermore, Mulyani et al. (2024) through a fundamental analysis approach on PT Summarecon Agung Tbk showed that financial ratios such as liquidity, solvency, and profitability reflect the company's stable and healthy financial performance over the past five years. These three studies emphasize the importance of in-depth understanding of market efficiency and issuer fundamentals in making investment decisions - in line with the focus of the study on TLKM shares in May in this study.

Given these differing findings, this study seeks to analyze whether PT Telkom Indonesia Tbk (TLKM) stock during May falls under the category of a weak-form efficient market. It also aims to evaluate the implications for suitable investment strategies, both long-term and short-term. Hence, the research is titled: "Market Efficiency and Investment Feasibility of PT Telkom Indonesia Tbk (TLKM) Stocks for the Month of May".

2. METHODOLOGY

2.1 Market Efficiency

Market efficiency is the idea that stock prices already reflect all available information, including past data, current circulating information, and even private or unknown information. Fama (1970) categorized this efficiency into three levels: weak, semi-strong, and strong.

If the market is weak-form efficient, it means all historical data, such as past prices, has already been incorporated into the stock price. Thus, predicting future prices using old patterns is impossible. In this case, strategies like technical analysis are not effective, because stock prices move randomly.

Evidence of weak-form efficiency can be seen in research by Tyta Ripal et al. (2023), who analyzed the LQ45 index and found that price movements were random. This supports the idea of weak-form efficiency.

Similar findings were presented by Zíková and Veselá (2021), who stated that highly liquid and large-cap stocks tend to exhibit efficient characteristics, making price predictions increasingly difficult.

2.2 Autocorrelation

Autocorrelation is a statistical tool used to determine whether there is a relationship between today's returns and previous returns. If no significant correlation is found, it means stock prices move randomly, supporting the concept of weak-form market efficiency.

Zíková and Veselá (2021) used the Ljung-Box Test to check whether stock prices are still correlated day to day. In some markets, such correlations still exist, indicating inefficiency. However, Tyta Ripal et al. (2023) found no such autocorrelation in the LQ45 index, indicating random movement.

In this study, autocorrelation is applied to TLKM stock to determine whether past prices influence current prices. If no pattern emerges, the stock is considered to move randomly and the market efficient.

2.3 ADF Test (Augmented Dickey-Fuller)

The ADF test is used to determine whether stock data is stationary, meaning the mean and variance of returns remain stable over time. If stock prices are non-stationary but returns are stationary, price movements are difficult to predict.

Guo (2023) studied Amazon and Nike stocks and found their prices fluctuated without consistent patterns, while returns were relatively stable—supporting weak-form efficiency.

TLKM stock is tested similarly. If the returns are stationary, then historical patterns cannot be used to predict price, which supports market efficiency.

2.4 Run Test

The run test checks whether stock prices move randomly. A "run" refers to a sequence of increasing or decreasing prices. If the number of runs is significantly different from expected, there may be hidden patterns. If the number of runs matches expectations, the data is random.

Hassan and Ahmad (2020) applied the run test on the KMI-30 index and found clear patterns, indicating the market was not fully efficient.

In this research, the run test is applied to TLKM stock. If results show random movement, it indicates weak-form efficiency and limits the usefulness of historical analysis.

2.5 Research Flow

The following is the research flow that illustrates the stages undertaken by the researchers throughout the study process. This flow is structured starting from problem identification to the conclusion stage, systematically reflecting the quantitative method used in analyzing market efficiency and the investment feasibility of PT Telkom Indonesia Tbk (TLKM) stock.

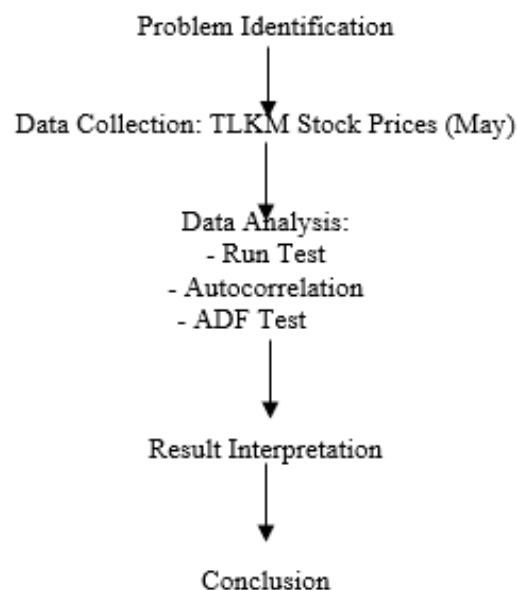


Figure 1. Source: Processed by the researchers (2025)

3. RESULTS AND DISCUSSION

3.1 Autocorrelation Test Results

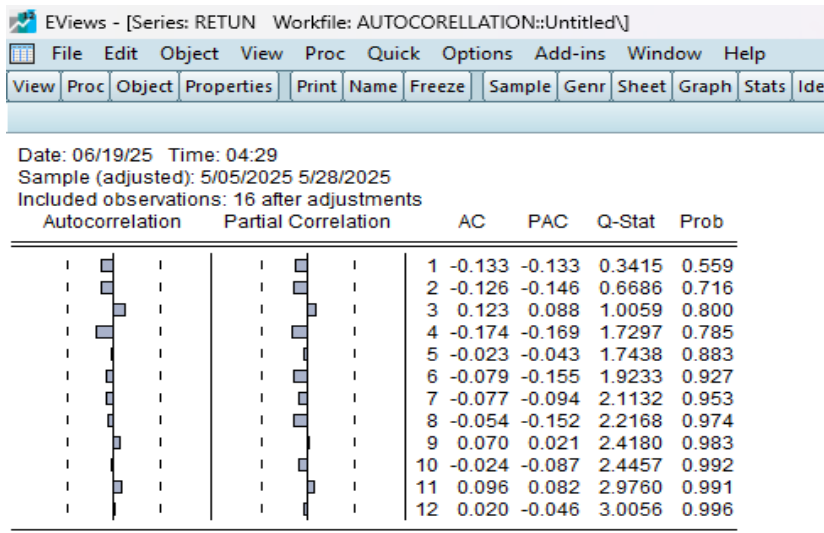


Figure 2. Autocorrelation Test

Based on the results of the autocorrelation test on the return data of TLKM stock for the period of May 2025, the probability (p-value) of the Q-Statistic for each lag was found to be greater than 0.05, such as at lag 12 (0.996). This indicates that there is no significant relationship between current returns and past returns. In other words, the movement of stock prices is random and does not form a specific pattern, thus supporting the hypothesis that the TLKM stock market is weak-form efficient. This is consistent with the concept that when autocorrelation is not significant, historical information cannot be used to predict future stock price movements.

3.2 ADF Test Results

Table 1. ADF Test Result Table – TLKM Stock Return (May 2025)

Description	Result
ADF Test Statistic	-4.2102294
p-value	0,0004
Critical Value (1%)	-2,728252
Critical Value (5%)	-1,966270
Critical Value (10%)	-11,605026
Conclusion	Stationary (ADF < critical values and p < 0.05)

Model Summary

Variable	Coefficient	p-value
RETURN(-1)	-1.114736	0.0009

Additional Model Statistics

Indicator	Value
R-squared	0,5585
Standar Error	0,0238
Durbin-Watson Star	1,9977

The Augmented Dickey-Fuller (ADF) test showed a t-statistic value of -4.210294, which is much smaller than the critical values at the 1% (-2.728252), 5% (-1.966270), and 10% (-1.605026) significance levels, with a p-value of 0.0004. This significant result indicates that TLKM stock returns are stationary. With stable fluctuations and no clear trends, the data supports the conclusion that prices move randomly and cannot be predicted from past

data—supporting the weak-form efficiency of the TLKM stock market.

3.3 Run Test Results

Tabel 3. Uji Run Test

Component	Value
Total Observations	17
Number of Positive Returns	9
Number of Negative Returns	7
Number of Runs	11
Expected Number of Runs	8,875
Standard Deviation	1,900
Z-Statistic	+1,12
p-Value (estimated)	>0,05
Conclusion	Random Return
Market Efficiency	Weak-form Efficient

From the run test on TLKM stock returns for May 2025, the number of runs was 11, with an expected value of 8.875 and a Z-statistic of 1.12. Since the Z-value is not significant ($p > 0.05$), it is concluded that TLKM stock returns are random. This supports the assumption that the stock market is weak-form efficient.

3.4 Investment Feasibility Discussion

Based on the results from the three methods (autocorrelation, ADF, and run test), it is concluded that TLKM stock prices in May moved randomly and did not show predictable patterns from historical data. Autocorrelation showed no significant daily return relationship, ADF confirmed that the return data was stationary, and the run test showed a non-significant Z-value ($p > 0.05$), indicating random return movement.

These results consistently indicate that TLKM stock operates in a weak-form efficient market. In such conditions, investment strategies based on technical or historical analysis are less effective. Instead, a long-term investment strategy focused on company fundamentals is more appropriate. Investors cannot consistently earn abnormal profits using short-term strategies, making TLKM stock more suitable for long-term investments based on intrinsic value and business prospects.

4. Conclusion

Based on the research conducted on PT Telkom Indonesia Tbk (TLKM) stock during the month of May, it can be concluded that the TLKM stock market exhibits weak-form efficiency. This is supported by three testing methods: autocorrelation, Augmented Dickey-Fuller (ADF), and run test. The autocorrelation test showed no significant relationship between today's and previous returns; the ADF test confirmed that the returns were stationary; and the run test indicated that returns were random.

These three methods consistently reinforce that TLKM stock prices cannot be predicted from historical data. Therefore, short-term technical-based investment strategies are less effective. Conversely, long-term investment approaches based on fundamental analysis are more appropriate, since stock prices already reflect past information and move randomly—demonstrating weak-form market efficiency.

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