

A Comparative Study on Efficient Market Hypothesis and Adaptive Market Hypothesis in Indian Stock Market

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Abstract- *Efficient Market Hypothesis (EMH) has always been considered a theory that best explains the working of the stock market on the grounds of stock prices being perfectly reflecting all information available. However, market anomalies, financial crises, and behavioural biases raised questions against this theory, resulting in the formulation of the Adaptive Market Hypothesis (AMH). This hypothesis states that market efficiency keeps changing with changing market conditions. Therefore, this study attempts to make a comparison between the two hypotheses with regard to the Indian stock market based on the analysis of NIFTY 50 Index. Quantitative approach is taken up for this study using secondary data collected from the National Stock Exchange (NSE) over the period from April 2011 to March 2026. Efficiency of the market is determined with the help of various statistical tests that include Runs Test, Autocorrelation Test, Variance Ratio Test, and rolling window test. It was found that there is a mixed result with respect to market efficiency. While the results from Runs Test and Autocorrelation Test suggest the existence of serial dependency and periods of inefficiency, the results from Variance Ratio Test suggest random walk over the entire time horizon. Moreover, the results of rolling window test show that market efficiency changes with changing economic and financial scenarios over time. It can thus be concluded that Adaptive Market Hypothesis has a better application in the case of Indian stock market due to changing economic conditions and behaviour of investors.*

Keywords - *Efficient Market Hypothesis, Adaptive Market Hypothesis, Indian stock market, Random walk, NIFTY 50, Behavioural Finance*

I. INTRODUCTION

The Efficient Market Hypothesis (EMH), being one of the dominant concepts in the field of finance, states that all the information available about a firm is included in the price of its stocks, thereby making abnormal profits for the investors very difficult. Nevertheless, due to the existence of anomalies in the

markets, financial crises and due to the presence of behavioural biases, this assumption is questionable. In order to overcome the drawbacks of EMH, the Adaptive Market Hypothesis (AMH) is introduced, which states that the level of efficiency of the market changes over time due to the prevailing economic conditions and the behaviour of the investors. In this study, we have compared the two hypotheses based on their applicability in explaining the Indian stock market behaviour using the NIFTY 50 Index. This paper makes use of the statistical methods like Runs Test, Autocorrelation test and Variance Ratio test to examine the consistency of efficiency of the market over time.

II. LITERATURE REVIEW

According to prior research, EMH assumes that prices of stocks contain all the information whereas AMH states that market efficiency varies with the passage of time based on investors' behaviour and market conditions. Lo (2004) formulated AMH as an extension of EMH through behavioural finance and evolutionary approach. Studies carried out empirically by Urquhart and McGroarty (2016), Hiremath (2014, 2016), Rönkkö et al. (2024), and Okorie and Lin (2020) have proved that the efficiency of the market varies with time and is affected by financial crises, economic events, and adaptation. There have been many other empirical studies carried out in the field of cryptocurrencies, REITs, DeFi, and emerging markets which have also supported the AMH by proving that market predictability varies with time. However, most studies have been country or market-specific, with statistical approaches limited to a few, and very few studies consider more than one efficiency test at a time. Thus, the current study seeks to fill this gap by comparing AMH with EMH using NIFTY 50 Index through various statistical techniques.

Research Design:

Objectives For the Study

1. To Compare the validity and explanatory power of the EMH and AMH in explaining Stock market behaviour.
2. To investigate market efficiency changes over time due to variation in market conditions, economic events, and structural changes.
3. To examine the level of market efficiency in the Indian stock market using the principles of the Efficient Market Hypothesis (EMH).
4. To determine which theoretical farmwork, EHM or AHM are better explains the behaviour of the Indian market.

Scope Of the Study:

This research will examine the ability of the Efficient Market Hypothesis (EMH) and the Adaptive Market Hypothesis (AMH) to explain stock market behaviour.

It involves assessing the degree of market efficiency of the stock market by analysing the historical price data of stocks.

It will explore whether the level of market efficiency stays constant or varies because of events in the economy and finance sector and structure of the stock market.

Various situations in the stock market, including times when there are no financial or economic disruptions as well as periods of crisis and significant economic events, will be considered in this study. Statistical analysis tools such as the Variance Ratio Test, BDS Test, among others, will be applied in analysing the data.

Hypothesis:

H0: There is no significant change in the market efficiency over time due to variations in the market conditions, economic events and structural changes.

H1: There is significant change in the market efficiency over time due to variations in the market conditions, economic events and structural changes.

H0: There is no significant difference between the Efficient Market Hypothesis (EMH) and the

Adaptive Market Hypothesis (AMH) in explaining stock market behaviour.

H1: There is a significant difference between the Efficient Market Hypothesis (EMH) and the Adaptive Market Hypothesis (AMH) in explaining stock market behaviour.

III. RESEARCH METHODOLOGY

A quantitative and empirical approach has been used in the present study in order to determine the validity of the Efficient Market Hypothesis (EMH) and Adaptive Market Hypothesis (AMH) in determining the behaviour of the Indian stock market. In this regard, the entire research will be conducted on the basis of secondary data obtained from the official websites of NSE India and BSE India. Daily price data of the NIFTY 50 Index was chosen via purposive sampling since the NIFTY 50 Index reflects the total performance of the Indian equity market.

The methodology involves calculating daily logarithmic returns, followed by the application of statistical techniques such as the Runs Test, Autocorrelation Test, and Variance Ratio Test to examine weak-form market efficiency under the EMH. Further, a rolling-window analysis is used to evaluate time-varying market efficiency under the AMH by identifying periods of efficiency and inefficiency. The results of these tests are compared to determine which hypothesis better explains the behaviour of the Indian stock market.

IV. DATA ANALYSIS AND DISCUSSION

The data for the study consisted of the daily closing price of the NIFTY 50 index ranging from 1st April 2011 to 31st March 2026. The duration was 15 years and covered various important economic events. Daily logarithmic returns were computed to observe the behaviour of the market. The analysis involved three statistical tests such as Runs Test, Autocorrelation test, and Variance Ratio Test to determine the market efficiency based on the Efficient Market Hypothesis (EMH). Besides, a rolling window analysis was performed to measure

the market efficiency varying over time based on the Adaptive Market Hypothesis (AMH).

The Runs Test resulted in a Z-statistic of -5.122 and the p-value of 0.000 , suggesting that the series of returns is not randomly distributed and rejects the assumption of weak-form market efficiency. Likewise, the Autocorrelation Test found the positive autocorrelation for all lags (1 to 20). Thus, it confirms the presence of serial correlation in returns and also rejects the random walk hypothesis. However, the Variance Ratio Test shows the Z-statistics within critical limits (± 1.96), thus, suggesting that the market follows the random walk and is weak-form efficient.

The rolling window analysis found that there were variations in market efficiency. Based on 174 rolling windows, 112 were found to be efficient and 62 inefficient. Thus, it can be observed that NIFTY 50 switches between the periods of efficiency and inefficiency. The above results support the Adaptive Market Hypothesis (AMH) suggesting that market efficiency changes in accordance with the changing economic environment and market events.

V. FINDINGS

- The Runs Test indicates that the NIFTY 50 market is not completely random.
- The Autocorrelation Test shows significant dependence on past returns.
- The Variance Ratio Test supports weak-form market efficiency over the overall sample.
- Rolling-window analysis shows that market efficiency changes over time, supporting the Adaptive Market Hypothesis.

VI. SUGGESTIONS

- Investors should adopt flexible investment strategies that adapt to changing market conditions.
- Regulatory authorities should enhance market transparency and timely information disclosure.
- Investment decisions should consider both market trends and behavioural factors.

- Future research should include sector-wise indices and individual stocks.
- Advanced statistical and machine learning techniques can be used to improve market efficiency analysis.
- Similar studies may be conducted in other emerging markets to compare the applicability of EMH and AMH.

VII. CONCLUSION

This study compared the Efficient Market Hypothesis (EMH) and the Adaptive Market Hypothesis (AMH) in explaining the behaviour of the Indian stock market using the NIFTY 50 index. The empirical results show mixed evidence regarding market efficiency. While the Variance Ratio Test supports weak-form market efficiency, the Runs Test and Autocorrelation Test indicate the presence of serial dependence and periods of market inefficiency. The rolling-window analysis further confirms that market efficiency changes over time, particularly during major economic and financial events. These findings suggest that market behaviour is dynamic rather than constant. Therefore, the Adaptive Market Hypothesis provides a more realistic and comprehensive framework for explaining the behaviour of the Indian stock market compared to the traditional Efficient Market Hypothesis. The study contributes to a better understanding of time-varying market efficiency and offers useful insights for investors, researchers, and policymakers.

VIII. LIMITATIONS OF THE STUDY

- The study is based only on secondary data.
- The research will be restricted to the chosen stock market or index only, which may not necessarily be true for other stock markets.
- The results might be affected by any sudden occurrence of economic, political, or financial events during the research period.
- The research concentrates more on the stock price movements in history and less on behavioural and psychological factors.
- The results are dependent on the reliability of secondary data sources.

- The study is limited to a 6-week project period, which restricts extensive data collection and analysis.

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