

The Limitations of the Efficient Market Hypothesis

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Abstract. The Efficient Market Hypothesis (EMH) has long been a fundamental theory in finance, asserting that financial markets are efficient and that asset prices reflect all available information. However, empirical evidence suggests limitations in three critical aspects. Firstly, momentum and reversal phenomena challenge the EMH, indicating the existence of persistent price trends and patterns that deviate from immediate information incorporation. Secondly, the presence of inside information and insider trading undermines the assumption of equal access to information, revealing information asymmetry and compromising market efficiency. Lastly, the influence of financial institutions, with their market power and associated complexities, introduces further challenges to the EMH. Agency issues, herding behavior, and short-termism among financial institutions can compromise market efficiency. Acknowledging these limitations is crucial for market participants as it allows for a refined understanding of market dynamics and informs the development of more comprehensive theories that better capture the complexities of real-world financial markets.

Keywords: Efficient Market Hypothesis, Momentum, Reversal, Insider Trading, Institutional Investors.

1. Introduction

Throughout the history of the securities market, investors have continuously explored various strategies to capitalize on its profit potential. This exploration has led to the development of several significant theories, one of which is the well-known efficient market theory. The efficient market theory categorizes the market into three levels of efficiency: weak, semi-strong, and strong efficient markets [1]. This framework provides valuable insights into the functioning of the securities market and forms a solid foundation for its growth. Over time, the efficient market theory has garnered substantial support, with influential figures like Malkiel endorsing its principles. He argues that despite occasional market anomalies, the securities market remains highly efficient [2]. However, empirical evidence suggests that the efficient market theory may not hold entirely true, regardless of the specific type of market efficiency being considered. These deviations from the theory cannot be dismissed as mere anomalies, prompting market participants to actively investigate and uncover the factors that hinder the success of the efficient market theory. If the efficient market theory were indeed valid, both institutions and individuals would face significant difficulties, if not impossibilities, in surpassing the market and achieving alpha returns. However, real-world evidence contradicts this notion, as numerous publicly available funds featured on various financial websites have actually outperformed market benchmarks. This clear demonstration illustrates that investors have the capability to identify effective strategies for generating profits, which may extend beyond legal means to encompass illicit practices as well.

This paper aims to provide a brief outline of several notable factors that challenge the efficient market theory. One such factor is the phenomenon of short-term momentum and long-term reversal. Another factor is insider trading, wherein individuals trade securities based on non-public information. Furthermore, the influence of institutional trading on market dynamics cannot be ignored. By studying and analyzing these three phenomena, it becomes evident that investors have the potential to predict or influence the direction of certain securities in the market. These insights allow investors to achieve returns that surpass market performance, contradicting the efficient market theory's notion of market efficiency. Recognizing and understanding these factors will help investors to enhance their ability to seek out profitable opportunities in the securities market that go beyond what the efficient market theory predicts. At the same time, it can enable regulators to better construct the securities

market, providing a fairer and more efficient investment environment for all investors and contributing to its stable and healthy development.

2. Momentum and Reversal

In the realm of finance, momentum is a concept that describes the persistence of an asset's price movement in either an upward or downward direction over a specific timeframe. It stems from the belief that assets that have shown strong performance in the recent past will likely continue to perform well in the near future, while those that have underperformed are likely to continue on a downward trajectory. Jegadeesh & Titman's research indicates that investors who purchased stocks with a strong past 6 months performance and sold stocks with a weak past 6 months performance experienced notable and positive returns within holding periods ranging from 3 to 12 months. Based on the research of De Bondt & Thaler, they conducted a comprehensive test spanning from 1965 to 1989 by devising and examining 16 different strategies. Through this thorough analysis, they arrived at the conclusive finding that momentum effects have the potential to generate favorable returns. On average, it was observed that the strategy achieved a compounded excess return of 12.01% per year [3].

Although the conclusions drawn confirmed the existence of momentum effects, some issues inevitably arose during the testing process. Firstly, there was a concern about data mining, as constructing models based on in-sample data would be more convincing if they could be validated with out-of-sample data, yielding similar results. Therefore, in 2001, Jegadeesh & Titman made additional contributions by including test results from the period spanning from 1990 to 1998 [4]. Remarkably, they arrived at the same conclusions as before, indicating that the returns obtained through the use of momentum effects remained consistent. However, since this involved out-of-sample data, it significantly enhanced the reliability of the conclusions. As an important phenomenon in finance, the momentum effect is specifically applicable to the short term. In contrast, in the longer term, the securities market experiences another phenomenon known as reversal.

Reversal in finance pertains to the occurrence where assets that have displayed notable positive (or negative) returns in the past exhibit a subsequent reversal or reversion in the opposite direction. It stands in contrast to the momentum effect. Following a period of significant outperformance, assets subject to reversal tend to underperform, while assets that have previously underperformed tend to enjoy a period of outperformance. This reversal effect is commonly observed over extended timeframes, extending beyond the realm of short-term momentum effects. De Bondt & Thaler proposed that buying stocks with poor performance in the past 3-5 years and holding them would result in higher returns compared to buying stocks with good performance under the same conditions in 1985. After holding for 36 months, stocks with poor past performance had a higher return rate of about 25% compared to stocks with good past performance. They conducted experiments using monthly returns of common stocks from the New York Stock Exchange. The experimental data spanned from the beginning of 1926 to the end of 1982, and the same phenomenon was still detectable in the 5 years following the experiment [5]. However, this experiment also has its limitations, as some observed phenomena were not accompanied by explanations or clarifications. Particularly, the phenomenon of most returns occurring in January was not adequately explained.

In 1988, Poterba & Summers conducted a comprehensive study utilizing the variance ratio approach to explore the phenomenon of reversal in financial markets. This particular method proved to be advantageous as it effectively addressed the challenge posed by the concentration of returns in January. To investigate this phenomenon, Poterba & Summers focused on analyzing the NYSE indices from the CRSP database which covered a substantial period ranging from 1926 to 1985, providing a robust foundation for their research. The outcomes of their study were remarkable. Both the value-weighted return and the equal-weighted return displayed a negative serial correlation over the long term, implying a clear pattern of reversal in the market [6].

The EMH posits that past prices and trends do not offer valuable information for predicting future prices. However, empirical evidence from momentum and reversal effects challenges this assumption. These effects indicate that the market may exhibit overreactions or underreactions to new information, implying that past price trends do contain useful information that can be leveraged to generate abnormal returns. As a result, these findings point to deviations from market efficiency as proposed by the EMH.

3. Inside Information and Insider Trading

Information asymmetry happens when there is an imbalance in the distribution of knowledge or information between the parties engaged. It refers to a situation where one party possesses greater or more information compared to the other one. In many economic and business interactions, information plays a crucial role. However, when one party is able to reach information that the other party does not have, it creates an imbalance of power and can lead to disadvantages or inefficiencies in the transaction. Information asymmetry can occur in various contexts. For instance, it can exist between buyers and sellers in financial markets, where insiders or market professionals possess material non-public information. Information asymmetry can result in adverse selection, moral hazard, or other market failures.

Jaffe explored this issue as early as 1974, citing the conclusions of many previous studies on insider trading to highlight the lack of clear evidence regarding its profitability. For the period from 1962 to 1968, a random sample of 200 large companies was selected as the initial sample, which included approximately 1,000 trading records per month for each company. The examination was conducted using Sharpe and Lintner's model of equilibrium pricing of risky capital assets. By testing the "Sample of Large Transactions" and "Intensive Trading Samples", it was demonstrated that insiders indeed possess specific information and that these trades can generate profits for them [7].

Seyhun conducted further research in 1986, following the examination of insider trading studies by Jaffe and others. The insider trading data used in this study were obtained from a computer tape compiled by the SEC. This tape contained 1.5 million insider trading transactions from 790 companies spanning the period from 1975 to 1981. After excluding 21 companies that had no reported insider transactions, the final sample consisted of 769 companies. Additionally, Seyhun segmented the sample based on the following categories: officers, directors, officer-directors, chairmen of the boards of directors, and large shareholders [8]. By analyzing data around 100 days before and after trading days, Seyhun found that insiders buy stocks before the release of positive information and sell stocks before the release of negative information. They refrain from buying before the release of negative information and from selling before the release of positive information. Furthermore, Seyhun discovered that insiders adjust the volume of their stock purchases based on the value of their insider information. This indicates a positive correlation between trading volume and the value of insider information, which was not identified in Jaffe's 1974 study. Through this research, Seyhun confirmed that insiders can predict abnormal stock price changes. They buy stocks prior to abnormal price increases and sell stocks prior to abnormal price declines. Moreover, different insiders possess varying levels of information quality.

According to the EMH, in a strong efficient market, market prices fully reflect all available information, and no one can consistently outperform the market using any information. However, both Jaffe and Seyhun have provided empirical evidence that within a company and among those who have access to insider information, individuals can use this information to generate excess profits for themselves. They are able to predict the future price movements of stocks based on the information they possess. While these excess profits may not be sustainable in the long term, the fact that such opportunities exist challenges the EMH.

4. Institutional Investors

Financial institutions play a crucial role in the market as significant participants, forming a diversified market ecosystem along with other investors. They engage in transactions with individual investors, other institutional investors, and corporations, among other market participants, influencing market behavior and dynamics. As one of the main participants in the market, financial institutions provide market liquidity through their trading activities. They participate in buying and selling transactions, acting as counterparties for other market participants and facilitating the execution of trades. The trading activities of financial institutions play a vital role in price formation and discovery in the market. They help guide the equilibrium of market supply and demand through their buying and selling activities, influencing asset price fluctuations and trends, and participating in the price discovery process. Given that financial institutions typically have larger trading volumes and market shares, their trading activities can have a significant impact on the market. Their buying and selling decisions and behaviors can attract attention and followers from other market participants, thereby influencing market prices and trends. This is commonly referred to as the herding effect.

In 1999, Wermers examined herding behavior under different conditions by using monthly return data from 1975 to 1994 and combining it with Lakonishok's herding measure formula. The study investigated herding in various scenarios, including 1) herding between large-cap and small-cap stocks, 2) herding among stocks with high and low past returns, and 3) herding in the selling and redemption activities of mutual funds. The study also tested whether mutual fund herding had an impact on stock prices. The following conclusions were drawn: The direction of mutual fund herding appears to be related to future stock returns, and growth-oriented mutual funds exhibit significant herding behavior in small-cap stock trading. Examining future returns based on various herding theories proves useful, and although herding-induced abnormal returns are more apparent in small-cap stocks, similar situations also occur in large-cap stocks [9]. In the same year, Nofsinger & Sias examined the existence of herding by studying the relationship between the ownership of shares by institutional investors and returns. They analyzed data from 1977 to 1996, spanning a period of 20 years, on the annual fraction of shares held by institutional investors for all NYSE firms. The results showed a strong positive correlation between the annual changes in institutional ownership and returns within the herding interval [10].

The herd behavior of institutional investors can trigger greater market volatility. When a large number of institutional investors make similar buying or selling decisions simultaneously, the market can experience significant fluctuations, exacerbating market volatility. The herding effect may lead to price imbalances in stocks, where the prices do not align with the underlying fundamental value of the companies. Concentrated investments by institutional investors can result in certain stocks being overvalued or undervalued, deviating from their true worth. The herding effect of institutional investors can cause the market to lose sensitivity to information, making it relatively irrational and inefficient. This can hinder investors from making wise investment decisions based on fundamental value, thus challenging the theory of market efficiency.

5. Conclusion

This paper uses empirical evidence from three aspects to illustrate the potential challenges to the EMH. Firstly, the existence of momentum and reversal implies that there may be information in the market that is not fully reflected in stock prices, allowing investors to achieve returns above the market average by using these strategies. This poses a challenge to market efficiency because the EMH assumes that all available information is already fully reflected in stock prices, making it impossible to predict future stock performance through technical analysis or past price trends. Secondly, information asymmetry and insider trading, where one party possesses more or more accurate information than other market participants. This information asymmetry may prevent the market from efficiently reflecting all relevant information, thereby undermining the assumptions of the EMH. Finally, institutional trading, where herding behavior can lead to price distortions and

bubbles in the market. This behavior can cause stock prices to deviate from their fundamental value, thereby affecting market efficiency.

However, the existence of the market is complex, especially when it comes to the behavior and thoughts of market participants, which are difficult to study thoroughly. Challenging market efficiency based solely on three aspects may oversimplify the complex market phenomena. The market is a complex ecosystem influenced by numerous factors, including economic indicators, political dynamics, and the behavior of market participants, among others. Questioning market efficiency based solely on momentum, reversal, insider trading, and institutional trading may fail to cover other important influencing factors. Furthermore, this approach may suffer from selective bias. Selective bias refers to focusing only on situations that contradict the theory of market efficiency while disregarding evidence that supports the theory. This bias can lead to cognitive distortions, thereby influencing an objective assessment of market efficiency.

Lastly, this approach may overlook the adaptability and evolutionary nature of the market. The market is constantly changing and evolving, with new trading strategies and behavioral patterns emerging that can affect market efficiency. However, the market also possesses self-correcting and adaptive capabilities, potentially making adjustments to these new factors. Therefore, by focusing only on a few aspects to challenge market efficiency, the dynamic nature of the market and its self-adjusting mechanisms may be overlooked. In summary, the Efficient Market Hypothesis has its validity and limitations. Properly understanding its strengths and weaknesses can enable all market participants and managers to engage more effectively in construction and optimization.

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