International Business & Economics Studies
ISSN 2640-9852 (Print) ISSN 2640-9860 (Online)
Vol. 6, No. 5, 2024
www.scholink.org/ojs/index.php/ibes

Original Paper

The Market Efficiency Debate: Developments of Financial Market Theories

Gavin Datta[1]

[1] Acton-Boxborough Regional High School, Acton, MA 01720 USA

Received: January 9, 2023 Accepted: February 16, 2023 Online Published: October 15, 2024

doi:10.22158/ibes.v6n5p146 URL: http://dx.doi.org/10.22158/ibes.v6n5p146

Abstract

A united hypothesis to explain the price movement of financial assets has been a significant research goal over the past few decades. This paper reviews the existing literature on both Efficient Markets and Behavioral Finance, concluding with more contemporary literature that attempts to combine the two theories. It summarizes the EMH and Behavioral Finance concepts, the debate between them, and the evidence supporting both. By recognizing the vast swaths of evidence in support of both hypotheses, one can conclude that the questions surrounding the efficiency or inefficiency of markets remain unanswered. Instead, the evidence supporting both hypotheses suggests the necessity of a compromise to rationalize these results instead of relying on one hypothesis or another. The compromise between both hypotheses, in turn, makes the debate between efficiency and inefficiency almost moot. Researchers must account for human misbehavior and rational expectations on a spectrum when formulating new market hypotheses, remaining open to changes in market theory as new variables continue to be discovered.

Keywords

Efficient Markets, Behavioral Finance, Adaptive Market Hypothesis

Background

Financial markets come with a long history of attempts at explaining the price movements of assets. The most influential of these theories is the Efficient Market Hypothesis. If one assumes that all market participants act rationally based on the available information, it would be easy to explain all price actions. However, the recurrence of market bubbles, for example, appears to be contrary to the EMH and bears explanation. Behavioral finance directly and increasingly challenges the essential tenets of the EMH by claiming that humans often act non-rationally when making economic and financial decisions. It will remain to be seen whether markets are more or less efficient than non-rational.

Literature Review

The introduction of the EMH into the academic limelight by Fama (1970) further supports its status as the dominant market hypothesis during his time. His criteria of semi-strong efficiency stated that the price established by the market represented all public information, whereas weak efficiency only considered past price history. This contrasts with the strong interpretation of the EMH, where all public and private information is included in an asset's price. Through data-driven support of the weak, semi-strong, and strong efficiency interpretations, the EMH developed greater flexibility to adapt to any "anomalies" discovered within the market. The approach by Fama to explain the EMH relied heavily on mathematical analysis.

However, the mathematical approach for proof of the EMH fails to support a fundamental tenet, the Expected Utility Theory. The expected utility theory postulates that rational market actors will always maximize utility. Kahneman and Tversky (1979) explored the idea of human thought processes contrary to the belief of the expected utility theory. Through a survey-style study, they discovered that humans tend to value losses more than they value gains, a behavior named Prospect Theory. Thus, people tend to be more risk-seeking when faced with greater potential losses and more risk-averse when faced with greater potential gains. This research underlined a significant issue with the EMH, as one of its core tenets seemed incorrect. Humans did seem to have consistent irrational biases.

These irrational behaviors were also not limited to just Prospect Theory, as the entire idea of rational behavior by market actors came under question by behavioral scientists. Shiller (1999) explored other recently discovered behavioral tendencies and how they could impact the markets. For example, the Regret Theory states that some market actors don't want to sell stocks that have lost value to finalize their losses but will sell stocks that are higher in price so as not to regret not realizing the gains. Finally, the most important and directly contradictory theory to RET is overconfidence and over/underreaction to information. The theory states that people tend to be overconfident in their interpretation of information, thus over or underreacting to information presented in the market. This contradicts the RET, as market participants are expected to act in the best possible manner and react to the best information. So, to claim that market participants could under or overreact would directly contradict the EMH. Nevertheless, Shiller remained somewhat skeptical of the impacts of behavioral finance as a leading theory for market function, as he stresses the importance of proving the widespread impact of these behavioral phenomena.

The main question proposed by Shleifer (2000) leads the discussion surrounding the importance of behavioral psychology in understanding markets. The challenge of applying behavioral psychology to financial markets is that individuals express many different behaviors. Furthermore, it was always assumed that people who made irrational decisions could be defined as "noise traders," and it was thought that noise traders were arbitraged away. Understanding whether or not the misbehaviors were correlated is essential in discovering if there was a potential for market-wide mispricing.

Fama (1998) still finds fault with the methodology of studies that try to attribute pricing anomalies to widespread misbehavior. Instead, Fama found that markets tended to revert after a period of three to five years. Thus, most anomalous pricing was due to chance instead of market-wide investor irrationality. Through his statistical analysis of markets, Fama concluded that the methodology used by those attempting to prove irrationality in markets needed to be corrected. Therefore, the notion of market efficiency is still valid.

Nevertheless, with increasing pricing anomalies being observed, researchers were required to figure out the cause. Shefrin (2001) found that investors favored companies with lower book-to-market equity ratios than higher book-to-market equity ratios, even though higher book-to-market equity ratios had higher historical returns. This showed non-rational behavior committed by large portions of investors. However, those supporting the EMH, such as Fama (1993), explained that book-to-market equity was another risk factor to be added to CAPM, explaining the excess returns gained by companies with high book-to-market equity. La Porta (1997) explains that the explanation of the EMH, claiming book-to-market equity is another risk factor, and the explanation of inefficient market advocates may be correct. There is likely some level of preference surrounding risk aversion or preference responsible for the existence of value and growth stocks. It seems that preference does impact the price of stocks, but whether the preference is efficient remains unsolved.

With a more modern acceptance of behavioral finance, Thaler (2005) writes about the importance of understanding how non-rational human behavior impacts the market. He acknowledges the potential of arbitrageurs to correct for mispriced assets but still believes that there could be a widespread error due to common behaviors by market participants. More modern researchers concur with this analysis but interpret the differences between an efficient and inefficient market more flexibly.

Farboodi (2021) found that assets have become more informative as they become larger, whereas smaller cap stocks tend to be less informative. The extent to which assets are informative can indicate efficiency and potentially show that there are degrees of efficiency in the market, even outside Fama's still strict weak, semi-strong, and strong efficiency categories. Cajueiro (2004) also found that markets become more efficient as they develop. It is claimed that deviations from efficiency are due to underdeveloped market status. With the relationship between informativeness and efficiency, developed markets likely see greater efficiency due to higher information transmission and dispersion rates.

Another angle taken to approach the hybrid model of efficiency and inefficiency is in Lo's (2005) introduction of the Adaptive Market Hypothesis. It gives way to both behavioral finance and the EMH, as it marries the two ideas as not mutually exclusive. The theory underlies that people tend to act rationally but can become irrational due to significant volatility in the market. He believes that overconfidence and overreaction are due to factors such as natural selection. Thus, these factors would naturally occur during times of volatility in response to seemingly unexplained price movement. He also adds that people learn from their mistakes, meaning if they try something and it works, they will likely do it again. The AMH argues that investors tend to be rational most of the time but naturally

make mistakes, which influences future investment decisions depending on the result of that error. If a decision leads to good results, even if it is irrational and considered a mistake, more of the market would mimic it. Which, in turn, could lead to mass market misbehavior. However, if the non-rational decision led to bad investments, the market would move more towards efficiency. Thus, the AMH helps explain why markets can act rationally and create bubbles simultaneously.

Finally, Chu (2019) tested the AMH in high-frequency cryptocurrency markets. Even though there is no established model for testing the AMH, he found periods of efficiency and inefficiency in the market using preexisting methodology to test for such factors. Furthermore, when the market swung from efficiency to inefficiency, it correlated with market volatility, supporting the AMH.

Analysis

The beginnings of the EMH and further expansion by Fama (1970) didn't initially spell inflexibility by researchers. Evolving from the Random Walk Hypothesis, where it was believed that markets moved randomly and unpredictably, the EMH furthered the ability of investors to understand the root cause of asset prices. More importantly, it gave researchers a practical and straightforward way of projecting market activity and explaining price movements. This, however, shouldn't have been the end of the market hypothesis debates.

When analyzing the behaviors discussed by Kahneman (1979) and Shiller (1999), the evidence is clear that humans have widespread non-rational behavior. Prospect Theory establishes widespread correlated deviance from rational expectations. Furthermore, Regret Theory, Overconfidence, and Over/Underreaction are examples of correlated non-rational behaviors humans express. The studies done in these papers partially answer Shleifer’s question about whether humans' non-rational behavior in the market is correlated. Nevertheless, it doesn’t fully answer the question about the extent to which non-rational behaviors impact the market.

Even with solid evidence in support of widespread misbehavior, Fama (1998) is mostly successful in defending the EMH by showing how it is still possible that the deviations in the market could be due to chance. This provides a dichotomy of two strongly supported market dynamics hypotheses with no clear solution.

With such a vast disagreement on the nature of markets and strong support for both arguments, the best way to solve the discrepancy between the two theories is to stop viewing them as mutually exclusive. Farboodi (2020) and Cajueiro (2004) both evaluated market efficiency on a spectrum, showing how the market can swing through “levels of efficiency.” This idea becomes fully explored through Lo’s (2005) AMH. Combining the idea of the EMH on a spectrum with the concepts expressed in behavioral finance creates the perfect compromise between two contrasting ideas.

The evidence supporting both the EMH and behavioral finance concepts shows the necessity for a compromised hypothesis between the two. The existence of a compromise is likely to be the only potential solution, as the existence of pricing anomalies and empirical evidence in support of

widespread correlated misbehavior support the concepts of behavioral finance. However, the mathematical support of market efficiency provides strong evidence of efficient markets.

While Lo's AMH might not be the final answer for determining how financial markets work, researchers should be able to somewhat resolve the debate between efficiency and behavioral finance. It isn't a question of either or but should instead be treated as a spectrum.

Conclusion

Behavioral finance has revolutionized the way we think about the market. While the issue of efficiency versus inefficiency in the market hasn't fully been resolved and likely never will be, accepting that a compromise is the most logical way forward is necessary to advance our understanding of financial markets. Researchers may never discover a perfect hypothesis to explain financial markets, but as new variables explaining market price movements continue to be uncovered, researchers should be wary of treating market hypotheses as orthodoxy.

Suggestions for Future Research

Defining how a compromise between behavioral finance and the EMH would exist is essential. The AMH provides a potential compromise but lacks a mathematical model to test the hypothesis. Researchers must develop a testable market hypothesis when creating a hybrid hypothesis. Furthermore, exploring the applications of other fields of science to formulating a market hypothesis, as seen through the AMH, could prove valuable in understanding markets. Future research must consider new formulations of behavioral science, efficient markets, and alternative scientific concepts when hypothesizing new market hypotheses.

References

Cajueiro, D. O., & Tabak, B. M. (2004). The Hurst exponent over time: testing the assertion that emerging markets are becoming more efficient. *Physica A: Statistical Mechanics and Its Applications*, *336*(3), 521-537. https://doi.org/10.1016/j.physa.2003.12.031

Chu, J., Zhang, Y., & Chan, S. (2019). The adaptive market hypothesis in the high frequency cryptocurrency market. *International Review of Financial Analysis*, *64*, 221-231. https://doi.org/10.1016/j.irfa.2019.05.008

Fama, E. F. (1970). Efficient Capital Markets: a Review of Theory and Empirical Work. *The Journal of Finance*, *25*(2), 383-417. https://doi.org/10.2307/2325486

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, *49*(3), 283-306. https://doi.org/10.1016/s0304-405x(98)00026-9

Fama, E. F., & French, K. R. (1993). Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics*, *33*(1), 3-56.

Farboodi, M., Matray, A., Veldkamp, L., & Venkateswaran, V. (2021). Where Has All the Data Gone? *The Review of Financial Studies*, *35*(7), 3101-3138. https://doi.org/10.1093/rfs/hhab110

Kahneman, D., & Tversky, A. (1979). Prospect Theory: an Analysis of Decision under Risk. *Econometrica*, *47*(2), 263-292. https://doi.org/10.2307/1914185

Lo, A. W. (2005). Reconciling Efficient Markets with Behavioral Finance: The Adaptive Markets Hypothesis. *Journal of Investment Consulting*, *7*(2), 21-24.

Porta, R. L., Lakonishok, J., Shleifer, A., & Vishny, R. (1997). Good News for Value Stocks: Further Evidence on Market Efficiency. *The Journal of Finance*, *52*(2), 859. https://doi.org/10.2307/2329502

Shefrin, H. (2001). Do Investors Expect Higher Returns From Safer Stocks Than From Riskier Stocks? *Journal of Psychology and Financial Markets*, *2*(4), 176-181. https://doi.org/10.1207/s15327760jpfm0204_1

Shleifer, A. (2000). *Inefficient Markets: An Introduction to Behavioral Finance*. Oxford Univ. Press.

Shiller, R. J. (1999). Human behavior and the efficiency of the financial system. *Handbook of Macroeconomics*, *1*(C), 1305-1340. https://doi.org/10.1016/s1574-0048(99)10033-8

Thaler, R. H. (1999). The End of Behavioral Finance. *Financial Analysts Journal*, *55*(6), 12-17. Retrieved from http://www.jstor.org/stable/4480205