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## Is Market Really Efficient?

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### Abstract

Market efficiency is the degree to which stock prices reflect all available and relevant information. The theory of market efficiency says that the stock market reacts very quickly to the new information and represents the sum of the information available and choices made by traders and investors. There is a well known and well accepted phenomena, Efficient Market Hypothesis, which states that market prices incorporate all information rationally and instantly but is this really so? Do markets really behave rationally or are driven by fear and greed? The present paper is an attempt to reconcile market efficiency with actual behaviour of investors by taking recent research in the cognitive neuroscience that has been transforming and revitalizing the interaction of psychology and economics, as the base. The present paper is a theoretical work based on the literature reviewed on the efficient market hypothesis. There are some other more promising alternatives to Efficient Market Hypothesis like Behavioral Psychology Approaches to stock market trading. The present paper would try to highlight some of these alternatives and justify whether the Efficient Market Hypothesis hold really true and whether the market is really efficient.

**Keywords:** Stock Market, Market Efficiency, Efficient Market Hypothesis, Information, Investors, Behaviour.

### Introduction

One of the most enduring ideas from this intellectual history is the Efficient Markets Hypothesis (EMH), a deceptively simple notion that has become a lightning rod in the storm of controversy between its disciples and the proponents of the emerging field of behavioral economics and finance. In this article, I review the current state of the controversy surrounding the EMH and propose a new perspective that reconciles the two opposing schools of thought in a natural and intellectually satisfying manner.<sup>1</sup> The proposed reconciliation is based on an evolutionary approach to economic interactions, as well as some recent research in the cognitive neurosciences that has been transforming and revitalizing the intersection of psychology and economics. Although some of these ideas have not yet been fully articulated within a rigorous quantitative framework, long-time students of the EMH and investment professionals will no doubt recognize immediately the possibilities generated by this new perspective.

### The Classical Efficient Markets Hypothesis

There is an old joke, widely told among economists, about an economist strolling down the street with a companion. They come upon a \$100 bill lying on the ground, and as the companion reaches down to pick it up, the economist says, "Don't bother if it were a genuine \$100 bill, someone would have already picked it up". This humorous example of economic logic gone awry is a fairly accurate rendition of the EMH, one of the most hotly contested propositions in all the social sciences. It is disarmingly simple to state, has far-reaching consequences for academic theories and business practice, and yet is surprisingly resilient to empirical proof or refutation. Even after several decades of research and literally thousands of studies, many published in this journal, economists have not yet reached a consensus about whether markets particularly financial markets are, in fact, efficient. The origins of the EMH can be traced back to Paul Samuelson (1965), whose contribution is neatly summarized by the title of his article: "Proof that Properly Anticipated Prices Fluctuate Randomly". In an informational efficient market, price changes must be unforecastable if they are properly anticipated, i.e., if they fully incorporate the information and expectations of all marked participants. A decade after Samuelson's (1965) landmark paper, many others extended his framework to allow for risk-averse investors, yielding a "neoclassical" version of the EMH where price changes, properly weighted by aggregate marginal utilities, must be unforecastable. In markets where, according to Lucas (1978), all investors have "rational expectations", prices do fully react all available information and marginal-utility-weighted prices follow martingales. The EMH has been extended in many other directions, including the incorporation of non-traded assets such as human capital, state-dependent references, heterogeneous investors, asymmetric information, and transactions costs.

### The Sociology of Market Efficiency

To see how reconciliation between the EMH and its behavioral critics might come about, it is useful to digress briefly and consider the potential origins of this controversy. Although there are no doubt many factors contributing to this debate, one of the most compelling explanations involves key differences in the cultural and sociological aspects of economics and psychology, which are surprisingly deep

despite the fact that both fields are concerned with human behavior. Consider, first, some of the defining characteristics of psychology (albeit from the perspective of an economist):

- Psychology is based primarily on observation and experimentation.
- Field experiments are common.
- Empirical analysis leads to new theories.
- There are multiple theories of behavior.
- Mutual consistency among theories is not critical.

Contrast these with the comparable characteristics of economics:

- Economics is based primarily on theory and abstraction.
- Field experiments are not common.
- Theories lead to empirical analysis.
- There are few theories of behavior.
- Mutual consistency is highly prized.

Although there are, of course, exceptions to these generalizations, they do capture much of the spirit of the two disciplines. For example, while psychologists certainly do propose abstract theories of human behavior from time to time, the vast majority of academic psychologists conduct experiments. Although experimental economics has made important inroads into the mainstream of economics and finance, the top journals still publish only a small fraction of experimental papers, the majority consisting of more traditional theoretical and empirical studies. Despite the fact that new theories of economic behavior have been proposed from time to time, most graduate programs in economics and finance teach only one such theory: expected utility theory and rational expectations, and its corresponding extensions, e.g., portfolio optimization, the Capital Asset Pricing Model, and dynamic general equilibrium asset-pricing models. And it is only recently that departures from this theory are not rejected out of hand; less than a decade ago, manuscripts containing models of financial markets with arbitrage opportunities were routinely rejected from the top economics and finance journals, in some cases without even being sent out to referees for review.

### **Review of Literature**

The proposition that securities markets are efficient forms the basis for most research in financial economics. A voluminous literature has developed supporting this hypothesis. Indeed, apparent anomalies such as the discounts on closed end mutual funds and the success of trading rules based on earnings announcements are treated as indications of the failures of models specifying equilibrium returns, rather than as evidence against the hypothesis of market efficiency. Despite the widespread allegiance to the notion of market efficiency a number of authors have suggested that certain asset prices are not rationally related to economic realities. Modigliani and Cohn (1979) suggest that the stock market is very substantially undervalued because of inflation illusion. A similar claim regarding bond prices is put forward in Summers (1982). Brainard, Shoven and Weiss (1980) find that the currently low level of the stock market cannot be rationally related to economic realities. Shiller (1979, 81a) concludes that both bond and stock prices are far more volatile than can be justified on the basis of real economic events. Arrow (1982) has suggested that psychological models of "irrational decision making" of the type suggested by Tversky and Kahneman (1981) can help to explain behavior in speculative markets. Lo (2004) proposed a new framework that reconciles market efficiency with behavioral alternatives by applying the principles of evolution, competition, adaptation and natural reflection to financial interactions. Summers (1986) examined the power of statistical tests commonly used to examine the efficiency of speculation markets and suggested that speculation is unlikely to insure valuations, since similar problems of identification plague both financial economics and would be speculators.

### **Evidence against the Efficient Markets Hypothesis**

Although most empirical evidence supports the weak-form and semi-strong forms of the EMH, they have not received uniform acceptance. Many investment professionals still meet the EMH with a great deal of skepticism. For example, legendary portfolio manager Michael Price does not leave anybody guessing which side he is on: "...markets are not perfectly efficient. The academics are all wrong. 100% wrong. It's black and white." (taken from *Investment Gurus* by Peter Tanous) We will discuss some of the recent evidence against efficient markets. The efficient markets hypothesis implies that investors react quickly and in an unbiased manner to new information. In two widely publicized studies, DeBondt and Thaler present contradictory evidence.<sup>17</sup> They find that stocks with low long-term past returns tend to have higher future returns and vice versa - stocks with high long-term past returns tend to have lower future returns (long-term reversals). These findings received significant publicity in the popular press, which ran numerous headlines touting the benefits of these so-called contrarian strategies.<sup>18</sup> The results appear to be inconsistent with the EMH. One of the most enduring anomalies documented in the finance literature is the empirical observation that stock prices appear to respond to earnings for about a year after they are announced. Prices of companies experiencing positive earnings surprises tend to drift upward, while prices of stocks experiencing negative earnings surprises tend to drift downward. But this anomaly is yet to be explained.

## Conclusion

Although no theory is perfect, the overwhelming majority of empirical evidence supports the efficient market hypothesis. The vast majority of students of the market agree that the markets are highly efficient. The opponents of the efficient markets hypothesis point to some recent evidence suggesting that there is under- and over-reaction in security markets. However, it's important to note that these studies are controversial and generally have not survived the test of time. Ultimately, the efficient markets hypothesis continues to be the best description of price movements in securities markets.

The efficient market hypothesis assumes that all investors perceive all available information in precisely the same manner but in actual practice, they don't. The numerous methods for analyzing and valuing stocks pose some problems for the validity of the EMH. One argument against the EMH points out that, since investors value stocks differently, it is impossible to ascertain what a stock should be worth under an efficient market. Under the efficient market hypothesis, no single investor is ever able to attain greater profitability than another with the same amount of invested funds: their equal possession of information means they can only achieve identical returns. According to the EMH, if one investor is profitable, it means the entire universe of investors is profitable. In reality, this is not necessarily the case. Under the efficient market hypothesis, no investor should ever be able to beat the market, or the average annual returns that all investors and funds are able to achieve using their best efforts. This would naturally imply, as many market experts often maintain, that the absolute best investment strategy is simply to place all of one's investment funds into an index fund, which would increase or decrease according to the overall level of corporate profitability or losses. There are, however, many examples of investors who have consistently beat the market - you need look no further than Warren Buffett to find an example of someone who's managed to beat the averages year after year. All these facts gave birth to the question "Is market really efficient?"

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