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Market Predictions, FAANG, and the Efficient Market Hypothesis (EMH)

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Abstract

This study is an exploration of the efficient market hypothesis (EMH), a widely used conventional framework of predictability in finance that conveys the idea of "asset prices, stock prices in particular, that fully reflect information" [3]. The EMH is a key concept in the field of finance that assumes reflection of either weak, semi-strong, or strong forms of assumptions that are summarized as public knowledge seen in stock prices. Possibilities for analysis can be the five popular tech savvy FAANG companies ((acronym for the companies Facebook (now Meta Platforms), Apple, Amazon.com, Netflix, and Google (now Alphabet)) that trade heavily within the framework of the EMH. FAANG are the "most widely held stocks" [11]. These large firms have high volatility, are innovative, and are assumed to reflect all public information. FAANG often displays non-random or herd behaviour where anomalies occur. This demonstrates that the EMH may not predict stock movements accurately or efficiently all the time. Yet the EMH is still an important component of understanding large firms with anomalies that reflect no perfect market efficiency.

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Introduction to the Efficient Market Hypothesis (EMH)

An exploration of the efficient market hypothesis (EMH) deals with the "predictability of prices in financial markets" and investor behaviour considering whether or not prices signal "incorrect" information to become inefficient. The EMH is just a "broad statement that information determines prices" where the reward requires risks [3]. If modern economies are to become efficient then the skill of how to predict prices are going to go up or down according to pricing data (in general) that can help investors "beat the market". Therefore, the EMH is a framework that is often seen as "simple and appealing" within the scope of being a conventional theory of finance that may lack ordinary decision-making, clarity, and "diversification in asset pricing theory" and

where there are high risks. As the EMH expresses rational investor behaviour where market "bubbles" exist otherwise, known as periods of recession and sometimes a direct influence of psychological aspects not apparent in the EMH [14]. The EMH may not predict stock movements accurately or efficiently because alternative data reflects anomalies such as herd behaviour, and this often occurs in large firms like the tech savvy FAANG ((acronym for the companies Facebook (now Meta Platforms), Apple, Amazon.com, Netflix, and Google (now Alphabet)), but all too often with great success [11]. Studies can use Netflix for example, a FAANG company, to argue alternative methods like machine learning (ML) (a branch of artificial intelligence (AI)) too analyse high social influence that points to anomalies in behavioural finance [19].

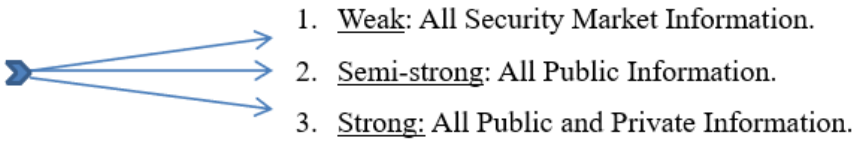
The common definition of the EMH then can be that it is a conventional belief of predictability in financial markets used as a framework for efficient behaviour for market growth, to convey the idea of "asset prices, stock prices in particular, that fully reflect "information" [3].

The EMH rests on "three crucial arguments or assumptions" [13]:

- Investors are assumed to be rational and value securities on the basis of maximum expected utility.
- If investors are not rational, their trades are assumed to be random, offsetting any effect on prices.
- Rational arbitragers are assumed to eliminate any influence irrational investors have on market/security prices.

The EMH is also based on a random walk model where information in the market is unpredictable and price changes are random. This random walk process tends to hopefully forecast that the "average return is associated with above average risk" [13]. Here, information is a prediction regarding "historical and present data" where investors have difficulty forecasting future profit "above average risk". This argues that all markets are efficient to a certain extent, but that all it takes is knowledge to make continuous profit. "More knowledgeable investors can outperform less knowledgeable ones" [7]. Knowledge does not place the random walk process into a realm of behavioural finance. Recent empirical evidence points to "behavioural data" that exists as knowledge in the world of finance where anomalies make assumptions less true. Professional investors (or traders) today wish more often than not to seek companies with high volatility and growth like the tech savvy FAANG companies because of high performance rather than content of "small capitalization stocks that are considered to be less efficient than markets in large ones". Forms of market efficiency (or categories) that help analyse price movements of stocks are: weak, semi-strong, or strong forms of the EMH, where there is no monopoly on information [13].

Figure 1: Forms of Market Efficiency



See [13]. The efficient market hypothesis: A critical review of the literature. IUP Journal of Financial Risk Management, 12(4), 48-63.

The most common form of the EMH is often considered to be the semi-strong form because there are unexplainable "behavioural data" that have "anomalies" to use for predictability patterns in the present [3]. To acquire an innovative mindset, one can utilize behavioural data like cultural, political, economic, and social differences with diverse populations to make sense of "puzzling aspects of stock market data" rather than mere rational "stock market return data".

Large firms such as FAANG have high volatility, are innovative, and are assumed to reflect all public information with semi-strong tendencies where weak, semi-strong, and strong forms of the EMH interpret knowledge of prices. But FAANG (for example Netflix) often develop into non-random or herd behaviour where anomalies occur. Different stimuli or new information makes it redeemable to consider alternative models [8]. This reiterates that irrationality can take the form of "herd instinct" (do what other people do) and emotionally driven responses or even stressful circumstances can take form [14]. Herd mentality is when customers flock to where others are consuming. "Netflix capitalizes on herd mentality by prominently displaying its Top 10 list" [6].

By highlighting what others are watching, it encourages new viewers to follow the trend, increasing engagement with popular shows". These irrational variables to consider can place the newer behavioural finance theory on the map for traditional investors to wrestle with.

It may seem more rational to pick companies with large capitalization. Current debate is that past knowledge generally has "no value" in the prediction of "future stock prices" [3]. The EMH is subject to "empirical validation" that can invite a more innovative mindset, one that can utilize cultural, political, economic, and social differences with diverse populations. Therefore, the following research question is provided:

RQ 1: Is there empirical evidence that supports or refutes that the efficient market hypothesis (EMH) reflects perfect market efficiency?

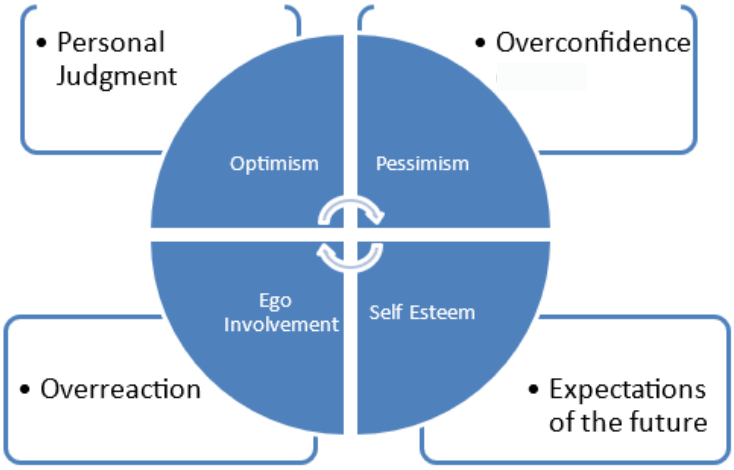
Literature Review

The efficient market hypothesis (EMH) has been a sound concept in the field of modern finance for decades. The concept of market efficiency or the market efficiency theory was founded by G. Gibson in 1889 [4]. Gibson's work was based on "correct guesses" and for the London, Paris and New York stock exchanges. The speculation theory was later coined by French mathematician L. Bachelier in 1900 who estimated that the expected return of any investment was zero. By the 20th century, the randomness of stock prices was demonstrated and by 1905, K. Pearson used the term the "random walk" for the first time. There was no empirical evidence that professional investors could "predict future prices and earn excess profit" as a result. There was more research that suggested a random walk. J. M. Keynes in 1923 argued that the stock market was merely "wild instincts". In fact, investing by that time was deduced to: higher risks taken = an investor's gain. The ability to predict the future then was not a factor, but increased risk factors was a strategy. Because efficient market prices in the system are said to "reflect fundamental information about companies" scholars argue that all information fully reflects an efficient market. The EMH as a modern financial theory works with the assumption that "all relevant information" exists in the current stock prices.

Information did not always have a relevant understanding of market inefficiency. By the 21st century psychology and sociology was a factor, and this slowly gained much interest as a behavioural finance model [13].

Proceeding the 1980's, there was a shift from the "efficient market model" or "tradition market theory" to an understanding of a "psychological theory" that can account for anomalies that exhibit irrational or illogical behaviours in the market. Anomalies can be "cognitive biases" like personal judgment or "calendar effects" or short-term momentum. Because of market inefficiencies, it is argued by supporters of behavioural finance that a combination of both conventional economic and financial theory with behavioural psychological theories (and cognitive biases) should be incorporated to resolve matters for market efficiency. "Mixed results" often work as alternative empirical evidence.

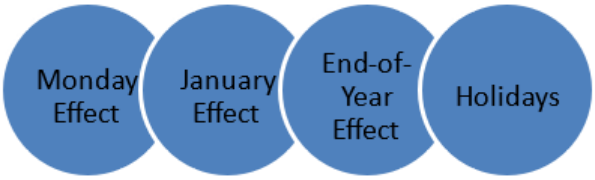
Figure 2: Cognitive Biases



See [13]. The efficient market hypothesis: A critical review of the literature. IUP Journal of Financial Risk Management, 12(4), 48-63.

Empirical evidence and formal research tends to support cognitive biases and calendar effects attributes to market inefficiency, and these factors need to be incorporated in stock prices (p. 48). Calendar effects have an effect on stock returns that point to the calendar that attribute reasoning for "specific anomalies" observed. However, this type of anomaly must be tested as being significant. Combining all information, from all calendar effects from many different firms or even within other major countries can be a way to test results [9].

Figure 3: Calendar Effects



See [9]. Testing the significance of calendar effects (No. 200303). Working paper.

Models are often used to foresee factors, for example the popular capital asset pricing model (CAPM) which looks at "statistical returns" to measure risks and this is assumed a good test for the accuracy [3]. The CAPM relies on equilibrium in that "there is no tendency for prices to deviate from the current prices because investors are satisfied with their current portfolios given their wealth constraints".

Historical Development of the Hypothesis

Historical finance displays a lot of faith in the efficient market hypothesis (EMH) but historical finance later questions market efficient behaviour. Studying financial data has benefits because you see both sides of the coin, but also limitations to the EMH. Haggai 1:6 (ESV, 2001) relates working for wages may lead you to only put them in a situation with holes while Proverbs 20:14 (ESV, 2001) focuses on the dishonesty of buyers who haggle down prices only to misuse the market of the time. The efficient market hypothesis may not be so cut and dry, but there are several aspects of financial outcomes that the everyday situations of financial woes for economists must avoid. Data can sometimes be very complex and maybe even be less effective [1].

Economists are not always in strict agreement over which holes are relevant, and they argue that classic models are rather linear in nature but the higher the risk the better the reward. Perhaps economists are looking for a model that is stable and linear in nature because of the complexity of data that is non-linear projects behavioural patterns. Psychology and sociology is an anomaly that tends to disrupt "classic models" to become something like a "hybrid model" that will be able to input data within a "dynamic system" like the stock market.

This illustrates that academia by the end of the 20th century held the EMH the most reasonable way to obtain the best stock market information [3]. "Empirical validation" was that prices match up accurately while at the same time "summarize all information" and this will provide data regarding performance. Research has shown, however, that alternative frameworks like the adaptive market hypothesis (AMH) (as one example) can give opportunity to observe inefficiencies apparent to the EMH. This argues however that the EMH is merely "simple and appealing" with assumption and rationality [14]. Yet when recession or resistance hits the market it can experience anomalies and be placed into "bubbles" of psychological bias denial. Other models therefore may be worthy to explore.

Key Studies and Debates

Key studies and debates depict no accurate pictures of market efficiency. One can discuss how market efficiency appears to be broken down into 3 levels: weak, semi-strong, and strong forms. See Figure 1. Forms of Market Efficiency [4]. Here, as mentioned in the introduction, information and data are interpreted to relate to profit. Because the EMH argues that markets are efficient but behavioural finance argues that it isn't, there are contradictions that proponents of the EMH need to be address. One can discuss that these two philosophies are just opposite sides of the coin and that the adaptive market hypothesis (AMH) helps examine efficiencies for further introspection. Proverbs 14:23 (ESV, 2001) provides that labour develops into profit. Good reasons why peaks happen, especially anomalies, can account for labour causes and effects (which is profit) not a random happening, or a reason for it rather than irrational or illogical reasons. Research generates that determining market efficiency into the three aspects provide loose reasons to help investors develop better stock prices: weak, semi-strong, and strong [16].

Accuracy

To describe all three forms of market efficiency accurately can suggest that all forms can suggest inefficiencies to a point. The weak aspect suggests that "the current stock prices reflect all information related to the stock price changes in the past" and it is nearly impossible to make excess profit; but it can increase risk. For the semi-strong aspect, "current stock prices reflect not only information about historical prices but also all current publicly available information, e. g., announcements of acquisitions, dividend pay-outs, changes in accounting policy, etc." to yield an excess return. The strong aspect depicts that "efficient markets, current stock prices reflect all possible information which does not necessarily have to be public". These three aspects offer "absolute or partial rationality of market" risk factors where the strong aspect exhibits more "market inefficiencies".

Behavioural Finance

Conventional thinking sees that the stock market predicts. Efficient markets follow a random walk process where "historical data" can be retrieved for predictable functionality; and most economists agree that for "prediction surveys" to determine efficiency in different markets brews evidence for financial behaviour as an alternative to the efficient market hypothesis (EMH) [1]. Economists realized that by the 1980"s "behavioural effects on market movements" were factors in profitability, and there were effects that when observed it unleashed "excess unexplained volatility" that was not due to rationality. Overconfidence, one bias for example, can turn risk into a disaster. The adaptive market hypothesis (AMH) became a theory that works with movements in the market, where "a combination of complicated psychological factors" and rational means found that over periods of time, the market adapts to new circumstances.

In the real world, how accurate is the EMH? That is a good question to pose. Research suggests that there are weak and strong points, but also that it doesn't provide extraordinary means of understanding anomalies. Behavioural finance is information that works for economists to find reasons behind why efficient markets have anomalies [14]. It is interesting to note that there are some complex prediction models

formulated by computers today which are machine learning tools that uses powerful algorithms. Algorithmic Trading (AT) is a new advanced trading system that expects to have efficient market quality [5]. The EMH is a general classification of stock market prediction that rises or falls "to forecast the subsequent day's closing price movement relative to the present day's closing price" [17]. The algorithms in use are called linear regression relationships "between an independent variable and a dependent variable to forecast the result of upcoming events". The machine learns the algorithm and there are two factors present in the data "that predicts continuous or numeric variable by simulating a mathematical connection between the variables". Linear regression models are recorded as performing well [20]. In relation to FAANG, companies who incorporate linear regression models are known for their innovation and continuous growth as "global tech companies" that produce tech stocks with "major market capitalizations" [11]. The linear regression model has tested algorithms with FAANG; this has been done with Netflix stock prices and with alternative dataset that tends to predict "closing end value" [21].

There is another current alternative method, the Artificial Neural Networks (ANN) which is a computing model that strives to simulate biological processes of thinking to solve variables and patterns as a "statistical method" for humans [1]. Scholars believe that these combinations can solve problems with the EMH. The EMH is "classical finance" that needs to look at anomalies [15].

The EMH is the best way to look for optimal risky stock ventures where finance professionals assume that rational results are efficient. The debate whether or not it is merely "passive investing" continues to grow with scholarly fever.

Analysis

The reasoning behind efficient markets and whether they really are efficient depends on which theory you want to perceive markets as. A rational person will look at factors such as "price mechanism" and other measurements of presumption.The efficient market hypothesis (EMH) looks at the predictability of market behaviours; it looks at what is "commonly assumed" within the scope of "rationality" [3]. It's a utility function like prices, where "assumed conditions" imply efficiency with how to produce the right amount or to "buy and sell" that is the amount assumed to be efficient. Behavioural finance however examines the EMH in that it may not reflect efficient market behaviour, not entirely, because prices may not always "reflect value" or reasons for why efficiency depends on models in financial research. It can shed light on "unexplained stock market behaviour" rather than just the rationality of stock prices. It's worthy to note that behavioural finance can offer more tools for understanding market efficiency. Therefore, the behavioural finance theory may be a good alternative in the professional world.

Empirical Evidence

The considerable evidence that places into question the validity of the efficiency market hypothesis (EMH) points to behavioural finance, and the interaction against ongoing anomalies. These ongoing anomalies are bubbled within the rational spectrum widely discussed today in modern finance. One efficient risk for all investors can be described as "assets" with "a simple mean-variance characterization." Many investors are looking at "statistical return distributions" and one risk-free rate [3]. This appears to be the jest of the EMH in that it can be broad information where the prediction of future stock returns creates the idea of reward with risks. This means the EMH is essentially a market model but there are tests (or theories) that can provide other information like capital asset pricing model (CAPM) so modern finance is still at work; CAPM states that beta determines the risk of individual stock. Diversification is also an issue, because a "universal" financial language so to speak may return the risk. A global perspective may help produce understanding on risk factors in the overall stock market.

Evidential Value of the EMH

There has been a decline since the 1980's in the evidential value of the EMH. The only drawback to fully understand behavioural finance workings is that it "does not eliminate the usefulness of the EMH" – the EMH can still work, but relies on assumption rather than other clear evidential elements that can be misleading. The strategy of the EMH is a big part of modern finance, and it can be "applied to capital markets" [4]. Introspection into the random walk theory insinuates that nothing is predictable and that asset prices are random. This supposedly makes

the market efficient but unpredictable because past prices have no effect on future changes in stock prices [18].

Psychological factors can "account for the irrationality and illogicality in behaviours" even if predictable patterns prevail [13]. Personal judgments and other cognitive biases that happen are attributed to market inefficiency. The EMH is a good theory when the economy is working efficiently, and even when driven by "wild instincts" [4]. This does not mean stock prices should follow a random walk. It means that this strategy can be successful but you have to know risk factors.

No Perfect Efficient Market

The use of other models tends to provide evidence that there is no perfect efficient market. The science can become stronger, and new pioneering methods like the Artificial Neural Networks (ANN) offer interesting results; combinations may provide a better nuanced view that combines EMH with behavioural factors, while adaptive perspectives brings in the current trends and movements of the market, it can be advantageous to incorporate more adaptive methods. One can reiterate that the random walk process assumes that the results can be "arbitrary" without a high degree of certainty [3].

One can explain that a conventional theory like the EMH cannot show investors how ordinary people make decisions contrary to prediction [14]. But behavioural finance does help discover why efficient markets have anomalies. The use of other models like the AMH poses as a possible alternative to understanding myopic characteristics and loss aversion.

Methodology

This research is a content analysis paper and critique of the efficient market hypothesis (EMH). A content analysis is an "observational method" often used in business research to "systematically evaluate the symbolic content of all forms of recorded communications" [12]. The investigation provides an objective opportunity to use a conceptual method for the researcher to base understanding on many levels of information that is often a "laborious and lengthy process," especially with the demand for information on this topic. The basis of the content analysis is to look through the necessary data, mostly textual, in journals, books, online business articles, or online market and stock sites for current movement and trends, and within the scope of past and present knowledge; but by incorporating the most reliable information and samples of reliability available, searchable, and used for meaningful evidence [2].

Meaningful evidence here exists within past and present research, like past or current stock market flows and values, with anomalies. Anomalies are discussed within the realm of behavioural finance that often disagrees with the EMH. Because current academics often rethink the foundation of the EMH as a general "economic theory" understanding market prices through "psychological arguments" can raise doubt on assumptions [3].

Content that is less than informational or resourceful helps contrast content that can produce "verification" and "validation" or confirm "substantive correctness" and/or "relevance according to the requirements of the system" where validation procedure looks at content for the most reasonable report or conclusion [2].

Discussion

Evaluation of the efficient market hypothesis includes criticisms of the theory and potential alternative explanations for market behaviour. While other models can create clarification there is no perfect efficient market. New pioneering methods like the artificial neural networks (ANN) may offer interesting or profound insights; but combinations may provide a better nuanced view that mixes the EMH with behavioural factors. One can attest that the random walk process assumes results can be "arbitrary" without a high degree of certainty [3]. More, there are fair assumptions where value is accumulated because the "outcome cannot be known with certainty" (p. 10). Research depicts no degree of certainty for the best estimate of future value. Yet, the EMH is still under consideration in market finance and widely discussed because of adaptive processes where the "risk-weighted return is expected to be higher in inefficient markets" so compelling corporate executives still use the EMH as a comprehensive understanding of the market [4].

One can argue that to investigate psychological traits or irrational behaviours can offer a better understanding of stock price models [14].

Conclusion

The efficient market hypothesis (EMH) is a comprehensive understanding of market behaviour but needs alternative models to supplant for incoming irrational or illogical anomalies.

Some alternatives are the adaptive market hypothesis (AMH), Machine Learning (ML) (a branch of artificial intelligence (AI)), and/or the Artificial Neural Networks (ANN), a computing model. The literature review sifted through a great deal of key studies and arguments, to give a reasonable analysis of empirical evidence that supports the hypothesis in parts and refutes the hypothesis in other parts because anomalies will occur. A sound position is that the EMH provides a comprehensive understanding of market efficiency but implications for investors begs for alternative methods especially with today's big tech savvy companies (FAANG) who generate a lot of wealth.

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