Efficient or Inefficient Markets: A Behavioral Finance Perspective

About the author
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Abstract
Purpose: This paper aims to bring the major researches in the field of market efficiency. This paper also highlights the major anomalies which question the basic tenets of efficient market and move to behavioral factors in explaining these anomalies.

Design/methodology/approach: The paper is a review paper, evaluating all the major researches on efficient markets and behavioral finance.

Findings: The two schools are at odds with each other. Several cases of irrationality have been there which highlight the role of behavioral factors in explaining the stock market movements. But the role of arbitrageurs in driving the markets back to efficiency cannot be ignored altogether. Certain empirical issues in testing of market efficiency also lead to markets being categorized as inefficient.

Research Implications: Ideas in this paper have some important implications for the proponents of efficient markets as well as behavioral finance. The role of arbitrageurs has been highlighted.

Limitations: The debate on efficiency or inefficiency of markets is very much limited by the tests that are used in testing the efficiency. Development of such asset pricing models which may capture investor’s decision making biases can be a move further in this direction.

Keywords: Efficient markets, Anomalies, Behavioral finance.

Conference Tracks: Accounting and Finance
Efficient market theory claims that security prices reflect all information i.e: the current price of the stock reflects all relevant information (Fama, 1970). If a market is efficient then the best estimate of the true value of a security is its current market price. Any deviation from the true value would lead to mispricing and arbitrageurs would play their role driving the market prices instantaneously towards the true value of the security.

Eugene Fama, who is considered to be the father of this theory, divided market efficiency into three forms depending on the type of information that is available at a particular time. Tests of the market efficiency are essentially tests of whether the three general types of information – past prices, public information and inside information – can be used to make above average returns on investments. If the market is efficient, it is impossible to make above average returns regardless of the information available, unless abnormal risk is taken.

According to weak form of EMH, the current prices of stocks fully reflect all the information that is contained in the historical sequence of prices. Everyone has access to past prices, even though some people can get them more conveniently than others. Liquidity traders (traders who do not investigate before investing) may sell their stocks without considering their intrinsic value and may cause prices to fluctuate. Buying and selling activities of the information traders (they analyze properly before buying and selling) lead the market price to align with the intrinsic value. In this form of market efficiency traders may earn by the naive buy-and-hold strategy while some may incur loss, but the average buy and hold strategy cannot be beaten to earn abnormal returns. The semi strong form professes that the current prices of stocks not only reflect all informational content of historical prices, but also reflect all publicly available knowledge about the corporations being studied. Thus the effort by analysts and investors to acquire and analyze public information is not going to yield consistently superior returns. In contrast to the proponents of the semi-strong form of EMH, there are investors who think they can profit from a careful study of the publicly available data. These investors practise fundamental analysis and use the information in financial statements and other public sources to identify mispriced securities. The third form of efficiency is the strong form. This form states that current prices already reflect all public and private information. In this form of market efficiency any information that is available be it public or ‘inside’, cannot be used to earn consistently superior investment returns. It represents an extreme hypothesis which most observers do not expect to be literally true.

Early researches provide evidence in favor of markets being weak form efficient. Kendall (1953), Roberts (1959), Osborne (1959), Granger and Morgenstern (1963), Fama (1965, 1965a, 1970) all supported efficiency in it’s weak form. Despite evidence in support of weak form, there were instances of anomalous price behaviour, where certain series appeared to follow predictable pattern. DeBondt and Thaler (1985) testified whether there is reversal effect, in which losers turns winner and winners fade back over long horizon. Poterba and Summers (1988) and Fama and French (1988a and 1988b) discuss the linkage between short-horizon positive serial correlation in stock returns, accompanied by negative correlation over longer intervals. Poterba and Summers suggest that their findings are indicative of a market inefficiency. Jegadeesh and Lehman (1990) also gave evidence in favour of short term return reversals (contrarian strategies). Jegadeesh and Titman (1993) provided evidence in favour of return continuation i.e: momentum strategies. Barman and Samanta (2001) divided their

**Market anomalies**

As more and more researches tested EMH, some rather controversial evidence began to appear. An unexpected blow came in 1980 in the form of Grossman Stiglitz paradox; published in their article in 1980 “On the impossibility of informationally efficient markets” They argued that if all relevant information were reflected in market prices market agents would have no incentive to acquire the information on which prices are based. Also Shiller (1981) examined variation in stock prices and found that that the fluctuations were too large to be justified by the subsequent variation in dividend payments.

EMH became more controversial especially after the detection of anomalies in the capital markets. Anomalies are chance events that are not anticipated and offer investors a chance to earn abnormal profits. Some of the main anomalies are summarized below.

**A. The January effect:** Rozeff and Kinney (1976) were the first to document evidence in favour of january effect, also known as turn-of-the-year effect. Their results showed higher mean returns in january as compared to other months. Later studies of Keim (1983), Bhardwaj and Brooks (1992), Eleswarapu and Reinganum (1993), document that the effect persisted. Bhabra et al. (1999) documented a November effect, and also found that the january effect is stronger since 1986. Recently Booth and Keim (2000) have shown that turn-of-the-year anomaly is not reliably different from zero over the period 1982 to 1995.

**B. The weekend effect (or Monday effect):** French (1980) analysed returns of stocks for the period 1953-1977 and found that there is a tendency for returns to be negative on Mondays, whereas they are positive on other days of the week. He further said that “these negative returns are caused by the weekend effect and not by the general closed market effect”. A trading strategy which would be profitable in this case would be to buy stocks on Monday and sell them on Friday. Internationally Agarwal and Tandon (1994) found significant negative returns on Monday in nine countries and on Tuesday in eight countries and large and positive returns on Friday in 17 out of the 18 countries studied.

**C. Other seasonal effects:** Holiday and turn-of-the-month effect have been well documented across time and across countries. Lakonishok and Smidt (1988) showed that the U.S stock returns are significantly higher at the turn of the month, which is defined as the last and first three trading days of the month. Ariel (1987) also showed that returns tend to be higher on the last day of the month. Ariel(1990) and Cadsby and Ratner (1992), all provided evidence to show that returns are on average higher the day before a holiday as compared to other trading days. Gultekin and Gultekin (1983), Jaffe and Westerfield (1985) also identified seasonal patterns.

**D. Small firm effect:** Banz (1981) was the first one to document the small firm effect also known as the ‘size effect’. He showed that small firms outperform large stocks even after adjustment for systematic risk. Supporting evidence is provided by Reinganum (1981) who found that the risk adjusted annual return of small firms is greater than 20% as compared to high capitalization
firms. If the market is efficient, one would expect the prices of the low capitalization stocks to go up to a level where the risk adjusted returns to future investors would be normal. But this did not happen, and this anomaly could be used to earn abnormal profits.

E. P/E ratio effect: Sanjoy Basu (1977) showed that the stocks of companies with low P/E ratios earned a premium for investors during the period 1957-1971 which clearly contradicted EMH. Campbell and Shiller (1988b) showed that P/E ratios have reliable forecast power. Also Fama and French (1995) found that market and size factors in earnings help explain market and size factors in returns.

F. Value line enigma: The value-line organization divides the firm into five groups and ranks them according to their estimated performance based on publicly available information. Over a five year period starting from 1965, returns to investors correspond to the rankings given to firms. That is higher ranking firms earned higher returns. Several researchers (eg. Stickel, 1985) found positive risk-adjusted abnormal (above average) returns using value line rankings, to form trading strategies, thus challenging EMH.

G. Overreaction/ underreaction of stock prices: There is substantial evidence on both over and under reaction. DeBondt and Thaler (1985, 1987) reported positive (negative) abnormal stock returns for portfolios that previously generated inferior (superior) returns and earnings performance supporting overreaction. Lehman (1990) also identified reversal effects. Underreaction to stock prices was documented by Jegadeesh and Titman (1993). They focussed their attention on relative strength strategies (momentum strategies) i.e: buying past winners and selling past losers. They select stocks based on their past six month returns and hold them for six months, which realise a compounded excess return of 12.01% per year on average. Long term performance reveals that these profits dissipate within a period of two years from the date of portfolio formation.

H. Weather: Very few people would argue that sunshine puts people in a good mood, and people in good mood make more optimistic choices and judgements. Saunders (1993) shows that NYSE index tends to be negative when it is cloudy. More recently Hirshleifer and Shumway (2001) analyze data for 26 countries from 1982-1997 and find that stock market returns are positively correlated with sunshine in almost all of the countries studied. Also they find that snow and rain have no predictive power.

The phenomena discussed above have been referred to as anomalies because the returns cannot be explained by risk based models (CAPM and Fama-French model) and are beyond the existing paradigm of EMH. It clearly suggests that information alone is not moving prices (Roll, 1984). These anomalies have led researchers to question the very basic concept of EMH, and investigate alternate models of market behaviour. This has given birth to new theory behavioural finance which lays emphasis on investor’s psychology in interpreting information.

Are the markets really inefficient: Issues in empirical tests of market efficiency?

The tests that are carried out for market efficiency and their interpretation is a difficult task. There are some common pitfalls in testing and unless research is carefully conducted it is possible that inefficiencies that emerge may simply be due to a faulty asset pricing model or faulty research. There are several reasons that prevent us from interpreting that the markets are inefficient.
First, any test of market efficiency is a joint test of efficiency and the model that explains normal returns (Fama 1991). If the model is misspecified, then it will not estimate the correct normal returns, and the so called abnormal returns that emerge are not evidence of market inefficiency, but only a bad model.

Second, many anomalies arise in the context of some specific models and tend to disappear when exposed to different models or different methods to adjust for risk or when different statistical approaches are used to measure them. This is rightly referred as specification searches. If one is to rightly decide whether markets are efficient or not, then one should test the model in different sample periods.

Third, many anomalies have disappeared after their publication, such as size effect.

Fourth, there is a distinction between statistical and economic significance. Most of the markets studied concluded markets as inefficient only on statistical basis. To be economically significant profits must be calculated after the transaction costs. Jensen (1978) insisted that if for eg. The transaction costs are 1%, then abnormal returns up to 1% can be considered within the bounds of efficiency. Lesmond et. al (2001) found that standard “relative strength” strategies are not profitable because of trading costs involved. A market can be considered inefficient only if there is both statistical and economical proof of inefficiency.

Fifth, there is problem of inappropriate portfolio weightings. Mostly equally weighted abnormal returns are reported with the results being driven by small firms. The research concludes the market to be inefficient, when in fact only pricing of small, illiquid stocks are inefficient (Barberis and Thaler, 2003).

The inefficiency that appears may be due to these errors. There are weaknesses in the testing of efficient market theory. But while theoretical models of efficient markets have their place in the ideal world, one cannot maintain them in their pure form in the actual world (Shiller, 2002). Off late the role of human psychology has been documented in literature. There are several instances where market prices are not set by rational investors, but psychological considerations play a role in this. These are some irrefutable cases of market efficiency eg. In the October crash of 1987, the stock market lost about one-third of it’s value with essentially no change in the general economic environment. Similarly the pricing of internet stocks in early 2000 could only be explained by the behavior of irrational investors. Such instances question the very basic premise of efficient market theory. This irrational behavior and unexpected returns have found explanation in behavioral finance to some extent.

**Behavioral Finance**

The basic premise of behavioral finance is that changes in the future prices occur because of the inherent biases in the way individuals interpret information. The field merges the concept of finance and psychology to understand the role of human behavior in financial markets and to form winning investment strategies.

Established finance theory has assumed that investors are fully rational and have little difficulty making financial decisions and are well informed. Investors are not swayed away by their emotions. But in reality this assumption always does not hold true. Behavioral finance has been
growing over the last so many years specifically because of the observation that investors rarely behave according to the assumptions made in traditional finance theory. Supporters of behavioral finance cite various cases where reality seems to be at odds with rationality of investors. The excess volatility of 1980’s raised questions on whether this volatility is the same as predicted by the efficient markets model. Shiller (2002) observed that anomalies are small departures from the fundamental truth of market efficiency, but if most of the volatility is unexplained then it would question the basic principle of efficient market theory. Price movements are much greater than what an efficient market would allow. Similarly the dividend puzzle poses a challenge to EMH. MM argued that investors should be indifferent between dividend and capital gains. But in real world investors prefer capital gains to dividends because of taxes. Companies prefer repurchase to dividend. But companies do pay dividends and also stock prices increase with dividend announcement. Thus dividends have an information content in them which sends signals to the investors about the prospects of the company. Similarly the equity premium puzzle, which is much greater than can be explained by risk alone. These are various irregularities challenging EMH.

Many economists interpret the anomalies as consistent with several ‘irrationalities’ individuals exhibit in making decisions. These irrationalities results from two main premises; first, that investors do not always process information correctly and second, that even given a probability distribution of returns, investors often make inconsistent and sub optimal decisions. (Thaler, Handbook of economics of finance)

Some of the common information processing errors and behavioral irrationalities which may have a role to play in explaining the anomalies are discussed below.

**Information Processing Errors**

If there are errors in information processing then it can lead investors to misestimate the true probabilities of events. Some of the most important biases have been discussed below.

**Forecasting Errors**

Sometimes people give too much weight to recent experience compared to prior beliefs when making forecasts, and tend to make forecasts that are too extreme given the uncertainty inherent in their information. DeBondt and Thaler (1990) argue that P/E effect can be explained by earnings expectations that are too extreme. When the recent performance of a firm is favourable, forecasts about firm’s future earnings are too high relative to the objective prospects of the firm. The result is a high initial P/E followed by a poor subsequent performance, when investors recognize their errors.

**Overconfidence**

Overconfidence means that investors tend to overestimate their predictive skills and believe they can ‘time’ the market. The result of this is that investors and also financial analysts are sluggish to revise their previous assessment of a company’s future performance, even when there is clear cut evidence that their existing assessment is not true.
Conservatism

Conservatism states that investors are too slow and conservative in updating their prior beliefs in response to recent evidence. As a result of this investors may initially react to news about a firm partially so that the new information is fully reflected only gradually. Such a bias would lead to momentum in stock markets.

Sample size neglect

It is very important to take into account the size of the sample when making decisions. People often make the mistake of considering a small sample just as representative of a population as a large one. They may quickly infer a pattern based on small sample and extrapolate the trends too far into the future. For eg. a short lived report of good earnings would lead investors to revise their assessment about the future performance. This would generate buying pressure and lead to price run-up. When the large gap between price and intrinsic value of the stock becomes large enough, the market corrects it’s initial error

Representativeness

It is the tendency of the decision makers to make decisions based on the patterns where none exist. For example an investor may conclude that past earning of a company is representative of underlying earnings growth potential. In financial markets this can lead investors to buy ‘hot’ stocks and to shun stocks that have performed poorly in the recent past.

Disposition effect

A pattern where people are less willing to recognize losses, but are more willing to recognize gains. If investors make loss, then ideally they should sell those assets which have fallen in value, to exploit tax reductions on capital gains.

Behavioral Biases

Sometimes it is possible that individuals make less-than-fully rational decisions, even when information processing is perfect. Most common behavioral biases are discussed below.

Mental Accounting

It is the tendency of individuals to organize their worlds into separate ‘mental accounts’. Each investment has its own file and interactions among the assets in different folders are often ignored. It is a specific form of framing in which people segregate certain decisions. This can lead to inefficient decision making. Statman (1997) argues that mental accounting is consistent with some investors irrational preferences for stocks with high cash dividends, and with a tendency to hold losing stock positions far too long (since ‘behavioral investors’ are reluctant to realize losses). Mental accounting effects also help explain momentum in stock prices.
Regret Avoidance

Psychologists have observed that individuals who make decisions that turn out to be bad have more regret (blame themselves more) when that decision was more unfamiliar. For e.g. buying a blue chip portfolio that turns down is not as painful as experiencing the same losses on lesser known firm. Any loss on blue chip stocks can be easily attributed to bad luck rather than bad decision making and cause less regret.

Shefrin (2000) argues that that irrational information processing and behavioural biases cause market prices to deviate from fundamental values. DeBobdt and Thaler (1985) argue that because investors rely on representativeness heuristic, they can be overly optimistic about past winners and pessimistic about past losers and this bias can cause prices to deviate from their fundamental values and give rise to anomalies. There can be opportunities for investors to earn abnormal returns in this case and thus the credibility of EMH is undermined.

Can there be a compromise between the two schools: Evaluating the behavioral approach and counter arguments of traditional financial theorists.

Market efficiency implies that prices are right and that there are no easy profit opportunities. It is possible that anomalies may arise not because of the behavioral issues, but because of mis-specified systematic risk (through the use of incorrect asset pricing model) or because of data snooping. Fama (1998a) argues that “apparent overreaction of stock prices to information is about as common as underreaction” and suggests that this finding is consistent with the market efficiency hypothesis that the anomalies are chance events. Also the EMH does not require that all investors act in a rational manner. The principles of arbitrage would quickly drive prices to their correct level if only one of the parties were rational. To talk about efficiency, it is good to divide events into two categories ------- high frequency events and low frequency events. High frequency events occur very often and low frequency events occur rarely and may even take a long time to recover from, High frequency events have recurrent misvaluations and so trading strategies can reliably make money and the market is relatively efficient for these assets. Low frequency events however do not support market efficiency. For them it is impossible in real time to identify the peaks and troughs until they have passed.

The question is do the efforts by arbitrageurs to make money in practice really makes the market more efficient. As Sheilefer and Vishny (1997) argue in “Limits to arbitrage” article, the efforts of arbitrageurs to make money will make some markets more efficient but they won’t have any effect on other markets. It is indeed difficult to find trading strategies that make money. This does not mean that financial markets are informationally efficient; however low frequency misvaluations may be large without presenting any opportunity to reliably make money (Ritter, 2003). Behavioral factors do play a role in decision making and also explain anomalies, but this is not a sufficient condition to determine that markets are inefficient. The tools currently available for econometric studies are not powerful enough to distinguish market inefficiency
from bad asset-pricing models. Consequently the claims of both traditional and behavioral theorists cannot be disproved conclusively

References


