

# EFFICIENT MARKETS AND FINANCIAL BUBBLES

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**Abstract:** When it comes to money and investing, the individual portfolio investor is not always as rational as he believes he is – which is why there's a whole field of study that explains an individual's sometimes irrational and strange behavior. This research paper mainly deals with the insight into the theory and findings of behavioral finance and the financial bubbles in history. The paper will also assist individual investors to avoid these “mental mistakes and errors” by recommending some important investment strategies for those who invest in stocks and mutual funds.

**Keywords:** Investor biases, Behavioural Finance, Stock Market, Cognitive biases, Strategies to avoid biased decisions, Rational investor, Market crash and bubbles

## 1. INTRODUCTION

The objective of any investment is to make money. In the early years, investment was based on performance, forecasting, market timing and so on. This produced very ordinary results, which meant that investors were bested with very normal returns, and not much peace of mind. However available returns and actually received returns were different in reality and a valid justification was therefore required. While examining the process, they identified that it is caused by fundamental mistakes in the decision-making process, i.e. they were making irrational investment decisions. In recognizing these mistakes and the means to avoid them, they realized the impact of psychology in investment decisions to transform the quality of investment decisions and therefore return. This resulted in active research in the field of Behavioral Finance to understand the psychological processes driving these errors.

Lintner defines behavioral finance as being ‘the study of how humans interpret and act on information to make informed investment decisions’. Olsen asserts that ‘behavioural finance does not try to define ‘rational’ behaviour or label decision making as biased or faulty; it seeks to understand and predict systematic financial market implications of psychological decision processes.’

## 2. BEHAVIORAL FINANCE: QUESTIONING THE RATIONALITY ASSUMPTION

Much economic theory is based on the belief that individuals behave in a rational manner and that all existing information is embedded in the investment process. This assumption is the crux of the efficient market hypothesis. But researchers questioning this assumption have uncovered evidence that rational behavior is not always as prevalent as we might believe. Behavioral finance attempts to understand and explain how human emotions influence investors in their decision-making process. A market is said to be efficient with respect to an information set if the price ‘fully reflects’ that information set, i.e. if the price would be unaffected by revealing the information set to all market participants. The efficient market hypothesis (EMH) asserts that financial markets are efficient. On the one hand, the definitional ‘fully’ is an exacting requirement, suggesting that no real market could ever be efficient, implying that the EMH is almost certainly false. On the other hand, economics is a social science, and a hypothesis that is asymptotically true puts the EMH in contention for one of the strongest hypotheses in the whole of the social sciences. Strictly speaking the EMH is false, but in spirit is profoundly true. Besides, science concerns seeking the best hypothesis, and until a flawed hypothesis is replaced by a better hypothesis, criticism is of limited value.

## 3. STANDARD FINANCE AND BEHAVIORAL FINANCE

Standard finance is built on four foundation blocks:

- People are rational,
- Markets are efficient,
- People should design portfolios by the rules of mean-variance portfolio theory and do so, and,
- Expected returns of investments are described by standard asset pricing theory, where differences in expected returns are determined only by differences in risk.

Behavioral finance offers an alternative foundation block for each of the foundation blocks of standard finance. According to the theories of behavioral finance:

- People are normal,
- Markets are not efficient, even if they are difficult to beat,
- People design portfolios by the rules of behavioral portfolio theory and,
- Expected returns of investments are described by behavioral asset pricing theory, where differences in expected returns are determined by more than differences in risk.

#### 4. NORMAL AND RATIONAL INVESTORS

Miller and Modigliani (1961) described investors as rational in their article on dividends. Rational investors, they wrote, are investors who “always prefer more wealth to less and are indifferent as to whether a given increment to their wealth takes the form of cash payments or an increase in the market value of their holdings of shares.” This is a good beginning of a description of rational investors.

Shefrin and Statman (1984) argued that investors' wants, cognitive errors, and emotions affect their preferences for particular stocks. Miller (1986) responded: “stocks are usually more than just the abstract ‘bundles of return’ of our economic models. Behind each holding may be a story of family business, family quarrels, legacies received, divorce settlements, and a host of other considerations almost totally irrelevant to our theories of portfolio selection. That we abstract from all these stories in building our models, is not because the stories are uninteresting but because they may be too interesting and thereby distract us from the pervasive market forces that should be our principal concern.” (p. S467).

Yet questions about the effects of family business, family quarrels, legacies, and divorce settlements are questions of finance. We might splurge our parents' bequest money but feel compelled to preserve for our children money they labeled legacy. We might be reluctant to sell stocks and spend their proceeds, yet ready to spend dividends. Moreover, pervasive market forces are powered by our behavior. We cannot hope to understand these forces unless we understand our behavior.

Rational investors are immune to framing errors, the cognitive errors that lead many normal investors to conclude, in error, that a dollar in the form of dividends from shares of a stock is different in substance from a dollar in the form of the shares themselves when, in truth, the two dollars are different only in frame. Moreover, rational investors are immune to the entire range of cognitive errors and misleading emotions beyond framing errors.

Normal investors, unlike rational ones, are not immune to cognitive errors and misleading emotions. Yet normal investors are not all alike, varying in their wants of utilitarian, expressive, and emotional benefits and standing at places along the range from normal-ignorant to normal-knowledgeable. Knowledgeable investors have learned, imperfectly and with much effort, to overcome their cognitive errors and misleading emotions through science-based knowledge. Knowledgeable investors know, for example, that the cognitive error of hindsight fools them into believing that the future is as easy to forecast as the past. Still, even knowledgeable investors find it difficult to resist the intuition of hindsight, and sometimes they fail.

Ignorant investors have not learned to overcome their cognitive errors and misleading emotions through science-based knowledge. Moreover, some ignorant investors mistrust scientific evidence. Sapienza and Zingales (2013) asked economic experts and average Americans whether they agree or disagree with statements such as “It is hard to predict stock prices.” They found that 100% of economic experts agreed that it is hard to predict stock prices, whereas only 55% of average Americans agreed. The mistrust of average Americans in science is evident in the fact that the proportion of average Americans who agree that it is hard to predict stock prices declined from 55% to 42% when told that economic experts agree that such forecasts are difficult.

In truth, there is much evidence that it is difficult to forecast stock prices. For example, Fisher and Statman (2000) examined the ability of three groups of investors to predict stock prices: individual investors, writers of investment newsletters, and Wall Street strategists. They found that none are good at predicting stock prices. Indeed, predictions of high returns were followed by relatively low returns more often than they were followed by relatively high returns. And predictions of low returns were followed by relatively high returns more often than they are followed by relatively low returns.

#### 5. RATIONAL MARKETS AND HARD-TO-BEAT MARKETS

Warren Buffett illustrated the distinction between 'rational markets' and 'hard-to-beat markets' and the confusion that arises when they are lumped into 'efficient markets.' Buffett was considering bonds of Citizens Insurance, established by the state of Florida to cover hurricane damage and backed by state taxes. Berkshire Hathaway, his company, received three bids, one at 11.33%, one at 9.87% and one at 6.00%. "It's the same bond, the same time, the same dealer. And a big issue," said Buffett. "This is not some little anomaly, as they like to say in academic circles every time they find something that disagrees with their [efficient market] theory."

Buffett used the term 'efficient market' where the term 'rational market' would have been more precise. The story of the Citizens Insurance bonds is, as Buffett noted, an anomaly, contradicting the claim that the market for these bonds is rational. The intrinsic value of each Citizens Insurance bond is identical to the intrinsic value of every other Citizens Insurance bond since all Citizens Insurance bonds are identical in every feature. The fact that the bonds are selling at different prices contradicts the claim that the market of these bonds is rational since three different prices cannot all equal one intrinsic value. Two of the prices, and perhaps all three, must diverge from intrinsic value.

'Hard-to-beat markets,' however, are distinct from 'rational markets.' Whereas prices always equal intrinsic values in rational markets, prices sometimes deviate from intrinsic values in hard-to-beat markets. A market is hard-to-beat if investors find it hard to earn average returns higher than average market returns by exploiting gaps between prices and intrinsic values.

Excess returns come from exploiting gaps between prices and intrinsic values and gaps absent in rational markets, therefore Rational markets are unbeatable. But unbeatable markets are not necessarily rational. It might be that prices deviate from intrinsic values but deviations are hard to identify in time or difficult to exploit for consistent excess returns.

The intrinsic value of a stock is determined by dividends received during its life, including a dividend received at the end of its life, whether zero if it goes bankrupt or billions if another company buys it. Dividends are received in installments over many years so we discount future dividends to account for their time-value and expected return determined by the correct asset pricing model. Time-value involves the observation that dividend money received in the future is less valuable than dividend money received today. Expected return involves the observation that actual future dividends might differ from expected returns. The intrinsic value of a stock is the sum of the dividends it is estimated to bring during its lifetime, discounted to account for time-value and expected returns. Rational investors refuse to buy stocks at prices exceeding intrinsic values.

However, it is difficult to determine whether a market is rational because it is difficult to obtain near to close estimates of the future fortunes of companies and their resulting future dividends. Moreover, the discount rate applied to these dividends might be biased by an incorrect asset pricing model. As Fama (1991) noted, market efficiency per se is not testable. Instead, market efficiency must be tested jointly with an asset pricing model, such as the CAPM or the three-factor model. For example, the excess returns relative to the CAPM of small-capitalization stocks and stocks with high book-to-market ratios might indicate that the market is not efficient or that the CAPM is an incorrect model of expected returns.

## 6. MARKET BUBBLES AND CRASHES

A bubble is a type of investing phenomenon that demonstrates the frailty of some facets of human emotion. A bubble occurs when investors put so much demand on a stock that they drive the price beyond any accurate or rational reflection of its actual worth, which should be determined by the performance of the underlying company. Like the soap bubbles a child likes to blow, investing bubbles often appear as though they will rise forever, but since they are not formed from anything substantial, they eventually pop. And when they do, the money that was invested into them dissipates into the wind.

A crash is a significant drop in the total value of a market, almost undoubtedly attributable to the popping of a bubble, creating a situation wherein the majority of investors are trying to flee the market at the same time and consequently incurring massive losses. Attempting to avoid more losses, investors during a crash are panic selling, hoping to unload their declining stocks onto other investors. This panic selling contributes to the declining market, which eventually crashes and affects everyone. Typically crashes in the stock market have been followed by a depression.

The relationship between bubbles and crashes is like the relationship between clouds and rain. Since you can have clouds without rain but you can't have rain without clouds, bubbles are like clouds and market crashes are like the rain. Historically, a market crash has always precipitated from a bubble and the thicker the clouds or the bigger the bubble, the harder it rains. There is a distinction between a crash and a correction, A correction is supposedly the market's way of slapping some sense into overly enthusiastic and zealous investors. As a rule, a correction should not exceed a 20% loss of value in the market. Surprisingly, some crashes have been erroneously labeled as corrections, including the terrifying crash of 1987. But a "correction," however, is a time period until the steep drop has halted within a reasonable period.

We explore lessons from behavioral finance about the origins of the crisis and the likelihood of averting the next ones.

## 7. 1634-1637: THE TULIP AND BULB CRAZE

We highlight the tulip and the bulb craze in Holland during 1634-1637. According to researches, the amount the market declined from peak to bottom is difficult to calculate, but, at the peak of the market, a person could trade a

single tulip for an entire real estate, and, at the bottom, one tulip was the price of a common fruit. Such was the effect of the crash of the market due to a simple tulip bulb. In 1593 tulips were brought from Turkey and introduced to the Dutch. The attractiveness of the new flower made it widely sought after and therefore it started to sell at quite a high price. After a time, the tulips contracted a non-fatal virus known as mosaic, which didn't kill the tulip population but altered them causing "flames" of color to appear upon the petals. The color patterns came in a wide variety, increasing the rarity of a flower that was already unique.

Thus, tulips, which were already selling at a premium, began to rise in price according to how their virus alterations were valued, or desired. Everyone began to deal in bulbs, essentially speculating on the tulip market, which was believed to have no limits. The true bulb buyers (the garden centers of the past) began to fill up inventories for the growing season, depleting the supply further and increasing scarcity and demand. Soon, prices were rising so fast and high that people were trading their land, life savings, and anything else they could liquidate to get more tulip bulbs. Many Dutch persisted in believing they would sell their hoard to hapless and unenlightened foreigners, thereby reaping enormous profits. Somehow, the originally overpriced tulips enjoyed a twenty-fold increase in value - in one month!

The value of the tulip bulb, was thus not accurately reflected in the prices. As it happens in many financial speculative bubbles, some prudent people decided to sell and plough back their profits. A domino effect of progressively lower and lower prices took place as everyone tried to sell while not many were buying the tulip bulb. The price began to fall steeply, causing people to panic and sell regardless of losses. The contracts were refused to be honored by the dealers and people began to realize they traded their homes for a piece of greenery; a mere flower that was perishable, panic and pandemonium were prevalent throughout the land. The government attempted to step in and halt the crash by offering to honor contracts at 10% of the face value, but then the market plunged even lower, making such restitution impossible. No one emerged unscathed from the crash. Even the people who had locked in their profit by getting out early suffered under the following depression. The effects of the tulip craze left the Dutch very hesitant about speculative investments for quite some time. Investors can now learn from this craze over the price of a mere flower that it is better to stop and smell the flowers than to stake one's investment over the price of a flower.

## 8. 1711-1720: THE SOUTH SEA BUBBLE

In United Kingdom, the market declined from peak to bottom: Stocks in the South Sea Company were traded for 1,000 British pounds which were unadjusted for inflation and then were reduced to nothing by the latter half of 1720. An enormous amount of money was lost.

In the 1700s, the British empire was the big dog on the block, and that particular block spanned the entire globe. For the British, the eighteenth century was a time of prosperity and opulence, meaning a large section of the population had money to invest and were looking for places to put their money. So, the South Sea Company had no problem attracting investors when, with an IOU to the government worth £10,000,000.00, the company purchased the "rights" to all trade in the South Seas.

The few companies that were selling stock at that time were all solid but difficult investments to buy. For example, the East India Company was paying out considerable tax-free dividends to their mere 499 investors. The SSC was perched on top of what was perceived to be the most lucrative monopoly on earth. The first issue of stock didn't even satiate the voracious appetite of the hardcore speculators, let alone the average investors who were assured of this company's coming dominance. The popular conception was that Mexicans and South Americans were just waiting for someone to introduce them to the finery of wool and fleece in exchange for mounds of jewels and gold! So nobody questioned the repeated re-issues of stocks by the South Sea Company--people just bought the expensive stocks as fast as they were offered. It didn't matter either to investors that the company wasn't headed by experienced management. Those who lead the company, however, were born public relations directors, who set up offices furnished with affluence in the most extravagant quarters. People, once they saw the wealth the SSC was "generating," couldn't keep their money from gravitating towards the SSC. Not long after the emergence of the SSC, another British company, the Mississippi Company, established itself in France. The company was the brainchild of an exiled Brit named John Law. His idea wasn't so much based in trade, but in switching the monetary system from gold and silver into a paper currency system. The Mississippi Company caught the attention of all the continental traders and gave them a space to put their hard-earned dollars. Soon the worth of the Mississippi Company's stock was worth 80 times more than all the gold and silver in France. Law also began collecting defunct companies to add to his massive conglomerate.

This success on the continent stirred British pride, and, believing that British companies could not fail, British investors were desperate to invest their money. They were blind to many indications that the SSC was run too poorly to break even (whole shipments of wool were misdirected and left decaying in foreign ports), and people wanted to buy even more stocks. The South Sea Company and others made a point of giving people what they wanted. The

demand for investments caused IPOs to sprout out of everything, including companies that promised to reclaim sunshine from vegetables and to build floating mansions to extend Britain's landmass. They all sold like mad.

Eventually the management team of SSC took a step backward and realized that the value of their personal shares in no way reflected the actual value of the company or its dismal earnings. So they sold their stocks in the summer of 1720 and hoped no one would leak the failure of the company to the other shareholders. Like all bad news, however, the knowledge of the actions of SSC management spread, and the panic selling of worthless certificates ensued. The huge hole in the south sea bubble also punctured the Mississippi Company's unrealistic value and both came crashing down.

Because of the prominent economic position of the British Empire and the government's help in stabilizing the banking industry, a complete crash that would be heralded by the folding of banks was avoided. The British government outlawed the issuing of stock certificates, a law that was not repealed until 1825.

Any crisis highlights the need to incorporate behavioral finance into our economic and financial theories. Psychology, including aspirations, cognition, emotions, and culture, is at the center of behavioral finance. Bubbles pose a challenge to the efficient markets hypothesis. This hypothesis is on trial now, accused of facilitating the crisis by misleading its adherents into docility. "How did economists get it so wrong?" asked Krugman (2009). Some of the blame, he wrote, belongs to the belief that markets are efficient. "In short, the belief in efficient financial markets blinded many, if not most, economists to the emergence of the biggest financial bubble in history. And efficient-market theory also played a significant role in inflating that bubble in the first place." Quoted the New York Times in 2009. Bubbles cannot exist in rational markets because bubbles imply deviations of prices from intrinsic values. A positive bubble in a security exists when its price is higher than its intrinsic value, whereas a negative bubble exists when its price is lower than its intrinsic value. Bubbles can persist in unbeatable markets if investors are unable to exploit them for excess returns because, for example, digging for information about intrinsic values is difficult, trading on such information is costly, and risk embedded in necessarily imprecise estimations of intrinsic values can bring losses.

## 9. BEHAVIOURAL FINANCE BIASES

Anchoring	Panics
Financial Psychology	Disposition Effect
Cascades	Loss Aversion
Chaos Theory	Prospect Theory
Cognitive Bias	Regret Theory
Cognitive Dissonance	Groupthink Theory
Cognitive Errors	Anomalies
Contrarian Investing	Market Inefficiency
Crashes	Behavioral Economics
Fear	Overreaction
Greed	Under-reaction
Herd Behavior	Overconfidence
Framing	Mental Accounting
Hindsight Bias	Irrational Behavior
Preferences	Economic Psychology
Fads	Risk Perception
Heuristics	Gender Bias
Manias	Irrational Exuberance

## 10. HOW CAN INVESTORS OVERCOME THESE INVESTING BIASES

As investors, we are obviously influenced by various behavioral and psychological factors. Individuals who invest in stocks and mutual funds should implement several safeguards that can help control the biases during investing. One way is to implement a disciplined trading strategy.

### 10.1 In the Case of Stock Investments

The best way for investors to avoid biased decision making is to focus on a specific investment strategy over the long-term. Investors should keep detailed records as why a specific stock was purchased for their portfolio. Also, investors should decide upon the specific criteria for making an investment decision to buy, sell, or hold. For example, an investor should create a checklist for each of his investments that focus on the following:

- The reason for purchasing the stock.

- The investor's investment time horizon.
- The expected return from this investment one year from the purchase.
- What if a year from now the stock under-performs or over-performs his expectations?
- The plan of the investor on buying, selling, or holding his position
- Riskiness of this stock within his overall portfolio

The purpose of developing and maintaining an "investment record" is that over time it will assist an investor in evaluating investment decisions and to ascertain whether they were justified or not. With this type of strategy, investors will find it easier to admit their mental mistakes, and it will signal them to control their impulsive behaviour. Ultimately, the strategy to overcome emotional decision making is to trade less and implement a simple "buy and hold" strategy. A long-term buy and hold investment strategy usually outperforms a short-term trading strategy with high portfolio turnover. Year after year it has been recorded through many researches that a passive investment strategy beats an active investment philosophy approximately 60 to 80 percent of the time.

### 10.2 In the Case of Mutual Fund Investments

It is recommended that investors apply a similar "checklist" for individual stocks. Tomic and Ricciardi (2000) recommend that investors select mutual funds with a simple "4-step process" which includes the following criteria:

- Invest in only no-load mutual funds with low operating expenses;
- Look for funds with a strong historical track record over 5 to 10 years;
- Invest with tenured portfolio managers with a strong investment philosophy; and
- Understand the specific risk associated with each mutual fund by going through the terms and conditions of investment carefully

Essentially, these are good and strong criteria for mutual fund investors. The key to successful investing is recognizing the type of investor one is along with implementing a strict investment strategy. Ultimately, for most investors, the best way to maximize their investment returns is to control their "mental errors" with a long-term investment horizon.

Many similar researches have also concluded that the best trading strategy is a "long-term buy and hold" investment in a passive stock mutual fund such as S&P 500 index. Such investments are less susceptible to market risks, thereby ensuring good returns on the investment over a period of time.

## 11. SCOPE FOR FURTHER STUDY

This paper has attempted to study the differences between standard and behavioral finance, normal and rational investor and between rational markets and hard-to-beat markets. Two of the major financial market crashes in history have been studied. It has also suggested ways to assist individuals to resolve these "mental mistakes and errors" by recommending some important investment strategies for those who invest in stocks and mutual funds. However there exists a further scope of studying each of the biases separately and its effects can be traced through the Indian stock market fluctuations over a period of time. Also a further study may be undertaken to study the comparison of Indian stock markets vis-à-vis the international markets and to understand how investing biases affect both differently. There may also be a study undertaken to separately study the biases in terms of long term investors' vis-à-vis the speculative traders. Indian stock market fluctuations may also be studied separately to understand the effect of a particular bias at any given point of time.

## CONCLUSION

Behavioral finance therefore makes an attempt to explain and improve people's awareness regarding the mental factors and psychological processes of individuals and groups that invest in financial markets. Psychology is at the center of behavioral finance and psychology underlies much of our crisis. That psychology includes aspirations, cognition, emotions, culture, and perceptions of fairness. Aspirations propelled many renters into houses they could not afford, evoking emotions and cognitive errors that blinded homeowners to risk. And a culture where houses are central to the American Dream deepened the crisis and extended it. Aspirations for wealth and status blinded bankers to the risk of mortgages and mortgage securities. Overconfident bankers sidelined risk managers and proceeded to boost their company's leverage. And much of the public and its political leaders were persuaded that regulations are unnecessary because free markets are not only inherently efficient, but also inherently fair. Can we hope that next time will be different? Financial crises come much too often to leave us much hope. The crisis of

1974-75 was almost as long and severe as the Great Recession of 2007-2009. The twin Reagan-era recessions of the 1980s brought high unemployment and were followed by a sovereign debt crisis and an S&L crisis. The foreign currency crisis of the 1990s required action to dispose of Long Term Capital Management without breaking the global financial system. And the recent housing bubble followed a stock market bubble. This paper has established differences between standard and behavioral finance, normal and rational investor and rational markets vis-à-vis hard-to-beat markets. This paper has also discussed some trading approaches for stock and mutual fund investors to assist them in understanding and controlling their psychological barriers. These strategies are a starting point for investors that encourage them to keep an investment track record and checklist regarding each stock or mutual fund within their overall portfolio. Hopefully, these behavioral finance-driven structured guidelines for making investment choices will aid individuals by drawing attention to potential mental blocks, hopefully leading to increased and consistent profits. Regardless of our measures to correct the problems, the time between crashes has decreased. There were centuries between fiascos, then decades, then years and it cannot be said that whether this foretells anything dire for the future, but the best thing an investor can do is to keep himself educated, informed, and well-practiced in doing and studying research.

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