Investor Irrationality and Self-Defeating Behavior: Insights from Behavioral Finance

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ABSTRACT

The efficient markets hypothesis (EMH) has posited investment decision-makers as rational, utility-maximizing individuals. Cognitive psychology, on the other hand, suggests that human decision processes are susceptible to several illusions: those caused by heuristic decision-making processes, as well as those arising from the adoption of “mental frames.” Unfortunately, these heuristics may lead to cognitive illusions that include: representativeness, over-confidence, anchoring, gambler's fallacy, loss aversion, regret aversion, and mental accounting, among others. Behavioral finance proponents argue that heuristic-driven bias and framing effects cause market prices to deviate from fundamental values. This field amalgamates theories from financial economics, psychology, and sociology in an attempt to construct a more “complete” model that incorporates the idiosyncrasies of human behavior in financial markets. This paper argues that understanding of the findings of this research benefits individual investors the most as it seeks to create awareness of the various human biases and the high costs they impose on their portfolios.

INTRODUCTION

The collapse of the dot-com era of the late nineties and the continuing present anxiety over stock market performance has had a sobering effect on investors and warranted a revisiting of the rules of investing. Following the catastrophic events surrounding the bursting of the speculative technology bubble in March 2000 and the real estate bubble in September 2008, new attempts are being made to explain the behavior of financial markets, one of the foremost of which is in the area of behavioral finance.

Interest in behavioral finance research has been fueled by the inability of the traditional finance framework to explain many empirical patterns, including stock market bubbles in Japan in the late eighties and the U.S, post-announcement earnings drifts. Most modern textbooks in finance and investing appear to be silent on the influence of behavioral finance on financial markets. Olsen (1998) notes, behavioral finance recognizes the paradigms of traditional finance such as rational behavior and profit maximization in the aggregate, but asserts that these models are incomplete, since they do not fully consider individual behavior. Specifically, behavioral finance “seeks to understand and predict systematic market implications of psychological and economic principles for the improvement of financial decision making” (ibid.). Thus, the insight of how psychology affects financial decisions, corporations, and the financial markets is finding greater currency in mainstream finance.

Financial economists are increasingly coming to believe that the study of psychology and other social sciences can shed considerable light on the unpredictable and erratic nature of human behavior, and by extension, challenge the prevailing paradigm of efficiency of financial markets, as well as explain stock market anomalies, market bubbles, and crashes. Researchers now believe that these human flaws are consistent, predictable, and can be exploited for profit. At the very minimum, recognition of human biases and accompanying irrationality warrants greater investigation so as not to repeat the mistakes of the past. As Jolliffe (2005) explains, “for investors who bought technology funds during the internet boom, only to see their value halve when the bubble burst, studying behavioral finance, the analysis of irrational investor behavior, could pay big dividends”.

Despite the authority conferred on the field in the awarding of the 2002 Nobel Prize in Economic Sciences to noted behavioral economist Daniel Kahneman, behavioral finance is in a relatively incipient stage as a field of rigorous inquiry. Most discussion on corporate and individual financial security valuation still largely resides within the domain of fundamental analysis. Behavioral finance uses models in which some agents are not fully rational, either because of
individual preferences or mistaken beliefs; it, thus, encompasses research that drops the traditional assumptions of expected utility maximization with rational investors in efficient markets in traditional finance. The twin cornerstones of behavioral finance are cognitive psychology (how people think) and the limits to arbitrage (when markets will be inefficient).

This study attempts to discuss the central tenets of behavioral finance and uncover its impact upon investment decision-making at the individual level. It includes a discussion of various psychological biases that result in suboptimal investment strategies and concludes with a discussion of strategies for recognition and avoidance of these biases in portfolio decision-making and individual retirement planning.

I. Traditional versus behavioral finance

The efficient market hypothesis (EMH) is the cornerstone of rationality that purportedly governs the functioning of well-developed financial markets. Under the semi-strong form of the EMH, market prices are considered to reflect all past and current information regarding asset prices; thus, future changes in asset prices are said to follow a “random walk” and to that extent, unpredictable. As markets are rational, they are considered to subsume relevant, new information accurately and instantaneously into asset prices. Although the assumption of strict investor rationality is questionable, there is good evidence that markets are efficient in that it is very hard to consistently earn superior, risk-adjusted returns; this is evidenced by the fact that very few professional fund managers manage to show consistently high performance.

Although individual investors may be swayed by emotional or psychological factors in making decisions, markets are essentially 'auction places' and there is a seller for every buyer. The EMH does not necessarily require that every investor act in a rational manner once the economic dominance of rational investors acts to ensure that market prices reflect the fair value of traded assets.

While many research studies have indeed shown that it is hard to 'beat the market', the assumption of pervasive market efficiency has been muddied by recent events including the internet stock bubble and the post-Enron reaction to the accounting and business practices of a large number of US quoted firms. The burgeoning interest in behavioral finance and growing body of research is questioning the impact of individual and crowd psychology on decision-making in financial markets.

Under the paradigm of traditional financial economics, decision-makers are rational and utility maximizing. In contrast, cognitive psychology suggests that human decision processes are subject to several cognitive illusions, those caused by heuristic decision-making processes and those arising from the adoption of 'mental frames', the most salient of which are discussed below.

II. Psychological biases

Cognitive psychologists have documented many patterns of human behavior. Some of these patterns and their impact on individual investor decision-making are as follows:

1. Heuristics

Behavioral economists recognize that, in order to navigate through an increasingly complex world, we utilize heuristics (mental shortcuts) in our decision process. Unfortunately, in the world of finance, all too often our heuristics are not helpful and they result in poor investment decisions. Heuristics, as rules of thumb, make decision-making easier. But they can sometimes lead to biases, especially when things change. These can lead to suboptimal investment decisions.

An example of naïve diversification or the 1/n heuristic, as Benartzi and Thaler (2001) document, is that many people spread their savings evenly across several investment products without consideration to the riskiness of the alternatives, or their suitability in the 401(k) portfolio. If there are three funds, one-third goes into each, and if two are stock funds, two-thirds goes into equities. Thus, the greater the number of 401(k) stock funds, the higher the allocation to equities, a reality that is difficult to reconcile with investor rationality.
2. **Anchoring**

Anchoring arises when a value scale is fixed or anchored by recent observations. An example would include a case where a share has recently suffered a substantial fall in price. An investor may be tempted to evaluate the 'worth' of the share by reference to the old trading range.

As an example, take a company whose stock is trading at $10 a share. The company then announces a 300% earnings increase, but its stock price increases only to, say, $12 a share. The small rise occurs because investors are "anchored" to the $10 price. They believe that the earnings increase is temporary when, in fact, the company will probably maintain its new earnings level.

3. **Gambler's fallacy**

Gambler's fallacy occurs when investors inappropriately predict that a trend will reverse, for example, a gambler playing a fair roulette table who has seen seven black outcomes in a row may think that the next spin 'must' produce a red outcome. This illusion may encourage the purchase or sale of a share on the grounds that the recent bad/good luck of the firm must be about to change.

4. **Overconfidence**

People are overconfident about their abilities. Like the children of Garrison Keillor's Lake Wobegon, where "...all of the children are above average," the classic behavioral characteristic of "overconfidence" leads many investors to believe they can consistently select the best investment, manager and/or sector. Entrepreneurs are especially likely to be overconfident. Overconfidence manifests itself in a number of ways. One example is *too little diversification*, because of a tendency to invest too much in what one is familiar with. Thus, people invest in local companies, even though it is bad from a diversification viewpoint because their real estate (the house they own) is tied to the company’s fortunes, and they already have significant human capital invested in the firm. Computer hardware engineers in Silicon Valley are examples of people who have over-invested in the stock of their employing firm.

Illusions caused by over-confidence lead investors to overestimate their predictive ability (under EMH they have none) and to attempt to 'time' the market by buying or selling shares in advance of an anticipated share movement. One side effect of this can be to cause excessive trading, leading to increased trading costs.

Research shows that men tend to be more overconfident than women. This manifests itself in many ways, including trading behavior. Barber and Odean (2001) analyzed the trading activities of people with discount brokerage accounts. They found that the more people traded, the worse they did, on average. And men traded more, and did worse than, women investors.

5. **Mental Accounting**

Mental accounting is a term given to the propensity of individuals to organize their world into separate 'mental accounts'. This can lead to inefficient decision-making, for example, an individual may borrow at a high interest rate to purchase a consumer item, while simultaneously saving at lower interest rates for a child's college fund.

The use of mental accounts could be partly explained as a self-control device. As investors have imperfect self-control, investors may separate their financial resources into capital and 'available for expenditure' pools, in an effort to control their urge to overconsume. Investors tend to treat each element of their investment portfolio separately, possibly forgoing the benefits of portfolio diversification. This can discourage an investor from selling a losing investment, and possibly forgoing an alternative investment opportunity, because its 'account' is showing a loss.

People sometimes separate decisions that should, in principle, be combined. For example, many people have a household budget for food, and a household budget for entertaining. At home, where they follow a food budget, they will not eat lobster or shrimp because they are much more expensive than, say, chicken. But when in a restaurant, they will not hesitate to order lobster and shrimp even though the cost is much higher than a simple chicken entree. If they instead ate lobster and shrimp at home, and the chicken in a restaurant, they could save money. But because they are thinking separately about restaurant meals and food at home, they choose to limit their food at home. Many investors still divide their money into a mental account for downside protection (containing cash and bonds) and a mental account...
for upside potential (containing stocks, options, and lottery tickets). Holding low risk investments inside a pension plan for retirement and higher risk assets out-side of it demonstrates a similar mindset.

6. Framing

Framing in behavioral finance is the choosing of particular words to present a given set of facts; it can influence the choices investors make. Kahneman and Tversky developed "Prospect Theory" in 1979 using framed questions. They found that contrary to expected utility theory, people placed different weights on gains and losses and on different ranges of probability. They also found that individuals are much more distressed by prospective losses than they are happy by equivalent gains. Some have concluded that investors typically consider the loss of $1 twice as painful as the pleasure received from a $1 gain. Others believe that this work helps to explain patterns of irrationality, inconsistency, and sheer incompetence in the ways human beings arrive at decisions when faced with uncertainty. An increasing body of literature on framing supports a tendency for people to take more risks when seeking to avoid losses as opposed to securing gains.

Framing is important to understand as it reflects the tendency of people to make different choices based on how the decision is framed: is it framed in terms of the likelihood of a good outcome or in terms of the reciprocal likelihood of a bad outcome? Framing shows that the manner in which a concept is presented to individuals matters. For example, restaurants may advertise “early-bird” specials or “after-theatre” discounts, but they never use peak-period “surcharges.” They get more business if people feel they are getting a discount at off-peak times rather than paying a surcharge at peak periods, even if the prices are identical. Cognitive psychologists have documented that doctors make different recommendations if they see evidence that is framed in terms of “survival probabilities” rather than “mortality rates,” even though survival probabilities and mortality rates add up to 100%.

7. Representativeness

Representativeness refers to the tendency of decision-makers to make decisions based on stereotypes, to see patterns where perhaps none exist. An example of this is decision making based on the 'law of small numbers', whereby investors tend to over-reach and assume that recent trends will continue. In effect, people underweight long-term averages. Investors may seek to chase 'hot' stocks and avoid stocks which have performed poorly in the recent past. If markets are fully rational, recent trends in share price should not impact on future expectations of a share's price. People tend to put too much weight on recent experience. As an example, when equity returns have been high for many years (such as 1982–2000 in the U.S. and Western Europe), many people begin to believe that high equity returns are “normal.” Representativeness is poor protection against the laws of chance.

8. Conservatism

When things change, people tend to be slow to pick up on the changes. In other words, they anchor on the ways things have normally been. The conservatism bias is at war with the representativeness bias. When things change, people might underreact because of the conservatism bias. But if there is a long enough pattern, then they will adjust to it and possibly overreact, underweighting the long-term average.

9. Disposition effect

The disposition effect refers to the pattern that people avoid realizing paper losses and seek to realize paper gains. For example, if someone buys a stock at $30 that then drops to $22 before rising to $28, most people do not want to sell until the stock gets to above $30. The disposition effect manifests itself in lots of small gains being realized, and few small losses. In fact, people act as if they are trying to maximize their taxes! The disposition effect is reflected in aggregate stock trading volume. During a bull market, trading volume tends to grow. If the market then turns south, trading volume tends to fall. As an example, trading volume in the Japanese stock market fell by over 80% from the late 1980s to the mid-1990s. The fact that volume tends to fall in bear markets results in the commission business of brokerage firms having a high level of systematic risk.
10. Loss Aversion
Loss aversion is based on the idea that the mental penalty associated with a given loss is greater than the mental reward from a gain of the same size. If investors are loss averse, they may be reluctant to realize losses and may even take increasing risks to escape from a losing position. This provides a viable explanation for 'averaging down' investment tactics, whereby investors increase their exposure to a falling stock, in an attempt to recoup prior losses. Shefrin (2001) terms this phenomenon “escalation bias”.

11. Regret Aversion
Regret aversion arises due to the desire to avoid feeling the pain of regret resulting from a poor [investment] decision. It embodies more than just the pain of financial loss, and includes the regret of feeling responsible for the decision, which gave rise to the loss. Again, regret aversion can encourage investors to continue to hold poorly performing shares. The wish to avoid regret can also potentially bias new investment decisions. Investors may tend to avoid sectors / firms which have performed poorly in recent times, in anticipation of the regret they would feel if they made the investment and subsequently lost money. Regret aversion could encourage 'herd behavior' on the part of investors, for example, to invest in 'respected' or 'hot' companies as these investments carry implicit 'insurance' against regret (if you lose money, so will a lot of other people, and therefore you won't feel as bad about it.).

Although the above illusions are widespread, it is not claimed that all investors will suffer from each illusion to the same extent. Curiously, there is suggestive evidence (Shefrin, 2000) that less experienced investors tend to suffer more from representativeness than do experienced investors, whilst experienced investors are more prone to gambler's fallacy.

III. Implications for financial markets
Proponents of behavioral finance contend that heuristic-driven bias and framing effects cause market prices to deviate from fundamental values. It is argued that because these biases are an inherent part of all of our decision-making processes, they can systematically distort market behavior. For example, the representativeness heuristic could lead investors to become over optimistic about past winners and over pessimistic about past losers, causing share prices to deviate from their fundamental level. Anchoring and over-confidence could lessen analysts' tendency to adjust earnings predictions when new information arises. In particular, the biases may result in
* Over or under (depending on the bias) reaction to price changes or news
* Extrapolation of past trends into the future
* Lack of attention to the fundamentals underlying a stock
* Undue focus on popular stocks

If such patterns exist, there may be scope for investors to exploit the resulting pricing anomalies to capture superior, risk-adjusted returns. Proponents of EMH, in fact, argue that smart money will exploit such anomalies and drive prices to their fundamental values. Other research, however, shows that rational investor trading is unable to completely offset the actions of irrational investors. This, as pointed out by Edward M Miller in 1977, is largely be due to the inability of smart money to engage in short sales when the bulk of shares are held by irrational investors. Using data on the interest cost of borrowing and lending shares in the 1920s and 1930s, Jones and Lamont (2001) show that shares that were more expensive to short tended to be highly priced and had lower subsequent returns on average as predicted by Miller's theory.

Supporters of the traditional EMH theory (Fama, 1998), have firmly sought to refute behavioral finance. They note that if sufficient analysis is done on any data set of share prices, odd findings (such as a finding that share prices often rise or fall when a particular event occurs) will appear simply due to chance. They also argue that observed anomalies in market prices may not result from behavioral biases, but rather because of a misspecification of systematic risk. For example, if a share is traded by both rational and non-rational ('noise') investors, it may have an additional risk premium which will drive the share price in the 'wrong' direction as a result of a sudden, unjustified change in their expectations for the share.
Ritter (2003) argues that if it is easy to take positions (shorting overvalued stocks or buying undervalued stocks) and these misvaluations are certain to be corrected over a short period, then “arbitrageurs” will take positions and eliminate these mispricings before they become large. But if institutional barriers such as short sales constraints, for instance, make it difficult to assume such positions, or if there is no guarantee that the misvaluations will be corrected within a reasonable timeframe, then arbitrage will fail to correct them. If anything, arbitrageurs may even choose to avoid the markets where the mispricing is most severe, because the risks may be too severe. This is especially true when one is dealing with a large market, such as the Japanese stock market in the late 1980s or the U.S. market for technology stocks in the late 1990s. Arbitrageurs that attempted to short Japanese stocks in mid-1987 and hedge by going long in U.S. stocks were proven correct in the long run, but they lost vast sums amounts of money in October 1987 when the U.S. market crashed by more than the Japanese market (because of Japanese government intervention). Arbitrageurs, due to their own wealth constraints, would be forced to cover their positions just when the relative mispricing was greatest, resulting in additional buying pressure for Japanese stocks just when they were most overvalued.

IV. Strategies for Individual Investors

The preceding discussion has reviewed human behavioral biases and the manner in which they impair sound decision-making and hurt investor pocketbooks. Strategies that would be most beneficial to individual investor decision-making, at their core, require self-awareness and discipline. Specifically, investors can immunize themselves from these biases by following the following strategies:

1. **Understanding biases:** Recognition of biases in oneself and others can be the first step in avoiding them.
2. **Being aware of the reasons for investing:** Vagueness in articulating investment objectives such as “I want to retire rich” provide little investment direction. Specificity and quantification of goals such as “I want to retire in 10 years. A minimum of $100,000 of income per year in retirement would enable me to take two overseas vacations annually, and an investment income of $1.2 million would generate the desired annual income”. This quantification eliminates investor myopia and enables one to make informed changes in order to meet a long-term goal.
3. **Quantifying investment criteria:** Quantifying investment goals prevents one from acting on rumors, emotion, and other detrimental biases. The criteria for investing must first meet quantitative benchmarks and can be supplemented by qualitative information such as the firm’s recognition as a producer of quality products.
4. **Diversifying:** The principle of diversification was reinforced when Enron collapsed and $3 million portfolios evaporated in value. Diversification across different industries and across different investment vehicles (stocks, bonds, real estate, precious metals) would limit investment in one’s employer’s stock. This is desirable all of one’s human capital is already invested in the employer-firm.
5. **Controlling one’s investment environment:** This entails checking one’s stocks once per month, trading just once per month on the same day each month, reviewing portfolio annually to track if investments are meeting desired strategies.
6. **Understanding that earning the market rate of return, or even slight underperformance, should not be anathema:** The strategies for earning abnormal profits usually exacerbate cognitive biases and ultimately contribute to lower returns. Portfolio strategies based on indexing inhibit the deleterious effects of biases and wring out the emotion out of investing are, therefore, deemed the most successful.

V. Conclusion

The extent of research in the field of behavioral finance has grown noticeably in the past decade. The field merges concepts from financial economics, psychology and sociology in an attempt to construct a more detailed model of human behavior in financial markets. Currently, no unified theory of behavioral finance exists. Shefrin and Statman (1994) began work in this direction, but so far, most emphasis in the literature has been on identifying behavioral decision-making attributes that are likely to have systematic effects on financial market behavior.

Even as behavioral factors undoubtedly play a role in the decision-making processes of investors, they do not quash all the predictions of efficient market theory; they offer plausible explanations of financial markets which would
otherwise be categorized as anomalous. The current state of research from the efficient market and behavioral perspectives therefore suggests that an inclusive and diverse approach in the choice of theoretical explanations of the behavior of financial markets will be the pragmatic response to the inconclusive results on either side of the debate.

While, on the one hand, investors are not making large sums of money from market anomalies, not many people will disagree that the stock market bubble burst of 2000 or in 2008 is better explained by hubris and irrational exuberance grounded in behavioral finance than by the efficient markets theory. This research benefits individual investors the most as it seeks to create awareness of the various human biases and the costs they impose on their portfolios, and argues for voluntary detachment from the “emotion” inherent in investing.

REFERENCES

Barber, Brad, and Terry Odean, (2001), Boys will be boys: Gender, overconfidence, and common stock investment, Quarterly Journal of Economics, v. 116, 261-292.


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1 The Behavioral Finance Research Initiative established in May, 2004, at The International Center for Finance at the Yale School of Management and the introduction of behavioral finance in the curriculum for the Chartered Financial Analyst ® program administered by the CFA Institute since 2003 are but two prominent examples of the emergence of behavioral finance as a contributor to mainstream finance.

2 .....as the employees of Enron learned, to their devastation, when the firm filed for bankruptcy in December 2001.

3 Financial planners will readily attest to this phenomenon. It was at its most egregious level when the benefits of “old economy”, traditionally “blue chip”, stocks were summarily ignored in the face of one-day returns of 60% during the “heady” dot-com era.

4 Similarly, the short selling of yahoo or any of the high-flying internet stocks would have paid off handsomely had it occurred in April 2000, but potentially, wiped out the short seller if the transaction were initiated at the same time a year earlier.