RATIONAL INVESTORS TO BOUNDED RATIONALITY: A BEHAVIOURAL FINANCE PERSPECTIVE ON TRADITIONAL FINANCIAL MODELS.

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ABSTRACT

The field of behavioural finance is currently being developed into a robust framework within the finance industry. It integrates elements of traditional finance while supplanting others, and establishes connections between theory, empirical findings, and real-world application. Behavioural finance replaces rational people in standard finance with normal people. It replaces mean variance portfolio theory with behavioural portfolio theory and the CAPM and other models where expected returns are determined only by risk with the behavioural asset pricing model. The development of contemporary behavioural finance theories from the conventional framework is examined in this paper & it represents the contribution of behavioural finance to closing the gaps between conventional finance theories and real-world market dynamics. This entails replacing conventional theories of finance with more grounded behavioral theories, such as prospect theory (Kahneman & Tversky, 1979). The goal of this behavioral finance review will directly benefit anyone working in corporate finance, investment management, or personal financial planning. The various subtopics of behavioral finance will also be analysed, which include loss aversion, corporate finance, and momentum/contrarian investing. Section I of the present study introduces the Rationality, Bounded Rationality and emphasises on the importance of Behavioral finance. Section II focuses on the literature evaluation to comprehend the ideas of earlier scholars on the subject. Section III explains the Traditional finance theories, Assumptions & their evolution & contribution. Section IV deals with Behavioural finance theories, their evolution & brief introduction to different type's Behavioral biases particularly Heuristic driven biases & how it can impact on the decision making. Section V deals with key findings & conclusions of the study.

Keywords: Behavioural Finance, Traditional Finance Theories, Decision Making.

SECTION – I: INTRODUCTION

Economists assume that all investors make financial decisions based on reason and logic. A Rational investor will investigate and evaluate different stocks. Before choosing an investment, he or she would take into account variables including economic data, market trends, and financial health. In essence, rational thinking is the process of balancing your

advantages and disadvantages. You think about possible outcomes and use methodical techniques to reach conclusions. This theory assumes that everyone has access to complete and accurate information & can process it without emotional biases. The foundation of the notion of investor rationality is behavioral finance. By taking human emotions into account, this subtly questions established economic models. The dynamics of financial markets can be inferred from your investment decision-making process. The goal of this behavioural finance review is to highlight its importance and also will directly benefit anyone working in corporate finance, investment management, or personal financial planning. Moreover, since many variables are not observable and are challenging for researchers analysing data from actual financial markets to measure or control, the experimental method's tools—the capacity to directly observe, control, and manipulate variables—are sufficient for study in behavioural finance. One effect of this kind of ignorance is stock market crashes. Because of this, behavioral finance is a topic that is quite relevant in the modern era. Financial practitioners can benefit from this field by being able to identify mistakes they have made and others, as well as by comprehending the causes of these mistakes and taking preventative measures. Our goal in this paper is to go over how behavioral finance theories have developed beyond the conventional framework. The relevance of conventional financial theories, the circumstances in which they fall short, and the role that behavioral finance plays in closing these gaps are then critically examined.

SECTION II: LITERATURE REVIEW

(Tversky & Kahneman, 1973) The research gave rise to the idea of behavioural finance. In financial and economic theories at the time, the efficient market hypothesis and expected utility theory predominated, postulating that people would make only rational judgments and maximize the utility of each choice. Behavioural finance is a novel method of studying financial markets that resulted from the challenges faced by conventional theories. This is because certain financial phenomena can be better understood by employing models in which agents are not entirely rational.

(Barberis & Thaler, 2002), the study mentions that earlier many economists believed that Efficient market hypothesis because of Arbitrage. But study found that limits to arbitrage can permit substantial mispricing. Paper also focussed on models of bounded rationality & much more descriptions of behaviour than purely rational models.

(Statman, 1999), as per statman, he gives a more direct explanation of its idea by saying that "People in standard finance are rational." People in behavioural finance are normal". Understanding behavioural biases allows one to gain a greater understanding of the psychology that underlies market participants. It informs us about the reality that we are prone to making certain mistakes due to our psychology, or perhaps more accurately, our human nature. These errors cannot be disregarded since they have the potential to be highly costly in the financial markets.

(Sharpe, 1964), CAPM implies, among other things, that each investor's portfolio should contain a specific combination of hazardous assets. A portfolio that is significantly weighted toward hazardous assets is held by those who seek a high return. "Beta" is a measure of portfolio risk that cannot be eliminated by stock mixing. Sharpe's analysis implies, among

other things, that the expected return on a portfolio that exceeds a riskless return should equal beta times the market's excess return.

OBJECTIVES:

1. To study the Progression of behavioural finance theories from a traditional framework.

2. To study in brief Behavioural biases & their influence on Decision Making.

3. To analyse the limitations of Assumptions of traditional finance theories.

SECTION III: TRADITIONAL FINANCE APPROACH

In economics, the middle of the eighteenth century is regarded as the start of the classical period. Around this time, the idea of utility was developed, measuring people's pleasure with a good or service after they used it (Bernoulli, 2011). The idea of a rational economic man, or homo economicus, who seeks to maximize his financial well-being given the limitations he faces was first presented by John Stuart Mill in 1844. For this agent, perfect rationality, perfect self-interest, and perfect information are the three fundamental presumptions. These presumptions became the foundation of the conventional financial framework that looked for solutions in equilibrium by optimizing each person's marginal utility subject to situational limitations. "The capital asset pricing theory of Sharpe, and Black, the option pricing theory of Black, Scholes, and Merton, the portfolio principles of Markowitz, and the arbitrage principles of Miller and Modigliani are the cornerstones of standard finance." The goal of standard finance theories is to provide mathematical justifications for real-world financial issues. Their fundamental premise is that people are Rational (Statman, 1999). The summary of these classical scholars is given in Table 1, which begins with the anticipated utility theory, which is the standard theory of individual choice. Then, the capital asset pricing model and the Markowitz portfolio model, which are the classical models in asset pricing theories, are presented. The efficient market hypothesis, one of the most frequently cited and harshly criticized ideas, brings the issue to a close.

Table 1: Traditional Finance Theories

Author	Year	Findings
John Stuart Mill	1884	Concept of Homo Economicus
Von Neumann & Morgenstern	1944	Expected Utility Theory
Bernoulli	1954	
Harry Markowitz	1952	Markowitz Portfolio Theory
Treynor, Sharpe, Jan Mossin	1962,1964,1966	Capital Asset Pricing Model
Eugene Fama	1970	Efficient Market Hypothesis

Expected Utility Theory says that the projected utility values of the different options are compared by market players to make decisions under risk. The goal of rational investing is to maximize expected utility, which is determined by multiplying utility values by the corresponding probabilities and then weighting the results. It divides decision-makers into three groups: those who love risk, those who are risk averse, and those who are risk neutral.
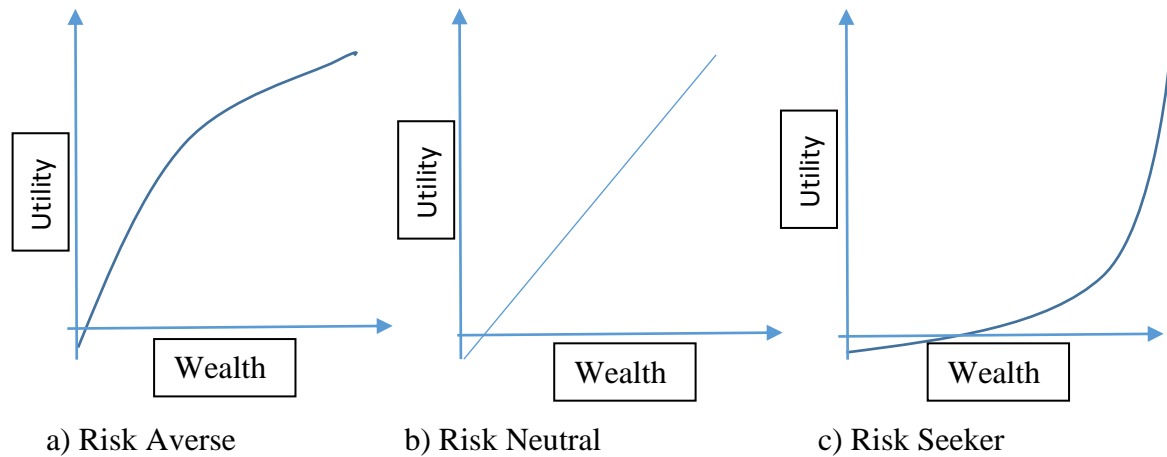
Figure 1: Expected Utility Function

(Fabozzi et al., 2011), **Markowitz** presents the model for selecting a portfolio. It explains how to build an ideal portfolio by choosing a few high-risk stocks along with a low-risk asset. It is concerned with either limiting risk for a given amount of expected return or optimizing the portfolio's expected return for a given level of risk. It contributes to portfolio diversification by choosing stocks that offer the best possible risk-return ratio. The foundation of the capital asset pricing model one of the most important asset pricing models in finance, was Markowitz portfolio theory.

Capital Asset Pricing Model is developed by Sharpe, Linter & Mossin (Sharpe, 1964), It provides the relationship between an asset's predicted return and risk. We list the fundamental tenets of the CAPM.

1. In a market where investors are price takers and their trades have no effect on the securities prices, perfect competition exists.

2. Since all investors are logical, they would all aim to maximize their personal portfolio's risk-return trade-off.

3. Only financial assets that are listed on a public exchange may be invested in. Private company assets and other non-traded assets are not included.

4. Investors do not pay any taxes on returns & there are no Transaction Cost on Trading Securities.

5. Investors have homogeneous expectations because they are as similar as possible and examine the securities in the same way.

The premise of ***Efficient Market Hypothesis***, which Fama introduces and explains, is the foundation of several asset pricing theories (1970). According to him, an efficient financial market is one in which the prices of securities always accurately represent the information that is accessible. In other words, if the efficient market hypothesis (EMH) is correct, investors have little chance of outperforming the market, and more research will not produce unusual returns.

Theoretical & Empirical Assumptions of Efficient Market Hypothesis:

1. It is believed that investors are logical. As a result, they fairly value the securities by taking into account all relevant data.

2. Furthermore, arbitragers' trading actions eliminate the impact of irrational investors on pricing.

EMPIRICAL FOCUS OF EMH HAS TWO ASPECTS:

It starts by taking fresh information's effect on securities prices into account. It specifies that any new information in the market must be promptly and accurately reflected in the prices of the securities so that any price trends or reversals cannot occur after the news' first impact.

Second, since a security's price is equal to its worth, it should only fluctuate in response to news of a shift in the security's underlying value.

(Fama, 1970) divides the historical data into three categories, resulting in three different types of market efficiencies: weak, semi-strong, and strong.

1. Weak Form- Although new information that is not yet publicly available may not be reflected in securities prices, the weak form of the Efficient Market Hypothesis (EMH) implies that all available public market information is reflected in securities prices. According to the weak form Efficient Market Hypothesis (EMH), technical trading strategies are not able to consistently provide excess profits since historical price performance is not able to forecast future price movement based on fresh information.

2. Semi Strong Form- Both technical and fundamental analysis are deemed useless in the semi-strong version of the idea. The semi-strong form of the Efficient Market Hypothesis (EMH) builds upon the assumptions of the weak form by positing that prices react promptly to new information that becomes accessible to the public. Consequently, it is deemed impossible for fundamental analysis to anticipate future price movements.

3. Strong Form- Prices always reflect all available information, both public and private, according to the strong form of the Efficient Market Hypothesis. This covers any information that is freely accessible to the public, including insider knowledge as well as information that is recent. Therefore, the strong variant of the Efficient Market Hypothesis (EMH) states that investors cannot continuously outperform the general market average through predictive edge provided by insider knowledge.

SECTION IV: BEHAVIOURAL FINANCE APPROACH

Table 2 Behavioural Finance Theories:

Author	Year	Theory/Model
Herbert Simon	1955	Model of Bounded Rationality
Tversky & Kahneman	1973,1974	Introduction to heuristic Biases: Availability, Anchoring Representativeness
Tversky & Kahneman	1979	The Prospect Theory
Richard Thaler	1985	Mental Accounting Bias
De Bondt Thaler	1985	Theory of Overreaction in Stock Markets.

Meir Statman	1999	Behavioural Asset Pricing Theory & Behavioural portfolio Theory.
Andrei Shleifer	2000	Linkage of Behavioural finance with efficient market hypothesis to find stock markets are inefficient.
Grinblatt & keloharju	2001	Role of behavioural factors in determining Trading Behaviour.
Barberis & Thaler	2003	Survey of Behavioural Finance

Behavioural Finance claims that markets are not efficient even when they are hard to beat, investors do not base their portfolio decisions on mean-variance theory, and expected returns are determined by factors other than risk. Investors are also described as "normal," not rational (Statman, 1999). Alternatively, they support notion of **Bounded Rationality** given by (Simon, 1952) According to this view, people's ability to be rational is limited by the knowledge at their

Disposal as well as the cognitive capacities of their minds. The stock market bubble, such as the dot-com bubble of the 1990s, is one of the most obvious examples of this oddity (Trousdale, 2014). The two psychologists, Amos Tversky and Daniel Kahneman, are recognized for their ground breaking contributions to behavioral finance. They presented the idea of **Prospect Theory**, which is used to analyse risk-averse decision-making. Behavioral finance is thought to be based on this notion. It was created as a substitute model for the theory of expected utility. Prospect Theory has three key Aspects:

Aspect 1- Depending on the nature of the prospect, people can display risk-loving or risk-aversion behaviours. This is due to the fact that individuals place less importance on probable outcomes than on certain ones. They therefore take less risk when making decisions with certain profits and more risk when making decisions with certain losses. Another name for it is the certainty effect.

Aspect 2- Individuals value experiences more highly than tangible possessions. Two different mental processes are at work here. These are assessment and editing. The prospects are ranked using heuristics (rules of thumb) during the editing stage, and during the evaluation stage, a reference point that offers a relative foundation for calculating gains or losses is considered.

Aspect 3- When the same amount of weight is gained, the weight age assigned to gains is lower. This is a result of people's aversion to losses since they seem more significant than profits. We refer to this as loss aversion.
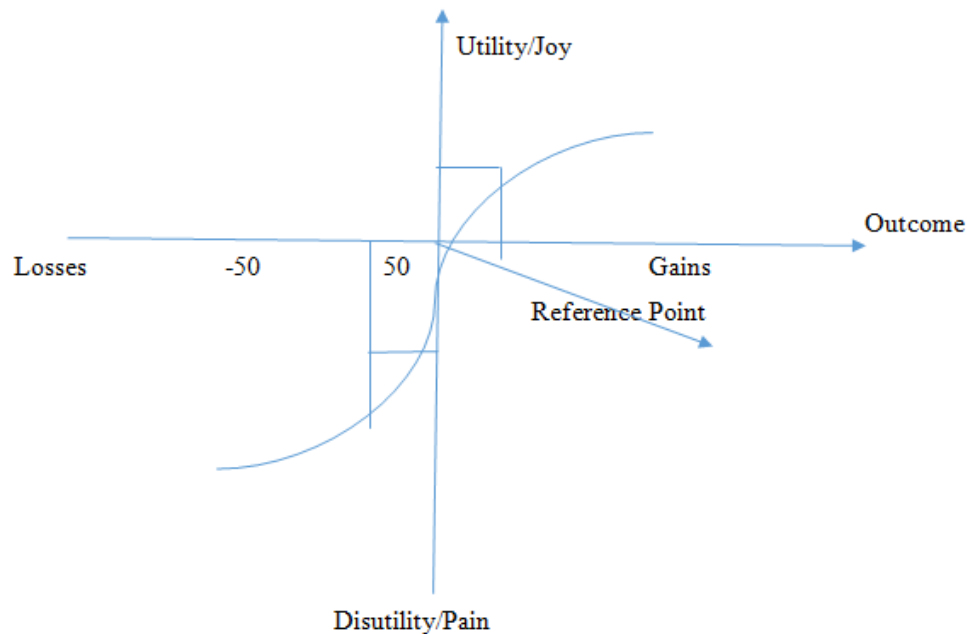
PROSPECT THEORY

Figure 2: Value Function in Prospect Theory (Kahneman &Tversky,1979)

 In the above graph, the gains curve is plotted in the first quadrant, indicating an upward trend in gains, and the loss curve is plotted in the third quadrant, indicating a downward trend in losses. These two curves, which represent gains and losses, are oriented in opposite directions. Graph illustrates that $50 Gain gives less joy as compared to the pain of losing $50. In other words a $50 loss gives more pain as compared to joy of a $50 gain & that's because people treat perceived gains and losses differently, the pain from the loss is much higher than the joy of an equivalent gain.

The *efficient market hypothesis* was also contested in the 1990s and 2000s by a number of scholars, including Andrei Shleifer and Robert Shiller. Shleifer (2000) offers an alternate method for using behavioural finance to investigate financial markets. The author admits that arbitrageurs with resources constrained by risk aversion, short time horizons, and agency issues compete against irrational investors in real financial markets. He offers behavioural theories to account for a number of oddities in the market, like the value companies' better performance, the closed-end fund puzzle, and the higher returns on the stocks that make up market indices, collapse of several well-known Hedge funds in 1988.

Some of key Points highlighted by Shleifer are:

1. Investors are not always rational. The majority of investors respond to unrelated information or make trades based more on noise than on facts.

2. These investors are vulnerable to a number of biases, including overreaction, loss aversion, representativeness, the disposition effect, and restricted framing.

3. According to the study, arbitrage is dangerous and thus restricted in real-world scenarios, in contrast to the EMH. Since the availability of identical or substantially

comparable replacements is a need for any arbitrage, securities may not always have such close alternatives.

He focuses on how investor perception, in addition to psychological and cultural elements, contributed to the DJIA's bubble phase in the late 1990s. The literature described above provides evidence that the peculiarities of stock markets cannot be explained by conventional finance theories alone. Recently, scholars have realized how critical it is to include behavioural aspects in addition to the classic theories in order to have a more accurate understanding of how stock markets operate. We will discuss some of the behavioural irrationalities that have been noted by renowned psychologists in the next part, along with how these inclinations may lead to abnormalities in the financial markets.

SECTION IV: INTRODUCTION TO BEHAVIOURAL BIASES

(Shefrin, 2002) broadly classifies these biases in two types: Heuristic driven biases & frame dependent biases.

Heuristic driven biases: Shefrin (2002) acknowledges that when processing data and reaching judgments, financial professionals employ heuristics or rules of thumb. For example, people think that historical performance is the best indicator of the stock's future performance. The author classifies these biases under the heuristic theme, which encompasses excessive optimism and pessimism, anchoring and adjustment, reinforcement learning, and overconfidence.

Frame Dependent Biases: The way financial professionals provide their options has an impact on their decision-making process as well. Biases such as the disposition effect, mental accounting, and restricted framing are included in this theme.

HEURISTIC DRIVEN BIASES:

In the 1950s, Herbert A. Simon, a cognitive psychologist and economist, proposed the idea of heuristics, arguing that rational decision-making had limitations. In the 1970s, psychologists Amos Tversky and Daniel Kahneman added to the field with their research on cognitive bias. It was their work that introduced specific heuristic models, a field which has only expanded since. While some argue that pure laziness is behind the heuristics process, this could just be a simplified explanation for why people don't act the way we expected them too.

Overconfidence: It is defined as the investors' tendency to overestimate the precision of their knowledge about the value of a security. Overconfidence is one of the most highly researched biases with abundant empirical findings. Gervais & Odean (2001) To estimate overconfidence, they create a multi-period market model. They suggest that investors who have seen large profits are more likely to be overconfident and trade more frequently. As a result, overconfidence causes trade volume to rise.

Anchoring: When people are required to estimate an unknown value or quantity, this bias becomes relevant. In this case, people begin estimating by speculating on a starting value, or "anchor." The final estimate is then obtained by fine-tuning and adjusting this anchor. Campbell & Sharpe, They discover that predictions for any particular release were based on the release's realized values in the previous months, which led to predicted surprises. This impact holds true for every major release. Both availability bias and representativeness have

the potential to cause overreactions in stock markets and investors. Lastly, the impact of adjustability and anchoring Bias may cause profit surprises to be expected. (Campbell & Sharpe, 2009) investigate the presence of anchoring bias in analyst's forecast of monthly economic releases for a period of 1991 to 2006.

Availability Bias: In this instance, people base their assessment of an outcome's likelihood on how common or familiar it is. Individuals who are susceptible to availability bias are more likely to remember or understand situations that are easy for them than to remember or understand experiences that are more difficult. (Kliger & Kudryavtsev, 2010) identify this bias in investors 'reaction to analysts'.

Representativeness: It is the propensity for people to calculate the probability of an occurrence by contrasting it with an earlier instance that they already have in their memories. Generally speaking, they view this present episode as the most pertinent or typical illustration of the current situation. Investors tend to buy stocks with recent positive abnormal returns. The heuristic that the historical price trend is indicative of the future price trend is supported by this.

Disposition Effect: It is defined as the tendency of investors to hold on to losing stocks & sell winning stock early. This concept is based on the implications of prospect theory. Odean uses market data on 10,000 individual investor discount brokerage accounts to show that the disposal impact exists. The disposition impact is calculated in his study using the ratio of realized gain over total gains (also known as the proportion of gains realized, or PGR) and the ratio of realized loss over total loss (also known as the proportion of loss realized, or PLR). He discovers that most investors are hesitant to acknowledge their losses. Along with other empirical researches & empirical evidences on the disposition effect shows that this bias has an impact on trading volume of stocks.

SECTION V: KEY FINDINGS

Through this paper we found out how behavioural finance developed from conventional finance ideas. It covers a number of conventional theories, including the efficient market hypothesis, the Markowitz portfolio model, the capital asset pricing model, and anticipated utility theory. All of these theories are regarded as foundational to the field of finance and have greatly influenced financial study throughout the years. The underlying presumptions of these theories are the efficiency of the market and the rationality of people. However, when these ideas failed to adequately explain market anomalies, their applicability in real-world situations was called into question. The constraints of conventional finance theories are lessened by behavioural finance. Concepts like the prospect theory, behavioral portfolio theory, behavioural asset pricing theory, and inefficient markets evolved as a result of behavioural finance's ability to give academics a more grounded perspective. So the impact of biases plays a major role in stock market anomalies.

CONCLUSION

In addition to introducing certain significant behavioral biases that are either frame dependent, such as loss aversion and limited framings, or heuristic driven, such as

representativeness, availability, anchoring, and adjustment, these notions integrated the psychological aspects of the investor thought process. The stock market is significantly impacted by these prejudices. According to earlier studies, the stock market's overreaction (under reaction) is caused by heuristics including representativeness, availability, and anchoring. However, other heuristics, such as optimism and overconfidence, can lead to speculative bubbles and an increase in trade volume. Herding and status quo bias are two more biases that are equally significant to the heuristic and frame dependent biases. One of the main causes of speculative bubbles in the stock market is herd mentality combined with optimism. Additionally, stock market crashes are caused by herding. The status quo bias is another pertinent bias. When making decisions, people with this bias attempt to stick to their current stance rather than selecting options they aren't confident about. Understanding these biases is essential for financial professionals such as analysts and portfolio managers as well as investors in order to understand market sentiment and provide investors with advice that maximizes their profits. It makes people more aware of their psychological mistakes while making decisions, but it offers no guidance on how to take advantage of any irrationality in terms of money.

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