A

LECTURE NOTE ON

Behavioural Finance (BF)

4th Semester

MBA

By

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BEHAVIOURAL FINANCE

MBPC4004 BEHAVIOURAL FINANCE (3-0-0)

Course Objectives:

1. Explore the intellectual foundations and evolution of behavioral finance, contrasting it with conventional finance theories.
2. Understand the psychological underpinnings and biases affecting financial decision-making, such as framing, mental accounting, and loss aversion.
3. Analyze the impact of investor sentiments, emotions, and external influences on market dynamics and bubble formation.
4. Discuss future directions in behavioral finance, including neurofinance, and address challenges in applying behavioral insights to financial planning.

Module- I

Introduction to behavioural finance; Intellectual underpinnings; The rise of the rational markets hypothesis; behavioral finance and conventional finance: A comparison; Foundation of Rational Finance: Expected utility theory, Agency theory; The influence of psychology: Allais paradox, Money illusion, Gambler's fallacy, Endowment effect, Ellsberg's paradoxes.

Module –II

Foundation of Behavioural Finance: cognitive psychology and Limits to arbitrage, Prospect Theory, Biases and Heuristics: Framing and Mental Accounting, Overconfidence, Loss Aversion, Concept of Heuristics; Familiarity & Related Heuristics; Representativeness & Related biases; Anchoring as a bias; Emotional Bias, Bounded Rationality.

Module III:

Investors sentiments and Bubble creation, Fear and Greed in Financial Market and the effect of External influence in stock market. Future Direction in Behavioural Finance; Neurofinance; Issues in applying Behavioural Finance; Behavioural Components of Financial Planning.

Course Outcomes:

CO-1: Identify the conceptual framework of behavioural finance based on traditional and modern theories.
CO-2: Examine the psychological aspects and challenges underlying the issue of rational and irrational behaviour
CO-3: Utilize the understanding of the concepts to help promote more efficient financial decisions for investors, professional traders and corporate.
CO-4: Integrate the knowledge of behavioural finance to predict and solve social ills like gambling.

Reference Books:

1. Behavioral Finance: Sinha PK - Himalaya
2. Behavioral Finance: Prasanna Chandra, McGraw Hill
3. Behavioral Finance: Shuchita Singh and Batt, Vikas.
4. Behavioural Finance, Forbes, William, Student ed, Wiley Publication
5. Choices, values and frames, Kahneman, D. and Tversky, A. Cambridge Univ. Press.

MODULE I - Introduction to Behavioural Finance

Behavioural Finance is the study of how psychological factors influence the financial decision-making of individuals and markets. Unlike traditional finance, which assumes that investors are rational and markets are efficient, behavioural finance recognizes that human behaviour is often influenced by emotions, cognitive biases, and social factors.

Traditional finance assumes that:

- Investors are fully rational decision-makers.
- Markets are efficient and reflect all available information.

However, in reality, these assumptions often fail. Investors are influenced by fear, greed, overconfidence, and other emotions, which can lead to systematic errors in decision-making. Markets, therefore, can experience anomalies such as excessive volatility, speculative bubbles, and sudden crashes.

For example, during a **stock market bubble**, the price of an asset rises significantly above its intrinsic value. Initially, investors buy due to strong fundamentals, but as prices continue to rise, more participants enter the market driven by **herd behaviour**. The thought process becomes: *"Everyone is making profits, so I should invest too."* Overconfidence and greed further fuel demand, inflating prices even beyond reality. Eventually, when reality sets in, panic selling occurs, leading to a sharp decline or market crash. This cycle demonstrates how psychological factors, rather than rational analysis, can dominate market outcomes.

Behavioural finance, therefore, provides a **realistic understanding of investor behaviour** and helps explain phenomena that traditional finance cannot account for.

Intellectual Underpinnings of Behavioural Finance

Behavioural finance is **interdisciplinary**, drawing insights from psychology, economics, and finance to explain real-world financial behaviour.

- **Psychology** studies human behaviour, emotions, and cognitive biases. It explains why individuals make irrational decisions, such as holding onto losing stocks, overreacting to news, or following heuristics like anchoring and representativeness.
- **Economics** provides a framework for understanding the allocation of scarce resources. Traditional economic models assume rational decision-making, but behavioural finance incorporates psychological deviations from rationality to explain inconsistent choices under uncertainty.
- **Finance** focuses on investment decisions, pricing of assets, and market dynamics. Traditional models such as the Efficient Market Hypothesis or Expected Utility Theory assume rationality, but behavioural finance extends these models to include psychological influences like loss aversion and investor sentiment.

The need for behavioural finance arises because **traditional theories fail to explain real-world phenomena** such as:

- Market crashes
- Excessive volatility
- Irrational investor behaviour

By integrating psychology with economics and finance, behavioural finance provides a more complete and realistic framework for understanding financial decisions and market anomalies.

Rational Markets Hypothesis (Efficient Market Hypothesis – EMH)

The Efficient Market Hypothesis (EMH) is a core concept in traditional finance which suggests that **asset prices fully reflect all available information**. According to this theory, it is impossible for investors to consistently earn above-average returns because markets instantly incorporate new information.

EMH is based on the following **assumptions**:

- Investors are rational and always make decisions that maximize wealth.
- Information is freely available and interpreted correctly by all participants.
- There are no transaction costs or barriers to trading.

EMH is classified into three forms:

- **Weak form**: Prices reflect all historical market data; technical analysis is ineffective.
- **Semi-strong form**: Prices reflect all publicly available information; fundamental analysis cannot yield excess returns.
- **Strong form**: Prices reflect all information, including private or insider knowledge; even insider trading cannot guarantee abnormal profits.

Despite its significance, EMH has been challenged by behavioural finance. Real-world observations show that investors are not always rational, and psychological biases can lead to **market inefficiencies**, such as bubbles, crashes, and mispricing.

Expected Utility Theory (EUT)

Expected Utility Theory explains how individuals make decisions under risk. It posits that investors choose the option that maximizes their **expected satisfaction (utility)** by considering both the probabilities and the outcomes of different choices.

Assumptions of EUT include:

- Rational decision-making
- Consistency in preferences
- Independence of irrelevant alternatives

However, in practice, individuals often violate these assumptions. Psychological factors, such as fear of losses or overweighing certain outcomes, lead to decisions that contradict the predictions of EUT. For example, the **Allais Paradox** demonstrates that people sometimes prefer a certain but lower payoff over a higher expected payoff, revealing the limitations of traditional utility theory.

Agency Theory

Agency theory examines the relationship between a **principal (owner)** and an **agent (manager)**, highlighting potential conflicts of interest. Managers, acting as agents, may pursue their own goals, such as personal job security or higher compensation, rather than maximizing shareholder wealth.

For example, a manager might avoid taking on a high-risk but potentially profitable project to protect their reputation. To address this, firms implement **mechanisms such as performance-based incentives, monitoring systems, and strong corporate governance** to align the interests of managers with those of shareholders. Agency theory explains how these conflicts can affect financial decision-making and firm performance.

Allais Paradox

The Allais Paradox demonstrates that individuals make inconsistent choices under risk, violating the assumptions of Expected Utility Theory. People often prefer a certain outcome over a probabilistic one, even when the expected value of the risky option is higher. When presented with similar choices in a different format, their preferences may change, showing that human decisions are **influenced by perception of certainty rather than rational calculation**. This paradox highlights the role of psychology in financial decision-making.

Money Illusion

Money illusion occurs when people think in **nominal terms rather than real terms**, ignoring inflation. For example, a 10% salary increase may feel rewarding, but if inflation is 12%, the individual is effectively worse off. This misperception can lead to poor financial decisions and misjudgment of real wealth. Behavioural finance emphasizes the importance of focusing on **real purchasing power** rather than nominal values.

Gambler's Fallacy

Gambler's fallacy is the belief that past random events influence future outcomes. For instance, if a coin lands on heads five times in a row, people may expect tails to occur next, even though each toss is independent. In financial markets, this fallacy can cause investors to make poor predictions, such as expecting a declining stock to rise simply because it has fallen for several days. It demonstrates how cognitive biases distort rational decision-making.

Endowment Effect

The endowment effect refers to the tendency of individuals to **assign higher value to things they own**. For example, a person may purchase an item for ₹100 but demand ₹150 to sell it. In finance, this effect leads investors to hold losing assets for too long or overvalue their investments. Emotional attachment, rather than rational assessment, influences behaviour.

Ellsberg Paradox

The Ellsberg Paradox shows that people **prefer known risks over unknown risks**, a behaviour known as ambiguity aversion. When faced with two options—one with a known probability and one with unknown probability—people tend to choose the known option. This behaviour contradicts traditional rational decision theory and explains why investors may avoid uncertain but potentially profitable investments.

Prospect Theory

Prospect Theory, developed by **Daniel Kahneman and Amos Tversky**, explains how individuals make decisions under risk and uncertainty. It emphasizes that people evaluate outcomes relative to a **reference point** and are more sensitive to losses than equivalent gains (**loss aversion**). The value function is concave for gains (risk-averse) and convex for losses (risk-seeking). This theory provides a more realistic description of investor behaviour than Expected Utility Theory and is fundamental to behavioural finance.

Heuristics

Heuristics are mental shortcuts used to simplify decision-making. While they make decision-making faster, they can lead to **systematic biases**. Examples include:

- **Representativeness**: judging likelihood based on similarity
- **Availability**: relying on easily recalled information
- **Anchoring**: relying too heavily on initial information

These shortcuts help reduce cognitive load but can cause irrational financial behaviour.

Bounded Rationality

Bounded rationality acknowledges that individuals are **rational only within the limits of available information, cognitive ability, and time**. People cannot process all information or evaluate every possible alternative, so they often make decisions that are "good enough" rather than optimal. This concept is central to behavioural finance because it explains why investors deviate from perfect rationality.

Rational Markets Hypothesis (Efficient Market Hypothesis – EMH)

The Efficient Market Hypothesis (EMH), also known as the Rational Markets Hypothesis, is a cornerstone of traditional financial theory. It states that **stock prices fully reflect all available information at any given time**, meaning that securities are always fairly valued. According to EMH, it is impossible for investors to consistently earn returns higher than the market average through either technical or fundamental analysis, because new information is rapidly incorporated into prices. This theory assumes that markets are inherently rational and efficient in processing information.

The EMH rests on several key **assumptions**:

- **Rational investors:** All market participants make decisions logically, seeking to maximize wealth.
- **Availability of information:** Information about securities is freely accessible and interpreted correctly by all investors.
- **Rapid adjustment:** Markets respond quickly to new information, immediately reflecting it in asset prices.

These assumptions form the foundation of EMH and explain why, under this theory, no single investor can consistently outperform the market without taking on additional risk.

EMH is classified into three **forms**, based on the type of information reflected in prices:

1. **Weak Form:** Stock prices reflect all historical market data, such as past prices and trading volumes. Under this form, **technical analysis is considered ineffective** because past patterns cannot predict future prices reliably.
2. **Semi-Strong Form:** Prices reflect all publicly available information, including financial statements, news, and economic reports. In this case, **fundamental analysis cannot consistently generate excess returns** because any new public information is immediately absorbed by the market.
3. **Strong Form:** Stock prices incorporate **all information, both public and private (including insider knowledge)**. According to this form, even insiders with private information cannot achieve abnormal profits consistently.

Despite its elegance and logical appeal, EMH has been **critically challenged** by both empirical evidence and behavioural finance research. Real-world markets often deviate from the assumptions of EMH for several reasons:

- **Investors are not always rational:** Human decisions are influenced by emotions such as fear, greed, and overconfidence, which can lead to mispricing of assets.
- **Market anomalies exist:** Events like speculative bubbles, sudden crashes, and long periods of under- or over-valuation cannot be explained by EMH alone.
- **Emotional and cognitive biases affect prices:** Behavioural factors such as herd behaviour, loss aversion, and overreaction to news can cause prices to deviate significantly from their fundamental values.

For example, during the dot-com bubble of the late 1990s, internet stocks were valued far above their intrinsic worth. Investors, driven by optimism and herd behaviour, kept buying overvalued stocks, ignoring traditional valuation metrics. This clearly demonstrates a failure of the market to be fully efficient and rational, as assumed by EMH.

Behavioural Finance vs Conventional Finance

Behavioural finance and conventional finance represent two different approaches to understanding financial decision-making and market behaviour. While conventional finance is grounded in classical economic theories that assume rationality and efficiency, behavioural finance incorporates insights from psychology to explain how human emotions, cognitive biases, and social factors influence financial decisions.

In **conventional finance**, investors are assumed to be **fully rational**, meaning they consistently make decisions that maximize their wealth based on available information. Their investment decisions are expected to be logical and objective, with a clear assessment of risks and returns. Markets, under this framework, are considered **always efficient**, as prices fully reflect all relevant information. Risk is measured objectively using statistical models such as standard deviation, beta, or value-at-risk, assuming that probabilities of outcomes are known and investors respond rationally to them.

In contrast, **behavioural finance** recognizes that investors are **boundedly rational**. This means that while they attempt to make rational decisions, their choices are constrained by **cognitive limitations, emotions, and incomplete information**. Decisions are often influenced by biases such as overconfidence, loss aversion, anchoring, and herd behaviour. Consequently, markets are **sometimes inefficient**, as prices can deviate from fundamental values due to collective irrational behaviour, speculative bubbles, or panic-driven sell-offs. Risk in behavioural finance is **subjectively perceived**, meaning that the same financial outcome may be interpreted differently by different investors depending on their emotions, reference points, and personal experiences.

To summarize the main differences:

- **Investor Behaviour:**
  - Conventional Finance: Fully rational, makes logical decisions.
  - Behavioural Finance: Bounded rational, influenced by emotions and cognitive biases.
- **Decision-Making:**
  - Conventional Finance: Decisions are objective and based on logical analysis.
  - Behavioural Finance: Decisions are affected by psychology, emotions, and heuristics.
- **Market Efficiency:**
  - Conventional Finance: Markets are always efficient; prices reflect true value.
  - Behavioural Finance: Markets are sometimes inefficient due to irrational investor behaviour.
- **Risk Perception:**
  - Conventional Finance: Risk is measured objectively using mathematical models.
  - Behavioural Finance: Risk is perceived subjectively, often leading to overestimation or underestimation of potential losses.

For example, during a speculative stock market rally, conventional finance would suggest that prices reflect the intrinsic value based on expected earnings and economic fundamentals. Behavioural finance, however, explains why prices may surge far beyond intrinsic value as investors become **overconfident**, follow the herd, and ignore warning signals. Similarly, a market crash is better understood through behavioural lenses as fear and panic drive irrational selling, not simply a rational revaluation of assets.

Foundations of Rational Finance

Rational finance forms the basis of traditional financial theory, assuming that investors and market participants are rational decision-makers who evaluate options logically to maximize their wealth. Two key components of rational finance are **Expected Utility Theory (EUT)** and **Agency Theory**, both of which provide frameworks to understand decision-making under risk and the relationship between owners and managers in organizations.

1 Expected Utility Theory (EUT)

Expected Utility Theory is a fundamental concept in economics and finance that explains how individuals make decisions when faced with risk. According to this theory, people evaluate each possible outcome of a decision by its **utility**—a measure of satisfaction or benefit—and weigh it by the **probability** of that outcome occurring. They then choose the option that maximizes their **expected utility**, which can be expressed mathematically as:

{Expected Utility} = {Probability of outcome} X {Utility of outcome}

The key **assumptions** underlying EUT include:

- **Rational preferences:** Individuals have clear, consistent preferences among different choices.
- **Consistency in choices:** Decisions are logically coherent and stable over time.
- **Risk evaluation based on logic:** People evaluate risk objectively, considering probabilities and potential outcomes.

While EUT provides a structured way to understand decisions under uncertainty, it has several **limitations** in explaining real-world behaviour. In practice, people often make choices that violate rationality due to emotions, biases, or misperceptions of risk. For example, paradoxes such as the **Allais Paradox** demonstrate that individuals sometimes prefer a certain but lower payoff over a higher expected payoff, contradicting the predictions of EUT. Behavioural finance addresses these limitations by incorporating

psychological factors such as loss aversion, overconfidence, and bounded rationality into the analysis of decision-making.

2 Agency Theory

Agency Theory examines the relationship between two parties in an organization: the **principal**, who is the owner or shareholder, and the **agent**, who is the manager responsible for making decisions on behalf of the principal. While principals expect managers to act in the best interest of the organization, **conflicts of interest** may arise if managers pursue personal goals instead of maximizing shareholder wealth.

The **principal-agent problem** occurs when agents take actions that benefit themselves at the expense of the principal. For example, a manager might avoid undertaking a risky but profitable project to protect their own job security or reputation, even though such a project could increase shareholder value. Similarly, managers may engage in excessive risk-taking if their personal compensation is tied to short-term performance metrics, potentially endangering the long-term interests of the organization.

To mitigate agency problems, firms implement **mechanisms to align incentives**, such as:

- Performance-based compensation, including bonuses or stock options
- Monitoring systems, such as audits and supervisory oversight
- Corporate governance practices that ensure accountability

Agency theory is critical in finance because it explains how conflicts between owners and managers can influence financial decision-making, investment choices, and overall firm performance. It also highlights the importance of designing proper incentives and controls to ensure that organizational goals are met efficiently.

Influence of Psychology on Finance

Behavioural finance emphasizes that **psychological factors play a crucial role** in financial decision-making. Traditional finance assumes that investors are perfectly rational and make decisions purely based on logic and information. However, research in psychology has shown that human behaviour is influenced by emotions, cognitive biases, and heuristics. These factors often lead to decisions that deviate from the predictions of classical financial theories. Several key psychological phenomena illustrate how these biases affect financial behaviour:

1 Allais Paradox

The **Allais Paradox** demonstrates that individuals often make **inconsistent decisions under risk**, thereby violating the assumptions of Expected Utility Theory. In particular, people tend to prefer **certainty over probabilistic outcomes**, even when the probabilistic choice has a higher expected value. For example, given a choice between a guaranteed gain of ₹1,000 or a 90% chance to gain ₹1,500, many individuals prefer the guaranteed ₹1,000. However, when the same options are framed differently, their preferences can change. This paradox highlights that human decision-making is **not always rational** and is strongly influenced by the desire to avoid uncertainty.

2 Money Illusion

Money illusion occurs when individuals focus on **nominal monetary values** rather than real purchasing power. People may perceive a nominal increase in income as an improvement in wealth, even when inflation erodes their real gains.

Example: Suppose an employee receives a 5% salary increase while inflation is 6%. In real terms, the purchasing power of their income has actually decreased. Despite this, the employee may feel "richer" because the nominal salary has increased. Money illusion can affect personal finance, wage negotiations, and investment decisions, often leading to choices that are **suboptimal from a real wealth perspective**.

3 Gambler's Fallacy

The **Gambler's Fallacy** is the mistaken belief that past random events influence future outcomes. People often assume that a series of similar outcomes increases the likelihood of the opposite outcome occurring, even when events are independent.

Example: If a coin lands on heads five times in a row, an individual may believe that tails is "due" on the next toss. In reality, each coin toss is independent, and the probability remains 50% for each outcome. In financial markets, gambler's fallacy can cause investors to make **irrational trading decisions**, such as expecting a stock to rise simply because it has declined for several consecutive days.

4 Endowment Effect

The **endowment effect** refers to the tendency of individuals to **assign greater value to things they own** compared to identical items they do not own. Ownership creates a sense of attachment, which increases the perceived value of the asset.

Example: A person may purchase an item for ₹100 but demand ₹150 to sell it, even though they would not pay ₹150 to buy the same item. In financial markets, the endowment effect can lead investors to **hold onto losing investments for too long**, overvaluing assets they own and delaying rational selling decisions.

5 Ellsberg Paradox

The **Ellsberg Paradox** demonstrates that people prefer **known risks over unknown risks**, a behaviour called **ambiguity aversion**. When faced with two options—one with a known probability and another with an uncertain probability—individuals often choose the option with a known outcome, even if the expected returns are similar.

This paradox highlights that **uncertainty or ambiguity** has a strong influence on decision-making. In finance, this can explain why investors sometimes avoid profitable opportunities that involve uncertain probabilities, preferring safer but potentially lower-return investments.

MODULE II: BEHAVIOURAL FINANCE THEORIES & BIASES

Cognitive Psychology in Behavioural Finance

Cognitive psychology is the study of how people **perceive, process, and interpret information** to make decisions. It explores the mental processes involved in understanding, reasoning, and problem-solving. In the context of finance, cognitive psychology helps explain why investors often make decisions that **deviate**

from purely rational models. It provides the theoretical foundation for many behavioural finance concepts, such as heuristics, biases, and bounded rationality.

A key idea in cognitive psychology is that humans rarely process information **perfectly or exhaustively**. Instead of carefully analysing all available data and calculating the optimal choice, people often rely on **mental shortcuts**, known as **heuristics**, to simplify complex decisions. While these shortcuts reduce cognitive effort and speed up decision-making, they can also introduce **systematic errors** or biases.

For example, when evaluating a stock investment, an investor may:

- Focus on **recent news or past performance** (availability heuristic) rather than long-term fundamentals.
- Anchor on the initial price of the stock, giving it undue influence over subsequent decisions (anchoring bias).
- Judge a stock as representative of a "successful company" because it shares characteristics with previously successful stocks, even if the actual probability of success is low (representativeness heuristic).

These shortcuts demonstrate that decision-making is **bounded by cognitive limitations**, such as limited memory, attention, and computational ability. People are not purely logical; their choices are shaped by perception, prior experience, and context. Cognitive psychology, therefore, provides the foundation for understanding why financial decisions often depart from the assumptions of **Expected Utility Theory** or **Efficient Market Hypothesis**.

Limits to Arbitrage

In traditional finance, arbitrage is considered a mechanism that ensures market efficiency. **Arbitrageurs** exploit price differences between similar or identical assets, buying undervalued securities and selling overvalued ones, with the expectation that prices will eventually converge to their true value. According to conventional theory, this process should eliminate mispricing in markets.

However, behavioural finance highlights that even when markets are inefficient, **arbitrage opportunities may not be fully exploited**, and mispricing can persist for extended periods. This is due to the concept of **limits to arbitrage**, which refers to practical constraints that prevent rational investors from correcting market inefficiencies.

The main reasons why arbitrage is limited include:

- **Risk:** Arbitrage is not risk-free. Prices may diverge further before converging, leading to potential losses for the arbitrageur. For instance, if an investor shorts an overvalued stock, the price could continue rising in the short term due to irrational buying by other market participants, exposing the arbitrageur to significant losses.
- **Transaction Costs:** Real-world trading involves costs such as brokerage fees, taxes, and bid-ask spreads. These costs reduce the profitability of arbitrage strategies and sometimes make them **uneconomical**, especially for small mispricing opportunities.
- **Lack of Perfect Substitutes:** Arbitrage relies on the ability to trade comparable or identical assets. In many markets, perfect substitutes may not exist, or assets may differ in ways that make arbitrage difficult. For example, short-selling a stock to arbitrage a pricing discrepancy might be impossible if there are **restrictions on borrowing shares**, or if the substitute asset behaves differently due to liquidity or dividend differences.

Due to these limitations, mispricing can persist for longer than traditional finance predicts. For example, during speculative bubbles, stocks can remain overvalued for months or even years, despite the presence of informed investors capable of arbitrage. This shows that **market inefficiencies are not automatically corrected** and that psychological factors, such as herd behaviour or overconfidence, can amplify deviations from fundamental values.

Prospect Theory

Prospect Theory, developed by **Daniel Kahneman and Amos Tversky**, is a cornerstone of behavioural finance that explains how people make decisions under risk and uncertainty. Unlike traditional Expected Utility Theory, which assumes that individuals evaluate outcomes purely based on final wealth and act rationally, Prospect Theory recognizes that **people evaluate outcomes relative to a reference point** and are influenced by psychological biases, particularly **loss aversion**. This theory provides a more realistic understanding of investor behaviour in financial markets.

One of the **key features** of Prospect Theory is **loss aversion**. According to this principle, **losses have a stronger emotional impact than equivalent gains**. For example, losing ₹1,000 feels more painful than the pleasure derived from gaining ₹1,000. This asymmetry in perception explains why investors often hold onto losing stocks too long, hoping to avoid realizing a loss, or why they may sell winning stocks too quickly to secure a gain.

Another important concept is the **reference point**. Individuals evaluate outcomes relative to a reference point, which could be their current wealth, a target price, or an expected return. Gains and losses are not assessed in absolute terms but are **perceived relative to this reference point**. For instance, if an investor expects a stock to rise to ₹120 but it only rises to ₹110, they may perceive a "loss" even though the stock's price has increased. This highlights how expectations and context shape financial decisions.

The **value function** in Prospect Theory further explains decision-making behaviour. The function is:

- **Concave for gains:** People are risk-averse when facing gains, preferring certain but smaller profits over risky but potentially larger ones.
- **Convex for losses:** People are risk-seeking when facing losses, preferring to gamble to avoid realizing a loss rather than accepting a certain but smaller loss.

This combination of **loss aversion, reference points, and the shape of the value function** helps explain several observed behaviours in financial markets, including:

- **Disposition effect:** Selling winners too early and holding losers too long.
- **Excessive risk-taking during downturns:** Attempting to recover losses rather than making rational long-term decisions.
- **Overreaction or underreaction to market news:** Investors' perceptions are shaped more by relative gains/losses than absolute values.

Heuristics (Mental Shortcuts)

In behavioural finance, **heuristics** refer to mental shortcuts or rules of thumb that people use to simplify complex decision-making processes. While heuristics can speed up decisions and reduce cognitive effort, they often lead to **systematic biases** and errors in judgment. Investors rely on these shortcuts when processing large amounts of information, especially under uncertainty or time pressure.

1 Representativeness Heuristic

The **representativeness heuristic** occurs when people make judgments about the probability of an event based on how similar it is to a stereotype or previous experience, rather than considering actual statistical probabilities. Investors often assume that past performance predicts future success, leading to biased decisions.

Example: If a company has shown strong financial growth for several years, an investor may assume it will continue to perform well indefinitely, ignoring potential market risks or changing economic conditions. This can result in **overestimation of probabilities** and excessive confidence in future outcomes, which may lead to mispricing or poor investment decisions.

2 Availability Heuristic

The **availability heuristic** refers to the tendency to make decisions based on information that is **easily recalled or recent**, rather than considering all relevant data objectively. Investors are influenced by vivid news stories, media coverage, or recent market trends, which can distort risk perception and lead to suboptimal choices.

Example: An investor may choose to invest in a stock frequently mentioned in the news, assuming it is a good opportunity, without conducting proper analysis of its fundamentals. This bias can contribute to herd behaviour, speculative bubbles, and overreaction to short-term events.

3 Anchoring Bias

Anchoring bias occurs when individuals rely too heavily on **initial reference points** or past information when making decisions, even if that information is irrelevant. In finance, the first price or valuation an investor encounters often serves as an anchor, affecting subsequent judgments about buying or selling decisions.

Example: An investor purchases a stock at ₹100 and later sees its price drop to ₹80. Despite evidence that the fair value is now lower, they may anchor on the original purchase price and refuse to sell, waiting for it to "return" to ₹100. This behaviour can lead to **holding losing investments longer than rational analysis would suggest**.

Biases in Behavioural Finance

Behavioural finance shows that investors' decisions are often influenced by **cognitive biases and psychological tendencies**, which cause deviations from the rational behaviour assumed in conventional finance. These biases affect both the way people perceive risk and how they act in markets, often leading to systematic errors, mispricing, and suboptimal financial decisions. Some of the most significant biases include:

1 Overconfidence Bias

Overconfidence bias occurs when investors **overestimate their knowledge, skill, or ability to predict market outcomes**. This bias leads to excessive trading, taking on higher risks than intended, and ignoring contrary evidence or market signals.

Effects of overconfidence:

- **Excessive trading:** Investors believe they can time the market or pick winning stocks consistently, resulting in higher transaction costs and lower net returns.
- **Poor decision-making:** Overconfidence can lead to underestimating risk, ignoring diversification, or holding undiversified portfolios.

Example: An investor might repeatedly buy and sell stocks based on "gut feeling" rather than careful analysis, believing they have superior insight, even when historical data suggests their predictions are no better than random chance.

2 Loss Aversion

Loss aversion refers to the tendency to **weigh losses more heavily than equivalent gains**. Individuals experience pain from losses more acutely than pleasure from gains of the same size.

Effects of loss aversion:

- Investors often **hold losing investments too long**, hoping to avoid realizing a loss.
- They may sell winning investments too quickly to "lock in gains," potentially sacrificing higher long-term returns.

Example: A stock purchased at ₹100 falls to ₹80. Even if rational analysis suggests selling is the best option, the investor may retain the stock to avoid acknowledging the loss, leading to further financial harm.

3 Framing Effect

The **framing effect** occurs when the **way information is presented influences decision-making**, even if the underlying facts are the same. People tend to react differently depending on whether outcomes are framed as gains or losses.

Example: An investment described as having a "90% chance of success" may be more attractive than one described as having a "10% chance of failure," even though the probabilities are identical. This bias shows how perception and context can influence financial choices.

4 Mental Accounting

Mental accounting refers to the tendency of individuals to **treat money differently depending on its source or intended use**, rather than evaluating all resources together. People may create separate "mental accounts" for salaries, bonuses, gambling winnings, or investment returns, assigning different risk tolerances and spending rules to each.

Example: An investor may treat a bonus as "extra money" and spend it freely, while being highly risk-averse with their regular salary, even though the total wealth is fungible. Mental accounting can lead to **suboptimal allocation of resources and misjudged investment decisions**.

5 Familiarity Bias

Familiarity bias is the tendency to **prefer investments or financial instruments that are familiar**, such as domestic stocks or companies the investor knows personally, over unfamiliar options. This bias reduces perceived risk but may limit diversification and increase exposure to sector-specific or geographic risks.

Example: An investor may hold a portfolio concentrated in local technology companies because they "understand" them, ignoring potentially better opportunities in international markets or other sectors. Familiarity bias often results in **overconcentration and vulnerability to market shocks**.

Emotional Biases in Behavioural Finance

In addition to cognitive biases and heuristics, **emotions play a powerful role in financial decision-making**. Investors are not purely rational; their choices are often influenced by feelings such as fear, greed, regret, and pride. These emotional biases can lead to **irrational behaviour, market anomalies, and suboptimal investment outcomes**, even when the investor is well-informed.

Fear

Fear is one of the strongest drivers of investor behaviour. It often manifests as **panic during market downturns**, causing investors to sell assets hastily at low prices. Fear can also lead to excessive risk aversion, making investors avoid profitable opportunities due to the possibility of loss.

Example: During a market crash, fear can trigger a **herd reaction**, where many investors sell simultaneously, amplifying the decline in stock prices beyond what fundamentals justify.

Greed

Greed motivates investors to take excessive risks in pursuit of higher returns. It can drive speculative behaviour and contribute to the formation of **bubbles**, where asset prices rise far above their intrinsic value.

Example: In the dot-com bubble, greed led investors to pour money into technology stocks with little regard for profitability, relying instead on the expectation of continuous price appreciation.

Regret

Regret influences decisions when investors anticipate feeling disappointed about past choices. The fear of making a "wrong" investment can cause indecision, excessive caution, or holding onto losing investments too long to avoid the emotional pain of acknowledging a mistake.

Example: An investor may refuse to sell a declining stock to avoid the regret of realizing a loss, even though selling would be the rational choice based on fundamentals.

Pride

Pride or overconfidence in one's abilities can lead investors to **overestimate their knowledge and decision-making skills**, resulting in excessive trading or ignoring contrary information. Pride reinforces the tendency to stick with previously chosen investments or strategies, even when evidence suggests change is necessary.

Example: An investor who has made a few successful trades may develop an inflated sense of expertise and continue taking higher risks, believing their decisions are superior to market averages.

Bounded Rationality

Bounded rationality is a concept introduced by Herbert Simon that recognizes the **limitations of human decision-making**. Unlike traditional finance theories, which assume that investors are perfectly rational and have access to all information, bounded rationality acknowledges that real-world decision-making is constrained by **cognitive, informational, and temporal limitations**.

Investors face three primary constraints:

1. **Limited Information:** Individuals rarely have access to complete or perfectly accurate information. Financial decisions often must be made with **incomplete, noisy, or uncertain data**, which prevents the calculation of an optimal solution. For example, an investor may not know all relevant market signals, economic indicators, or company-specific risks before buying a stock.
2. **Time Constraints:** Decision-making is often **time-sensitive**, especially in fast-moving financial markets. Investors cannot spend unlimited time analyzing every alternative, which forces them to make quick judgments based on **partial analysis** or heuristics.
3. **Cognitive Limitations:** Human cognitive ability to process and analyze complex information is **limited**. Even with sufficient information, investors may be unable to evaluate all possibilities logically and systematically. This leads to reliance on mental shortcuts, rules of thumb, or simplifications that can introduce biases.

Because of these limitations, individuals **satisfice** rather than optimize; that is, they choose solutions that are "good enough" rather than perfectly rational. Bounded rationality explains why investors sometimes make **suboptimal financial decisions**, such as:

- Holding onto losing investments due to incomplete analysis of alternatives.
- Overreacting to recent news without fully considering historical trends.
- Relying on familiar assets instead of diversifying optimally.

Bounded rationality is a cornerstone of behavioural finance because it provides a **realistic framework for understanding investor behaviour**. It shows that markets are influenced not only by rational calculations but also by **human limitations, cognitive biases, and practical constraints**, which can lead to persistent mispricing, bubbles, and other market anomalies.

MODULE III: MARKET BEHAVIOUR & APPLICATIONS

Investor Sentiment

Investor sentiment refers to the overall **mood, attitude, or feelings of market participants** toward the financial markets or specific securities at a given time. Unlike fundamental analysis, which evaluates assets based on intrinsic value, investor sentiment reflects **psychological factors** such as optimism, pessimism, fear, and greed. It captures the collective emotional state of investors and plays a crucial role in driving market dynamics.

Investor sentiment can have a significant **impact on stock prices**. When sentiment is overly positive, investors tend to buy aggressively, often pushing prices above their fundamental value. Conversely, when sentiment is negative, fear can drive selling pressure, causing prices to drop below intrinsic levels. These emotional reactions can result in **market overreactions and underreactions**, where prices move excessively in response to news or fail to adjust appropriately to changes in fundamentals.

Examples of sentiment-driven behaviour include:

- **Overreaction:** During periods of excessive optimism, such as a stock market rally, investors may bid up prices far beyond fair value, creating speculative bubbles. For instance, during the dot-com bubble, enthusiasm for technology stocks led to unsustainable valuations.
- **Underreaction:** During periods of pessimism, investors may ignore positive news, resulting in a slower price adjustment. A company reporting strong earnings may see little immediate impact on its stock price if the market sentiment is predominantly negative.

Investor sentiment is influenced by several factors, including:

- **Media coverage:** Positive or negative news can amplify investor optimism or fear.
- **Economic indicators:** Reports on GDP growth, unemployment, and inflation shape collective expectations.
- **Social and psychological factors:** Herd behaviour, social pressure, and past experiences can reinforce prevailing market moods.

Bubble Formation

A **financial bubble** occurs when the price of an asset rises significantly above its **intrinsic value**, driven more by investor psychology than by fundamentals. Bubbles are a classic example of how **irrational behaviour and collective sentiment** can distort markets. While traditional finance struggles to explain why prices deviate so far from fair value, behavioural finance highlights that **emotions, overconfidence, and herd behaviour** play a central role in creating and sustaining bubbles.

Causes of Bubbles

1. **Overconfidence:** Investors often overestimate their ability to predict market movements or the future potential of an asset. This overconfidence encourages aggressive buying, even when valuations are clearly inflated.
2. **Herd Behaviour:** People tend to follow the actions of the majority, assuming that the crowd must know something they do not. This herd mentality can amplify price movements, driving asset prices higher regardless of underlying fundamentals.
3. **Speculation:** The expectation of future price increases motivates investors to buy assets not for their intrinsic value but to profit from short-term price appreciation. Speculative behaviour fuels rapid price escalation and further detaches the market from fundamentals.

Stages of Bubble Formation

Financial bubbles typically follow a **recognizable progression**:

1. **Displacement:** A new opportunity or innovation captures investor attention, creating initial excitement. This could be a technological breakthrough, deregulation, or low interest rates.
2. **Boom:** Optimism spreads, more investors enter the market, and prices start rising rapidly. Early gains reinforce positive sentiment, attracting additional buyers.
3. **Euphoria:** This is the peak of irrational exuberance. Investors ignore risks and overvalue assets, believing prices will continue to rise indefinitely. Media hype and social influence intensify the frenzy.
4. **Crash:** Eventually, reality sets in as fundamentals fail to justify inflated prices. Panic selling ensues, leading to a sharp decline in asset prices and often severe financial losses.

Example: The **housing bubble of 2008** illustrates this pattern clearly. Displacement occurred with easy credit and low interest rates. The boom was driven by rising housing prices and speculation on mortgage-backed securities. Euphoria peaked as investors believed housing prices would never fall, and the crash came when defaults rose and the market recognized the overvaluation.

Fear and Greed in Financial Markets

Investor behaviour in financial markets is often driven by **emotions**, and among these, **fear and greed** are the most powerful forces shaping price movements. Unlike fundamental analysis, which focuses on intrinsic values, behavioural finance emphasizes that emotions can **override rational decision-making**, causing markets to deviate from their true value. Fear and greed not only affect individual investors but can also influence collective market behaviour, creating cycles of volatility, bubbles, and crashes.

Fear

Fear in financial markets arises from uncertainty, negative news, or sudden price declines. It prompts investors to act defensively, often **selling assets hastily**, even at a loss, to avoid further potential declines.

Effects of fear include:

- **Panic selling:** Large numbers of investors simultaneously try to exit the market, which drives prices down rapidly.
- **Market crashes:** Fear can magnify minor negative news into widespread selling pressure, resulting in sharp declines in stock prices or entire market indices.

Example: During the **2008 global financial crisis**, fear of bank failures and mortgage defaults triggered massive sell-offs in equity and real estate markets, creating a downward spiral of declining prices and investor confidence.

Greed

Greed, on the other hand, motivates investors to **take excessive risks** in pursuit of profits. When markets are rising, greed encourages buying based on the expectation of continued price increases rather than fundamentals.

Effects of greed include:

- **Excessive buying:** Investors chase rising assets, ignoring valuations, and contributing to inflated prices.
- **Market bubbles:** Greed fuels speculative behaviour, where assets are bought simply because everyone else is buying, detaching prices from intrinsic values.

Example: In the **dot-com bubble of the late 1990s**, greed led investors to buy internet stocks with minimal earnings potential, expecting prices to continue soaring. This irrational optimism drove the bubble until it eventually burst.

Interplay of Fear and Greed

Fear and greed often act as **opposite forces in cycles**:

- Greed dominates during bull markets, pushing prices above fundamental values.
- Fear dominates during bear markets, pulling prices below intrinsic values.

Understanding the dynamics of these emotions is essential in behavioural finance, as it explains why **markets are not always efficient** and why extreme events—such as bubbles and crashes—occur more frequently than predicted by classical financial theories. Investors and financial planners can benefit from recognizing these emotional drivers, using strategies to **mitigate risk and make more rational decisions** even in volatile markets.

External Influences on the Stock Market

Investor behaviour and stock prices are influenced not only by fundamentals and psychological biases but also by **external factors**. These factors can significantly affect market sentiment, driving prices either upward or downward, often independently of intrinsic value. Behavioural finance recognizes that markets are **socially and environmentally embedded**, meaning that media, news, government policies, and social trends can shape collective investor decisions.

1. Media

The **media** plays a critical role in shaping investor perceptions. Positive or negative news coverage can amplify optimism or fear, influencing buying and selling behaviour. Sensational headlines, expert opinions, and social media commentary often trigger **herd behaviour**, where investors follow trends rather than relying on their own analysis.

Example: During a period of strong media coverage on a company's new product launch, investors may rush to buy its stock, inflating its price beyond fundamental value. Conversely, negative reporting on economic instability can trigger panic selling.

2. Economic News

Economic news, such as GDP growth rates, inflation data, employment figures, and interest rate changes, directly impacts investor expectations. Good economic news can boost confidence and increase demand for equities, while bad news can lead to caution or mass sell-offs.

Example: Announcements of higher-than-expected corporate earnings or lower unemployment rates often drive stock prices up, while news of rising inflation or slowing growth may depress markets. Investors react not only to the actual data but also to **their interpretation and emotional response** to that data.

3. Government Policies

Government policies, including fiscal and monetary measures, regulation, and taxation, significantly influence markets. Investors respond to policy changes based on expected impacts on corporate profits, liquidity, and economic growth.

Example: A cut in corporate tax rates may encourage investment in equities, while tighter regulations or higher taxes can reduce market attractiveness. Policy announcements can also create short-term volatility as investors quickly adjust positions in response to anticipated effects.

4. Social Trends

Social trends and cultural shifts also affect investor sentiment. Popular trends, changing consumer preferences, and social movements can drive capital flows into certain sectors or companies.

Example: The growing emphasis on renewable energy and sustainability has attracted investor interest in green technologies and ESG (Environmental, Social, and Governance) stocks, sometimes pushing valuations higher than traditional metrics would suggest.

Neurofinance

Neurofinance is an emerging field within behavioural finance that combines **neuroscience, psychology, and economics** to study how the human brain influences financial decision-making. While traditional finance assumes that investors are fully rational, neurofinance investigates the **biological and neurological processes** behind risk-taking, reward evaluation, and emotional reactions to financial choices. It seeks to explain why people often make **irrational decisions**, even when provided with sufficient information.

Focus Areas of Neurofinance

1. **Emotional vs Rational Thinking**

The human brain processes decisions through both **emotional and rational pathways**.

- The **emotional system**, primarily involving the amygdala, responds to fear, greed, and stress, influencing impulsive decisions.
- The **rational system**, associated with the prefrontal cortex, evaluates information logically and plans strategically.

Neurofinance studies how the **interaction between these systems** affects investor behaviour. For instance, during market volatility, emotional responses can dominate rational thought, causing panic selling or irrational exuberance. Understanding this interplay helps explain why even experienced investors sometimes deviate from rational strategies.

2. **Brain Activity During Risk-Taking**

Neurofinance also examines **how different brain regions respond to financial risk and reward**. Functional MRI (fMRI) studies show that:

- Anticipation of gains activates reward-related areas such as the **ventral striatum**, encouraging risk-seeking behaviour.
- Anticipation of losses or uncertainty triggers the **insula**, associated with anxiety and loss aversion, leading to cautious or avoidant behaviour.

These insights demonstrate that **risk perception is not purely cognitive**; it is heavily influenced by physiological and neurological responses. This explains why investors may take excessive risks in some situations while being overly conservative in others, even when expected outcomes are identical.

Implications of Neurofinance

Neurofinance provides a **scientific foundation for behavioural finance**, linking observed market anomalies to biological processes. By understanding how the brain reacts to financial decisions:

- Financial advisors can design strategies to **mitigate emotional biases**.
- Investors can become more aware of their **risk tendencies** and emotional triggers.
- Policymakers and market regulators can better anticipate **herding behaviour, bubbles, and crashes** driven by collective neurological responses.

Issues in Behavioural Finance

While behavioural finance has significantly advanced our understanding of financial markets by incorporating psychology and human behaviour, it also faces several **challenges and limitations**. Unlike traditional finance, which relies on precise mathematical models and quantifiable variables, behavioural finance deals with **complex, subjective, and often unpredictable human behaviour**, making it inherently difficult to formalize.

1. Difficulty in Quantifying Behaviour

One of the primary challenges in behavioural finance is that **human behaviour is hard to measure objectively**. Investors' emotions, biases, and cognitive errors are often **qualitative and context-dependent**, making it difficult to assign numerical values or create predictive models. Unlike risk, return, or volatility, psychological factors cannot be directly observed or calculated with precision.

Example: Measuring the impact of fear or overconfidence on market prices requires indirect proxies, such as trading volume, survey data, or sentiment indices, which may not capture the full extent of behavioural influence.

2. Lack of Universal Models

Behavioural finance lacks **universally accepted models** to explain and predict financial decisions. While numerous theories, such as Prospect Theory or heuristics, provide insights into specific biases, there is no comprehensive framework that applies to all investors, markets, or situations. As a result, behavioural finance remains **more descriptive than prescriptive**, often explaining past behaviour rather than predicting future outcomes with certainty.

Example: A model that explains investor overreaction in the stock market may not apply to commodity markets or real estate, highlighting the difficulty of generalization.

3. Individual Differences

Investor behaviour is highly **heterogeneous**, influenced by personality, cognitive ability, education, cultural background, and past experiences. These **individual differences** mean that two investors may respond very differently to the same market information, making it difficult to create standardized behavioural models or universally applicable strategies.

Example: One investor may sell a declining stock immediately due to loss aversion, while another may hold it in hope of recovery. Both are influenced by psychological factors, but their behaviour is unique.

Bounded Rationality

Bounded rationality is a concept introduced by **Herbert Simon** that challenges the classical finance assumption of fully rational investors. Traditional finance assumes that individuals make decisions by evaluating all available information logically and choosing the option that maximizes utility. In reality,

however, **decision-making is constrained by human limitations**, including cognitive capacity, available information, and time pressures. Bounded rationality provides a more **realistic framework for understanding investor behaviour**.

Key Limitations in Decision-Making

1. **Limited Information**
   Investors rarely have access to complete, accurate, or timely information. Decisions are often made under **uncertainty**, and missing data can lead to suboptimal choices. Even when some information is available, processing it accurately may be beyond an individual's ability.

Example: An investor considering a stock purchase may not have access to confidential company strategies or upcoming market shifts, making it impossible to evaluate all relevant factors perfectly.

2. **Time Constraints**
   Decision-making in financial markets is often **time-sensitive**. Investors cannot spend unlimited time analyzing every possible alternative, especially in volatile or rapidly moving markets. As a result, they must make quick judgments based on **incomplete analysis**, which can increase the likelihood of errors.

Example: During intraday trading, decisions must be made within minutes or even seconds, forcing reliance on heuristics or past experience rather than thorough evaluation.

3. **Cognitive Limitations**
   Human cognition has inherent limitations. Individuals cannot process and evaluate large amounts of complex information simultaneously. This **bounded cognitive ability** forces investors to simplify decision-making, often using heuristics or mental shortcuts, which can introduce biases.

Example: An investor may focus only on recent news about a company rather than analyzing long-term fundamentals, leading to overreactions to short-term events.

Implications of Bounded Rationality

Because of these constraints, investors often **satisfies** rather than optimize. That is, they choose options that are "good enough" rather than perfectly rational. Bounded rationality explains why:

- Market anomalies persist, such as mispricing or bubbles.
- Investors make inconsistent decisions in similar circumstances.
- Cognitive biases, heuristics, and emotional influences have a strong effect on financial decisions.