## 1. INTRODUCTION

Traditional economic and financial theories typically assume that:

i. Individuals are rational
ii. Markets are efficient

Behavioral finance challenges these assumptions. Two classifications of behavioral finance are:

1) **Behavioral Finance Micro (BFMI) –** distinguishes individual investors from rational decision makers and examines how individuals make financial decisions.
2) **Behavioral Finance Macro (BFMA) –** distinguish markets from efficient markets and examines market anomalies.

## 2. CATEGORIZATIONS OF BEHAVIORAL BIASES

**Categories of Behavioral Biases:**

Behavioral finance identifies two primary reasons behind irrational decision making of investors.

**1) Cognitive errors**: Cognitive errors are mental errors including basic statistical, information-processing, or *memory errors* that may result from the use of simplified information processing strategies or from reasoning based on faulty thinking. These biases are related to the inability to do complicated mathematical & statistical calculations i.e. updating probabilities.

- If identified, cognitive errors can be relatively easily corrected and ***moderated**** with better information, education and advice.

**2) Emotional biases:** Emotional biases are mental errors that may result from impulse or intuition and/or reasoning based on feelings, perceptions, or beliefs. These biases are usually related to human behavior to avoid pain and produce pleasure.

- Emotional biases are less easily corrected than cognitive errors. These biases can only be "***adapted to***".

***NOTE:**

- **Moderating a bias** refers to recognizing the bias and taking steps to reduce or even eliminate it within the individual.
- **Adapting a bias** refers to recognizing the bias and accepting it by adjusting decisions for it.
- Some biases have aspects of both cognitive errors and emotional biases.

## 3. COGNITIVE ERRORS

**Categories of Cognitive Errors:**

Cognitive errors can be classified into two categories:

**A. BELIEF PERSEVERANCE BIASES:**

Belief perseverance is the tendency to cling to one's initial belief even after receiving new information that contradicts or disconfirms the basis of that belief.

- Belief perseverance bias is closely related to ***Cognitive Dissonance*** which is the inconsistent mental state that occurs when new information conflicts with previously held beliefs or cognition. To deal with it, people tend to
  - Focus only on information that supports a particular belief, known as ***selective exposure.***
  - Ignore, reject, or minimize any information that conflicts with a particular belief, known as ***selective perception***.
  - Remember and focus only on information that confirms a particular belief, known as ***selective retention***.

**Types of Belief perseverance biases:** Following are five types of Belief perseverance biases.

**1) Conservatism:** It is a tendency of people ***to maintain*** their prior beliefs or forecasts by improperly incorporating new information.

- Conservatism bias implies investor ***under-reaction*** to new information and failure to modify beliefs and actions based on new information.
- In other words, financial market participants (**FMPs**) tend to *overweight the base rates* and *underweight the new information* to avoid the difficulties associated with analyzing new information.

- **Cognitive Costs:** It refers to the difficulty associated with processing the new information and updating the beliefs.
  - o The _higher the cognitive costs_ (e.g. in case of abstract and statistical information), the higher the probability that _new information is underweighted_ (or base rate is overweighted).
  - o The _lower the cognitive costs_, the higher the probability that _new information is overweighted_ (or base rate is underweighted).

**Consequences of Conservatism Bias:**

- Conservatism bias influences FMPs to ***maintain a view or a forecast*** to avoid the difficulties associated with analyzing new information.
- Conservatism bias makes FMPs ***slow to react to new information*** to avoid the difficulties associated with analyzing new information. For example, FMPs may hold winners or losers too long.

**Detection of and Guidelines for Overcoming Conservatism Bias:** To correct or reduce the impact of Conservatism bias, FMPs should:

- Adequately analyze the impact of new information and then respond appropriately i.e. should assign proper weight to new information.
- Seek advice from professionals when they lack the ability to interpret or understand the new information.

**2) Confirmation:** It is a tendency of people to *selectively* seek and focus only on information that confirms their beliefs or hypotheses while they ignore, reject or discount information that contradicts their beliefs. This bias also involves interpreting information in a biased way. It is also referred to as "***selection bias***".

- Confirmation bias implies assigning greater weight to information that supports one's beliefs.

**Consequences of Confirmation Bias:**

- Confirmation bias makes FMPs to ***focus only on confirmatory (or positive) information*** about existing investment while ignore/reject any contradictory (or negative) information about an existing investment.
  - o As a result, FMPs tend to overweight those investments in their portfolios about which they are optimistic, leading to under-diversified portfolios and excessive exposure to risk.
- Confirmation bias makes FMPs to develop biased screening criteria and prefer only those investments that meet those criteria.

**Detection of and Guidelines for Overcoming Confirmation Bias:** To correct or reduce the impact of confirmation bias, FMPs should:

- Try to collect complete information i.e. both positive and negative.
- Actively look for contradictory information.
- Use more than one method of analysis.
- Perform additional research.

**3) Representativeness:** In representativeness, people tend to make decisions based on stereotypes i.e. people stereotype the recent past performance about investments as "strong" or "weak". In this bias,

- People seek to look for similar ***patterns*** in new information (i.e. assess probabilities of outcomes on the basis of their similarity to the current state).
- People treat characterizations from a small sample as "*representative*" of all members of a population.

Representativeness bias implies investor ***over-reaction*** to recent/new information and negligence of base rates. E.g. an individual may conclude too quickly that a yellow object found on the street is gold.

FMPs suffering from representativeness bias tend to buy stocks that represent desirable qualities e.g. a good company is viewed as a good investment.

**Types of Representativeness Bias:**

**a) Base-rate neglect bias:** It is a bias in which people tend to ***underweight the base rates*** and overweight the new information. E.g. an investor views stock of a "growth" company as a "growth stock".

**b) Sample-size neglect bias:** It is a bias in which people incorrectly consider small sample sizes as representative of the whole population. In this bias, FMPs tend to ***overweight the information*** in the small sample. For example,

- FMPs may consider the past returns to be ***representative*** of expected future returns i.e. stocks with strong (poor) performance during the past *3-5 years* may be considered winners (losers).

**Consequences of Representativeness Bias:** When FMPs suffer from representativeness bias, they tend to:

- Overweight (overreact to) new information and small samples.
- Consider the recent past returns to be ***representative*** of expected future returns.
- Hire investment managers based on its recent/short-term strong performance results without considering the sustainability of such returns.
  - o This attitude may result in high investment manager turnover, excessive trading and long-term underperformance of portfolio.
- Update beliefs using simple personal classification to avoid difficulty associated with dealing with complex information.

**Detection of and Guidelines for Overcoming Representativeness Bias:** To correct or reduce the impact of representativeness bias, FMPs should:

- Develop and follow an appropriate asset allocation strategy to achieve better long-term portfolio returns.
- Invest in a diversified portfolio to meet financial goals rather than chasing returns.
- Use a "Periodic table of investment returns" in which the asset classes' returns are ranked over time. This table facilitates investors to analyze historical patterns of the relative returns of the asset classes to better evaluate the recent performance of an individual.

**Practice: Example 2, Volume 1, Reading 1.**

**4) Illusion of control:** It is a tendency of people to incorrectly believe that they have the ability to exert influence over uncontrollable events (e.g. outcomes of their investments) and thereby overestimating their ability to succeed in uncertain or unpredictable environmental situations.

- This bias tends to increase with choices, familiarity with the task, competition and active involvement in the investment.

**Consequences of Illusion of Control Bias:** FMPs suffering from illusion of control bias tend to:

- Have higher expectancy of personal success and higher certainty or confidence about their ability to predict. This leads to *excessive trading and long-term underperformance* of portfolio.
- Prefer to invest in companies over which they perceive to have some control (e.g. employer's company stock), leading to *under-diversified* portfolios.

**Detection of and Guidelines for Overcoming Illusion of Control Bias:** To correct or reduce the impact of illusion of control bias, FMPs should:

- Realize that it is difficult to have complete control over the outcomes of the investments and the success of investment depends on various uncertain factors.
- Attempt to look for contradictory viewpoints.
- Maintain records of their transactions and should clearly document rationale underlying each trade.
- Maintain a long-term perspective rather than chasing returns.

**5) Hindsight:** It is a tendency of people to ***overestimate*** ***"ex-post"*** the predictability of events or outcomes that have actually happened. In hindsight bias, people tend to believe that their forecasts / predictions about future events (e.g. investment outcomes) were more accurate than they actually were and they perceive events that have already happened as inevitable and predictable. This is simply because in retrospect, things often appear to be much more predictable than at the time of our forecast.

**Consequences of Hindsight Bias:**

- This bias causes FMPs to overestimate their ability to forecast and predict uncertain outcomes. This overconfidence about the accuracy of their forecasts:
  - Makes FMPs to underestimate the risk of large errors, leading to excessive exposure to risk.
  - Hinder their ability to learn from their past forecasting errors and to improve their forecasting skills through experience.
- This bias causes FMPs to inadequately evaluate money managers or security performance against what has happened as opposed to expectations.

**Detection of and Guidelines for Overcoming Hindsight Bias:** To correct or reduce the impact of hindsight bias, FMPs should:

- Recognize and own up their investment mistakes.
- Maintain records of their investment decisions (both good and bad) and should carefully examine them to avoid repeating past investment mistakes.
- Always remember that markets are sensitive to business cycles; this implies that investors should manage their expectations and should evaluate the performance of investment managers relative to appropriate benchmarks and peer groups.

**B. PROCESSING ERRORS BIASES:**

Processing Errors Biases result from processing information for the purpose of financial decision-making in an illogical and irrational way.

**Types of Processing Errors Biases:** Following are four types of Processing Errors Biases.

**1) Anchoring and adjustment:** It is a tendency of people to develop estimates for different categories based on a particular and often *irrelevant* value, known as "***anchor***" (*either quantitative or qualitative in nature*) and then adjusting their final decisions up or down based on that "anchor" value.

- For example, a target price, the purchase price of a stock, prior beliefs on economic states of countries or on companies etc.