1. INTRODUCTION AND CATEGORIZATION OF BEHAVIORAL BIASES

Traditional economic and financial theories typically assume that:

i. Individuals are rational
ii. Markets are efficient

This theory assumes individual make rational decisions using all available information, which lead them to optimal outcome. As a result, markets are efficient.

Behavioral finance challenges these assumptions. When individuals face complex decisions, they tend to simplify the situation and often rely on basic judgement and preferences.

2. CATEGORIZATIONS OF BEHAVIORAL BIASES

Categories of Behavioral Biases:

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

1. Cognitive errors – faulty cognitive reasoning
2. Emotional biases – errors based on feelings and emotions

1) Cognitive errors are mental errors that may result from faulty reasoning due to statistical, information-processing, or *memory errors*.

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

2) Emotional biases are mental errors that may result from impulse or intuition and/or reasoning based on feelings.

- 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.

3. COGNITIVE ERRORS

Categories of Cognitive Errors: Cognitive errors can be classified into two categories:

1) Belief perseverance
2) Processing errors

3.1 Belief Perseverance Biases

Belief perseverance is the tendency to cling to one's initial belief even after receiving new information that contradicts with the beliefs or cognitions referred to as cognitive dissonance.

- ***Cognitive Dissonance***: a mental discomfort that occurs when new information conflicts with previously held beliefs or cognitions.

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

i. Conservatism
ii. Confirmation
iii. Representativeness
iv. Illusion of control
v. Hindsight

3.1.1) Conservatism Bias

It is a tendency of people ***to maintain*** their prior beliefs or forecasts by not incorporating new information properly.

- In other words, financial market participants (FMPs) ***overweight*** their prior beliefs and ***underweight*** new information.

Consequences of Conservatism Bias:

Conservatism bias makes FMPs:
- ***to maintain a view*** to avoid the difficulties associated with analyzing new information.
- ***slow to react*** even when presented with new information.

Detection of and Guidelines for Overcoming Conservatism Bias: FMPs should:

- Carefully and 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.

3.1.2) Confirmation Bias

It is a tendency of people to focus only on information that confirms their beliefs, and they ignore or reject information that contradicts their beliefs.

- 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: 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.

<u>Practice:</u> Example 2, Reading 52, CFA Institute's Curriculum.

3.1.3) Representativeness Bias

In representativeness, people typecast new information based on past experiences or labels. The new information may seem representative or may resemble to elements they classify previously.

Types of Representativeness Bias:

a) Base-rate neglect bias: It is a bias in which people tend to <u>*underweight (or neglect) the base rates*</u> and overweight the new information.

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:

- Overreact to specific new information or small samples.
- Consider the recent past returns to be ***representative*** of expected future returns.
- 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:

- Conduct more research.
- Ask questions like "what are the chances that a stock belongs to Group A (considered representative) versus Group B (statistically more likely to belong to)"

<u>Practice:</u> Example 3, Reading 52, CFA Institute's Curriculum.

3.1.4) Illusion of Control Bias

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.

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

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

Detection of and Guidelines for Overcoming Illusion of Control Bias: FMPs should:

- Realize that investment is a probabilistic activity as the success of investment depends on various uncertain factors and it is difficult to have control over the outcomes of the investments.
- Attempt to look for contradictory viewpoints.
- Ask yourself the rationale behind each trade and consider downside risk for each investment.

3.1.5) Hindsight Bias

It is a tendency of people to ***overestimate "afterwards"*** the predictability of events or outcomes that have actually happened in the past.

In hindsight bias, people tend to believe that their forecasts about future events (e.g., investment outcomes) were more accurate than they actually were. 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 predict uncertain outcomes.
- inadequately evaluate money managers or security performance against what has happened as opposed to expectations when decision was made.

Detection of and Guidelines for Overcoming Hindsight Bias: FMPs should:

- Recognize and own up their investment mistakes.
- Maintain written records of their investment decisions (both good and bad) and should carefully examine them to avoid repeating past investment mistakes.

Practice: Example 4, Reading 52, CFA Institute's Curriculum.

3.2 Processing Errors

Processing Errors 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.

i. Anchoring & Adjustment
ii. Mental Accounting
iii. Framing
iv. Availability

3.2.1) Anchoring and Adjustment Bias

It is a tendency of people to rely on initial piece of information (preliminary number) to make subsequent decision or judgement. The initial value/number is known as "***anchor***" (*either quantitative or qualitative in nature*) and then adjusting their final decisions up or down based on that "anchor" value.

Consequences of Anchoring and Adjustment Bias: Anchoring bias may cause FMPs to continue to stick closely to their original estimates (anchor values) rather than new pieces of information.

Detection of and Guidelines for Overcoming Anchoring and Adjustment Bias: FMPs should:

- Objectively examine new pieces of information.
- NOT base their investment decisions upon past prices (i.e. purchase prices or target prices), market levels, and economic states of countries and companies.

Practice: Example 5, Reading 52, CFA Institute's Curriculum.

3.2.2) Mental Accounting Bias

It is a tendency of people to divide one sum of money into different mental accounts based on some arbitrary categories where each category addresses a specific financial goal.

People suffering from mental accounting bias tend to treat money as "non-fungible" or "non-interchangeable".

Consequences of Mental Accounting Bias: This bias causes FMPs to

- Ignore the correlations among various assets by placing them into distinct layers addressing particular investment goals.
- Invest in an inefficient manner resulting in suboptimal portfolio and poor performance.
- Irrationally treat income returns different from the capital appreciation.

Detection of and Guidelines for Overcoming Mental Accounting Bias: FMPS should:

- develop the holistic asset allocation approach by considering all the assets and their correlations.
- combine all assets on one spreadsheet.
- focus on total return and should not treat income return differently from capital return.

Practice: Example 5, Reading 52, CFA Institute's Curriculum.

3.2.3) Framing Bias

Framing bias refers to the tendency of people to respond differently based on how questions are asked (framed).

Narrow framing: It is a sub category of framing bias. It refers to a tendency of people to focus only on a narrow frame of reference when making decisions i.e. analyzing a situation in isolation while neglecting the larger context.

Consequences of Framing Bias:

- Framing bias affects investors' *attitude toward risk* e.g. when an outcome is framed in terms of gains, investors tend to exhibit risk-averse attitude and when an outcome is framed in terms of losses, investors tend to exhibit risk-seeking attitude (or loss aversion).
  - As a result, FMPs may misidentify their risk tolerance, leading to suboptimal portfolios.
- Framing bias may cause FMPs to pay attention to short-term price movements, which may lead to excessive trading.

Detection of and Guidelines for Overcoming Framing Bias: FMPs should try to:

- eliminate any reference to gains and losses already incurred; instead, they should focus on the future prospects of an investment.
- be as neutral and open-minded as possible when interpreting investment-related situations.

Practice: Example 7, Reading 52, CFA Institute's Curriculum.

3.2.4) Availability Bias

It is a tendency of people to overestimate the probability of an outcome based on the ease with which the outcome comes to mind. In other words, individuals tend to place too much weight on evidence that is in front of them, readily available or easily recalled.

Four Sources of Availability Bias:

a) Retrievability: It is a tendency of people to incorrectly choose the answer or idea that is quickly recalled or easily retrieved.
b) Categorization: It is a tendency of people to categorize new information by using familiar classifications and search sets based on their perception.
c) Narrow range of experience: It is a tendency of people to make decisions based on their narrow range of experience.
d) Resonance: It is a tendency of people to overweight an outcome that ***resonate*** (match) with their way of thinking.

Consequences of Availability Bias:

- FMPs tend to select an investment, investment advisor, or mutual fund based on advertising rather than on a thorough analysis considering investment objectives and risk/return profile.
- FMPs may focus on a limited set of investments.
- FMPs tend to pay attention to few specific points and characteristics and as a result may fail to diversify.

Detection of and Guidelines for Overcoming Availability Bias: FMPs should:

- develop and follow an appropriate investment policy strategy.
- make investment decisions and asset allocation based on a thorough analysis and research.
- Focus on long-term historical data.

Practice: Example 8 & 9, Reading 52, CFA Institute's Curriculum.

4. EMOTIONAL BIASES

Following are the six types of emotional biases:

1. Loss-aversion
2. Overconfidence
3. Self-Control
4. Status Quo
5. Endowment
6. Regret-Aversion

4.1 Loss-Aversion Bias

People tend to prefer 'avoiding losses' as opposed to 'seeking gains. The result of loss-aversion is disposition effect.

Disposition Effect: It is the tendency of an individual to hold on to losing stocks too long in the expectation of return to break even or better while holding (selling) winning stocks too early in the fear that profit will evaporate unless they sell.

Consequences of Loss Aversion: FMPs hold losing investments longer while sell winning investments too quickly.

Detection of and Guidelines for Overcoming Loss Aversion: FMPs should:

- develop and follow a disciplined investment policy strategy.
- FMPs should make investment decisions realistically based on a detailed fundamental analysis.

Practice: Example 10, Reading 52, CFA Institute's Curriculum.

4.2 Overconfidence Bias

It is a tendency of people to overestimate their knowledge ability to process information. People wrongly believe that they have superior knowledge, and they make accurate forecasts.

This bias has features of both emotional and cognitive errors.

Two Types of Overconfidence Bias:

a) Prediction overconfidence is the tendency of people to estimate *narrow* confidence intervals (narrow range of expected returns) for their predictions.

b) Certainty overconfidence is a bias in which people tend to assign high probabilities of success to their outcomes.

Overconfidence bias escalates, when combined with self-attribution bias.

Self-attribution Bias: It is a bias in which people tend to attribute successful outcomes to their own skills while blame external factors (e.g., luck) for failures or poor outcomes.

Consequences of Overconfidence Bias: FMPs

- may underestimate risks and overestimate expected returns
- hold poorly diversified portfolios.

Detection of and Guidelines for Overcoming Overconfidence Bias: FMPs should:

- critically and objectively evaluate investment outcomes.
- perform post-investment analysis on both successful and unsuccessful investments and must acknowledge their failures.
- calculate portfolio performance over at least two years.

4.3 Self-Control Bias

It is a tendency of people to consume today (i.e., focus on short-term satisfaction) at the expense of saving for tomorrow (i.e., long-term goals).

Due to self-control bias, people are reluctant to sacrifice present consumption for the sake of long-term satisfaction.

- This bias is related to "***hyperbolic discounting***" which refers to human propensity to prefer small payoffs now rather than larger payoffs in the future.

Consequences of Self-Control Bias: FMPs often:

- save insufficient amount for the future; therefore, they often take excessive risk later to generate higher returns for meeting long-term goals.
- borrow excessively to finance current consumption.

Detection of and Guidelines for Overcoming Self-Control Bias: FMPs should follow:

- an investment and saving plan.
- maintain an appropriate asset allocation.

Practice: Example 11, Reading 52, CFA Institute's Curriculum.

4.4 Status Quo Bias

It is the tendency of people to prefer to "do nothing" (i.e., maintain the "status quo") instead of making a change. Status quo bias is often difficult to overcome.

Consequences of Status-quo Bias: This bias causes FMPs to:

- continue to hold portfolios with inappropriate risk characteristics.
- ignore other profitable opportunities.

Detection of and Guidelines for Overcoming Status-quo Bias: FMPs should:

- recognize and quantify the risk-reducing and return-enhancing advantages of diversification.

Practice: Example 12, Reading 52, CFA Institute's Curriculum.

4.5 Endowment Bias

It is a bias in which people become ***emotionally attached to the asset they own*** so they value an asset more when they own it than when they do not. As a result, the minimum selling price that owners ask for an asset is almost always greater than the maximum purchase price that they are willing to pay for the same assets.

Consequences of Endowment Bias: FMPs:

- fail to sell assets with which they are familiar
- maintain an inappropriate asset allocation and inappropriate portfolio.

Detection of and Guidelines for Overcoming Endowment Bias: FMPs should:

- treat inherited investments as if they have received cash and then invest that cash appropriately based on investment goals.

Practice: Example 13, Reading 52, CFA Institute's Curriculum.

4.6 Regret-Aversion Bias

It is the tendency of people to avoid making decisions due to the fear of experiencing the pain of regrets associated with unsuccessful decisions.

For any unfavorable outcome, regret from *action taken* is more intense versus regret from *not taking an action*.

Consequences of Regret Aversion Bias: This bias may cause FMPs to:

- to be *too conservative* in their investment choices.
- to engage in "***Herding Behavior***" in which investors simply try to follow the crowd (i.e. invest in a similar manner and in the same stocks as others) to avoid the burden of responsibility and hence the potential for future regret.

Detection of and Guidelines for Overcoming Regret-Aversion Bias: FMPs should:

- recognize and quantify the risk-reducing and return-enhancing advantages of diversification.
- keep in mind long-term benefits of adding risky assets in the portfolio.

Practice: Example 14, Reading 52, CFA Institute's Curriculum.

5. HOW BEHAVIORAL FINANCE INFLUENCES MARKET BEHAVIOR

5.1 Defining Market Anomalies

Market movements that deviate from the efficient market hypothesis are called ***market anomalies***.

Anomalies are '*persistent*' returns that differ from zero and are predicable.

The most persistent market anomalies are the ***momentum effect***, ***bubbles*** *and* ***crashe****s*. These are explained in the next section.

Abnormalities from the following three sources are not considered 'persistent' and are not called market anomalies. These misclassifications are:

a) **Choice of asset pricing model** – inaccurate estimates used in the asset pricing model
b) **Statistical issue** - anomalies due to small samples, survivorship bias, or data mining bias, choice of benchmark.
c) **Temporary disequilibria** – anomalies that survive for some period but ultimately disappear due to arbitrage opportunities e.g. weekend effect, the small company January effect, turn-of-the-year effect.

5.2 Momentum

Momentum or Trending effects: Momentum refers to the future pattern of returns that is correlated with the recent past. In general,

- Returns are positively correlated in the short-term i.e. up to 2 years.

- Returns are negatively correlated in the long-term (i.e. 2-5 years) and tend to revert to the mean.

Momentum can be explained by various biases including:

- Availability bias
- Hindsight bias
- Loss aversion bias

Availability bias: This bias makes investors to extrapolate recent price trends into the future. It is also referred to as "***Recency Effect***". Under the recency effect, recent events are unduly overweighted in decision making.

For example, faulty trading models which are developed based on *recent experience*. If in the model, asset price rise for a period, investors extrapolate this rise in asset price in the future.

Hindsight Bias: Investors tend to see past events as having predictable. Regret is typically an expression of hindsight bias. When market is volatile, regret become particularly acute.

Practice: Example 15, Reading 52, CFA Institute's Curriculum.

5.3 Bubbles and Crashes

Market bubble is characterized by a rapid increase in the price of the asset, caused by panic buying, which is not based on economic fundamentals.

Market crashes refer to periods of significant drop in asset prices caused by panic selling that is not based on economic fundamentals.

Rational reasons behind some bubbles:

- Investors may not know the exact timing of future crash.
- Limits to arbitrage due to short-selling constraints, lack of suitable instruments available etc.
- Investment managers who are compensated based on short-term performance may participate in the bubble to avoid commercial or career risk.

Behavioral biases and symptoms associated with market bubbles include:

- ***Overconfidence*** encourages investors to trade excessively.
- ***Overtrading:*** In market bubbles, overall trading volumes increase.
- ***Underestimation of risks*** due to overconfidence.
- ***Failure to diversify***, leading to highly concentrated portfolios.
- ***Rejection of contradictory information:*** This behavior contributes to confirmation and self-attribution bias.
- ***Increase in market volatility:*** Overconfidence among traders also leads to increase in the market volatility.
- ***Regret aversion*** may encourage investors to participate in a bubble to avoid foregoing the opportunity to profit from stock price appreciation.

Behavioral biases and symptoms associated with Market Crashes include:

- ***Anchoring bias:*** During crashes, anchoring bias influences investors who already own assets to initially under-react to new (particularly negative) information; however, subsequently selling pressure accelerates, leading to sharp decline in asset prices.

5.4 Value and growth

Value-effect anomaly: According to ***value-effect anomaly***, value stocks tend to outperform growth stocks i.e. the stocks with low price-to-earnings (P/E) ratios, low price-to-sales (P/S) ratios, high dividend yield ratio and low market-to-book (M/B) ratios tend to generate more returns and outperform the market relative to growth stocks (i.e. with high P/E, P/S and M/B ratios and low dividend yield ratio).

- However, it has been evidenced that value effect anomalies do not exist when shortcomings associated with pricing model are removed e.g. value-effect anomaly disappears in the *three-factor asset pricing model* where three factors include size, value and market risk factors.
- According to the three-factor asset pricing model, higher return of value stocks is associated with their higher risk of financial distress during economic downturns.

The Halo Effect: The halo effect refers to the tendency of people to generalize positive views/beliefs about one characteristic of a product/person (e.g. good earnings growth rate) to another characteristic (e.g. good investment). E.g. an investor may perceive ABC Ltd a good investment because it is a growth stock.

- The halo effect is closely related to ***representativeness.***
- The halo effect influences investors to make investment decision based on a single piece of information.
- Investors' preference to hold growth stocks can be explained by the halo effect. Also, the halo effect leads to overvaluation of growth stocks.

Home Bias Anomaly: A home bias anomaly refers to the tendency of investors to invest a greater portion of their global portfolio in domestic stocks or stocks of companies headquartered nearer them either due to relative informational advantage or due to familiarity which gives investors a false sense of security and comfort.

- Under home bias, investors expect ***negative correlation between risk and return*** i.e. investors perceive domestic stocks or stocks of companies located in proximity to be less risky and to have higher expected return.
- In contrast, according to capital asset pricing model, risk and return are positively correlated.

Practice: End of Chapter Practice Questions for Reading 52 & Questions from FinQuiz Question-bank.