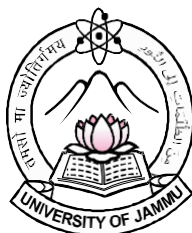


CENTRE FOR DISTANCE & ONLINE EDUCATION
UNIVERSITY OF JAMMU
JAMMU



SELF LEARNING MATERIAL OF
BEHAVIOURAL FINANCE
FOR M.COM SEM III
FOR THE YEAR 2023,2024,2025

COURSE NO. MCOMFE355

UNIT: I - IV

LESSON: 1 - 20

Course Coordinator

Prof. Sandeep Kour Tandon
CDOE, University of Jammu, Jammu

Teacher In charge

Dr. Deepti Abrol
Assistant Professor, CDOE

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COURSE NO. M.COMFE355

Written By:

Dr.SUMEET KOUR

Lecturer,PG Deptt.

Of Commerce

University of Jammu

Jammu.

Editing and Proof reading by:

Prof.Sandeep Kour Tandon

Co-ordinator,M.Com

Room No.111,Ist Floor

DD & OE,University of

Jammu

Ms.Shriya Gupta

Teacher Incharge,M.Com

Room No.205,IInd Floor

DD&OE ,University of

Jammu

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CENTRE FOR DISTANCE & ONLINE EDUCATION
UNIVERSITY OF JAMMU
SYLLABUS
M.COM. THIRD SEMESTER (NON CBCS)
BEHAVIOURAL FINANCE
(Core Course)

Course: MCOMFE355

Max Marks: 100 Marks

Credit: 4

External: 80 Marks

Time: 3.00 Hrs

Internal: 20 Marks

(Syllabus for the examination to be held in December 2023, 2024, 2025)

COURSE OBJECTIVES

1. To provide understanding about basic concepts of behavioural finance;
2. To acquaint the students with utility theory, emotions and decision making;
3. To impart knowledge about behavioural factors and financial markets
4. To familiarize students with behavioural corporate finance.

COURSE OUTCOMES:

After the completion of this course, the student will be able to:

1. understand the investment decision cycle.
2. compare expected utility theory with other related theories.
3. learn about active portfolio management
4. understand the role of behavioural factors in corporate decision making.
5. demonstrate a basic understanding of mental accounting

UNIT I INTRODUCTION

Nature, Scope, objectives and application; Investment Decision Cycle: Judgement under uncertainty; Mental Accounting; Cognitive information perception;

Peculiarities(biases) of quantitative and numerical information perception; Representativeness; Anchoring; Exponential Discounting; Hyperbolic Discounting; Bounded rationality in real market conditions.

UNIT II UTILITY, EMOTIONS AND DECISION-MAKING

Expected utility theory and rational thought; Expected utility as a basis for decision-making; investor rationality and market efficiency; Decision making under risk and uncertainty; Emotional mechanisms in modulating risk-taking attitude; neurophysiology of risk taking; Personality traits and risk attitudes in different domains.

UNIT III BEHAVIOURAL FACTORS AND FINANCIAL MARKETS

Efficient Market Hypothesis; Fundamental information and financial markets; Information available for market participants and market efficiency; Market predictability; Limits of arbitrage model; Asset management and behavioural factors; Active portfolio management; Return statistics and sources of systematic underperformance; Fundamental information and technical analysis

UNIT IV BEHAVIOURAL CORPORATE FINANCE

Behavioural factors and corporate decisions on capital structure and dividend policy; Capital structure dependence on market timing; Systematic approach using behavioural factors in corporate decision-making; External factors and Investor Behaviour: Mechanisms of external factors influence on risk perception and attitudes; Connection to human psychophysiology and emotional regulation; Active portfolio management: Source of systematic underperformance.

SUGGESTIVE READINGS

1. Ackert, L. and Deaves, R. Behavioural Finance: Psychology, Decision Making and Markets. South-Western, Cengage Learning, Ohio.
2. Forbes, W. Behavioural Finance. Wiley, West Sussex.
3. Kahneman, D. and Tversky, A. Choices, Values and Frames. Cambridge University Press.

4. Shefrin, H. Beyond Greed and Fear: Understanding Behavioural Finance and Psychology of investing. Oxford University Press, New York.
5. Shleifer, A. Inefficient Markets: An Introduction to Behavioural Finance. Clarendon Press, Oxford.
6. Parikh, P. Value Investing and Behavioural Finance. Tata McGraw-Hill, New Delhi.

NOTE FOR PAPER SETTING

The paper consists of two sections. Each section will cover the whole of the syllabus without repeating any question in the entire paper.

Section A: It will consist of eight short answer type questions, selecting two from each unit. A candidate has to attempt any six and answer within 200 words. Each question carries 4 marks, total weightage to this section shall be 24 marks.

Section B: It will consist of six essay type questions. The answer of each question should be within 800 words. One questions shall be set atleast from each unit and the candidate has to attempt four. Each question will carry 14 marks and total weightage shall be 56 marks.

MODEL QUESTION PAPER BEHAVIOURAL FINANCE

Time : 3 hrs

M. Marks : 80

SECTION-A

Note:- Attempt any six questions. Each question carries 4 marks. Answer to each question should be within 200 words.

1. Discuss behavioural finance as art as well as science.
2. Explain mental accounting with suitable examples.
3. Explain the expected utility as a basis for decision making.
4. Discuss the behavioural factors that affect the financial market.
5. Discuss the misconceptions surrounding the efficient market hypothesis.
6. Write short note on efficiency and information.
7. “Decision process are Cognitive illusion”. Explain.
8. Define buy-and-hold strategy.

SECTION-B

Note:- Attempt any four questions. Each question carries 14 marks. Answer to each question should be within 800 words.

1. Explain the peculiarities of quantitative and numerical information perception.
2. Explain the emotional mechanisms in modulating risk-taking attitude.
3. Explain the meaning of ‘Capital Market’ and ‘Money Market’. Also bring out the similarities and the difference between two markets.
4. Describe the relationship between risk attitude and personality of individuals.
5. Explain Dow theory and how it is used to determine the direction of stock market.
6. Explain the sources of systematic under performance of active portfolio management.

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INTRODUCTION

**M.COM III SEM
MCOMFE355**

**UNIT- I
LESSON - 1**

BEHAVIOURAL FINANCE : INTRODUCTION TO BEHAVIOURAL FINANCE, NATURE, SCOPE AND APPLICATION

STRUCTURE

- 1.1 Introduction
- 1.2 Objectives
- 1.3 Concept of Behavioural Finance
 - 1.3.1 Meaning
 - 1.3.2 Definitions of Behavioural Finance
 - 1.3.3 Assumptions of Behavioural Finance
 - 1.3.4 Silent Features of Behavioural Finance
 - 1.3.5 Behavioural Finance as a Science or an Art
- 1.4 Nature of Behavioural Finance
- 1.5 Scope of Behavioural Finance
- 1.6 Objectives of Behavioural Finance
- 1.7 Application of Behavioural Finance
- 1.8 Summary
- 1.9 Glossary

1.10 Self-Assessment Questions

1.11 Lesson End Exercise

1.12 Suggested Readings

1.1 INTRODUCTION

What is expected to be done in a given situation, whether it relates to a crisis situation or is a routine activity decision differs to a large extent in reality. When this happens, what had been specified as a logically expected move in vast literature of financial management is subjected to a specific behavioural attitude of a financial participant. For example: we expect that using the theories of dividend decisions a company shall resort to huge dividends, but an AGM ends without any dividend declaration. From financial analysts to investment community all are unable to digest this type of attitude as they remain unexplained by normal finance literature. They simply claim these moves as irrational decisions resulting from agency problems.

Another simple example is why investors sell profit making securities and retain losing assets on the other hand. Strong evidence provided with ample theoretical back drop and practical applications fails to explain situations of this kind as they are closely associated with the behavioural aspect, the latest dimension added to financial management.

Those who are taking such decisions (claimed as irrational) will yield gains or losses is a secondary matter, but aspect of great prominence is that their behaviour shall disturb the general expectations of the market. Unless modern financial management is equipped with such behavioural traits and provides a base for changing the expected values to prospective values, they remain incompetent to match the realities of investment era and gradually can lose their practical application.

Behavioural finance is the study of the influence of psychology on the behaviour of financial practitioners and the subsequent effect on markets. Behavioural finance is of interest because it helps explain why and how markets might be inefficient.

Conceptual development of behavioural finance is done with the combination of finance and social-psychology with an aim to solve several market puzzles that cannot be solved without understanding the psychological dimensions in decision making. Neoclassical view of Irving fisher that all economic agents are equally rational does not hold true in reality where imperfect market conditions prevails over natural expectations.

Thus, behavioural finance is a modern financial tool kit that tries to explain these abnormal reactions in the market and circumstances that lead to such situations. It explains the anomalies by linking them with the biases of investors in investment decisions. Existence of wide spread VUCA conditions in financial markets requires development of behavioural financial analysts to properly understand the possible psychological issues causing the volatile conditions in the market, increasing the uncertainty, complexity and ambiguity in managing the portfolios. The dream of complete diversification of risk is never realised unless; the reasons for anomalies are traced in the process of investment management.

1.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- meaning and assumptions of Behavioural Finance
- nature of Behavioural Finance
- scope of Behavioural Finance
- objectives of Behavioural Finance
- applications of Behavioural Finance

1.3 CONCEPT OF BEHAVIOURAL FINANCE

1.3.1 Meaning

Behavioural Finance is the study of investors psychology while making financial decisions. It is the study of the influence of psychology and sociology on the behaviour of financial practitioners and the subsequent effect on market. According to Behavioural

finance, investors' market behaviour derives from psychological principles of decision-making to explain why people buy-sell stock. Behavioural finance focuses upon how investor interprets and acts on information to take various investment decisions. Behavioural finance can be explained as modern finance in which it seeks the reasons of stock market anomalies by justifying them with explanation of various biases that the investors have while taking investment decisions. Behavioural finance is an add-on paradigm of finance, which seeks to supplement the standard theories of finance by introducing behavioural aspects to the decision-making process. Behavioural finance deals with individuals and ways of gathering and using information. At its core, behavioural finance analyses the ways that people make financial decisions. Behavioural finance seeks to understand and predicts systematic financial market implications of psychological decision processes. In addition, it focused on the financial decision-making. Behavioural finance is the combination of psychology, sociology and finance.

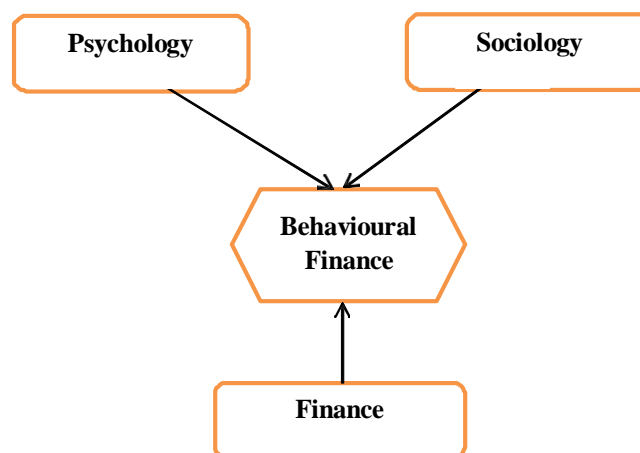


Figure 1.1 CONCEPT OF BEHAVIOURAL FINANCE

In addition behavioural finance also place emphasis on investor's behaviour leading to various market anomalies. Investors fall prey to their own and sometimes others' mistake due to the use of emotions in financial advisors, behavioural finance is still unfamiliar and unused subject.

1.3.2 Definitions of Behavioural Finance

- **Lintner G. (1998)** has defined behavioural finance as being study of human interprets and acts on information to make informed investment decisions.
- **Olsen R. (1998)** asserts that behavioural finance seeks to understand and predict systematic financial market implications of psychological decision process.
- **Shefrin (1999)**, “Behavioural finance is rapidly growing area that deals with the influence of psychology on the behaviour of financial practitioner”.
- **W. Forbes (2009)** defined behavioural finance as a science regarding how psychology influences financial market. This view emphasises that the individuals are affected by psychological factors like Cognitive biases in their decision-making, rather than being rational and wealth maximizing.
- **M. Sewell (2007)** has stated that behavioural finance challenges the theory of market efficiency by providing insights into why and how market can be inefficient due to irrationality in human behaviour.
- **M. Schindler (2007)** has given certain examples while defining behavioural finance:
 - (a) Investors’ biases when making decisions and thus letting their choices to be influenced by optimism, overconfidence, conservatism.
 - (b) Experience and heuristics help in making complex decisions.
 - (c) The mind processes available information, matching it with the decision’s maker own frame of reference, thus letting the framing by the decision the maker impact the decision.

Thus, behavioural finance is defined as the field of finance that proposes psychological based theories to explain stock market anomalies. Within the behavioural finance it is assumed that the information structure and the characteristics of market participants systematically influence individual’s investment decisions as well as market outcomes.

Thus, Behavioural finance can be described in the following ways:

- Behavioural finance is the integration of classical economics and finance with psychology and the decision making sciences.
- Behavioural finance is an attempt to explain what causes some of the anomalies that have been observed and reported in the finance literature.
- Behavioural finance is the study of how investors systematically make errors in judgment or 'mental mistakes'.

Behavioural finance is defined as the field of finance that proposes psychological based theories to explain stock market anomalies. Within the Behavioural finance it is assumed that the information structure and the characteristics of market participants systematically influence individual's investment decisions as well as market outcomes.

1.3.3 Assumptions of Behavioural Finance

- **Loss aversion:** Loss aversion is a tendency in Behavioural finance where investors are so fearful of losses that they focus on trying to avoid a loss more so than on making gains i.e. for them it is better to avoid a loss of Rs. 500 than to gain Rs. 500.
- **Bounded rationality:** The manner in which human being behave, limits the irrationality.
- **Denial of risk:** They may know statistical odds but refuse to believe these odds.

1.3.4 Silent Feature of Behavioural Finance

The following are the silent features of behavioural finance:

1. **Psychology of stock markets:** Understanding of economic behaviour of agents is sufficient when markets are assumed to efficient and all investors act in same rationality. But this seldom happens due to the dependency of stock prices on the mental attitude of the investing public at large. Thus behavioural finance does include the study of psychology of financial participants

ranging from financial managers attitudes to the general investors beliefs. Behavioural finance takes the insights of psychological research and applies them to financial decision.

2. **Role of Biases:** Most people know that emotions affect investment decisions. People in the industry commonly talk about the role greed and fear play in driving stock markets. An investor well informed of these existing emotions currently in the market can safeguard himself from irrational behaviour in the market. Investment advisors and other investor educating institutions provides propaganda on this unusual impact of greed and fear can bring market corrections and thereby reduce the impact of emotional biases on the market. Behavioural finance extends this analysis to the role of biases in decision making, such as the use of simple rules of thumb for making complex investment decisions.
3. **Heuristics and Biases:** Behavioural Finance, explains that the real world is different from what neoclassical models in economics and finance assumes. Choosing a best alternative from universe of alternatives not at all possible, because people have limited cerebral capacity and information sources. Therefore, they rely on heuristics which can lead to biases.
4. **Vulnerability:** Understanding of behavioural finance is aimed to protect the individual participants in the capital market from vulnerable effects of market behaviour from being exploited. They can be advised to stick to fundamentals without over reacting to the market.
5. **Hedging strategies:** Analysis of risk and its identification in behavioural finance will be different from that of traditional finance. So, financial engineers are expected to develop new strategies and financial instruments that can guard the investors at least from certain normal and repetitive biases in the market. Thus, behavioural finance aims at limiting chances for extreme volatility conditions by explaining the reasons for imperfection from behavioural point of view.

1.3.5 Behavioural Finance as a Science or an Art

Behavioural Finance as a Science

Whether behavioural finance should be regarded as a science or not depends on how we define science. To put it simple, science is a systematic and scientific way of (i) observing, (ii) recording, (iii) analyzing and (iv) interpreting any event.

The field of behavioural finance has taken inputs from standard finance only, which is a systematic and well-designed subject based on various theories. The theories of standard finance also help in justifying the price movements and trend of stocks (Fundamental Analysis), the direction of markets (Technical Analysis), construction, revision and evaluation of investors' portfolios (Markowitz Model, Sharpe's Performance Index, Treynor's Performance Index, various formula plans of portfolio revision). Hence, on the basis of this discussion behavioural finance can justify as a science.

Behavioural Finance as Art

Art as a subject is entirely different from science. In science, we work according to the rule of thumb whereas in art we create our own rules. Art helps us to use theoretical concepts in the practical world. While executing the theories and concepts of standard finance too, certain modifications and aberrations in the theories take place. These aberrations are because of the effect of the psychology of different users.

Behavioural finance forces on the reasons that limit the theories of standard finance and also the reasons for market anomalies created. It also provides guidance to investors to identify themselves better by providing various models of human personality. Once investors get to know the limitations and also the remedies of their mental set up, they tend to plan their finances better.

Behavioural finance provides various tailor made solutions to the investors to be applied in their financial planning, hence it can be justified as an finance in a more practical manner.

1.4 NATURE OF BEHAVIOURAL FINANCE

Behavioural finance is not just a part of finance but is broader and wider in scope and includes insights from Behavioural economics, psychology and microeconomic theory. In the process of making financial investments, investors often have difficulty while choosing the most economic option because of the impact of his/her various psychological and mental filters. When investors ask for guidance from an agent or a professional in the field of finance, their behaviour may also be influenced by market information or strategies of other agents or professionals.

Behavioural finance can be defined as open-minded finance. The main theme of traditional finance is to avoid all possible effects of the personality and mindset of an individual. But anomalies and biases existing in the real world are explained with the help of behavioural finance to explain the reasons for the same. As per standard finance theories, investors should be rational in their approach but behavioural finance helps in explaining the normal behaviour of investors.

As indicated in earlier behavioural finance is a combination of two fields of study i.e., Psychology and finance. Even though the need for this was felt in the early 1980's, its popularity in leaps and bounds until financial experts failed to explain the stock market behaviour and reasons for various crisis in the absence of study of anomalies and biases present in the behavioural attitude of investors. This dimension was not there in the literature of finance that includes famous concepts like Markowitz efficient frontier, efficient market hypothesis, random walk theory and technical analysis. It will be an absolute blunder to say that behavioural finance is a replacement of current studies on financial management and stock markets. Behavioural finance starts from where finance was left. Especially in the times of imperfection or irrational movements in stock markets, behavioural finance adds to the current financial understanding in predicting the proactive movements in stock market variables using some additional theories of psychology blended into finance.

Behavioural finance, as a subject, can be better discussed if we divide it into two branches which are as follows:

- i. Micro Behavioural Finance
 - ii. Macro Behavioural Finance
- i. Micro Behavioural Finance (BFMI):** This branch deals with the behaviour of individual investors. In BFMI, we compare irrational investors to rational investors, as observed in the rational/classical economic theory. These rational investors are also known as “homo economicus” or the rational economic man.
- ii. Macro Behavioural Finance (BFMA):** Unlike micro behavioural finance (BFMI), which deals with the behaviour of individuals, macro behavioural finance deals with the drawbacks of the efficient market hypothesis. Efficient market hypothesis is one of the models in conventional finance that helps us understand the trend of financial markets. Macro behavioural finance also addresses the limitations of Portfolio Principles of Markowitz, the Capital Asset Pricing Model (CAPM), Theory of Sharpe, Linter, Black and the Option-Pricing Theory of Black, Scholes and Merton.

1.5 SCOPE OF BEHAVIOURAL FINANCE

The scope of Behavioural finance can be visualized by examining its role in investment decision-making if individuals as well as corporate. The scope areas of Behavioural finance are discussed as follows:

- a. *To understand the reasons of market anomalies:*** Though standard finance theories are able to justify the stock market to a great extent, still there are many market anomalies that take place in stock markets, including creation of bubbles, the effect of any event, calendar effect on stock market trade etc. These market anomalies remain unanswered in standard finance but behavioural finance provides explanation and remedial actions to various anomalies.
- b. *To identify investor's personality:*** An exhaustive study of behavioural finance helps in identifying the different types of investors' personality. Once the biases of the investor's actions are identified, by the study of investor's personality, various new financial instruments can be developed to hedge the unwanted biases created in the financial markets.

- c. ***To enhance the skill set of investment advisors:*** This can be done by providing better understanding of the investor's goals, maintaining a systematic approach to advise, earn the expected return and maintain a win-win situation for both the client and the advisor.
- d. ***Helps to identify the risks and develop hedging strategies:*** Because of various anomalies in the stock markets, investments these days are not only exposed to the identified risks, but also to the uncertainty of the returns.

1.6 OBJECTIVES OF BEHAVIOURAL FINANCE

Some specific objectives of Behavioural finance have been summarized as follows:

- a. To review the debatable issues in standard finance and to protect the interests of stakeholders in volatile investment scenario.
- b. To examine the relationship between theories of standard finance and behavioural finance and to analyze the influence of biases on the investment process because of different personalities playing in the investment market.
- c. To examine the various social responsibilities of the subject.
- d. To discuss emerging issues in the financial world.
- e. To discuss the development of new financial instruments, which have been developed because of the need of hedging the conventional instruments against various market anomalies.
- f. To familiarize themselves with trend of changes over the years across various economies.
- g. To examine the contagion effect of various events.
- h. An effort towards more elaborated identification of investor's personality.
- i. More elaborate discussions on optimum asset allocation according to age, sex, income and unique personality of investors.

1.7 APPLICATION OF BEHAVIOURAL FINANCE

Behavioural finance actually equips finance professionals with a set of new lenses, which allows them to understand and overcome many proven psychological traps that are present involving human cognition and emotions. This includes corporate boards and managers, individual and institutional investors, portfolio managers, analysts, advisors, and even policy makers. Behavioural traps exist and occur across all decision spectrums because of the psychological phenomena of heuristics and biases. These phenomenon and factors are systematic in nature and can move markets for prolonged periods. It applies to:

1. Investors
2. Corporations
3. Markets
4. Regulators
5. Educations

Capital Asset Pricing Model (CAPM) and the Efficient Market Hypothesis (EMH) are based on rational and logical theories. These theories assume that people, for the most part, behave rationally and predictably. For a while, theoretical and empirical evidence suggested that CAPM, EMH and other rational theories did a respectable and commendable job of predicting and explaining certain events.

However, as time went on, academics in both finance and economics starts to find anomalies and behaviours that could not be explained by the theories available at the time. While these theories could explain certain idealized events, the real world proved to be a messy place in which market participants often behaved very unpredictably.

People are not always rational and markets are not always efficient. Behavioural finance explains why individuals do not always make the decisions they are expected to make and why markets do not reliably behave as they are expected to behave.

Recent research shows that the average investors make decisions based on emotion, not logic; most investors buy high on speculation and sell low in panic mode. Behavioural finance is a new academic discipline which seeks to apply the insights of the

psychologists to understand the behaviour of both investors and financial markets. It helps us to avoid emotion-driven speculation leading to losses, and thus devise an appropriate wealth management strategy.

If behavioural finance were to be helpful to the majority of financial advisors in creating better investment portfolios, the three key challenges are required to be tackled:

First, advisors needed a guidebook to teach them the basics of behavioural biases and how to diagnose them in clients.

Second, even if advisors could diagnose client biases, they needed to know what to do with that information. For example, given a certain set of behaviour, should they attempt to change behaviour of the client to match the allocation that is right for the client, or should they change the allocation to match the client's behaviour.

Third, the industry needed a common behavioural finance language. Behavioural biases, as earlier articulated, were not user friendly because there was not a widely accepted set of terms for describing and communicating these biases to other advisors or to clients.

To understand the behavioural bias, the prerequisite is an understanding of various personality dimensions which have implications for the investors' behaviour. The purpose of behavioural finance is, given the irrational investors' behaviour, to create better investment portfolio for financial advisors.

In doing so, certain key challenges relating to investment decisions need to be tackled. First and foremost, the investment advisors need a comprehensive guidebook to make them understand basics of behavioural biases and how to properly diagnose them in their clients.

1.8 SUMMARY

Behavioural finance is the study of the influence of the psychological factors on financial markets evolution. In other words, financial markets inefficiency is analysed in the light of the psychological theories and perspectives. Behavioural finance is a relatively recent and high paradigm which provides an interesting alternative to classical finance.

The classical finance assumes that capital markets are efficient, investors are rational and it's not possible to outperform the market over the long-term.

Behavioural finance represents a revolution in financial theory. The combination of financial theory with other social sciences resulted in the appearance of behavioural finance. This is a relatively young and promising field of modern finance which has registered remarkable progress in the last decades. Behavioural finance is a concept developed with the inputs taken from the field of psychology and finance. It tries to understand the various puzzling factors in stock markets to offer better explanations for the same. These factors or abnormalities were initially termed as market anomalies, as they could not be explained in the Neo-classical framework. To answer the increased number and types of market anomalies, a new approach to financial markets had emerged - the Behavioural finance. Behavioural finance is defined as the study of the influence of socio-psychological factors on an asset's price. It focuses on investor behaviour and their investment decision-making process.

1.9 GLOSSARY

- **Finance:** Finance is a term broadly describing the study and system of money, investments, and other financial instruments.
- **Behavioural Finance:** Behavioural finance is the study of the influence of psychology on the behaviour of investors or financial analysts.
- **Bounded rationality:** The manner in which human being behave, limits the irrationality.
- **Risk:** Risk is any uncertainty with respect to your investments that has the potential to negatively affect your financial welfare.

1.10 SELF ASSESSMENT QUESTIONS

1. What do you mean by Behavioural Finance?

2. What are the main objectives of behavioural finance?

3. Explain the term behavioural biases.

4. Discuss the silent features of behavioural finance.

1.11 LESSON END EXERCISE

1. What is behavioural finance and its assumptions?

2. Explain the nature and scope of behavioural finance.

3. Discuss the application of behavioural finance.

4. Discuss behavioural finance as art as well as science.

1.12 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
- Singh. S., & Bahl. S (2015). *Behavioural Finance*. Vikas Publishing House, Noida (India).
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- Ackert, L.F., & Deaves, R. (2010). *Behavioural Finance: Psychology, Decision Making and Markets*. Cengage Learning.
- Sewell, M. (2007). *Behavioural finance*. University of Cambridge, 1-14.

INTRODUCTION

**M.COM III SEM
MCOMFE355**

**UNIT- I
LESSON - 2**

INVESTMENT DECISION CYCLE AND JUDGEMENT UNDER UNCERTAINTY

STRUCTURE

- 2.1 Introduction
- 2.2 Objectives
- 2.3 Behavioural Finance and Investment Decision
 - 2.3.1 Behavioural Biases that influence Investment Decisions
 - 2.3.2 Approaches to Decision-making in Behavioural Finance
- 2.4 Investment Decision Cycle
- 2.5 Judgement Under Uncertainty
- 2.6 Traditional finance and Behavioural finance
- 2.7 Summary
- 2.8 Glossary
- 2.9 Self-Assessment Questions
- 2.10 Lesson End Exercise
- 2.11 Suggested Readings

2.1 INTRODUCTION

Classical investment theories are based on the assumption that investors always act in a manner that maximizes their return. Yet a number of research show that investors are not always so rational. Human become puzzled when the uncertainty regarding investment decisions engulfs them. People are not always rational and markets are not always efficient. Behavioural finance explains why individual do not always make the decisions they are expected to make and why markets do not reliably behave as they are expected to behave. Recent research shows that the average investors make decisions based on emotion, not logic; most investor's buy high on speculations and sale low on panic mood. Psychological studies reveal that the pain of losing money from investment is really three times greater than the joy of earning money. Emotions such as fear and greed often play a pivotal role in investor's decision; there are also other causes of irrational behaviour. It is observed that stock price moves up and down on a daily basis without any change in fundamental of economies. It is also observed that people in the stock market move in herds and this influence stock price. Theoretically markets are efficient but in practice, they never move efficiently. For example, a reputed company announces a mega investment in an emerging area over next few years, the stock price of the company starts moving up immediately without looking into the prospects, return or the amount of investment to be made in this project. That is how the behaviour of investor moves the stock price.

2.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- behavioural finance and investment decision
- behavioural biases that influence investment decisions
- approaches to decision making in behavioural finance
- investment decision cycle
- judgement under uncertainty
- traditional finance and behavioural finance

2.3 BEHAVIOURAL FINANCE AND INVESTMENT DECISION

Decision making is a complex process which can be defined as a process of choosing a particular alternative among a number of possible courses of actions after careful evaluation of each. Most crucial challenges to investor is to make investment decisions, having a difference in their profile, like demographic factors, socio economic factors, educational levels, age, gender and race.

Given the run up in stock (capital) market in 2004 to the end of 2007 and subsequent downturn of financial market, understanding irrational investor behaviour is as important as it has ever been. In present scenario behavioural finance has become an integral part of decision-making process due to its influence on performance of investment stock market as well as mutual funds.

Most critical issue is market participant cannot behave rationally always, they deviate from rationality and expected utility assumption, while really making investment decisions. So, behavioural finance help investors as well as market participants to understand biases and other psychological constraints in their interplay in market.

2.3.1 Behavioural Biases that Influence Investment Decisions

Following are the biases which influences investment decisions:

- a. **Denial:** Most of the times investors do not want to believe that the stock they have held since ages has become under-performing or they need to sell it off. They are in a constant state of denial. Even through the said asset brings the overall return of the portfolio down, investors are reluctant to part with it.
- b. **Information processing errors:** Often referred to as the heuristic simplification, information-processing error is one of the biases of investor psychology. These people use the simplest approach to solve a problem rather than depending on logical reasoning. Heuristic simplification can be detrimental to the investing decisions. This is done by omitting crucial information to reduce complexity and processing only part information. Such an approach can led to flawed decisions which can be dangerous to the stock market.

- c. **Emotions:** Most of the behavioural anomalies stem from extreme emotions of the investors do not make decisions with an objective mind and only tend to respond to their biases. Misconceptions, misinterpretations, risk-aversion, past experiences all combine to block the logical bent of mind and exposes the investment decisions to possibilities of risk and losses.
- d. **Loss Aversion:** The risk-taking ability of each investor is different. Some are conservative in their approach while others believe in taking calculated risks. However, among the conservative investors are few who fear losses like anything. They may be aware about the potential gains from an asset class but are intimidated by the prospects of incurring even a short-term loss. In short, their excitement for gains is much less than their aversion towards losses. Needless to say, these investors miss out on quite a few fruitful investments.
- e. **Social influence/herd mentality:** Herding is quite an infamous phenomenon in the stock markets and is the result of massive sell offs and rallies. These investors do not put in deep research behind their decisions and only follow the sentiment of the crowd whether positive or negative. Whether it was the tech-bubble in the early 90's, the subprime crisis in 2010 or the recent banking sector scams in India, the market has seen huge sell-offs. Most of them weren't even warranted.
- f. **Framing:** According to the Modern Portfolio Theory, an investment cannot be evaluated in isolation. It has to be viewed in the light of the entire portfolio. Instead of focusing on individual securities, investors should have a broader vision of wealth management. However, there are investors who single out assets or a particular investment for evaluation. This is viewing at things through a "narrow frame". This may lead to losses. Investors need to look at the holistic picture and evaluate with a "wider frame".
- g. **Anchoring:** Many a time investor holds on to a particular belief and refuse to part ways with it. They "anchor" their beliefs to those notions and have difficulty in accepting any new piece of information related to the subject. This is true in cases wherein a real estate or pharmaceutical company is involved in a legal

battle or bank has been involved in a scam. This negative information is received with greater intensity, so much so that no other piece of positive information can neutralize its effect.

2.3.2 Approaches to Decision-making in Behavioural Finance

Behavioural finance advocates two approaches to decision-making:

- **Reflexive** – Following your gut feeling and inherent beliefs. Infact this is your default option.
- **Reflective** – This approach is logical and methodical, something that requires a deep thought process.

The more investors rely on reflexive decision-making, the more exposed they are to behavioural biases like self-deception biases, heuristic simplification, excess emotions and herding. Behavioural finance is an in depth study on these pattern and is creating a crucial place for itself among investors and investment managers.

To mitigate against reflexive decision-making, it's important to set up processes. Consider setting up processes that guide you through a logical decision-making approach and therefore help mitigate the use of reflexive decision making.

2.4 INVESTMENT DECISION CYCLE

Behavioural finance integrates economic principles with psychological influences of human behaviour in the investment decision. The systematic Cognitive errors and biases are recurrent and predictable but this can be observed mostly ex post. It is relatively easy to find an explanationon why a certain person assumed a financial decision in some circumstances but it is extremely difficult to use the explanatory power of behaviour finance to predict how the respective person will react in the future to the same type of events and within similar circumstances. From a psychology standpoint, investors make non rational mistakes because the inner resorts of human nature prevail over any education, training and computing power. No matter how sophisticated is the financial data, the decision has to be implemented by a human being, subjected to emotions and fears, job security

constraints etc. If these biases and errors are recurrent and predictable, that means that a rational investor can profit from non-rational decisions of some noisemakers activating in the market.



Figure 2.1 : Investment Decision Cycle.

In Figure above shows an approximation of the emotional states that accompany a typical market cycle. The dashed line are representation of asset prices through an economic expansion and ensuing recession.

1. Reluctance

It is worth starting with the word that occurs at both the start and end of the chart: reluctance. This is the default state of most investors. In normal circumstances we fear taking a risk and getting it wrong, more than we fear missing out. This reluctance to get involved is compounded by another strong behavioural effect: loss aversion.

2. Optimism to Exuberance

Reluctance starts diminishing when markets pick up and the economy enters a positive phase. Fear of loss quickly turns into a fear of missing out. Our natural aversion to loss may now cause us to take action to increase short-term emotional comfort, this time by entering the market.

3. Denial to panic

Investors always try to compute gains and losses from the point at which they enter

the market. Only those investors who are in immediate need of liquidity try to sell the holdings, but remaining investors hesitate to sell the stocks in loss (i.e prefer to hold loss making securities). But further fall in the market price leads them to panic situation. Few of the investors may be found to sell their investments for reasons other than liquidity needs. Thus we see fall in price a common phenomenon in all these points, only difference is volume. Volume which is dried up at denial stages bursts at panic stage.

4. Capitulation to reluctance

On the way down, loss aversion and denial tends to cause investors to hold on to their investments. As their portfolio plummets, the emotional pain of selling at a loss increases too, but at a diminishing rate. Losing 5% hurts, but the first 5% hurts the most. Once you've already lost 30%, the difference between -35% and -30% feels less significant than the difference between -5% and no loss at all. The point of despondence can be explained as a point of maximum safety. Hence buying process starts due to emotional safety assumed by investors. When volume of buying gradually increases, there will be phases like depression, apathy and indifference.

2.5 JUDGEMENT UNDER UNCERTAINTY

Judgement and uncertainty play significant roles in behavioural finance. People's decisions are often influenced by Cognitive biases and emotions, leading to irrational choices. Uncertainty about future outcomes also affects decision - making, causing individuals to rely on heuristics and overreact to new information. These factors contribute to market anomalies and deviations from traditional finance theories.

Heuristics are mental short cuts or rules of thumb that individuals use to simplify decision – making and problem – solving. They help people make quicker judgements and choices in complex situations by relying on simplified strategies rather than exhaustive analysis. While heuristics can be efficient, they can also lead to Cognitive biases & errors in judgement, especially in uncertain or ambiguous situations.

Heuristics are shortcuts and rule of thumb approaches used by human mind while

making decision on variable which are highly uncertain. Such use of heuristics can cause bias and lead to irrational responses from investors. In 1974, two brilliant psychologists, Amos Tversky and Daniel Kahneman described three heuristics that are employed when making judgments under uncertainty.

1. **Representativeness Heuristics:** When people are asked to judge the probability that an object or event A belongs to class or process B, probabilities are evaluated by the degree to which A is representative of B, that is, by the degree to which A resembles B.
2. **Availability Heuristics:** When people are asked to assess the frequency of a class or the probability of an event, they do so by the ease with which instances or occurrences can be brought to mind.
3. **Anchoring and adjustment Heuristics:** In numerical prediction, when a relevant value (an anchor) is available, people make estimates by starting from an initial value (the anchor) that is adjusted to yield the final answer. The anchor may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient.

2.6 TRADITIONAL FINANCE AND BEHAVIOURAL FINANCE

The key difference between “Traditional Finance” and “Behavioural Finance” are as follows:

- Traditional finance assumes that people process data appropriately and correctly. In contrast, behavioural finance recognizes that people employ imperfect rules of thumb (heuristics) to process data which induces biases in their belief and predisposes them to commit errors.
- Traditional finance presupposes that people view all decision through the transparent and objective lens of risk and return. Put differently, the form (or frame) used to describe a problem is inconsequential. In contrast, behavioural finance postulates that perceptions of risk and return are significantly influences

by how decision problem is framed. In other words, behavioural finance assumes frame dependence.

- Traditional finance assumes that people are guided by reasons and logic and independent judgment. While, behavioural finance, recognizes that emotions and herd instincts play an important role in influencing decisions.
- Traditional finance argues that markets are efficient, implying that the price of each security is an unbiased estimate to its intrinsic value. In contrast, behavioural finance contends that heuristic-driven biases and errors, frame dependence, and effects emotions and social influence often lead to discrepancy between market price and fundamental value.
- Traditional finance views that price follows random walk, though prices fluctuate to extremes, they are bought back to equilibrium in time. While behavioural finance views that prices are pushed by investors to unsustainable levels in both directions. Investor optimists are disappointed and pessimists are surprised. Stock prices are future estimates, a forecast of what investors expect tomorrow's price to be, rather than an estimate of the present value of future payment streams.

2.7 SUMMARY

Behavioural finance seeks to find how investor's emotions and psychology affect investment decisions. It is the study of how people in general and investors in particular make common errors in their financial decision due to their emotions. It is nothing but the study of why otherwise rational people takes some really thumb investment decisions. Decision making is a process of choosing best alternatives among a number of alternatives. This decision has come out after a proper evaluation of all the alternatives. Decision making is the most complex and challenging activity of investors. Every investor differs from the others in all aspects due to various factors like demographic factor, socioeconomic background, educational level, sex, age and race. An optimum investment decision plays an active role and is a significant consideration. Investor is a rational being who will always act to maximize his financial gain. Yet we are not rational being; we are human being; an integral part of this humanness is the

emotion within us. Indeed, we make most of our life decisions on purely emotional considerations. In the financial world, investor's sometimes base their decisions on irrelevant figures and statistics, e.g., some investor may invest in the stock that have witnessed considerable fall after a continuous growth in recent past. They believe that price has fallen which is only due to short term market movements, creating an opportunity to buy the stock cheap. However, in reality, stocks do quite often also decline in value due to changes in their underlying fundamentals.

Thus, Behavioural finance provides explanations for why investors make irrational financial decisions. It demonstrates how emotions and Cognitive errors influence investors in the decision making process. The various causes that led to behavioural finance are anchoring, overconfidence, herd behaviour, over and under reaction and loss aversions. In essence, behavioural finance approach investigates the behavioural patterns of investors and tries to understand how these patterns guide investment decision. Behavioural finance offers many useful insights for investment professionals and thus, provides a framework for evaluating active investment strategies for the investors.

2.8 GLOSSARY

- **Decision making:** It is a complex process which can be defined as a process of choosing a particular alternative among a number of possible courses of actions after careful evaluation of each.
- **Heuristics:** Heuristics are shortcuts and rule of thumb approaches used by human mind while making a decision on variable which are highly uncertain.
- **Anchoring and adjustment:** Anchoring and adjustment is a Cognitive heuristic where a person starts off with an initial idea and adjusts their beliefs based on this starting point.
- **Herd mentality:** These investors do not put in deep research behind their decisions and only follow the sentiment of the crowd whether positive or negative.

- **Framing:** Framing is a Cognitive heuristic in which people tend to reach conclusions based on the 'framework' within which a situation was presented.

2.9 SELF ASSESSMENT QUESTIONS

1. What do you mean by investment decision?

2. Discuss behavioural biases that influence investment decisions.

3. Explain the approaches to decision making in behavioural finance.

4. Explain the investment decision cycle.

2.10 LESSON END EXERCISE

1. Write a note on judgement under uncertainty.

2. Explain the term behavioural bias.

3. How behavioural finance is different from traditional finance?

2.11 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
- Singh. S., & Bahl. S (2015). *Behavioural Finance*. Vikas Publishing House, Noida (India).
- Sulphey, M.M. (2014). *Behavioural Finance*. PHI Learning, Delhi.
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INTRODUCTION

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**UNIT- I
LESSON - 3**

MENTALACCOUNTING

STRUCTURE

- 3.1 Introduction
- 3.2 Objectives
- 3.3 Concept of mental accounting
 - 3.3.1 Meaning of mental accounting
 - 3.3.2 Definitions
 - 3.3.3 Examples of mental accounting
 - 3.3.4 Mental accounting in investing
- 3.4 Summary
- 3.5 Glossary
- 3.6 Self-Assessment Questions
- 3.7 Lesson End Exercise
- 3.8 Suggested Readings

3.1 INTRODUCTION

Mental accounting (or psychological accounting) attempts to describe the process whereby people code, categorize and evaluate economic outcomes. The concept

was first named by Richard Thaler. Mental accounting deals with the budgeting and categorization of expenditures. People budget money into mental accounts for expenses (e.g., saving for a home) or expense categories (e.g., gas money, clothing, utilities). Mental accounts are believed to act as a self-control strategy. People are presumed to make mental accounts as a way to manage and keep track of their spending and resources. People also are assumed to make mental accounts to facilitate savings for larger purposes (e.g., a home or college tuition). Like many other Cognitive processes, it can prompt biases and systematic departures from rational, value-maximizing behaviour, and its implications are quite robust. Understanding the flaws and inefficiencies of mental accounting is essential to making good decisions and reducing human error.

Mental accounting is a set of Cognitive processes used by individuals and families to organize, evaluate and track financial activities (Thaler, 1999), affecting how investors and other individuals spend and save their money, as well as how they deal with unexpected losses, and explain how investors make their financial and investment decisions by creating separate psychological accounts in their minds for the same type of resource, and how their psychological feelings about it prevent them from focusing on the final outcome of their financial and investment decisions.

Mental accounting often leads people to make illogical investment decisions and to act in ways that negatively or financially counterproductive, and investors have to treat the funds invested as permanently replaceable when invested between different accounts, whether in the calculation of the budget or the calculation of wealth (savings and investments); in order to avoid bias in mental accounting.

Mental or psychological accountability has sometimes serious consequences in everyday life, it affects how investors spend money and how they save it, where the majority of investors make big mistakes when making their financial and investment decisions because of that psychological phenomenon, and this phenomenon affects how they deal with unexpected losses and gains, the source of money affects how it is spent.

3.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- concept of mental accounting
- examples of mental accounting
- concept of mental accounting in investment

3.3 CONCEPT OF MENTAL ACCOUNTING

3.3.1 Meaning of Mental Accounting

The mental accounting concept was introduced by Richard Thaler in a paper titled "Mental Accounting Matters," which was published in the Journal of Behavioural Decision Making. Thaler noted that people place the value of money differently, and it exposes them to irrational decision-making. In simple terms, the concept states that individuals classify money differently based on subjective criteria, and it often leads people to make irrational spending and financially counterproductive investment decisions. The concept suggests that people do not treat money as fungible - i.e., mutually interchangeable - and instead, link their spending to particular budgets. For example, if an individual is paid an end-year bonus of \$1,000 for exemplary performance, they may feel that the bonus allows them to spend money on extravagant items, such as meals, lavish vacations, and other expenses that they would never justify spending regular income on. The concept holds that people are more likely to be impulsive with unexpected money because such money was not factored in their financial plan.

3.3.2 Definitions

According to **Richard Thaler**, "Mental accounting is the set of Cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities".

According to **Shiller** "Mental accounting is the tendency of people to place particular events into different mental accounts based on superficial attributes".

According to the **Thaler**, “Mental accounting explains how we tend to assign subjective value to our money, usually in ways that violate basic economic principles”.

Underlying the theory is the concept of fungibility of money. To say money is fungible means that, regardless of its origins or intended use, all money is the same. To avoid the mental accounting bias, individuals should treat money as perfectly fungible when they allocate among different accounts, be it a budget account (everyday living expenses), a discretionary spending account, or a wealth account (savings and investments).

They also should value a dollar the same whether it is earned through work or given to them. However, Thaler observed that people frequently violate the fungibility principle, especially in a windfall situation. Take a tax refund. Getting a check from the IRS is generally regarded as "found money," something extra that the recipient often feels free to spend on a discretionary item. But in fact, the money rightfully belonged to the individual in the first place, as the word "refund" implies, and is mainly a restoration of money (in this case, an over-payment of tax), not a gift. Therefore, it should not be treated as a gift, but rather viewed in much the same way that the individual would view their regular income.

3.3.3 Examples of Mental Accounting

The following are common examples of mental accounting:

Individuals don't realize the mental accounting line of thinking seems to make sense, but is in fact highly illogical. For instance, some people keep a special "money jar" or similar fund set aside for a vacation or a new home, while at the same time carrying substantial credit card debt. They are likely to treat the money in this special fund differently from the money that is being used to pay down debt, in spite of the fact that diverting funds from the debt repayment process increases interest payments, thereby reducing their total net worth.

Broken down further, it's illogical (and, in fact, detrimental) to maintain a savings jar that earns little or no interest while simultaneously holding credit-card debt that accrues double-digit figures annually. In many cases, the interest on this debt will erode any

interest you could earn in a savings account. Individuals in this scenario would be best off using the funds they have saved in the special account to pay off the expensive debt before it accumulates any further.

Put in this way, the solution to this problem seems straightforward. Nonetheless, many people do not behave in this way. The reason has to do with the type of personal value that individuals place on particular assets. Many people feel, for example, that money saved for a new house or a child's college fund is simply "too important" to relinquish, even if doing so would be the most logical and beneficial move. So, the practice of maintaining money in a low- or no-interest account while also carrying outstanding debt remains common.

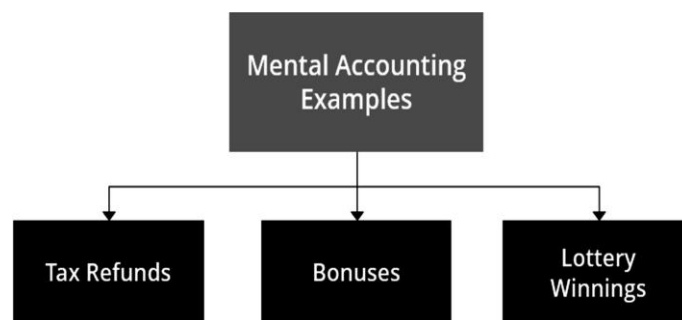


Figure 3.1

Examples of Mental Accounting

- **Tax Refunds**

A tax refund is a reimbursement of the excess amount of tax paid by a taxpayer to the federal or state government. If a taxpayer receives a refund, it means they overpaid their taxes in the previous tax year, and this represents an interest-free loan to the government.

Most taxpayers look at tax refunds as a bonus or sort of windfall whose spending has no impact on their financial plan for the year. It is erroneous since tax refunds represent money that rightfully belongs to the taxpayer, and the tax authority only restores an amount equivalent to the overpaid tax. Instead, tax refunds should be treated as a fungible commodity regardless of its origin, and it should be treated the same way as regular income.

- **Bonuses**

A bonus is a payment to a person above and beyond their regular income. Usually, bonuses are awarded as a form of incentive to entry-level and senior-level employees. Companies also use bonuses to reward special achievements or for the accomplishment of certain milestones.

However, employees see bonuses in a different light other than mere ordinary income. As a result, many employees spend their bonuses on unnecessary expenses such as cars, vacations, fancy clothing, etc.

Such spending behaviour is against the concept of fungibility. Before spending bonuses on extravagant expenses, employees should compare the expenses with what that the money could alternatively be spent on -- something that is more deserving of that money.

- **Lottery Winnings**

Lottery winners often spend their fortunes on dubious purchases that are only justified by the unmerited prize they won. As a result, many lottery winners go bankrupt shortly after receiving their prize and spending their fortune on undeserving expenses.

If the fortune had been spent in line with the financial plan that the winners had before the win, they would've earned returns on their investments or spent the fortune on justifiable expenses.

3.3.4 Mental Accounting in Investment

People also tend to experience the mental accounting bias in investing as well. For instance, many investors divide their assets between safe portfolios and speculative ones on the premise that they can prevent the negative returns from speculative investments from impacting the total portfolio. In this case, the difference in net wealth is zero, regardless of whether the investor holds multiple portfolios or one larger portfolio. The only discrepancy in these two situations is the amount of time and effort the investor takes to separate out the portfolios from one another.

Mental accounting often leads investors to make irrational decisions. Borrowing from

Daniel Kahneman and Amos Tversky's groundbreaking theory on loss aversion, Thaler offers this example. An investor owns two stocks: one with a paper gain, the other with a paper loss. The investor needs to raise cash and must sell one of the stocks. Mental accounting is biased toward selling the winner even though selling the loser is usually the rational decision, due to tax loss benefits as well as the fact that the losing stock is a weaker investment. The pain of realizing a loss is too much for the investor to bear, so the investor sells the winner to avoid that pain. This is the loss aversion effect that can lead investors astray with their decisions.

3.4 SUMMARY

The theory of mental accounting is based on the tendency of investors to place certain events and transactions in different mental accounts, and this bias is often manifested when investors make investment decisions in financial markets when investors divide their money into separate accounts for different reasons, and give each part a different assessment depending on its source, instead of looking at the scene as a single component they look at individual decisions in a way Separately, this behaviour greatly affects when creating portfolios and dealing with assets and shares, making investors deviate from what the portfolio theory suggests if they focus on the interaction between portfolio components to reduce risk by making models of financial assets in separate accounts based on risk rates.

3.5 GLOSSARY

- **Mental accounting:** Mental accounting is the set of Cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities
- **Tax refund:** It is a reimbursement of the excess amount of tax paid by a taxpayer to the federal or state government.
- **Bonus:** A bonus is a payment to a person above and beyond their regular income.
- **Lottery:** Lottery winners often spend their fortunes on dubious purchases that are only justified by the unmerited prize they won.

3.6 SELF ASSESSMENT QUESTIONS

1. What do you mean by mental accounting?

2. Explain mental accounting in context of investment.

3.7 LESSON END EXERCISE

1. Explain the term mental accounting and give some examples.

2. How the mental accounting helps investors in making decisions?

3.8 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
- Singh. S., & Bahl. S (2015). *Behavioural Finance*. Vikas Publishing House, Noida (India).
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INTRODUCTION

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**UNIT- I
LESSON - 4**

COGNITIVE INFORMATION PERCEPTION AND PECULIARITIES (BIASES) OF QUANTITATIVE AND NUMERICAL INFORMATION PERCEPTION, ANCHORING, REPRESENTATIVENESS

STRUCTURE

- 4.1 Introduction
- 4.2 Objectives
- 4.3 Cognitive information perception
- 4.4 Peculiarities of quantitative and numerical information perception
- 4.5 Anchoring
- 4.6 Representativeness
- 4.7 Representativeness v/s Anchoring
- 4.8 Summary
- 4.9 Glossary
- 4.10 Self-Assessment Questions
- 4.11 Lesson End Exercise
- 4.12 Suggested Readings

4.1 INTRODUCTION

With the development of standard finance and widespread application of complex econometric models, economy has started to move away from the field of social sciences and gravitate towards the field of natural sciences. The emergence of behavioural finance prevented further distancing of economy from the social sciences by integrating specific scientific knowledge in the fields of psychology, sociology, anthropology and economics, and shifting the main focus to people, i.e. the human factor. Behavioural finance shifts the focus of economic theorists and researchers from the complex mathematical and statistical models to studying human behaviour and psychology.

The focus of behavioural finance is the analysis of the process of making financial decisions, with representatives of behavioural finance pointing to the frequent disruptions of the principle of the rational financial decision-making. In addition to the disruption of the mentioned principle, another even more significant issue emerges and that is the issue of systemic recurrence of irrationality. Irrationalities that occur in the complex world of finance are explained by behavioural economists based on the Cognitive biases which emerge due to limited Cognitive capacities of decision makers. Systemic errors in reasoning and irrational outcomes of the decision-making process are, in fact, the results of Cognitive biases. Cognitive biases is an integral element of behavioural finance and source of irrational reasoning in financial decision making. Understanding Cognitive biases, especially the ways and mechanisms of overcoming them can be of great benefit to investors, portfolio managers, financial analysts and other financial decision makers.

Behavioural finance is relatively young and productive field of finance, which is rapidly developing and finding its place in practice.

Behavioural finance rests upon the following:

- Cognitive (behavioural) psychology - which studies cognition, i.e. mental processes that regulate human behaviour. It focuses on the mental process, that is, examines how minds of investors undertake the calculations required to maximise wealth;

- Emotional aspects - which tells us that decision-making process is more than a strictly calculative process;
- Social psychology - which recognises the need of a decision maker to be accepted in society and to find encouragement for his/her decisions.

In terms of qualitative methodology, behavioural finance mainly uses inductive approach. By employing experimental research, the way in which some person behaves, thinks and makes financial decisions is observed. This is followed by drawing general conclusions by applying generalisation.

4.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- concept of Cognitive information perception
- biases of quantitative and numerical information perception
- meaning of anchoring bias
- meaning of representative bias
- difference between anchoring and representative bias

4.3 COGNITIVE INFORMATION PERCEPTION

Cognitive psychology is the scientific study of the mind as an information processor. Cognitive psychologists try to build up Cognitive models of the information processing that goes on inside people's minds, including perception, attention, language, memory, thinking, and consciousness.

Cognitive perception includes, aside from the senses listening, seeing, smelling, tasting and feeling, the way in which we deal with information. While perception refers to ways of obtaining information from our environment, cognition describes processes such as remembering, learning, solving problems and orientation.

People use heuristics to control extreme complexity. Heuristics are strategies for information processing, which help to find a quick but not necessarily optimal decision.

Standard finance assumes unlimited cerebral capacity, but in reality human Cognitive system likes to process only a limited information. In behavioural finance it is believed that people tends to make decisions with inadequate and imperfect information and have limited Cognitive capacity. Thus relying on heuristics is a common process in business decision making under risk and uncertainty. A heuristic is a crude rule of thumb for making judgments about probabilities, future outcomes, and so on. A bias is a tendency toward making judgmental errors. The heuristic and biases approach studies different kinds of short cuts people employ to form judgments and the associated biases in those judgments.

Cognitive information perception

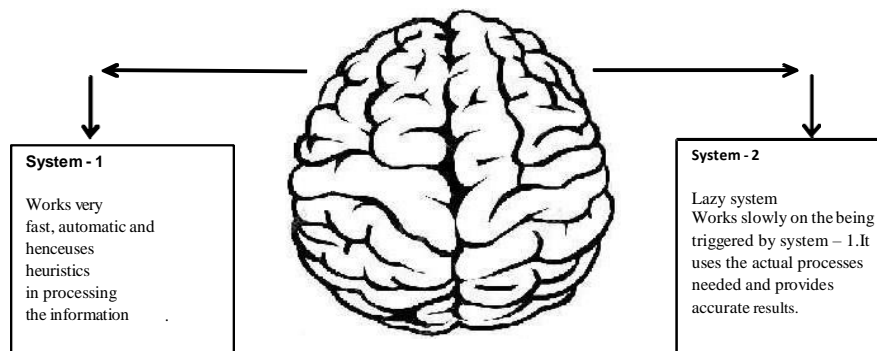


Figure 4.1

For understanding of Cognitive information perception, understanding of working of these two systems of human brain is important. **Psychologists Keith Stanovich** and **Richard West** refer to them as System 1 and System 2. System 1 operates automatically and rapidly. It requires little or no effort and is not amenable to voluntary control. System 2 is effortful, deliberate and slow. It requires mental activities that may be demanding, including complex calculations. As Daniel Kahneman put it, "The operations of system 2 are often associated with the subjective experience of agency, choice and concentration."

Bat and Ball experiment

A bat and a ball cost Rs. 120. A bat costs Rs. 100 more than the ball. What is the cost of the ball?

The number that most probably comes to mind quickly is 20. But is a wrong calculation basically done by System - 1. The correct answer should be 10.

Psychological researchers have given the bat and ball puzzle to thousands of university students. They were shocked to find that more than 50% of students at Harvard, MIT and Princeton failed to give the correct answer. In many other cases such failure rate is even more than 80%.

This experiment proves that people tends to be overconfident in dealing with things which they presume to be familiar and provides answers based on system - 1 which uses heuristics instead of complex calculations. Human mind being familiar with calculation of $120 - 20 = 100$ repeatedly uses that familiarity heuristic to give a biased answer.

4.4 PECULIARITIES (BIASES) OF QUANTITATIVE AND NUMERICAL INFORMATION PERCEPTION

People including the investment community had their own problems in understanding the computations in mathematics. This is especially true in their capability to deal with probability concept. Bias in terms of quantitative and numerical information perception is an unavoidable fact.

Innumeracy: In his book “Innumeracy: Mathematical Illiteracy and its consequences”, John Paulos noted that ? some of the blocks to dealing comfortably with numbers and probabilities are due to quite natural psychological responses to uncertainty to coincidence, or to how a problem is framed. Trouble with numbers is reflected in the following areas.

1. **Money illusion:** People have a continued trouble in understanding the monetary values because, they seldom understands the meaning of nominal value and real value. The impact of inflation is a very hard econometrics that can be easily interpreted by people in framing the decisions on investment. They tends to make illogical approximations or just satisfies with time value of money (capital budgeting) which is more convenient way to understand the profitability of investment.

2. **True probabilities:** People due to their familiarity or otherwise tends to overestimate the probability or underestimate it even though numerically they have equal chances of occurrence.

The 50 Balls experiment

Suppose there are 50 balls with number marked on it as 1 to 50. Now we have to draw 5 balls at a time. When selected group of people are asked to draw 5 balls, which should be marked with 1 to 5, they tend to say it's impossible. At the same time they think that getting some other number combination is possible. But the reality is that all 5 number combinations have equal probability.

3. **Big numbers and small numbers:** Another irrational attitude is identified in choosing between numbers is the tendency of choosing the bigger number and ignoring smaller numbers. For example, in taking capital budgeting decisions, generally higher number NPV are compared for making the choice and Profitability index which is mostly a two digit number is ignored. In the study of financial statements, only the total net earnings are observed by EPS is ignored.
4. **Base rate v/s case rate :** To understand the fundamental strength of an entity at the time of investment, base rate cannot be ignored. But the limited cerebral capabilities in processing vast information for the purpose of understanding the base rate automatically avoids such cumbersome calculations and searches for a shortcut route of considering the case rate as a substitute for it. Case rate means processing currently available small amount of information.

4.5 ANCHORING

It implies resistance to change and attributing undue emphasis to long-term trends. People get used ("anchor") to the existing state of affairs and resist changes, i.e. it takes a long time for people to accept them, because every change carries some risk and an air of discomfort. Those people who inherited some company's shares, let

say from their father, that had been held by his/her family for many years, will find it very difficult to sell them, even if the price of these shares is continuously declining and most investors are trying to sell them. The fact that people are reluctant to change is indirectly supported by research conducted by Johnson and Goldstein (2003). In some European countries (e.g. in Austria, Belgium, France) over 95% of the citizens are willing to donate an organ, while in other European countries (e.g., Denmark) the willingness to donate an organ is below 10%. The reason lies in the fact that, in the first group of countries, based on the relevant applicable law, all citizens are considered to have agreed to be an organ donor when they die unless they have recorded or explicitly expressed in words a decision not to donate, while in the second group of countries citizens are not considered donors by default and they have to register in order to become organ donors. It is not difficult to conclude that in both groups of countries only a small percentage of the citizens will decide to change the default option, i.e., the existing state of affairs, which confirms the assumption that people are not prone to changes - more precisely, they avoid them. An integral part of the tendency to avoid changes is the endowment effect which implies overestimation of the true value of one's real or financial assets (Morewedge & Giblin, 2015). People get sentimentally attached to assets they own, which is why they are not willing to sell them at fair market or any other price. Many people are reluctant to sell their car at twice the price of its real market value. In the case of inherited family home, the endowment effect is even more pronounced. When changes do occur, people underreact because of conservatism. However, if there is a long enough pattern of such changes, the people will adjust to it and in most cases overreact. Therefore, in a short-term period, conservatism cause people to underreact; however, it will cause people to overreact to changes in a long-term period.

While making a quantitative judgment, people are subconsciously anchored to some arbitrary stimulus. Kahneman and Tversky carried out a famous experiment called "wheel of fortune" in 1974 to demonstrate the phenomenon of anchoring. People tried to make adjustments to the number available to them by the wheel because, they really don't know the true value for the question asked to them.

Multiplication experiment

A group of 5 students in the class are asked to make a quick estimate (in 10 seconds) of the value for $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \dots\dots\dots$ the median value of their estimate was 760 as against the true answer of 40320.

Another group of 5 students in the class are again asked to make a quick estimate (in 10 seconds) of the value of the equation $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 \dots\dots\dots$ the median value of their estimate is 4200.

Anchoring can be identified in these two experiments. While the first group is anchored by value received from the multiplication of first 4 or 5 numbers and adjusted to estimate the final value. Same thing happened in the subsequent case as well, but value of first 3 or 4 numbers is anchored for adjustment to get the final value. While the first group based their estimation on lower value ($1 \times 2 \times 3 \times 4 \times 5$) and second group might have based their expectation on higher value ($8 \times 7 \times 6 \times 5$).

4.6 REPRESENTATIVENESS

Representativeness, the first of the "big three" heuristics, is a Cognitive shortcut that replaces a question of probability with one of similarity. In other words, rather than considering the objective chances of a scenario happening, individuals find it easier and faster to assess how closely it corresponds to a similar question. The representativeness bias further supports the notion that people fail to properly calculate and utilize probability in their decisions. Investors can fail to notice trends or extrapolate data erroneously because they interpret it as fitting their preconceived notions.

The most common mistake to arise from this heuristic is the conjunction error. This refers to when the probability of A&B happening is judged to be higher than the probability of A. For instance, after Readings a brief character description of someone lacking imagination but being very analytical, individuals deemed such a character more likely to both be an investor and play jazz than just play jazz. They failed to realize that an investor who plays jazz is nested within the category of anyone playing jazz. In the markets, investors can encounter the conjunction fallacy when interpreting

key indicators. Pointing this error out does not preclude people from falling prey to it again. Although they understand the basic calculating error, people are prone to making the mistake time and time again. What is even more concerning is that experts making high-stakes decisions make the conjunction error too. The failure to recognize nested scenarios affected nearly all economists, analysts, and professional statisticians—illustrating how difficult it can be to avoid this mistake, implies making financial decisions based on the available and easily accessible information that is not necessarily complete and representative (Baker & Ricciardi, 2014; De Bondt et al., 2008; Hammond et al., 1998; Hayibor & Wasieleski, 2009; Tversky & Kahneman, 1974). According to Ritter (2003), people put too much weight on recent experience or the experience that immediately comes to mind. Also, people put too much weight on information spewed out by media on everyday basis. Swimmers often underestimate the danger of currents and overestimate the danger of shark attacks, because media covers almost every shark attack story and rarely reports on the occurrence of the dangerous water currents (Shefrin, 2010). Similarly, people often overestimate the danger of traveling by plane, despite the fact that flying is actually one of the safest forms of transportation, and underestimate the dangers of road transportation, because the media around the world are apt to cover any plane crash as breaking news, while road accidents get much less media coverage. Furthermore, investors, guided by the representativeness bias, overestimate the likelihood that the purchase of well-known large cap stocks is a good investment decision. The groundedness of such investment decisions is questionable, because the high demand for the shares of large companies implies a high share price and consequently low returns. Also, when choosing securities, investors are often guided by recent movements in their prices, completely ignoring their fundamental value. They believe that the securities that used to generate above-average returns in the past will continue to do so in the future, thereby ignoring the possibility of a well-known regression towards the mean, or average value. Similarly, when choosing an investment fund to entrust the management of their assets, investors usually opt for the investment fund that has recently managed to "beat" the market, or the one most aggressively advertised, i.e. the one most present in the media.

Thus, representativeness bias implies that investors make unfounded financial decisions and jump to conclusions based on a limited set of information, advertising ads,

recommendations from friends, some isolated case, analogies, stereotypes or events that have left a strong impression, i.e., a strong emotional impact, on them. Representativeness bias means that investors make conclusions without taking much thought of the size and representativeness of the sample. They ignore the fact that small samples are not equally representative as the large ones. The law of small numbers cannot replace the law of large numbers, therefore related misconceptions often result in making wrong decisions.

4.7 REPRESENTATIVENESS V/S ANCHORING

Underweighting of base rate (Representativeness) and anchoring can at times appear conflicting. While the former says that people are overly influenced by sample information (or case rate), the latter says that people tend to pay insufficient attention to sample data.

To understand this conflict, let us consider - a picnic panic story narrated by Prasanna Chandra in his book Behavioural Finance. According to him, people are coarsely calibrated, which means that people see things as black or white and ignores all different shades of gray possible with combination of black and white.

Suppose a person is planning to picnic on a holiday with family. He learnt from metrological announcement that it is likely to be sunny day. Indeed, as he start off to the park, the day is sunny. After a while, some clouds gather. Anchored by his prior view, he ignored the clouds, viewing them as a passing phenomenon. More clouds gather but he console himself by saying "eventually it will turn out to be a sunny day." The sky, however grows even darker. Because of coarse calibration, he abruptly change his belief and say, "it is now surely going to rain, so started to head back home."

The reality, however, is more complex. At the beginning of the day. The meteorologist had forecasted that it was likely to be a sunny day with some probability of rain. But being coarsely calibrated, he focused on "sunny day" and ignored the possibility of rain. He clung on to this view, despite mounting evidence of potential rain. When the sky turned too dark to ignore, he coarsely transitioned to a view that the probability of rain was 100%, not realizing that

the dark clouds might blow away. Perhaps the true probability of rain had gone up but not to 100%. Instead of heading back to home, perhaps he should have remained near the car, ready for a sudden down pour or else resuming his picnic.

This narration is equally applicable to investors in investment decision cycle framed with uncertainty. Thus, we can conclude that Anchoring and Representativeness heuristics are different. Underweighting of base rate is called representativeness, complete ignorance of it is called as Anchoring.

4.8 SUMMARY

Behavioural finance seeks to explain the reasons behind the irrational behaviour of investors and find answers to many questions that remain unanswered by standard finance, such as: Why the active portfolio strategy is predominantly applied when managing a portfolio despite a growing number of studies that indicate this strategy is unsupported by results? Why investors would rather have a one-dollar of dividends than a one-dollar increase in the value of capital? Why investors ignore the benefits of diversifying investments and invest in only three or four securities? Why they ignore investment diversification benefits and rather invest in only three or four securities? Why they hang on to "losers" and thus increase the tax burden and why small-cap shares bring higher returns than large-cap shares. In order to answer these and similar questions we should consider Cognitive biases, however we must keep in mind that a single behavioural finance model cannot be universal tool for answering all the questions. Just as in medicine there is not one drug for every disease, so we should not expect that there will be one model that will fit all of the behavioural finance aspects.

4.9 GLOSSARY

- **Cognitive psychology:** Cognitive psychology is the scientific study of the mind as an information processor.
- **Heuristics:** Heuristics are strategies for information processing, which help to find a quick but not necessarily optimal decision.

- **Anchoring bias:** implies resistance to change and attributing undue emphasis to long-term trends.
- **Representativeness bias:** implies making financial decisions based on the available and easily accessible information that is not necessarily complete and representative.

4.10 SELF ASSESSMENT QUESTIONS

1. What do you mean by Cognitive information perception?

2. Explain the peculiarities of quantitative and numerical information perception.

4.11 LESSON END EXERCISE

1. Explain the term anchoring biasness.

2. Write a note on representativeness bias?

3. Differentiate between anchoring and representativeness bias.

4.12 SUGGESTED READINGS

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INTRODUCTION

**M.COM III SEM
MCOMFE355**

**UNIT- I
LESSON - 5**

EXPONENTIAL AND HYPERBOLIC DISCOUNTING AND BOUNDED RATIONALITY IN REAL MARKET CONDITIONS

STRUCTURE

- 5.1 Introduction
- 5.2 Objectives
- 5.3 Exponential discounting and hyperbolic discounting (present bias-lack of self-control)
 - 5.3.1 Exponential discounting
 - 5.3.2 Hyperbolic discounting
 - 5.3.3 Exponential and Hyperbolic discounting (Present bias)
- 5.4 Bounded rationality in real market conditions
 - 5.4.1 Utility preference function
 - 5.4.2 Approaches to preference relations
- 5.5 Summary
- 5.6 Glossary
- 5.7 Self-Assessment Questions
- 5.8 Lesson End Exercise
- 5.9 Suggested Readings

5.1 INTRODUCTION

It is a well known fact that behaviour can be rational or irrational, then, it could be inferred that preferences, beliefs, expectations and the decision-making process are also. Cyert & March mention that the company is an institutional, functionally rational response to uncertainty and bounded rationality. How much of this can be observed in reality is to be doubted. Rationality in the real world is a complex concept, due to which there are numerous research works that argue that rationality is bounded by the lack of knowledge.

Human beings struggle for rationality, but it is restricted within the limits of their knowledge. The rational choice is feasible as the bounded set of factors on which the decision is based corresponds to a closed system of variables. Vargas-Hernández et al., indicates that decisions can be made without taking into account the possible results derived from knowledge biases. A branch of the social sciences that tries to mitigate these biases, along with the economy, is operations research, however, the behavioural part is incorporated into these areas to try to explain and solve the limitations of the decision making in the firms.

A decision can be called objectively rational, if, in fact, it is the correct behaviour to maximize the values given in a specific situation. A decision is subjectively rational if it maximizes achievement relative to the subject's actual knowledge. From this it can be inferred that an action is consciously rational insofar as the adjustment of the means to the ends is a conscious process. This resembles what economic man (*homo economics*) represents, since it has characteristics such as being fully informed, sensitive and rational.

An economic man according to the theory of the decision has complete information, assuming that he knows not only all the courses of action, but also his results. It is sensitive to the available alternatives. The crucial fact about the economic man is that he is rational. This means that their preferences are complete, transitive and that there are perfect substitutes; and on the other hand he makes his decisions to maximize his utility. The same author refers to the behaviour in the decisions, mentioning that humans are neither perfectly consistent nor perfectly sensitive.

The above makes sense to the extent that it is understood that in the tensions that exist between society and the individual, there is a great demand to compete within the individual conscience. Where rational economic approach is to think individually, as well as the economic man who seeks to maximize its utility derived from instrumental rationality (rational choice). And since the capacity of the human mind to formulate and solve complex problems is very small compared to the size of the problems, whose solution is necessary for objectively rational behaviour in the real world, instrumental rationality becomes, so to speak, bounded rationality.

The theory of the instrumental rationality or rational choice, assumes that, in a situation of decision, the means, the information, the beliefs and personal analyzes, are optimal; the estimates of probabilities are easily realizable; the individual has at his disposal information about all possible alternatives and has a complete and consistent system of preferences that allows him to make a perfect analysis of all of them. It does not present difficulties or limits in the mathematical calculations that it must carry out to determine which is the best, therefore, it guarantees that the chosen alternative is a global optimum.

The theory of bounded rationality, sees the decision process from a very different point of view. In the decision-making process, even in relatively simple problems, a maximum cannot be obtained since it is impossible to verify all possible alternatives. People differ in both available opportunities and desires (influenced by environmental factors). When an individual must decide, they influence him, both the desires that he possesses and the opportunities that he thinks he has. It is not certain that these beliefs are correct: it is possible that the individual is not aware of some opportunities that are actually viable to him or, he may believe that certain opportunities are favorable to him, which in reality are not, therefore it cannot be guaranteed that choose the best alternative.

As mentioned in Vargas-Hernández et al., about bounded rationality, referring to the fact that human behaviour is rational first intention, but bounded by information asymmetry. And as mentioned earlier, the ability of the human mind to formulate and solve problems is small and is bounded by neuropsychological issues on the one hand and language limits on the other. Physical limits are the individual abilities to receive,

retrieve and process information; those of language refer to the inability of individuals to articulate their knowledge or feeling by the use of a word, so that they can be understood by others.

5.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- exponential discounting and hyperbolic discounting
- concept of bounded rationality
- utility preference function
- approaches to utility relations

5.3 EXPONENTIAL DISCOUNTING - HYPERBOLIC DISCOUNTING (PRESENT BIAS - LACK OF SELF-CONTROL)

5.3.1 Exponential Discounting

Exponential discounting is a specific form of the discount function, used in the analysis of choice over time (with or without uncertainty). Exponential discounting implies that the marginal rate of substitution between consumption at any pair of points in time depends only on how far apart those two points are. Exponential discounting is not dynamically inconsistent. A key aspect of the exponential discounting assumption is the property of dynamic consistency- preferences are constant over time. In other words, preferences do not change with the passage of time unless new information is presented. For example, consider an investment opportunity that has the following characteristics: pay a utility cost of C at date $t=2$ to earn a utility benefit of B at time $t=3$. At date $t=1$, this investment opportunity is considered favorable; hence, this function is: $\delta C + \delta^2 B > 0$. Now consider from the perspective of date $t=2$, this investment opportunity is still viewed as favorable given $\delta C + \delta B > 0$. To view this mathematically, observe that the new expression is the old expression multiplied by $1/\delta$. Therefore, the preferences at $t=1$ is preserved at $t=2$; thus, the exponential discount function demonstrates dynamically consistent preferences over time. For its simplicity,

the exponential discounting assumption is the most commonly used in economics. However, alternatives like hyperbolic discounting have more empirical support.

5.3.2 Hyperbolic Discounting

Traditional finance assumes exponential discounting. Exponential discounting is a time-consistent model of discounting, implying that a constant discount rate is assumed across time. This means that valuation falls by a constant factor per unit of delay, irrespective of the total length of the delay. For an individual with an exponential discount function, the subjective present value of a rupee received in one year is a_1 ; of a rupee received in two years is a_2 ; of a rupee received in three years is a_3 ; and so on. This means that the ratio of the subjective value of a rupee at some point in time (say t) to its value one period later in the future is as follows: $\delta = \delta_{t+1}/\delta_t = 1 + \rho$, $t \geq 0$. It must be emphasised that this ratio is the same across time, implying that preferences are dynamically consistent. A number of studies, however, have demonstrated that the assumption of constant discount rate is systematically violated. These studies show that people don't use a constant discount rate across time. Rather they do hyperbolic discounting, in which valuation falls very rapidly for small delay periods, but then falls slowly for longer delay periods. To understand hyperbolic discounting consider the following scenario. Suppose a person is given a choice between two payments a smaller payment at time t and a larger payment at time $t + 1$. When t is far off, the person typically prefers the larger payment. But as t nears zero (now), the person is likely to reverse the preference. As a concrete example, a person choose 21150 in two years instead of 21000 a year from now, but the same person will choose 21000 now instead of 21150 one year hence. This means that preferences are not consistent over time. Individuals who display such preferences are described as "present-biased" as they lack self-control.

It may be noted that Adam Smith, father of modern economics, had expounded on self-control in his earlier book *The Theory of Moral Sentiments* published in 1759. He portrayed it as a struggle between our "passions" and what he called our 'impartial spectator.' As he puts it, "the pleasure which we are to enjoy ten years hence, interests us so little in comparison with that we may enjoy to-day." In 1871, William Jevons, another economics stalwart, modified Smith's observation about myopia, when he

observed that the preference for present consumption over future consumption declines over time. It is a failure of willpower, or, as Arthur Pigou, an eminent economist, famously said that it could be a failure of imagination: "Our telescopic faculty is defective and we, therefore, see future failures, as it were, on a diminished scale." Thus, individual Thus, individuals who use hyperbolic discounting make choices that are inconsistent over time. They make choices today that their future self would not make, despite using the same reasoning. Mathematically, the hyperbolic discounting function behaves as follows:

$$PaH, /332 H, 1332 H$$

Essentially, the discount function shows a steep decline initially, but then looks very similar to an exponential function.

While hyperbolic discounters display standard preferences when they compare money at two different future points in time, they seem to have a problem.

When one of the sums to be compared is immediate. This is a manifestation of the self-control problem.

In the context of savings, people want to start a savings programme next year, not now. A person who likes the idea of saving a rupee a year from now but is not keen to do it now, has a hyperbolic discounting function.

5.3.3 Exponential and Hyperbolic Discounting (Present Bias)

Standard finance assumes exponential discounting of future cash flows for taking Investment decisions. According to exponential discounting model, r = discount rate remains constant throughout the life of the project. More unrealistic is that everyone depending up on the risk level of the project should have same discount rate. That means discount rate is project specific and risk aversion levels of individual investors is not a concern. Behavioural finance model try to adjust this fallacy by introducing the hyperbolic discounting model. Here it is important to note that the false base is not in the finance theory but in the behaviour of investors who lacks self-control. They tend to systematically violate the constant discount rate assumption of standard finance. Between various points of time they have different

rates of discounting. That means the ratio of discounting is not constant. This makes the model called Hyperbolic discounting with different discounting ratios and changing preferences on the curve. To understand Hyperbolic discounting consider a scenario, where an option is given to receive 100 in one year from now or to receive 130 in two years from now. The persons tends to choose 130 in two years. But same option is given as 100 today (immediate) and 130 a year from now. Choice is to take 100 today. This is the reason for having two different preferences between two points on the same curve. As t is nearing Zero, immediate payments are preferred and t is far away from Zero we see the tendency to choose large values in future. This asymmetric behaviour is called present bias or lack of self control.

Equations and graphs of Exponential and Hyperbolic curves

P_n = Present value at n th period

A_n = Amount at n th period

e = exponential value

r = discount rate

t = time period (1,2,3,4 n)

Exponential discounting model provides the relationship between present value and future value as $P_n = A_n * e^{-rt}$

$\int e^{-rt} = 1/r$ the total are bounded between the exponential curve and x,y axis of the graph.

Hyperbolic Discounting α = risk aversion of investor for discounting such that

Discounting model is given by $1 / (1 + \alpha *t)$

$\int 1 / (1 + \alpha *t) = \infty$ (Infinite)

When these functions are graphed on the same graph, we observe that exponential discounting overvalues the present values. That means value presumed by investors considering their risk aversion in hyperbolic discounting is lower

present value defined by exponential discounting model. (Short run). But, over a long period of time, present values under hyperbolic discounting tends to be more than constant discount under exponential discounting model.

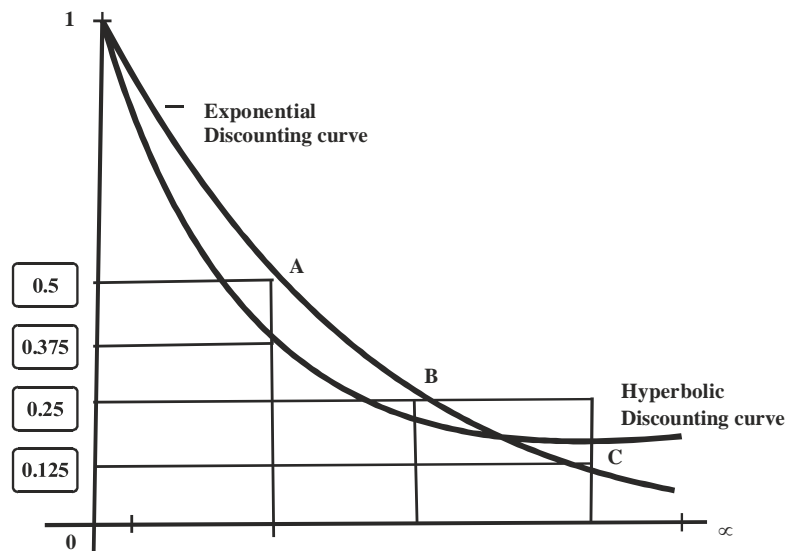


Figure 5.1 : Exponential Discounting Curve

In the above graph we can observe that at a time period called $t = 0$ we have present value = 1 for both the models. But at point A when $t = 1$, we can see that value on Y - axis is 0.50 for exponential discounting but value on the same axis is 0.375 for Hyperbolic discounting.

At point -B same is the behaviour but the difference is very narrow. At Point C we observe a reverse tendency, where Value under hyperbolic discounting curve is higher than exponential discounting value. Individuals who display such preferences are described as present - biased as they lack self-control. William Jevons one of the economic stalwart, explains this myopia as the preference for present consumption over future consumption but at diminishing rate. That means the preference for present consumption decreases gradually over a time.

5.4 BOUNDED RATIONALITY IN REAL MARKET CONDITIONS

Bounded rationality is the idea that rationality is limited when individuals make decisions.

In other words, humans' "preferences are determined by changes in outcomes relative to a certain reference level". Limitations include the difficulty of the problem requiring a decision, the Cognitive capability of the mind, and the time available to make the decision. Decision-makers, in this view, act as satisficers, seeking a satisfactory solution, rather than an optimal solution. Therefore, humans do not undertake a full cost-benefit analysis to determine the optimal decision, but rather, choose an option that fulfils their adequacy criteria.

Some models of human behaviour in the social sciences assume that humans can be reasonably approximated or described as "rational" entities, as in rational choice theory or Downs' political agency model. The concept of bounded rationality complements "rationality as optimization", which views decision-making as a fully rational process of finding an optimal choice given the information available. Therefore, bounded rationality can be said to address the discrepancy between the assumed perfect rationality of human behaviour (which is utilised by other economics theories such as the Neoclassical approach), and the reality of human cognition. In short, bounded rationality revises notions of "perfect" rationality to account for the fact that perfectly rational decisions are often not feasible in practice because of the intractability of natural decision problems and the finite computational resources available for making them.

How should we decide? And how do we decide? These are the two central questions of Decision Theory. In the prescriptive (rational) approach to decision making explains how rational decisions should be made. But descriptive (behavioural) approach explains how actual decisions are made. The study of rational decisions is classical and behavioural theories have raised several questions on its actual application in late 1970's.

5.4.1 Utility preference function

A common feature of decision theories under risk and uncertainty is that they define so called preference relations (or) preference functions between lotteries. A lottery is nothing but a set of states together with their respective outcomes and probabilities. A preference function is a set of rules that defines how we make pairwise

decisions between lotteries.

To give a formal description of likings and dis-likings of the things the concept of preferences is introduced in decision theories. A preference compares lotteries, i.e probability distribution denoted by P , on the set of possible payoffs. If we prefer lottery A over B , we simply write $A > B$. If we are indifferent $A \sim B$. If either of them holds $A \succsim B$.

5.4.2 Approaches to Preference relations

- 1) State preference approach
- 2) State Independent approach
- 3) State dominance approach
- 4) Stochastic approach
- 5) Utility functional approach

1) State preference approach

In this type of approach, decision making depends on state, its probabilities and also on outcomes of each state. A persons preference for a hot coffee or Ice cream depends on state of weather. In an investment scenario state can be like boom or recession where their respective probabilities and outcomes.

<i>State</i>	<i>Probability</i>	<i>Equity Investment</i>	<i>Bond Investment</i>
Boom	P_1	a_{11}	a_{12}
Recession	P_2	a_{21}	a_{22}

Above table is called state preference approach to decision making under risk and uncertainty.

The expected utility of an act is a weighted average of the utilities of each of its possible outcomes, where the utility of an outcome measures the extent to which that outcome is preferred, or preferable, to the alternatives. The utility of each outcome is weighted according to the probability that the act will lead to that outcome.

2) **State Independent approach (or) Lottery approach**

State becomes independent when every outcome had same probability under different states. In such case decision can be taken on alternatives having highest total payoff. This it is also called as lottery approach.

3) **State dominance approach**

Preference choice can be identified based on the dominance of payoffs in an alternative compared to another alternative. Suppose that equity alternative had larger payoffs than bond payoffs, we call it as state dominance, because one alternative had dominating preference in any state.

<i>State</i>	<i>Probability</i>	<i>Equity</i>	<i>Bond</i>
Boom	2/3	1000	400
Recession	1/3	500	380

Above table is an example state dominance preference. Equity can be preferred because, $1000 > 400$, $500 > 380$. Here state and corresponding probabilities are independent.

4) **Stochastic approach**

In conditions where dominance is not clear but still preference is identified due additional advantage in one state, such approach is called as stochastic approach. Taking above example where we replace a payoff of 380 with 600. Then state of dominance is absent since $500 < 600$. But still equity is taken as a preference considering the special advantage of difference between 1000 and 400 in one state (Boom). That means loss with equity in recession is compensated with large advantage available in boom. This is called stochastic approach.

5.5 SUMMARY

From a rational point of view Simon states that choice is the process by which an alternative behaviour for each moment is selected. For this, the possible alternatives must be selected, determine the consequences of each alternative and compare them. Being able to determine the consequences of the decisions taken is complex, since we

must know the actions of other individuals or firms. However, from a logic of the limits of rationality in individual behaviour it is not possible to reach a high degree of rationality.

Choices made by an individual usually take place in an environment where premises are given, which are accepted as the basis of choice; and the behaviour only fits within the limits set by these given environments. One of the functions of the organization is to establish its members in such a psychological environment that it helps to adapt their choices to the objectives of the firm, providing the necessary information to make their decisions.

Bounded rationality occurs when companies lack perfect information, that is, they do not have context information about the results of their actions, for example; they have bounded resources, and are restricted to the ability to process information. Under these conditions, firms are forced to make decisions, based on the data available for this, their resources and capacities to process information. This implies that firms can make decisions that are not completely optimal because they have to adjust to the conditions in which they operate.

Decisions involve a commitment of large amounts of resources of the organisation for the fulfillment of the objectives and purposes of the organisation through the appropriate means. These means can be translated into models that help reduce the limits of rationality in companies.

5.6 GLOSSARY

- **Bounded rationality:** Bounded rationality is a human decision-making process in which we attempt to satisfice, rather than optimise.
- **State dominance approach:** Preference choice can be identified based on the dominance of payoffs in an alternative compared to another alternative.
- **Utility preference function:** Utility function measures consumers' preferences for bundles of goods or services.

5.7 SELF ASSESSMENT QUESTIONS

1. What do you mean by bounded rationality?

2. Discuss the approaches of utility preference relation.

5.8 LESSON END EXERCISE

1. Explain the exponential discounting with the help of graph.

2. Differentiate between exponential and hyperbolic discounting

5.9 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
- Singh. S., & Bahl. S (2015). *Behavioural Finance*. Vikas Publishing House, Noida (India).
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UTILITY, EMOTIONS AND DECISION MAKING

**M.COM III SEM
MCOMFE355**

**UNIT- II
LESSON - 6**

CONCEPT OF EXPECTED UTILITY THEORY, RATIONAL THOUGHT AND EXPECTED UTILITY AS A BASIS FOR DECISION MAKING

STRUCTURE

- 6.1 Introduction
- 6.2 Objectives
- 6.3 Expected utility theory overview
 - 6.3.1 Meaning of Expected utility theory
 - 6.3.2 Key assumptions of expected utility theory
 - 6.3.3 Expected utility theory and risk attitudes of investors
- 6.4 Rational thought
- 6.5 Expected utility as a basis for decision making
- 6.6 Summary
- 6.7 Glossary
- 6.8 Self-Assessment Questions
- 6.9 Lesson End Exercise
- 6.10 Suggested Readings

6.1 INTRODUCTION

Expected utility, in decision theory, the expected value of an action to an agent, calculated by multiplying the value to the agent of each possible outcome of the action by the probability of that outcome occurring and then summing those numbers. The concept of expected utility is used to elucidate decisions made under conditions of risk. According to standard decision theory, when comparing alternative courses of action, one should choose the action that has the greatest expected utility.

The concept of expected utility and the rule of maximizing expected utility have wide application to decisions in business contexts, including those involving insurance, capital expenditures, investment, marketing, and operations. The utility of the outcomes under consideration in such contexts can usually be specified in terms of potential monetary profits and losses. Businesses can use their estimation of the likelihoods of the outcomes of options open to them along with their associated monetary losses and gains to determine the expected utility of each option in terms of its expected monetary profits. The option with the greatest expected utility will then simply be that which has the largest expected profit associated with it, and that option, according to the rule of maximizing expected utility, will be the optimal choice.

Although the concept of expected utility has played an important role in the study of economic behaviour, criticisms have been raised concerning its application to contexts of choice in business and economics. For instance, some theorists from the social and behavioural sciences argue that the Cognitive limitations of human beings make the concept of expected utility as a guide to choice too idealized for use in most significant decision contexts. Such critics thus advocate notions of bounded rationality that are more sensitive to those limitations and make use of evaluative concepts that do not depend on the precise sorts of assessments that are involved in determinations of expected utility. Other critics have argued that the application of expected utility to economic decisions, including policy decisions, has engendered inappropriate valuations, particularly in cases in which monetary units are used to scale the utility of nonmonetary outcomes, such as potential deaths or damage to the environment.

Many philosophers have questioned whether the rule of maximizing expected utility

represents an adequate or complete guide to decisions, particularly with regard to decisions of an ethical nature. The rule of maximizing expected utility represents a consequentialist form of reasoning, in which actions are judged solely in terms of their potential outcomes. As such, philosophers of a deontological orientation question whether such reasoning can provide an adequate account of the role of rights and duties in practical reasoning. Such philosophers argue, for instance, that the moral rights of those affected by an action place constraint on the worthiness of a choice independent of the value of the consequences of that choice.

6.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- expected utility theory
- key assumptions of expected utility theory
- expected utility theory and risk attitudes of investors
- expected utility as a basis for decision making

6.3 EXPECTED UTILITY THEORY OVERVIEW

In many cases, we notice that the behaviour of decision makers under condition of uncertainty does not match the standard value of expected cash. For example, we find that most owners of real estate and auto buying insurance for their property in spite of our observation that, they pay for the insurance companies more than what companies pay them compensation, as most insurance companies make a profit. According to the standard value of expected cash should not buy any these owners the amount of insurance where the monetary value of the expected less than zero. Hence, the question of why pay them more than they get from insurance companies? One of these reasons is that they do not follow to maximize the value of expected cash in their decisions, but follow to maximize the expected utility. Know the benefit as the amount of happiness or autarkic derived by a person of possession or use of objects and vary the amount of benefit from one person to another that is to say the idea of utility is the idea of self-in basis, for example, may check a piece of bread of great

benefit to the poor hungry while others may not achieve any benefit to the rich fed. Besides, the benefit achieved by the extra piece of bread be less than the first, whether the consumer is rich or poor, this is known as the law of diminishing marginal utility in economics. According to the standard expected utility to choose the act which maximizes expected utility is calculated not by money but by what achieved by the money of benefit to the people.

6.3.1 Meaning of Expected Utility Theory (EUT)

The expected utility of an entity is derived from the expected utility hypothesis. This hypothesis states that under uncertainty, the weighted average of all possible levels of utility will best represent the utility at any given point in time.

6.3.2 Key assumptions of Expected Utility Theory

1. It is regarded to be rational to be an expected utility maximizer, as this theory is based on compelling axioms about how people should behave. Expected utility theory posits that decision makers choose the prospect that maximizes their expected (or average) utility.
2. Under expected utility, risk preferences are captured by the shape of the utility function. Decision makers are risk-averse if $U(x)$ is concave, and risk-seeking if $U(x)$ is convex.
3. EUT is based on the tenet that decisions makers are risk-averse.
4. EUT assumes decision makers are rational.
5. Expected utility theory assumes that preferences between prospects do not depend on the manner in which they are described. (Invariance assumption).
6. Expected utility theory assumes that choices only reflect final outcomes. For example, if one were the beneficiary of a '100 check, but also received a '100 speeding ticket, these two events would offset one another in monetary terms.
7. Expected utility theory assumes this principle—adding a common consequence to two prospects should not change which alternative the decision maker prefers. This principle is known as the *independence axiom*.

Allais Paradox

Maurice Allais, a Nobel Laureate in economics identified an inconsistency between actual observed choices and that were predicted by EUT. In the experiment conducted for this purpose, two different situation X and Y are given to several people. In each situation there will be two alternatives X1, X2 and Y1,Y2. People are expected to select one choice in each of the alternatives.

Situation – X

X1 ——— ` 100,000 with 100% probability (Certainty)

X2 ——— ` 0 with 1% probability and ` 100,000 with 88% and ` 500,000 with 12% (Uncertainty)

Situation – Y

Y1 ——— ` 0 with 89% probability and ` 100,000 with 11% (Uncertainty)

Y2 ——— ` 0 with 90% probability and ` 500,000 with 10% (Uncertainty)

Results of the experiment

Results of the study indicated that large proportion of people choose X1 and Y2. If expected utility theory had been applied in the given scenario X2 and Y1 should be choice. This type of orthodox behaviour exhibited by the investors deviating from rational expectation is called Allais Paradox.

Daniel Bernoulli Theory

Daniel Bernoulli explained the paradox, by differentiating between EV (Expected Value) and U (value of utility). According to Bernoulli theory, value of wealth (U) is a diminishing function. If a payoff had 100,000 wealth and a Utility = 10 Units, It does not mean that another payoff with 200,000 wealth will have Utility = 20 Units. Due to diminishing nature (or) Concave shape of the curve such Utility is likely to be lower than 20 Units say 18 Units. Consider the following example.

Wealth (lakhs)	1	2	3	4	5	6	7
Utility (units)	10	18	25	31	36	40	43
Marginal Utility	10	8	7	6	5	4	3

Above table indicates that adding 1 Lakh to a wealth in each stage provided marginal utility of 10 units, 8 Units, 7 Units So on in diminishing manner. That means the total utility is increasing but at decreasing rate.

Situation – 1 Having 4 lakhs of wealth (100% probability)

Or

Situation – 2 Have 2 lakhs of wealth (50% prob) and have 6 Lakhs of wealth (50% prob).

The Utility in the case of situation – 1 is 31 Units and in situation – 2 is $(18 \times 50\% + 40 \times 50\%) = 29$ Units. Thus, Bernoulli offered a solution to the famous paradox and explained why investors become more risk averse in times of adding wealth i.e., gains.

6.3.3 Expected Utility Theory and Risk attitudes of Investors

Utility and Risk Preferences

Different Investors have different preferences for risk.

- Risk averse – has diminishing marginal utility of wealth.
- Risk neutral – has constant marginal utility of wealth
- Risk taker – has Increasing marginal Utility of wealth.

Example A gamble had 50% chance of winning 50000 and 50% chance of winning 150000.

Expected value of gamble = $0.50 \times 50000 + 0.50 \times 150000 = 100,000$

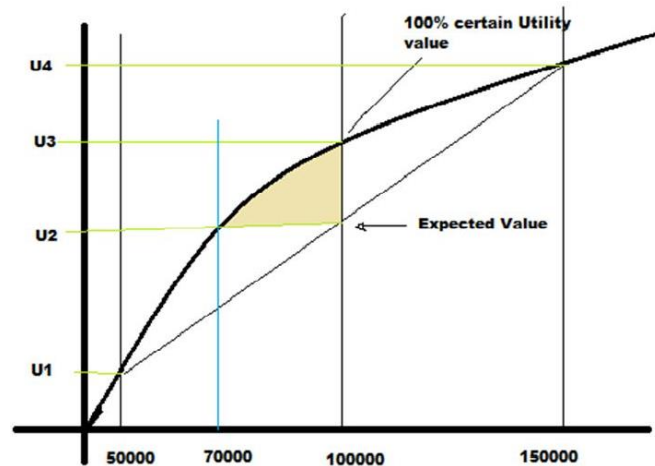


Figure 6.1 : Utility and Risk

When the payoff is at 50000, there is U1 Utility which increased to U3 when payoff is 100,000. For a payoff of 150000 there is wealth of U4. From 50K to 100K the difference in U3 and U1 is very significant compared to 100K to 150K where U4 and U3 are considered. That means $(U3 - U1) > (U4 - U3)$. So, investors does not be interested creating wealth beyond 100,000 where marginal utility derived is very low. Now if a risk averse investor selects 70000 with 100% certainty instead of EV of 100,000 it is due to the cost of insurance the investor is ready to pay to avoid the risk. The shaded arc area in the above diagram indicates the reason why investors chose an alternative that pays them lower payoff then EV. A careful observation of the diagram clearly indicates that U2 is the Utility that is common for payoff of 70,000 as well as 100,000, hence 70000 with certainty equivalent is selected by investors.

- **Risk neutral**

Investor is said to be applying risk neutral attitude when he chooses an alternative which expected to be chosen using EUT. This happens because the marginal utility remains constant between payoffs

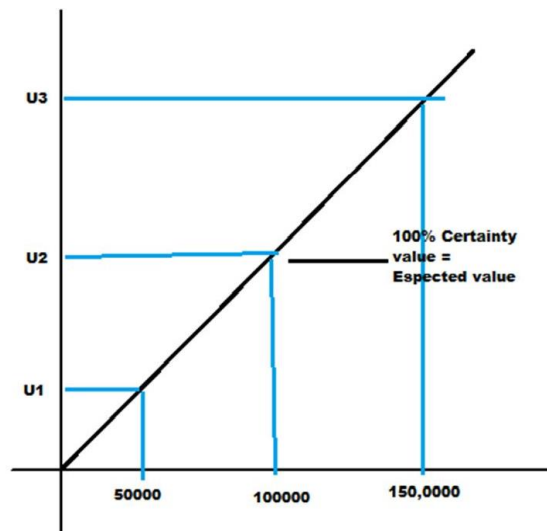


Figure 6.2 : Risk neutral

In the above diagram, a movement of wealth from 50,000 to 100,000 had an additional utility of $U_2 - U_1$. This is exactly equal to $U_3 - U_2$ when moving from 100,000 to 150,000 of wealth. Thus, risk neutral attitude is the only case where EUT is validated by investors in their behaviour. When there are two situations, an investor shall choose the alternative with highest EV, provided marginal utility remains constant. Thus, when the investor is risk neutral, he is indifferent in terms of risk, so bases his decision only on expected value.

- **Risk taker**

Risk taking attitude is identified in investors when the marginal utility is increasing. That means additional wealth is creating more value to the investor. At EV we observe that 100% certain value is lower than EUT. Increasing tendency of the marginal utility attracts the investors to take more risk. So, 100% certain value gives him less utility and encourages to take additional risk for additional wealth.

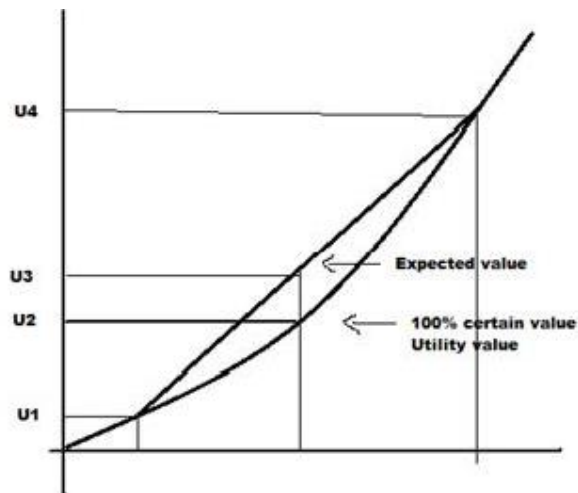


Figure: 6.3 : Risk taker

In this diagram, marginal utility curve of the investor is convex shape. It is increasing from left to right indicating that each additional wealth is bringing increased utility to the investor so he prefers gamble to 100% certain values. The proportion of utility to wealth in segment $U_3 - U_1$ is less than the proportion of wealth in the segment of $U_4 - U_3$.

6.4 RATIONAL THOUGHT

Rational behaviour is used to describe a decision-making process that results in the optimal level of benefit, or alternatively, the maximum amount of utility. Individuals who exhibit rational behaviour make decisions that provide them with the highest amount of personal satisfaction. Rational behaviour is the underlying assumption of the rational choice theory, which is an economic theory stating that individuals make decisions that provide the highest amount of benefit and satisfaction. An individual who exhibits rational behaviour uses all available information, evaluates each information by its costs and benefits, and takes sufficient time to make a utility-maximizing decision.

Rational behaviour does not simply involve choosing a decision that maximizes monetary benefit, rather, choosing a decision that maximizes satisfaction/utility, which could entail non-monetary benefits.

For example, an individual could be exhibiting rational behaviour if she is retiring early rather than staying at the company and earning a paycheck if she feels the utility gained from retiring early exceeds that of the paycheck. In such a scenario, the maximum satisfaction for this individual would entail choosing a decision that provides non-monetary benefits.

6.5 EXPECTED UTILITY AS A BASIS FOR DECISION-MAKING

Decision-making and choice are the basic behaviours constituting most human social and economic activities. Decision-making and choice theory are like social physics: search for universal mathematical laws of social and economic behaviour. It refers to models in which individuals seek to satisfy their needs and preferences from the consequences of their actions, given their beliefs about events, which are typically summarized by utility functions and probability distributions. This approach includes most standard models of mathematical economics, finance theory, statistical and behavioural decision theory, behavioural economics and behavioural finance. It also influences other areas such as marketing, operations management and accounting. Unfortunately, our current understanding of decision making and choice is like our understanding of physics in the mid-17th century. The quest is for a few universal mathematical laws that describe all facets of social and economic choice behaviour so that predictions of choice would be reliable with the mathematical laws of choice. However, this gives us opportunities to search for the mathematical laws to interpret and predict choice behaviour, like the predictions made with Newton's laws for motion in physics.

Although Daniel Bernouli (1738) proposed the theory of expected utility as a basis for decision-making under risk, using a logarithmic utility for wealth, his use of expected-value operation in conjunction with a utility function is largely ignored for 200 years until it re-emerged in modern financial economics, behavioural economics, and information theory. In the 1940's, von Neumann and Morgenstern resurrect utility theory by axiomatizing the concept of expected utility as part of a new game-theoretic foundation for economics. Soon thereafter, Nash (1950/51) proposes an equilibrium concept for non-cooperative games and a non-cooperative model of the bargaining

problem, which became the standard tools of game theorists. Besides the interactive decision theory, namely the game theory, the expected utility theory forms the foundation of the rationality hypothesis for behavioural decision theory, decision analysis, and so on.

In the 1960's and 1970's, the model of subjective expected utility is elaborated and applied to problems of Bayesian inference, decision analysis, equilibrium in markets under uncertainty. The subjective expected utility model belongs to the camp of rationality hypotheses as well.

Rational behaviour, in the broad meaning of sensible, planned, and consistent behaviour, is believed to govern most conduct in economic markets, because of self-interest and because of the tendency of markets to punish foolish behaviour. The rationality hypothesis formed the cornerstone of economic theory as shown in Hicks and Samuelson's classic theory of consumer demand.

However, Simon started to criticize the assumption in the 1950s, with the idea of bounded rationality. It suggests that the capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solutions is required for objective rational behaviour in the real world (Simon, 1997). As a result, the rationality hypothesis for human decision making, which assumes perfect information and unlimited computational capacity, is questionable.

In our view, rational behaviour is conscious choice behaviour, but not all conscious behaviour is rational. The decision maker is aware of the stimuli and consequences, is able to recollect the information needed for decision making, and is able to control his/her action and will to make the decision. There is other information pertaining to the stimuli and consequences that the decision maker is not aware of, unable to recollect and control, but this other information may contribute to the decisions being made. This part of decision making and choice behaviour is implicit, unconscious, or affective, which has been recently understood by behavioural researchers. With this view, the bounded rationality hypothesis is actually challenging the conscious proportion of the decision-making process, which is certainly limited in computational capacity because a large part of the decision-making process may be unconscious, like the 'iceberg'

under the water as described with Freud's psychoanalysis theory.

The classical expected utility theory can be presented with the following equation:

$$V(q) = \sum_i p_i u(x_i)$$

$V(q)$: expected value function

q : prospects, a probability distribution $= (p_1, p_2, \dots, p_n)$

p_1, p_2, \dots, p_n : probabilities

x_1, \dots, x_n : consequences ordered from worse (x_1) to best (x_n)

$u(x_i)$: utility function

Review the process flow of the information that is processed and the calculation of the expected value. The input for the utility function is the stimulus such as money and wealth, and output are consequences of the choice. If we use the information-processing framework (McFadden, 1999) to analyze the expected utility theory, only the inputs and outputs of the stimulus information are mapped, while the mental processes are largely ignored although there are attempts to remedy this (von Neuman & Morgenstern, 1941; Kahneman & Tversky, 1979).

Non-expected utility theory and unconscious information processing

In the 1980's, theories of "non-expected" utility theory respond to the persistent challenge of the rationality hypothesis and try to explain Cognitive anomalies from behavioural decision theory. The major contribution to the non-expected utility theories came from behavioural economics, for instance, "prospect theory" by Tversky & Kahneman (1992) and Kahneman & Tversky (1979). It postulates that choice is achieved by maximization of a weighted value function of gains and losses. The shape of the value function conforms to the asymmetry effect. The weighted value function is an outstanding departure from the subjective expected and expected utility functions. The formula for the value function is:

$$V(q) = \sum_i w_i u(x_i)$$

$w_i = p(p_i)$: decision weights

x_1 x_n : consequences ordered from worse (x_1) to best (x_n)

q : a probability distribution= (p_1, p_2, \dots, p_n)

Where, decision weight is determined by a probability weighting function, $n(p_i)$.

Review the process flow of the information that is processed and the calculation of the expected value. Although the decision weights replace the probability in the expected utility theory and psychological estimates on the probability is provided, how the information is processed in human mind is not represented in the value function. Meanwhile, the utility function, $u(x_i)$, still uses the inputs and outputs, not mental processes, for representing mental judgments.

6.6 SUMMARY

Expected utility theory is a theory about how to make optimal decisions under a given probability of risk. It has a normative interpretation which economists used to think applies in all situations to rational agents but now tend to regard as a useful and insightful first order approximation. In empirical applications, a number of violations have been proven to be systematic and these falsifications have deepened understanding of how people actually decide. Daniel Kahneman and Amos Tversky in 1979 presented their prospect theory which showed empirically, how preferences of individuals are inconsistent among the same choices, depending on how those choices are presented.[22] This is mainly because people are different in terms of their preferences and parameters. Additionally, personal behaviours may be different between individuals even when they are facing the same choice problem.

Like any mathematical model, expected utility theory is a simplification of reality. The mathematical correctness of expected utility theory and the salience of its primitive concepts do not guarantee that expected utility theory is a reliable guide to human behaviour or optimal practice. The mathematical clarity of expected utility theory has helped scientists design experiments to test its adequacy, and to distinguish systematic departures from its predictions. This has led to the field of behavioural finance, which has produced deviations from expected utility theory to account for the empirical facts.

Other critics argue applying expected utility to economic and policy decisions, has engendered inappropriate valuations, particularly in scenarios in which monetary units are used to scale the utility of nonmonetary outcomes, such as deaths.

6.7 GLOSSARY

- **Expected utility theory:** Expected utility refers to the utility of an entity or aggregate economy over a future period of time, given unknowable circumstances.
- **Risk Averse:** risk-averse describes the investor who chooses the preservation of capital over the potential for a higher-than-average return.
- **Decision-making and Choice theory:** It refers to models in which individuals seek to satisfy their needs and preferences from the consequences of their actions, given their beliefs about events, which are typically summarized by utility functions and probability distributions.

6.8 SELF ASSESSMENT QUESTIONS

1. Explain the expected utility theory.

2. Discuss the risk attitude of investors.

6.9 LESSON END EXERCISE

1. Explain the expected utility as a basis for decision making.

2. Explain the concept of expected utility with the help of example.

6.10 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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UTILITY, EMOTIONS AND DECISION MAKING

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**UNIT- II
LESSON - 7**

INVESTOR RATIONALITY AND MARKET EFFICIENCY

STRUCTURE

- 7.1 Introduction
- 7.2 Objectives
- 7.3 Investor Rationality
 - 7.3.1 Concept of Rational Behaviour
 - 7.3.2 Process of Rational Decision Making
 - 7.3.3 Behavioural factors that affect the Financial Market
 - 7.3.4 Challenges of Rational Behaviour
- 7.4 Concept of Market Efficiency
 - 7.4.1 Meaning of Efficient Market
 - 7.4.2 Market Efficiency – What it Does not Imply?
- 7.5 Investor Rationality and Market Efficiency
- 7.6 Summary
- 7.7 Glossary
- 7.8 Self-Assessment Questions
- 7.9 Lesson End Exercise
- 7.10 Suggested Readings

7.1 INTRODUCTION

The decision makers generate various strategies and follow specific logical procedures to resolve problems according to the nature of problem, timing and decision environment. Rational decision theory asserts that an individual attempts to reach an optimum decision by categorizing decision making into three types based on the level of rationality. First, pure rationality which allows decision makers to reach optimum decisions and achieve the highest efficiency out of unlimited time, resources and knowledge in order to make decisions. This type assumes the administration dichotomy, in which the former identifies goals for the latter to achieve (Gianakis, 2004). Second, the incremental type which is a less rational model in which goals are politically feasible and decisions are made by comparing several immediately available alternatives (Lindblom, 2005). Third, the bounded rationality type which is a mixture of the above two types that refers to the achievement of given goals subject to subjective constraints.

The bounded rationality framework asserts that individual investors are regarded as attempting to make rational decision but they often lack important information on the definition of the problem, the relevant criteria and so on. In general, the judgment of people is bounded in their rationality, so they will forego the best solution in favour of acceptable or reasonable one that is so-called the decision makers' satisfice (March and Simon, 1958). Amos Tversky and Kahneman (1974) provided critical information about specific systematic biases that affect judgment. Thaler (2000) argued that investors have bounded will power so they give greater weight to current concerns than to future concerns that will lead to a variety of ways in which their temporary motivations are inconsistent with long-term interests. It is understood that despite the investment decisions complying with rational decision-making process, the behavioural biases would still exist in the mind of investors.

7.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- concept of rational behaviour
- behavioural factors that affect the financial market

- challenges of rational behaviour
- concept of market efficiency
- investor rationality and market efficiency

7.3 INVESTOR RATIONALITY

Behavioural finance is the study of why individuals do not always make the decisions they are expected to make and why markets do not reliably behave as they are expected to behave. As market participants, individuals are affected by others' behaviour, which collectively affects market behaviour, which in turn affects all the participants in the market. Thus people are not always rational and hence markets cannot be expected to be efficient. An understanding of behaviour factors that impact the market shall decrease the vulnerability of investors. Ability to anticipate inefficient market behaviour improves financial decision making in such markets.

Behavioural finance is the study of why individuals do not always make the decisions they are expected to make and why markets do not reliably behave as they are expected to behave. As market participants, individuals are affected by others' behaviour, which collectively affects market behaviour, which in turn affects all the participants in the market. Thus, people are not always rational and hence markets cannot be expected to be efficient. An understanding of behaviour factors that impact the market shall decrease the vulnerability of investors. Ability to anticipate inefficient market behaviour improves financial decision making in such markets.

7.3.1 Concept of Rational Behaviour

Rational behaviour refers to a decision-making process that is based on making choices that result in the optimal level of benefit or utility for an individual. The assumption of rational behaviour implies that people would rather take actions that benefit them versus actions that are neutral or harm them. Most classical economic theories are based on the assumption that all individuals taking part in an activity are behaving rationally.

Rational behaviour is the cornerstone of rational choice theory, a theory of economics that assumes that individuals always make decisions that provide them with the highest amount of personal utility. These decisions provide people with the greatest benefit or satisfaction given the choices available. Rational behaviour may not involve receiving the most monetary or material benefit, because the satisfaction received could be purely emotional or non-monetary.

For example, while it is likely more financially beneficial for an executive to stay on at a company rather than retire early, it is still considered rational behaviour for her to seek an early retirement if she feels the benefits of retired life outweigh the utility from the pay check she receives. The optimal benefit for an individual may involve non-monetary returns.

Further, a person's willingness to take on risk, or conversely, their aversion to risk, may be considered rational depending on their goals and circumstances. For example, an investor may choose to take on more risk in his own retirement account than in an account designated for his children's college education. Both would be considered rational choices for this investor.

7.3.2 The Process of Rational Decision Making

- i. Define the Decision Situation.
- ii. Identify Decision Criteria.
- iii. Allocate Weights to the Criteria.
- iv. Identifying Alternatives.
- v. Evaluating Alternatives.
- vi. Selecting the Best Alternative.
- vii. Implementing Chosen Alternative and Evaluating the Result

The process of rational decision making can be further discussed in detail as :

i) Define the Decision Situation

The model begins by defining the problem. A problem exists when there is a discrepancy between an existing and a desired state of affairs (Pounds, 1969). It is impossible to make a rational decision unless one can clearly define the problem or context in which the decision needs to be made.

- Why does a decision need to be made?
- What will be the outcome if no decision is made?
- What outcome is desired?
- What is preventing that outcome from being realized?

ii) **Identify Decision Criteria**

Once a decision-maker has defined the problem, he or she needs to identify the decision criteria that will be important in solving the problems. In this step, the decision maker determines what is relevant in making the decision. This step brings the decision maker's interests, values, and similar personal preferences into the process. Identify criteria is important because what one person thinks is relevant to another person may not. Also, keep in mind that any factors not identified in this step are considered irrelevant to the decision maker.

iii) **Allocate Weights to the Criteria**

After identifying all the criteria, the decision maker will give weights to these. The main purpose of this is to give importance to the criteria which are most important in nature. Basically, in this way, the decision maker will give them the correct priority in the decision.

iv) **Identifying Alternatives**

The key to this step is not to limit one too obvious alternatives or to what has worked in the past. This step requires the decision maker to generate possible alternatives that could succeed in resolving the problems. The better decision's come from being open to multiple alternatives. It is often helpful to consult trusted adults or experts in the area in which the decision needs to be made.

v) **Evaluating Alternatives**

As the decision makers evaluate each alternative, they should be looking at the likely positive and negative consequences associated with each. It is unusual to find one alternative that would completely resolve the problem. As they consider positive and negative consequences, they must be careful to differentiate between what they know

for a fact and what they believe might be the case. The more the evaluation is fact-based, the more confident he/she can be that the expected outcome will occur.

vi) **Selecting the Best Alternative**

When acting alone or as part of a group, this is the natural next step after evaluating each alternative. In general, the best alternative is the one with the highest degree of probability that it will resolve the problem and the least amount of risk.

vii) **Implementing Chosen Alternative and Evaluating the Result**

While this might seem obvious, it is necessary to make the point that deciding on the best alternative is not the same as doing something. The action itself is the first real and tangible step in changing the situation. It is not enough to think about it or talk about it or even decide to do it. A decision only counts when it is implemented. In the final step, the result is to be evaluated. That means after implementing the decision, whether the problem is solved or not will be evaluated. If the problem remains or has worsened, the steps of the decision-making process need to be repeated until an acceptable resolution has been found. Effective decision making requires that the decision maker understand the situation.

Most of the people will consider an effective decision to be one that optimizes some set of factors, such as profits, sales, employee welfare, and market share. In some situation, an effective decision may be one that minimizes loss, expenses, or employee turnover.

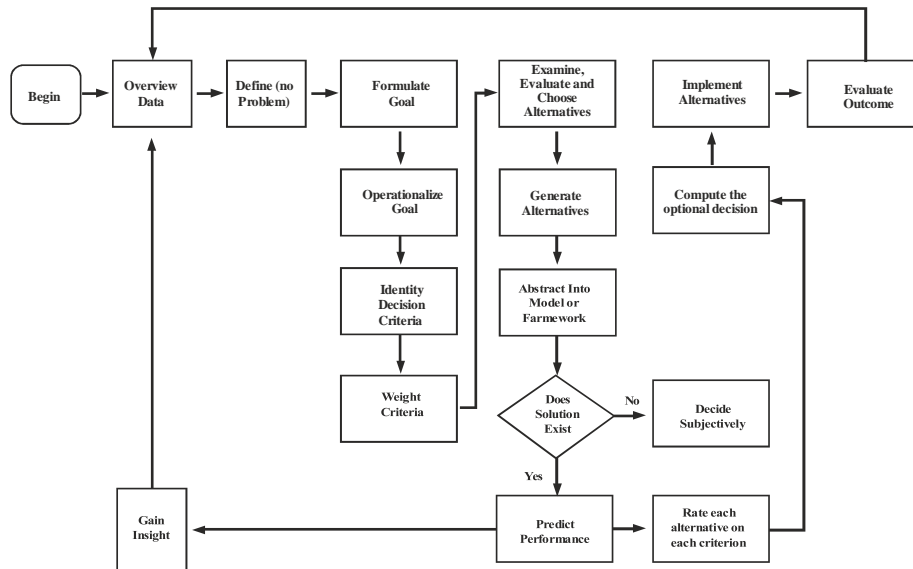


Figure: 7.1 : Rational Decision Making Model

Assumptions of this Model

The rational decision-making model We just described contains a number of assumptions. These assumptions are-

- Problem Clarity:** The problem is clear and unambiguous. The decision maker is assumed to have complete information regarding the decision situation.
- Known Options:** It is assumed the decision maker can identify all the relevant criteria and can list all the viable alternatives. Furthermore, the decision maker is aware of all the possible consequences of each alternative.
- Clear Performances:** Rationality assumes that the criteria and alternatives can be ranked and weighted to reflect their importance.
- Constant' Preferences:** It is assumed that the specific decision criteria are constant and that the weights assigned to them are stable over time.
- No Time or Cost Constraints:** The rational decision maker can obtain full

information about criteria and alternatives because it is assumed that there are no time or cost constraints.

- f. **Maximum Payoff:** The rational decision maker will choose the alternative that yields the highest perceived value.

7.3.3 Behavioural factors that affect the Financial Market

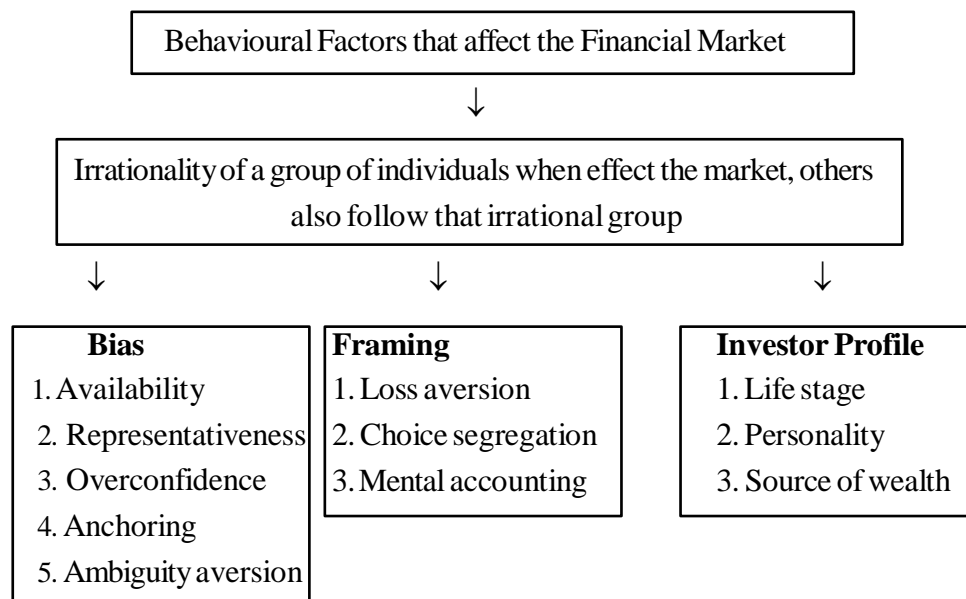


Figure: 7.2 : Behavioural factors

1. **Availability bias** occurs because investor rely on information to make informed decisions, but not all information is readily available. Investors tend to give more weight to more available information and to discount information that is brought to their attention less often. The stocks of operations that get good press publicity, are deemed to do better than those of less publicized companies but in reality, these-high-profile companies may actually have worse earnings and return potential.
2. **Representativeness:** Representativeness is decision making based on stereotypes, characterisations that are treated as representative of all members of a group. In investing, representativeness is a tendency to be more optimistic about investments that have performed well lately and more pessimistic about investments that have performed poorly. Investors in their mind will stereotype the immediate past

performance of investments as strong or weak. This representation then makes it hard to think of them in any other way or to analyze their potential. As a result, they may put too much emphasis on past performance and not enough on future prospects.

Objective investment decisions involve forming expectations about what will happen, making educated guesses by gathering as much information as possible and making as good use of it as possible.

3. **Overconfidence:** Overconfidence is a bias in which investors have too much faith in the precision of their estimates, causing them to underestimate the range of possibilities that actually exist. They tend to underestimate the extent of possible losses, and therefore underestimate investment risks.

Overconfidence also comes from the tendency to attribute good results to good investor decisions and bad results to bad luck or bad markets.

4. **Anchoring:** Anchoring happens when investors cannot integrate new information into their thinking because they are too - anchored to their existing views. By devaluing new information, investors tend to underreact to changes or news and become less likely to act, even when it is in their interest.

5. **Ambiguity aversion:** Ambiguity aversion is the tendency to prefer the familiar to the unfamiliar or the known to the unknown. Avoiding ambiguity can lead to discounting opportunities with greater uncertainty in favor of - sure things. In that case, the bias against uncertainty may create an opportunity cost in the portfolio. Availability bias and ambiguity aversion can also result in a failure to diversify, as investors tend to - stick with what they know.

6. **Framing:** Framing refers to the way we see alternatives and define the context in which we are making a decision. A. Tversky and D. Kahneman, *The Framing Decisions and the Psychology of Choice*, Investors framing determines how they imagine the problem, its possible solutions, and its connection with other situations. Every rational economic decision maker would prefer to avoid a loss, to have benefits be greater than costs, to reduce risk, and to have investments gain value.

7. **Loss aversion** refers to the tendency to loathe realizing a loss to the extent

that you avoid it even when it is the better choice. How can it be rational for a loss to be the better choice? Say you buy stock for \$100 per share. Six months later, the stock price has fallen to \$63 per share. You decide not to sell the stock to avoid realizing the loss. If there is another stock with better earnings potential, however, your decision creates an opportunity cost. You pass up the better chance to increase value in the hopes that your original value will be regained. Your opportunity cost likely will be greater than the benefit of holding your stock, but you will do anything to avoid that loss. Loss aversion is an instance where a rational aversion leads you to underestimate a real cost, leading you to choose the lesser alternative.

Loss aversion is also a form of regret aversion. Regret is a feeling of responsibility for loss or disappointment. Past decisions and their outcomes inform your current decisions, but regret can bias your decision making. Regret can anchor you too firmly in past experience and hinder you from seeing new circumstances. Framing can affect your risk tolerance. You may be more willing to take risk to avoid a loss if you are loss averse, for example, or you may simply become unwilling to assume risk, depending on how you define the context.

Framing also influences how you manage making more than one decision simultaneously. If presented with multiple but separate choices, most people tend to decide on each separately, mentally segregating each decision. By framing choices as separate and unrelated, however, you may miss making the best decisions, which may involve comparing or combining choices. Lack of diversification or over diversification in a portfolio may also result.

8. A concept related to framing is **mental accounting**: the way individuals encode, describe, and assess economic outcomes when they make financial decisions. In financial behaviour, framing can lead to shortsighted views, narrow-minded assumptions, and restricted choices.

7.3.4 Challenges of Rational Behaviour

The following are some challenges to the idea of rational behaviour:

- Individuals have limited capacity to accurately calculate the costs and benefits of a decision.

- individuals may choose a decision that is not optimal due to social norms.
- Individuals do not always act in their own pure self-interest.
- Individuals tend to satisfice rather than maximize decision outcomes.
- Individuals tend to have a strong bias towards maintaining the status quo.
- Individuals may exhibit emotional states, impacting the decision that they make at that time.
- Individuals may lack self-control and seek immediate satisfaction.

7.4 CONCEPT OF MARKET EFFICIENCY

Market efficiency is a relatively broad term and can refer to any metric that measures information dispersion in a market. An efficient market is one where all information is transmitted perfectly (everyone receives the information), completely (everyone receives the entire information), instantly (everyone receives the information at once), and for no cost (everyone receives the information for free).

The notion of market efficiency is closely tied to the Efficient Market Hypothesis, which was developed by Eugene Fama, an American financial economist. Fama built on the work done by other financial economists such as Harry Markowitz, Fischer Black, Myron Scholes, Jack Treynor, William Sharpe, Merton Miller, Franco Modigliani, John Lintner, Jan Mossin, and Robert Merton.

7.4.1 Meaning of an Efficient Market

An efficient market is characterized by a perfect, complete, costless, and instant transmission of information. Asset prices in an efficient market fully reflect all information available to market participants. As a result, it is impossible to ex-ante make money by trading assets in an efficient market.

The result provides an alternate definition of market efficiency, which is particularly popular among financial markets participants – An efficient market is any market where asset price movements can't be consistently estimated, i.e., it is impossible for an investor to consistently make money in an efficient market by trading financial assets.

Implications of Market Efficiency – An Illustrative Example

Company ABC is a publicly-traded technology company listed on the New York Stock Exchange (NYSE). The company releases a new product that is more advanced than anything on the market. If all the markets that Company ABC operates in are efficient, then the release of the new product should not affect the company's share price.

1. Company ABC hires workers from an efficient labor market. All workers are, therefore, paid the exact amount that they contribute to the company.
2. Company ABC rents capital from an efficient capital market. Therefore, the rental paid to capital owners is exactly equal to the amount contributed by capital to the company.
3. If the New York Stock Exchange is an efficient market, then Company ABC's share price perfectly reflects all information about the company. Therefore, all participants on the NYSE could predict that Company ABC would release the new product. As a result, the company's share price does not change.

7.4.2 Market Efficiency – What It Does Not Imply?

1. ***Asset prices never deviate from their true price***

The above statement represents a fundamental misunderstanding of the notion of market efficiency. Market efficiency DOES NOT say that the price of an asset is its true price. It only says that it is impossible to consistently estimate whether the asset price will move up or down.

2. ***All market participants are perfectly rational***

Perfectly rational market participants is not a necessary condition for an efficient market. If market participants demonstrate independent and uncorrelated deviations from rationality, then an efficient market can be achieved.

7.5 INVESTOR RATIONALITY AND MARKET EFFICIENCY

Economic behaviours affect economic markets. Market results reflect the collective

yet independent decisions of millions of individuals. There have been years, even decades, when some markets have not produced expected or “rational” prices because of the collective behaviour of their participants. In inefficient markets, prices may go way above or below actual value.

The efficient market theory relies on the idea that investors behave rationally and that even when they don't, their numbers are so great and their behavioural biases are so diverse that their irrational behaviours will have little overall effect on the market. In effect, investors' anomalous behaviours will cancel each other out. Thus, diversification (of participants) lowers risk (to the market).

Another protection of market efficiency is the tendency for most participants to behave rationally. If an asset is mispriced so that its market price deviates from its intrinsic value, knowledgeable investors will see that and take advantage of the opportunity. If a stock seems underpriced they will buy, driving prices back up. If a stock seems overpriced, they will sell, driving prices back down. These strategies are called arbitrage, or the process of creating investment gains from market mispricing (arbitrage opportunities). The knowledgeable investors who carry out market corrections through their investment decisions are called arbitrageurs.

There are limits to arbitrage, however. There are times when the stock markets seem to rise or fall much more or for much longer than the dynamics of market correction would predict.

Limits of Arbitrage

Arbitrage may not work when the costs outweigh the benefits. Investment costs include transaction costs, such as brokers' fees, and risk, especially market risk.

An investor who sees an arbitrage opportunity would have to act quickly to take advantage of it, because chances are good that someone else will and the advantage will disappear along with the arbitrage opportunity. Acting quickly may involve borrowing if liquid funds are not available to invest. For this reason, transaction costs for arbitrage trades are likely to be higher (because they are likely to include interest), and if the costs are higher than the benefits, the market will not be corrected.

The risk of arbitrage is that the investor rather than the market is mispricing stocks. In other words, arbitrageurs assume that the current valuation for an asset will reverse—will go down if the valuation has gone too high, or will go up if the valuation has gone too low. If their analysis of fundamental value is incorrect, the market correction may not occur as predicted, and neither will their gains.

Most arbitrageurs are professional wealth managers. They invest for very wealthy clients with a large asset base and very high tolerance for risk. Arbitrage is usually not a sound practice for individual investors.

Causes of Market Inefficiency

Market inefficiencies can persist when they go undiscovered or when they seem rational. Economic historians point out that while every asset “bubble” is in some ways unique, there are common economic factors at work. Charles P. Kindleberger and Robert Aliber, *Manias, Panics, and Crashes*, 5th ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2005). Bubbles are accompanied by lower interest rates, increased use of debt financing, new technology, and a decrease in government regulation or oversight. Those factors encourage economic expansion, leading to growth of earnings potential and thus of investment return, which would make assets genuinely more valuable.

During the period of rapid price increases, such as the Indian stock market bull run in the early 2000, investors often engage in herd behaviour by blindly following the crowd and buying stocks without thoroughly analysing their fundamentals. This can lead to over valuation of stocks and create a speculative bubble.

Similarly, during market crashes, like the one in 2008, fear and panic can cause investors to sell their stocks en masse, exacerbating the downward spiral. These behaviours are driven by cognitive biases like “confirmation bias” (Seeking information that confirms existing beliefs) and “loss aversion” (the tendency to strongly prefer avoiding losses over acquiring gains).

These instances of herd behaviour showcase how behavioural biases can lead to market inefficiencies and distortions in stock prices, deviating from the efficient market hypothesis assumptions.

Further a key study of the U.S. stock market points out that there are cultural as well as economic factors that can encourage or validate market inefficiency. Robert J. Shiller, *Irrational Exuberance*, 2nd ed. (New York: Random House, Inc., 2005). Examples include

- demographic factors of the population,
- attitudes reflected in the popular culture,
- the availability of information and analyses,
- the lowering of transaction costs.

These factors all lead to increased participation in the market and a tendency to “rationalize irrationality,” that is, to think that real economic or cultural changes, rather than mispricings, are changing the markets.

Sometimes mispricings occur when real economic and cultural changes are happening, however, so that what used to be seen a mispricing is actually seen as justifiable, fundamental value because the market itself has changed profoundly. An example is the dotcom bubble of 1990–2000, when stock prices of Internet start-up companies rose far higher than their value or earning capacity. Yet investors irrationally kept investing until the first wave of start-ups failed, bursting the market bubble.

Economic and cultural factors can prolong market inefficiency by reinforcing the behaviours that created it, in a kind of feedback loop. For example, financial news coverage in the media increased during the 1990s with the global saturation of cable and satellite television and radio, as well as the growth of the Internet. Robert J. Shiller, *Irrational Exuberance*, 2nd ed. (New York: Random House, Inc., 2005). More information availability can lead to more availability bias. Stereotyping can develop as a result of repeated “news,” resulting in representation bias, which encourages overconfidence or too little questioning or analysis of the situation. Misinterpreting market inefficiency as real changes can cause framing problems and other biases as well.

In this way, market inefficiencies can become self-fulfilling prophecies. Investing in an inefficient market causes asset values to rise, leading to gains and to more investments. The rise in asset values becomes self-reinforcing as it encourages anchoring, the

expectation that asset values will continue to rise. Inefficiency becomes the norm. Those who do not invest in this market thus incur an opportunity cost. Participating in perpetuating market inefficiency, rather than correcting it, becomes the rational choice.

Reliance on media experts and informal communication or “word of mouth” reinforces this behaviour to the point where it can become epidemic. It may not be mere coincidence, for example, that the stock market bubble of the 1920s happened as radio and telephone access became universal in the United States, See especially Robert J. Shiller, *Irrational Exuberance*, 2nd ed. (New York: Random House, Inc., 2005), 163. or that the stock boom of the 1990s coincided with the proliferation of mobile phones and e-mail, or that the real estate bubble of the 2000s coincided with our creation of the blogosphere.

Market efficiency requires that investors act independently so that the market reflects the consensus opinion of their independent judgments. Instead, the market may be reflecting the opinions of a few to whom others defer. Although the volume of market participation would seem to show lots of participation, few are actually participating. Most are simply following. The market then reflects the consensus of the few rather than the many; hence, the probability of mispricing rises.

It is difficult to know what is happening while you are in the middle of an inefficient market situation. It is easier to look back through market history and point out obvious panics or bubbles, but they were not so obvious to participants while they were happening. Hindsight allows a different perspective—it changes the frame—but as events happen, you can only work with the frame you have at the time.

7.6 SUMMARY

Proponents of behavioural finance view finance from a broad social science perspective that includes psychology and sociology. Unlike efficient market theorists, they believe that asset prices are not always driven by rational expectations of future returns. The author maintains that behavioural finance has become a vital research topic because it addresses many market anomalies that efficient market theory ignores.

The most significant market anomaly that efficient market theory fails to explain is

excess volatility. The idea that stock prices change more than they rationally should is more troubling for efficient market theorists than any other anomaly, such as the January effect or the day-of-the-week effect. If most of the volatility in the stock market is unexplained, then efficient market theory can be easily challenged. Efficient market theory says that asset prices can be forecast using the present discounted value of future returns. Yet because of excess volatility, forecasts of stock prices based on this idea tend to be more unreliable than the prices themselves. Some efficient market theorists argue that prices are efficient at the individual stock level but not at the aggregate market level, but others concede that the level of volatility in the overall stock market cannot be explained with any variant of the efficient market model.

In contrast to efficient market theory, one of the oldest ideas in behavioural finance, going back three centuries to Holland's tulip mania, is that of price-to-price feedback. In other words, prices go up because prices went up. Speculators talk of "new era" theories to justify price increases, but a bubble can be sustained only by expectations of further price increases; at the first instance that the expectation is proven false, the bubble bursts. This feedback theory, largely ignored by those in finance, is supported by psychological and "natural" experiments, as in the case of pyramid schemes.

One of the criticisms of feedback theory is that price changes are strongly serially correlated, but that is not the case. Feedback models incorporate exponentially declining weights on past prices through time, as well as other shocks to the system, to explain price changes. The price effect operates at a low frequency that can be observed only over a long period of time. The shocks affect day-to-day price changes.

Efficient market theory suggests that prices are kept in line with rational expectations by the interaction between "smart money" and "ordinary investors." Accordingly, the smart money sells when the irrationally optimistic ordinary investor buys, and buys when the irrationally pessimistic ordinary investor sells. This theory, however, requires smart money to engage in short selling, which is often not possible, at least not in the volume required to offset the irrational optimists. Thus, irrational price changes occur. Again, the author argues, the efficient market theory is unable to reconcile this fact.

In light of such discrepancies, it can be concluded that to better understand the

markets, behavioural finance must be incorporated into new economic models. Efficient market models, although useful as ideals, cannot provide accurate descriptions of real markets. In addition, the author warns that we should “distance ourselves from the presumption that financial markets always work well and that price changes always reflect genuine information.”

7.7 GLOSSARY

- **Behavioural Finance:** Behavioural finance is the study of why individuals do not always make the decisions which they are expected to make and why markets do not reliably behave as they are expected to behave.
- **Rational Behaviour:** Rational behaviour refers to a decision-making process that is based on making choices that result in the optimal level of benefit or utility for an individual.
- **Representativeness:** Representativeness is decision making based on stereotypes, characterizations that are treated as representative of all members of a group.
- **Overconfidence:** Overconfidence is a bias in which investors have too much faith in the precision of their estimates, causing them to underestimate the range of possibilities that actually exist.
- **Efficient Market:** An efficient market is one where all information is transmitted perfectly (everyone receives the information), completely (everyone receives the entire information), instantly (everyone receives the information at once), and for no cost (everyone receives the information for free).

7.8 SELF ASSESSMENT QUESTIONS

1. Explain the concept of investors rationality.

2. Discuss the behavioural factors that affect the financial market.

7.9 LESSON END EXERCISE

1. Explain the challenges of rational behaviour.

2. Explain the concept of market efficiency.

7.10 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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UTILITY, EMOTIONS AND DECISION MAKING

**M.COM III SEM
MCOMFE355**

**UNIT- II
LESSON - 8**

DECISION MAKING UNDER RISK AND UNCERTAINTY & EXPERIMENTAL MEASURES OF RISK-RELATED

STRUCTURE

- 8.1 Introduction
- 8.2 Objectives
- 8.3 Decision making under Risk and Uncertainty
 - 8.3.1 Prospect Theory
- 8.4 Experimental measures of Risk related
- 8.5 Difference between Expected Utility Theory and Prospect Theory
- 8.6 Summary
- 8.7 Glossary
- 8.8 Self-Assessment Questions
- 8.9 Lesson End Exercise
- 8.10 Suggested Readings

8.1 INTRODUCTION

In the decision-making process, the Cognitive factor is a preponderant element in choosing the best decision to be made, mainly because the most important decisions

involve risk and the market is formed by individuals who make mistakes of information processing and may act on little rational impulse, interpreting information according to his/her beliefs and values.

Several aspects may influence the decision-making and they are not completely rational. However, the traditional modern finances are based on the idea of unlimited rationality, in which their agents make entirely rational decisions. Nevertheless, from the identification of the phenomenon of aversion to loss through study of Kahneman and Tversky (1979), which investigated the human behaviour and the manner decisions are made in risk situation, several researchers started investigating the behavioural biases when making decisions.

The uncertainty effect is one of the biases that may interfere with the decision-making process, tending to generate an opposite result to that desired. According to the mentioned authors, this bias is present when the individual has preference for sure gains and, in situations in which these are probable, chooses the alternative whose gain has greater probability to occur. The uncertainty effect is a violation of the traditional rationality condition, as individuals tend to evaluate the participation in lottery for a value lower than the worst possible result for such lottery, that is, they are averse to gains risk and prefer a sure gain instead of risking themselves to have it. Accountants and administrators would not be free from such effects. It is worth mentioning that the accounting information influences its users' behaviour and beliefs. In general, accountants have formation to act as elaborators or auditors of this information, and administrators, to use such information when making a decision. However, both, due to behavioural biases, would not deal neutrally with data and information.

8.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- decision making under risk and uncertainty
- prospect theory
- experimental measures of risk related:

- BART Method. (The Ballon Analogue Risk Task)
- Questionnaires
- The Gneezy and Potters method
- The Eckel and Grossman method
- Ellsberg paradox
- bubble creation
- difference between expected utility theory and prospect theory

8.3 DECISION MAKING UNDER RISK AND UNCERTAINTY

Human behaviour is difficult to determine accurately, but can be expected, and this applies to human behaviour in financial matters or the so-called behavioural finance, there are many theories of control and describes the investment decision through human behaviour.

Formulated by Daniel Kahneman and Amos Tversky, Prospect Theory explains decision making involving uncertainty in the context of psychology and economics. In part, Prospect Theory offers insights into why people make non-optimizing decisions rather than only those that are profit maximizing. Prospect Theory is central to much of Behavioural Finance and is often contrasted with the more conventional Efficient Market Hypothesis and Expected Utility Theory.

8.3.1 Prospect Theory

Prospect theory has done more to bring psychology into the heart of economic analysis than any other approach. Prospect theory, developed by Kahneman and Tversky (1979) 48 and Tversky and Kahneman was proposed as a best practice alternative to conventional wisdom.

Prospect theory is a theory of average behaviour. It theorizes how an individual or group of individuals behave, on average, in a world of uncertainty. The prospect theory is proposed by Daniel Kahneman and Tversky. They describe how people

frame and value decision involving uncertainty. According to Prospect theory, people look at choices in terms of potential gains or losses in relation to specific reference point, which is often a purchase price. People feel more strongly about the pain from loss than the pleasure from equal gain.

Prospect theory is a representation of the statistical average of individual behaviours. Thus, there will be deviations from the mean. For example, a subsample of individuals behaving in a consistently deviant fashion can help explain important aspects of choice behaviour, whether or not such behaviour is consistent with the conventional wisdom or prospect theory. Nevertheless, the underlying empirics of prospect theory with regard to average choice behaviour have been well documented. As Tversky and Kahneman write:

“Prospect theory and the scales [used in this theory] should be viewed as an approximate, incomplete, and simplified description of the evaluation of risky prospects. Although the properties of v and π summarize a common pattern of choice, they are not universal: the preferences of some individuals are not well described by an S-shaped value function and a consistent set of decision weights.”

The visual representation of prospect theory shows an S shaped Value function. Value function is prospect theory's equivalent of classical economic utility function. However, it is defined over gains and losses around a reference point. The reference point is determined by the subjective feelings of the individual. It is the individuals' point of reference, the benchmark against which all comparison is made. Value function is concave for gains and convex for losses. This means that value function is steeper for losses than for gains- this is referred as loss aversion.

Three unique features of prospect theory:

- Prospect theory assumes that choice decisions are based upon a subjectively determined reference point independent of the decision maker's state of wealth.
- Subjective reference points introduce a frame to a prospect, which affects choice behaviour.

- A kink exists at the reference point of prospect theory's value function, assuming individuals weight losses at above twice that of gains.

Individuals tend to think in terms of gains and losses rather than a state of wealth. For example, if there are two people, one of them learns that his wealth has gone from 1 million to 1.3 million while other one learns that his wealth gone down from 5 million to 4.5 million.

Most of the people will say that the first guy is happier. However, if we look in terms of finance, the second person should be better pay off in terms of total wealth.

The Prospect theory explains that people focus on the outcomes of their decisions. This is in contrast to Bernoulli's expected utility theory that looked at the utility of the 19 state of wealth. The Prospect Theory of Kahneman and Tversky follow value functions. Reference points serve to frame the decision parameters. Thus, gain and losses are evaluated both separately and relatively, as opposed to simultaneously and in terms of absolute values of state of wealth.

History And Motivation:

In 1979, Daniel Kahneman and Amos Tversky conducted a series of thought experiments testing the Allais Paradox in Israel, at the University of Stockholm, and at the University of Michigan. Everywhere, the results followed the same pattern. The problem was even framed in many different ways, with prizes involving money, vacations, and so on. In each case, the substitution axiom was violated in exactly the same pattern. Kahneman and Tversky called this pattern the certainty effect -meaning, people overweight outcomes that are certain, relative to outcomes which are merely probable. Using the term "prospect" to refer to what we have so far called lotteries or gambles, (i.e., a set of outcomes with a probability distribution over them), Kahneman and Tversky also state that where winning is possible but not probable, i.e., when probabilities are low, most people choose the prospect that offers the larger gain. This is illustrated by the second decision stage in the Allais Paradox.

Experiments And Findings:

Kahnemann and Tversky also found strong evidence of what they referred to as the reflection effect

To illustrate: Imagine an Allais Paradox-type problem, framed in the following way. You

must choose between one of the two gambles, or prospects:

Gamble A:

A 100% chance of losing \$3000.

Gamble B:

An 80% chance of losing \$4000, and a 20% chance of losing nothing

Gamble C:

A 100% chance of receiving \$3000.

Gamble D:

An 80% chance of receiving \$4000, and a 20% chance of receiving nothing.

Kahnemann and Tversky found that 20% of people chose D, while 92% chose B. A similar pattern held for varying positive and negative prizes, and probabilities. This led them to conclude that when decision problems involve not just possible gains, but also possible losses, people's preferences over negative prospects are more often than not a mirror image of their preferences over positive prospects. Simply put – while they are risk-averse over prospects involving gains, people become risk-loving over prospects involving losses.

8.4 EXPERIMENTAL MEASURES OF RISK RELATED

Economists and psychologists have developed a variety of experimental methodologies to elicit and assess individual risk attitudes. Choosing which to utilize, however, is largely dependent on the question one wants to answer, as well as the characteristics of the sample population.

1. BART Method. (The Balloon Analogue Risk Task)

The Balloon Analogue Risk Task (BART) measures risk preferences by presenting individuals with a computer simulation of pumping air into a series of balloons. Balloons of three different colors (blue, yellow and orange) are presented one at a time. For each successive pump, the balloon grows in size and the individual earns money that is deposited into a temporary reserve. The value of the reserve is never revealed to the participant. As the balloon becomes bigger, the chances that it would pop after another pump grows as well; the probability of popping is negligible before the first pump and grows to certainty after the balloon reaches a particular size. If the balloon pops, all earnings in the temporary reserve disappear and a new balloon appears. At any given time, the participant can either pump the balloon or collect what she has earned so far. If the participant chooses to collect her earnings, that money is deposited into her permanent account and a new balloon appears. She then faces the same scenario with the next balloon.

The probability of popping increases monotonically with each successive pump and evolves according to a function specific to the color of the balloon. As participants are not informed of the actual probability function, this method thus tries to collect information on risk taking attitude of the individuals. Individuals are presented with 90 balloons in total, with the colors randomized accordingly.

Since each successive pump carried an increased risk of causing the balloon to pop, the authors took the average number of pumps, excluding balloons that exploded, to be the adjusted value corresponding to the individual's risk preference. This value correlated significantly with reported real-world risky behaviour such as gambling, drug use etc.

2. Questionnaires

Questionnaires are a commonly used method of eliciting risk preferences that rely on the individual's self-reported propensity for risk. A typical general risk question comes in the form of:- Rate your willingness to take risks in general on a 10-point scale, with 1- completely unwilling and 10-completely willing.

Such general risk questions implicitly assume that they are measuring a single, stable risk preference that influences behaviour across various domains. In turn, risk preferences derived through this method are commonly used as indicators for the propensity to engage in behaviour ranging from portfolio selection to smoking. However, a substantial amount of evidence suggests that the measured risk preferences are highly dependent on the domains in which they are elicited. The risk attitudes of company managers, for example, appear to differ substantially depending on whether risk was in the recreational or financial domain.

3. The Gneezy and Potters method

The elicitation method of Gneezy and Potters (1997) provides a measure of risk preferences in the context of financial decision-making with real monetary payoffs. Here, the decision maker receives $\$X$ and is asked to choose how much of it, $\$x$, she wishes to invest in a risky option and how much to keep. The amount invested yields a dividend of

$\$kx$ ($k > 1$) with probability p and is lost with probability $1 - p$. The money not invested

$\$(X - x)$ is kept by the investor. The payoffs are then $\$(X - x + kx)$ with probability p , and $\$(X - x)$ with $1 - p$. In all cases, p and k are chosen so that $p \times k > 1$, making the expected value of investing higher than the expected value of not investing; thus, a risk-neutral (or risk-seeking) person should invest $\$X$, while a risk-averse person may invest less. The choice of x is the only decision the participants make in the experiment.

For example, consider the case in which the participant receives an endowment of 100 cents. She is then asked to choose what part of this endowment (x) she would like to invest in a risky asset and how much to keep. The risky asset returns 2.5 times the amount invested with a probability of one-half and nothing with a probability of one-half.

The participant keeps the money that she does not invest ($100 - x$). The amount invested is then used as the measure of risk preferences.

Note that for these parameters, risk-neutral (and, in turn, risk-seeking) individuals should invest their entire endowment.

Hence, a disadvantage of this method is that it cannot distinguish between risk-seeking and risk-neutral preferences. However, since risk-seeking preferences appear to be relatively uncommon, and a fairly small fraction of participants choose to invest the entire amount of points, the amount invested x provides a good metric for capturing treatment effects and differences in attitude toward risk between individuals.

This elicitation method has been used to provide support for myopic loss aversion in the financial decisions of students, as well as professional traders. The method has also been used to show a positive correlation between risk taking, testosterone levels, and facial masculinity, and to compare gender differences in risk attitudes.

For example, consider the case in which the participant receives an endowment of 100 cents. She is then asked to choose what part of this endowment (x) she would like to invest in a risky asset and how much to keep. The risky asset returns 2.5 times the amount invested with a probability of one-half and nothing with a probability of one-half. The participant keeps the money that she does not invest ($100 - x$). The amount invested is then used as the measure of risk preferences.

Note that for these parameters, risk-neutral (and, in turn, risk-seeking) individuals should invest their entire endowment. Hence, a disadvantage of this method is that it cannot distinguish between risk-seeking and risk-neutral preferences. However, since risk-seeking preferences appear to be relatively uncommon, and a fairly small fraction of participants choose to invest the entire amount of points, the amount invested x provides a good metric for capturing treatment effects and differences in attitude toward risk between individuals.

4. The Eckel and Grossman method

The method developed by Eckel and Grossman (2002), was explicitly designed to be a simple way of eliciting risk preferences that produced enough heterogeneity in choices to allow for the estimation of utility parameters. The method asks subjects to make only one choice; participants are presented with a number of gambles and are asked

to choose one that they would like to play. The number of presented gambles can be varied. For example, participants are given with six gambles. Each of the gambles, listed in Table 1, involves a 50% chance of receiving the low payoff and a 50% chance of the high payoff. One of the gambles is a sure thing: in this case, Gamble 1 with a certain payoff of \$28. For Gambles 1–5, the expected payoff increases linearly with risk, as represented by the standard deviation. Note that Gamble 6 has the same expected payoff as Gamble 5 but with a higher standard deviation. The gambles are designed so that risk-averse subjects should choose those with a lower standard deviation (Gambles 1–4), risk-neutral subjects should choose the gamble with the higher expected return (Gamble 5), and risk-seeking subjects should choose Gamble 6.

Choice (50/50 Gamble)	Low Payoff	High Payoff	Expected Return	Standard Deviation	Implied CRRA range
Gamble 1	28	28	28	0	$3.46 < r$
Gamble 2	24	36	30	6	$1.16 < r < 3.46$
Gamble 3	20	44	32	12	$0.71 < r < 1.16$
Gamble 4	16	52	34	18	$0.50 < r < 0.71$
Gamble 5	12	60	36	24	$0 < r < 0.50$
Gamble 6	2	70	36	34	$R < 0$

Table 8.1 : The Eckel and Grossman Measure

This method allows for parameter estimation: the chosen gamble implies an interval for the risk coefficient under the assumption of constant relative risk aversion (CRRA). Under this assumption, utility can be represented by the function $u(x) = x^{1-r}$, with r corresponding to the coefficient of relative risk aversion and x corresponding to wealth. Individuals with $r > 0$ can be classified as risk averse, $r < 0$ as risk loving and $r = 0$ as risk neutral. Table 1 contains intervals for the risk coefficient corresponding to each chosen gamble. The intervals are determined by calculating the value of r that would make the individual indifferent between the gamble she chose and the two adjacent gambles. For example, a choice of Gamble 3 implies a risk coefficient in the interval of (0.71, 1.16): indifference between Gambles 3 and 4 corresponds to $r = 0.71$, and indifference between Gambles 2 and 3 to $r = 1.16$.

This measure has been used in Eckel and Grossman (2008) to demonstrate that women are significantly more risk averse than men. The authors also examined the stereotyping

of risk attitudes by asking subjects to guess the gamble choice of others and found that both men and women predicted greater risk aversion for women. In a field experiment with French farmers, Reynaud and Couture (2012) compared several risk elicitation methods and found the measure elicited using the Eckel and Grossman method correlated significantly with those elicited through the other methods. The measure is relatively easy for individuals to understand. However, it cannot differentiate between different degrees of risk-seeking behaviour.

5. Ellsberg Paradox

The Ellsberg's paradox was developed by Daniel Ellsberg in his paper "Risk, Ambiguity, and the Savage Axioms", 1961. It concerns subjective probability theory, which fails to follow the expected utility theory, and confirms Keynes' 1921 previous formulation. This paradox is usually explained with the next experiment (you may try it yourself):

An individual is told that an urn contains 90 balls from which 30 are known to be red and the remaining 60 are either black or yellow. He is asked to choose between the following gambles:

Gamble A: – \$100 if the ball is red

Gamble B: – \$100 if the ball is black And one between the following:

Gamble C: – \$100 if the ball is not black Gamble D: – \$100 if the ball is not red

In most cases people will choose A Over B and D over C. It is thought that betting for or against the known information (red ball) is safer than betting for or against the unknown (black ball). Nevertheless, these choices of preferences result in a violation of the sure-thing principle, which would require the ordering of A to B to be preserved in C to D.

We can derive a series of conclusions from this paradox. First, the appearances of a breach in the independence axiom, as common elements are considered in both gambles. Second, how individuals are reluctant to play in complex games, which shows their aversion to ambiguity. This statement also concerns the last conclusion which regards the disjunction effect. Decisions are postponed until having information, although this information may not have an influence in our final decision.

6. Bubble Creation

A bubble is an economic cycle characterized by the rapid escalation of asset prices followed by a contraction. It is created by a surge in asset prices unwarranted by the fundamentals of the asset and driven by exuberant market behaviour. When no more investors are willing to buy at the elevated price, a massive sell-off occurs, causing the bubble to deflate.

Meaning of a Bubble?

A bubble is an economic cycle characterized by the rapid escalation of asset prices followed by a contraction. It is created by a surge in asset prices unwarranted by the fundamentals of the asset and driven by exuberant market behaviour. When no more investors are willing to buy at the elevated price, a massive sell-off occurs, causing the bubble to deflate.

How a Bubble Works

Bubbles form in economies, securities, stock markets and business sectors because of a change in investor behaviour. This can be a real change — as seen in the bubble economy of Japan in the 1980s when banks were partially deregulated, or a paradigm shift — which took place during the dot-com boom in the late 1990s and early 2000s. During the boom, people bought tech stocks at high prices, believing they could sell them at a higher price until confidence was lost and a large market correction, or crash, occurred. Bubbles in equities markets and economies cause resources to be transferred to areas of rapid growth. At the end of a bubble, resources are moved again, causing prices to deflate.

Key Take aways

1. A bubble is a rapid escalation of asset prices followed by a contraction, often created by a surge in asset prices that is fundamentally unwarranted.
2. Changes in investor behaviour are the primary causes of bubbles that form in economies, securities, stock markets, and business sectors.

The Five Steps of a Bubble

Economist Hyman P. Minsky, who was one of the first to explain the development of financial instability and the relationship it has with the economy, identified five stages in a typical credit cycle. The pattern of a bubble is pretty consistent, despite variations in how the cycle is interpreted.

1. **Displacement:** This stage takes place when investors start to notice a new paradigm, like a new product or technology, or historically low interest rates — basically anything that gets their attention.
2. **Boom:** Prices start to rise at first, then get momentum as more investors enter the market. This sets up the stage for the boom. There is an overall sense of failing to jump in, causing even more people to start buying assets.
3. **Euphoria:** When euphoria hits and asset prices skyrocket, caution is thrown out the window.
4. **Profit taking:** Figuring out when the bubble will burst isn't easy; once a bubble has burst, it will not inflate again. But anyone who looks at the warning signs will make money by selling off positions.
5. **Panic:** Asset prices change course and drop as quickly as they rose. Investors and others want to liquidate them at any price. Asset prices decline as supply outshines demand.

The Dutch tulip bulb market bubble, also known as 'tulip mania' was one of the most famous market bubbles and crashes of all time. It occurred in Holland during the early to mid 1600s when speculation drove the value of tulip bulbs to extremes. At the height of the market, the rarest tulip bulbs traded for as much as six times the average person's annual salary.

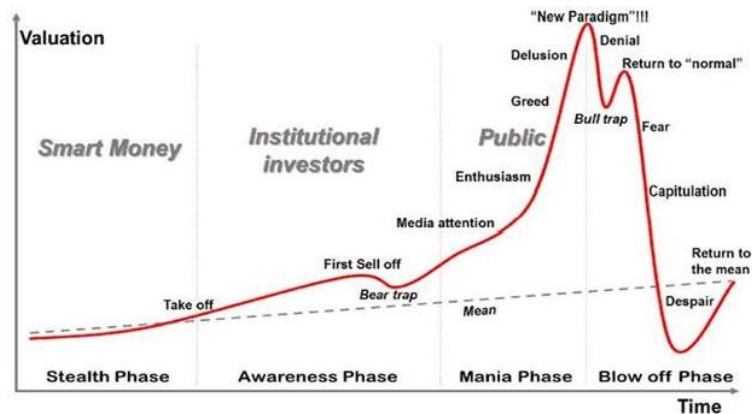


Figure: 8.1 : Stages in a Bubble

1. **Stealth.** Those who understand the new fundamentals realize an emerging opportunity for substantial future appreciation, but at risk since their assumptions are so far unproven. So the “smart money” gets invested in the asset class, often quietly and cautiously. This category of investors tends to have better access to information and a higher capacity to understand the wider economic context that would trigger asset inflation. Prices gradually increase, but often completely unnoticed by the general population. Larger and larger positions are established as the smart money starts to better understand that the fundamentals are well-grounded and that this asset class is likely to experience significant future valuations.
2. **Awareness.** Many investors start to notice the momentum, bringing additional money in and pushing prices higher. There can be a short-lived sell-off phase taking place as a few investors cash in their first profits (there could also be several sell-off phases, each beginning at a higher level than the previous one). The smart money takes this opportunity to reinforce its existing positions. In the later stages of this phase, the media starts to notice with positive reports about how this new boom benefits the economy by “creating” wealth; those getting in becoming increasingly “unsophisticated”.
3. **Mania.** Everyone is noticing that prices are going up and the public jumps in for this “investment opportunity of a lifetime”. The expectations about future appreciation

become a “no brainer” and a linear inference mentality sets in; future prices are an extrapolation of past price appreciation, which of course goes against any conventional wisdom. This phase is however not about logic, but a lot about psychology. Floods of money come in creating even greater expectations and pushing prices to stratospheric levels. The higher the price, the more investments pour in. Fairly unnoticed from the general public caught in this new frenzy, the smart money, as well as many institutional investors, are quietly pulling out and selling their assets. Unbiased opinion about the fundamentals becomes increasingly difficult to find as many players are heavily invested and have every interest to keep asset inflation going. The market gradually becomes more exuberant as “paper fortunes” are made from regular “investors” and greed sets in. Everyone tries to jump in and new entrants have absolutely no understanding of the market, its dynamic and fundamentals. Prices are simply bid up with all financial means possible, particularly leverage and debt. If the bubble is linked with lax sources of credit, then it will endure far longer than many observers would expect, therefore discrediting many rational assessments that the situation is unsustainable. At some point statements are made about entirely new fundamentals implying that a “permanent high plateau” has been reached to justify future price increases; the bubble is about to collapse.

4. Blow-off. A moment of epiphany (a trigger) arrives and everyone roughly at the same time realizes that the situation has changed. Confidence and expectations encounter a paradigm shift, not without a phase of denial where many try to reassure the public that this is just a temporary setback. Some are fooled, but not for long. Many try to unload their assets, but takers are few; everyone is expecting further price declines. The house of cards collapses under its own weight and late comers (commonly the general public) are left holding depreciating assets while the smart money has pulled out a long time ago. Prices plummet at a rate much faster than the one that inflated the bubble. Many over-leveraged asset owners go bankrupt, triggering additional waves of sales. There is even the possibility that the valuation undershoots the long term mean, implying a significant buying opportunity. However, the general public at this point considers this sector as “the worst possible investment one can make”. This is the time when the smart money starts acquiring assets at low prices.

The Bubble Bursts

By the end of 1637, the bubble had burst. Buyers announced they could not pay the high price previously agreed upon for bulbs and the market fell apart. While it was not a devastating occurrence for the nation's economy, it did undermine social expectations. The event destroyed relationships built on trust and people's willingness and ability to pay.

According to Smithsonian.com, Dutch Calvinists painted an exaggerated scene of economic ruin because they worried that the tulip-driven consumerism boom would lead to societal decay. They insisted that such great wealth was ungodly and the belief remains to this day.

8.5 DIFFERENCE BETWEEN EXPECTED UTILITY THEORY AND PROSPECT THEORY

S. No.	Expected Utility Theory	Prospect Theory
1	Expected Utility theory assumes that are generally risk – averse.	According to prospects theory investors individuals are not universally risk averse. They dislike risk in some situations, while liking risk in others.
2	Under expected utility, risk preferences are captured by the shape of the utility function. Decision makers are risk-averse if $U(x)$ is concave, and risk-seeking if $U(x)$ is convex.	In prospects theory risk preference depends on most losses and most gains situations. Individuals are risk-averse for most gains, but risk seeking for most losses.
3	Expected utility theory assumes that preferences between prospects do not depend on the manner in which they are described, (invariance assumption).	Prospect theory demonstrates that the same choices can be framed indifferent ways to produce dramatically different preferences. In other words, our choices do not always obey the invariance assumption.
4	Expected utility theory assumes that - adding a common consequence to two prospects should not change	Common consequence to two options changes preferences, contrary to expected utility theory.

	which alternative the decision maker prefers. This principle is known as the independence axiom.	
5	Expected UT assumes that investors always try to avoid risk or takes care for risk in making investment decisions. i.e., it assumes risk aversion.	Prospect Theory assumes that investors always try to avoid losses. This dislike of losses is known as loss Aversion. Put simply, losses loom larger than gains.

8.6 SUMMARY

Most people often make choices out of habit or tradition, without going through the decision-making process steps systematically. Decisions may be made under social pressure or time constraints that interfere with a careful consideration of the options and consequences. Decisions may be influenced by one's emotional state at the time a decision is made. When people lack adequate information or skills, they may make less than optimal decisions. Even when or if people have time and information, they often do a poor job of understanding the probabilities of consequences. Even when they know the statistics; they are more likely to rely on personal experience than on information about probabilities. The fundamental concerns of decision making are combining information about probability with information about desires and interests.

8.7 GLOSSARY

- **Uncertainty effect:** The uncertainty effect is one of the biases that may interfere with the decision-making process, tending to generate an opposite result to that desired.
- **Prospect theory:** Prospect Theory offers insights into why people make non-optimizing decisions rather than only those that are profit maximizing.
- **Bubble:** A bubble is an economic cycle characterized by the rapid escalation of asset prices followed by a contraction.

- **Boom:** Prices start to rise at first, then get momentum as more investors enter the market.
- **Blow-off:** A moment of epiphany (a trigger) arrives and everyone roughly at the same time realizes that the situation has changed.

8.8 SELF ASSESSMENT QUESTIONS

1. What is Bubble? How does it work?

2. Distinguish between expected utility theory and prospect theory.

8.9 LESSON END EXERCISE

1. Explain the Ellsberg paradox experiment.

2. Explain the five steps of a bubble cycle.

8.10 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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UTILITY, EMOTIONS AND DECISION MAKING

**M.COM III SEM
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**UNIT- II
LESSON - 9**

EMOTIONAL MECHANISMS IN MODULATING RISK-TAKING ATTITUDE

STRUCTURE

- 9.1 Introduction
- 9.2 Objectives
- 9.3 Emotions and Financial Market
- 9.4 Emotional mechanisms in modulating risk-taking attitude
- 9.5 Summary
- 9.6 Glossary
- 9.7 Self-Assessment Questions
- 9.8 Lesson End Exercise
- 9.9 Suggested Readings

9.1 INTRODUCTION

Decision making power of an individual is certainly affected by their emotions. This is the reason for suggesting not to make promises in over joy and keep your silence in anger. Controlling of these emotions is called emotional intelligence. In financial decisions, emotions leads to suppress the reasoning ability of the mind. Physiology of finance is more apt than psychology of finance in dealing with emotions. Rational

thinking and decision making does not leave any room for emotions. This means, emotions of any kind (good / bad) should not remain at the time of trading in financial securities, since emotions are irrational occurrences that may distort reasoning power of mind.

A further common view is that decision making is a rational mental process without emotion, and that emotions disrupt and jeopardize the rational process. In decision research, rationality is mostly understood as formal consistency, that is, conforming to the laws of probability and the axioms of utility theory. If people behave rationally in that sense, they will make optimal choices. Emotions, then, can only interrupt and impede the process of achieving an optimal decision.

However, there are presently both theories and research focusing on the important role of emotions in decision-making. Loewenstein and Lerner divide emotions during decision- making into two types:

1. Anticipating emotions
2. Immediate emotions

Risky decisions are taken by human with both anticipated emotions and immediate emotions. Immediate emotions refer to the uncontrollable pressure people feel as they contemplate a specific decision option when they have alternatives available at that movement. Whereas anticipated emotions are those emotions that people forecast that they will feel once they experience possible consequences of that decision. Thus expected emotions refer to anticipated emotional states associated with a given decision that are never actually experienced. Immediate emotions, however, are experienced at the time of decision, and either can occur in response to a particular decision or merely as a result of a transitory fluctuation.

Damasio formulated the somatic marker hypothesis (SMH), that proposes a mechanism by which emotional processes can guide (or bias) behaviour, particularly decision-making. Pfister and Böhm believe that "the issue of rationality should be based on the validity of emotional evaluations rather than on formal coherence."

9.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- emotions and financial market
- emotional mechanisms in modulating risk-taking attitude

9.3 EMOTIONS AND FINANCIAL MARKET

Emotion can be defined loosely as a physiological state of arousal triggered by beliefs about something. Arnold (1960) defines emotion as "the felt tendency toward anything intuitively appraised as good (beneficial), or away from anything intuitively appraised as bad (harmful)". A strict definition of the term is complex because emotion has Cognitive, physiological, social, and behavioural aspects.

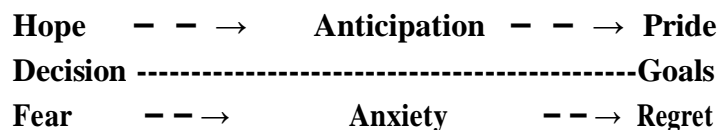
Despite the lack of a unified definition of emotion, there is some agreement on the set of emotions that exist. According to Elster (1998), some states are clearly emotions, including, for instance, anger, hatred, guilt, regret, fear, pride, elation, joy, and love. Elster further argues that these emotional states can be differentiated from other mental states on the basis of six features put forth long ago. These features do not provide a complete definition of emotion because not even one feature is an element of every emotion. Yet these six features remain central to current discussion and provide a framework for understanding what an emotion is. The brief descriptions that follow use one emotion-regret-for illustrative purposes

1. **Cognitive antecedents.** Emotions are triggered by beliefs. An investor regrets an investment decision because she believes that bad outcomes could have been avoided.
2. **Intentional objects.** Emotions are about something. The object of an emotion is usually the Cognitive antecedent. For example, the poorly performing investment is the object of the regretful investor
3. **Physiological arousal.** Changes in hormonal conditions and the autonomic nervous system accompany emotions. The regretful investor may feel pangs, a hollow stomach, or depression.

4. **Physiological expressions.** Observable expressions characterize emotions. Facial expressions, posture, voice intonation, and outward appearance are noteworthy. The regretful investor may appear pale, with slumped shoulders.
5. **Valence.** Emotions can be placed on a scale with pleasure at one extreme and pain at the other. Valence, or the experience of pleasure versus pain, translates to happiness or unhappiness. The regretful investor is decidedly unhappy about the poor investment outcome.
6. **Action tendencies.** Emotions are associated with a tendency to act. The regretful investor might take actions to avoid being exposed to similar investment opportunities.

Emotions have a bearing on risk tolerance, and risk tolerance influences portfolio selection. Investors experience a variety of emotions as they consider alternatives, decide how much risk to take, watch their decisions play out, assess whether the initial strategy needs modification, and finally learn how far they have succeeded in achieving their financial objectives.

The emotions experienced by a person with respect to investment may be expressed along an emotional time line as shown as below



Investment decisions lie at the left end of the time line and investment goals at the right end. According to psychologist Lola Lopes, investors experience a variety of emotions, positive and negative. Positive emotions are shown above the time line and negative emotions below the time line.

On the positive side, hope becomes anticipation which finally converts into pride. On the negative side, fear turns into anxiety which finally transforms into regret. Hope and fear have a bearing on how investors evaluate alternatives. Fear induces investors to look at the downside of things, whereas hope causes them to look at the upside. The

downside perspective emphasizes security; the upside perspective focuses on potential gains.

According to Lopes, these two perspectives reside in everyone, as polar opposites. However, they are often not equally matched, as one pole tends to dominate the other. The relative importance of these conflicting emotions determines the tolerance for risk.

9.4 EMOTIONAL MECHANISMS IN MODULATING RISK-TAKING ATTITUDE

1. The Loewenstein-Lerner classification

Loewenstein and Lerner (2003) construe emotions according to their place along the time course of a decision process, beginning with a deliberation phase leading to a choice, then implementing the choice, and, eventually, experiencing the outcomes. They distinguish between anticipated emotions and immediate emotions, with immediate emotions further classified into incidental and anticipatory emotions. Anticipated emotions are beliefs about one's future emotional states that might ensue when the outcomes are obtained. Immediate emotions, in contrast, are actually experienced when making a decision, thereby exerting an effect on the mental processes involved in making a choice. Immediate emotions come in two variants, either as incidental emotions caused by factors which are not related to the decision problem at hand, and as anticipatory or integral emotions, which are caused by the decision problem itself.

2. Peters' functional roles of affect Peters (2006) recently proposed a classification of the roles that affect plays in decision making. Affect is loosely defined as experienced feelings about a stimulus, either integral or incidental. Four roles are identified:

First, affect plays a role as information. These feelings, act as good-versus-bad information to guide choices, according to the affect heuristic proposed by Slovic.

The second role played by affect is as a spotlight, focusing the decision maker's attention

on certain kinds of new information and making certain kinds of knowledge more accessible for further information processing.

Third, affect operates as a motivator, influencing approach-avoidance tendencies as well as efforts to process information.

Finally, a fourth role of affect is to serve as a common currency in judgments and decisions. Just as money does for goods, affect provides a common currency for experiences. Affective reactions enable people to compare disparate events and complex arguments on a common underlying dimension.

3. The influence-on metaphor

Emotions - or affect, or feelings - are portrayed as external forces influencing an otherwise non-emotional process. It is assumed that the domain of emotion is qualitatively different and functionally separate from the domain of cognition. Decision making is then seen as an essentially Cognitive process, which does not necessarily entail emotions. Emotions may have an influence on decision making, but decision making per se might as well proceed without emotion. This is the premise of traditional approaches of behavioural decision making, but is also reflected in current dual- system theories. This antagonism of emotion and decision making is commonly accompanied by further dichotomies: Irrational emotions disturb rational cognitions, intuitive feelings outsmart deliberate thinking, and hot affect overwhelms cold logic.

4. Positive and negative emotions

All emotions are naturally classified as either positive or negative. More precisely, all emotional states can be mapped onto a one-dimensional scale of valence, characterized by contrasting labels such as positive versus negative, pleasurable versus painful, or helpful versus harmful. This assumption of one dimensional scalability corresponds to the economic notion of utility, which takes for granted that choice reveals an underlying one-dimensional utility scale. In a parallel manner, research on hedonic feelings and happiness postulates a general dimension of pleasant versus unpleasant feelings on which all experiences can be evaluated. Empirically, however, this view just does not

hold, and ample evidence demonstrates that human preferences do not conform to simple scalability.

9.5 SUMMARY

Effective emotion regulation might be a relevant facet of trader expertise as it diminishes susceptibility to Cognitive and psychological biases. Most studies investigating the interplay of emotion regulation and decision-making focused on the regulation of emotions that participants attach to possible outcomes that they anticipate as a consequence of making decisions. For instance, before making a risky decision, decision-makers can actively attempt to change the way they will perceive potential choice outcomes to minimize the emotional impact on decision-making. In this case, such emotions directly related to choice outcomes could either occur during decision-making (current emotions) or after decision-making (expected emotions).

9.6 GLOSSARY

- **Emotion:** Emotion can be defined loosely as a physiological state of arousal triggered by beliefs about something.
- **Valence.** Emotions can be placed on a scale with pleasure at one extreme and pain at the other.
- **Anticipated emotions:** Anticipated emotions are beliefs about one's future emotional states that might ensue when the outcomes are obtained.

9.7 SELF ASSESSMENT QUESTIONS

1. What is emotion?

2. Discuss the role of emotions in financial market.

9.8 LESSON END EXERCISE

1. Explain the Peters' functional roles of affect.

2. Explain the emotional mechanisms in modulating risk-taking attitude.

9.9 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
- Singh. S., & Bahl. S (2015). *Behavioural Finance*. Vikas Publishing House, Noida (India).
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UTILITY, EMOTIONS AND DECISION MAKING

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**UNIT- II
LESSON - 10**

NEUROPHYSIOLOGY OF RISK TAKING AND PERSONALITY TRAITS AND RISK ATTITUDE IN DIFFERENT DOMAINS

STRUCTURE

- 10.1 Introduction
- 10.2 Objectives
- 10.3 Neurophysiology of risk taking
- 10.4 Risk attitude
- 10.5 Personality traits and risk attitude in different domains
- 10.6 Summary
- 10.7 Glossary
- 10.8 Self-Assessment Questions
- 10.9 Lesson End Exercise
- 10.10 Suggested Readings

10.1 INTRODUCTION

All traits of personality are significantly influencing the risk tolerance level. All traits of personality, agreeableness, extroversion, conscientiousness, openness and neuroticism can significantly predict the risk tolerance of an investor. There is association of

behavioural finance biases with investor's personality and certain level of risk tolerance. Investors with conservative investor personality and low-risk tolerance level have mental accounting biases, whereas investors with radical investor personality and high-risk tolerance levels have self-control bias. Personality type A are more willing to take risk, thus holding more FRT as compared to the invertors having type B personality type. There exists a close relationship between individual's financial risk-taking behaviour with their personality characteristics. Personality taxonomies, that is, agreeableness, significant anxiety and cynical hostility articulate portfolio choice. The study stated that investors of type A personality have more FRT. Grable (2000) also stated through his research that personality type and risk tolerance are related to each other. Type A personality individuals are more willing to take risk as compared with type B personality. People who are more neurotic and more open and more aggregable generally take more risk as compared to the persons who are more conscientious. The association between different dimensions of PT and the associated FRT and stated that PT explains the risk tolerance of the investor, and the relationship is explained using a non-linear function. Personality trait openness to experience exhibits positive relationship, while agreeableness has a negative influence on risk-taking attitude of the investors. To conclude risk-taking determinants are influenced by different PTs like extraversion and neuroticism. Persons having traits other than neuroticism perform better under investments having long-term horizon. Investors having type A personality are more risk-takers as compared to the investors holding type B personality.

10.2 OBJECTIVES

After completion of this lesson, you should be able to understand:

- neurophysiology of risk taking
- risk attitudes
- types of risk attitude
- personality traits and risk attitude in different domains

10.3 NEUROPHYSIOLOGY OF RISK TAKING

10.3.1 Introduction to Neurophysiology of Finance

Neurophysiology is different from Psychology

Former is a study of body reactions and later is about mind directions to those reactions. There will be a communication channel between body and mind through the use of chemical messengers called Hormones. When watching a Chicken biryani making video, some may feel that their mouth is watering. It happens automatically, even though it not possible to taste that while watching it on TV. It's not possible to have control over these chemical messengers. Even though people know that what they are watching in a drama show is not really happening, they cannot stop crying for what happen to a character in the drama.

NeuroFinance or Neurophysiological Finance is thus an advancement in the field of behavioural finance. Here experiments are done on mind, hormone levels at the time of making a decision. For example, blood samples (or) urine samples if gathered from traders at the time of peak trading time, we can find that those traders, who are actual on loss on that day, shall have higher levels of Adrenalin, Cortisol in those samples.

This is a well-known fact that mind plays an important role on the body. The co-ordination between these is essential for rational decision making. Understanding of

Neuroscience to certain extent that helps us to understand the two important emotion states called Euphoria and stress shall provide the behavioural finance to take it's holistic form.

10.3.2 Behavioural Finance V/S Neurophysiological Finance

Behavioural Finance	Neurophysiological Finance
Greed	Euphoria/mania
Fear	Stress/Depression

Table 10.1

Behavioural finance explains why people tends acquire stocks or takes excessive risk than needed. This is because of a behavioural attitude called greed for money. This type of bias increases risk taking tendency, because human tends to earn like others and even want to do it much faster to reach there. Greed infact overcomes the fear.

Neurophysiology takes an extra mile in explaining what make the mind to become such a greed or fear mind. What are likely symptoms for that state of mind in short run and implications in long run.

Take the case of traditional Indian Ayurveda, when a person is suffering with fever – a part from giving medicine, such person is advised to go on fasting and take complete rest without body movements. For every activity like digestion, improving the immune system to fight against the virus, or even for natural needs energy is consumed. So when a person is on fasting, total body energy will be dedicated towards improving of immune system and recovery shall be fast. Modern day sciences, especially neuroscience also accepts that if mind belives then body relives. This can be explained by an experiment, where a dummy capsule is given as pain killer, patients used to say a small amount of recovery is there. This called placebo effect in western medical practices.

10.3.3 Neurophysiology of Risk taking - Hormones and their roles

Hormones are the chemical messengers that create a feel in mind. A feel of hunger, thirst, short of oxygen, sensation of heat or cold are all the results of chemical messenger communication between mind and body. Neurophysiology believes that risk taking attitude is also the impact of hormones at various stages of human life cycle.

Steroids – a special class of Hormones in the sense that they can send multiple messages at a time. They are very powerful in the sense that they can alter growth, shape, metabolism, immune function, mood, memory etc at time. This is the very reason for prohibiting these steroids in sports.

Types of Hormones / Steroids

Dopamine and Testosterone: Dopamine is the important hormone that sends message of satisfaction. A person after having a ‘1000 net earnings from a day’s

trading will have increased dopamine content in his blood for a short while. This state of mind is called euphoria. When the investor continues to do so for further few days, dopamine levels produced in diminishing rate. That means in order to have the same satisfaction level, humans need more dopamine release in the body to signal satisfaction in the mind. This feedback loop increases the risk taking attitude, as more of dopamine is needed to get same amount of satisfaction.

Disadvantage.

An alcoholic or smoker does not care the statutory warnings (i.e prefers to take risk) because levels of dopamine release from nicotine or Cocaine are many folds then taking food or any other normal pleasure giving activity. Thus excessive risk taking attitude through continuous trading can disrupt the normal euphoria levels to reach a clinical mania stage where medical intervention may be needed. Testosterone is similar to dopamine but acts like a steroid, so excessive risk taking with spontaneous decisions is quite possible with those traders having high levels of testosterone.

Dopamine scale

Food	+50%
Sex	+100%
Nicotine	+200%
Cocaine	+400%
Amphetamine	+1000%

Table 10.2 : Dopamine scale

Adrenalin and Cortisol :

These are the hormones responsible for body responses to fear. Even though market ups and downs are common, human mind's ability to use rationality is highly questionable. Adrenalin creates fear, change in facial expressions, increase in heart beat etc. With a decision being take (fight or fly) these hormone impact restores to its balance. But when there is continuation of the fear (or) stress there will be release of Cortisol levels in the blood which can in long run lead to depression requiring medical treatments.

A trader's feelings in front of a falling SENSEX is equivalent to that of a deer in front of a lion. Adrenalin is produced immediately to help body movements needed at that time.

Stress Response : like elevated heart rate, elevated blood pressure, elevated blood sugar levels, Sweating, Goosebumps, sudden urgency for urination or stooling are all the results of release of adrenalin. All these body reactions are needed for deer to escape from lion by running faster. But fact of most importance is fear or stress in normal life last for few minutes to days, but in financial markets, its long lasting, hence traders are highly vulnerable to Cortisol releases in blood in long run leading to depression.

Vagus nerves / Vagal brake / Response: Our physiological systems for defense are all wired together. Thus, we often experience simultaneous increases in heart rate, rapid respiration, sweating and muscle tension, all systems that need to be brought on line in order to protect ourselves in situations of threat. This is again the defensive system known as the sympathetic nervous system. However, when we activate the alternate system the impact is more calming (parasympathetic nervous system). Those responses are also wired together. Thus, if we can change one variable in that system, we can typically change the functioning in other areas. Since management of breathing is by far the easiest of those four systems of control, many techniques for breathing have been developed to help increase the involvement of the more common parasympathetic response.

The three types of situations that elicit a massive psychological stress response are “novelty, uncertainty and uncontrollability”, according to Coates. In market terms, he found that cortisol levels rose substantially with the volatility of the markets and that as the variability of traders' P&L rose, so too did their cortisol levels.

10.4 RISK ATTITUDE

In finance and economics, risk is a term that's related to uncertainty about an event and its outcome, regardless of whether the event and outcome are positive or negative. A good example of this is the risk of making a financial investment. We are uncertain

about the outcome of investing in a stock, and may quantify our uncertainty of loss and/or gain via a probability distribution model.

However, some models of risk are quite subjective. This is because some of our assumptions about risk deal with a person's individual attitudes toward risk and their understanding of a specific situation.

Risk attitudes generally vary from risk seeking, through risk neutral, to risk averse, suggesting that risk seeking and risk aversion are perceived as the more and less risky options, respectively. Standard economic theories pertaining to this field of study consider risk aversion as an inherent human attitude that depends primarily on the shape that people's utility functions take. Psychological theory further asserts that people's financial decisions under uncertainty differ according to their motives for taking economic risks. Influences on risky behaviour tend to stem from individual-level factors, with personality as a powerful influence.

10.4.1 Types of Attitudes

- ***Risk aversion*** is a type of attitude where an individual gravitates toward certain, as opposed to uncertain, events.
- ***Risk seeking*** is a type of attitude or behaviour where a person is inclined to take on less-certain activities in lieu of more certain ones.
- In the middle are ***risk neutral*** individuals, who have an indifferent attitude toward risk.

10.5 PERSONALITY TRAITS AND RISK ATTITUDE IN DIFFERENT DOMAINS

Risk attitude can be defined as a chosen response to uncertainty that matters, influenced by perception. Risk attitude is known to be a significant contributor on the risk management process in the project management industry at both individual and group levels. It is a chosen act to view at significant uncertainties. Since perception is a subjective matter, it suggests that the risk attitude of an individual might be unique compared to other attitudes adopted by others. In other words, risk attitude is

influenced by individual's perception towards risk, depending on their own judgment and evaluations of hazards or potential rewards.

Meanwhile, the five core personality traits are believed to be the cornerstone of human personality. This theory has been growing consistently, from the findings of Fiske (1949) and later supported by Norman (1967), and McCrae and Costa (1987). The factors represent endless variety of personality traits, namely openness, conscientiousness, extraversion, agreeableness and neuroticism (OCEAN). Each of the dimensions are measured by a continuum, whereby an individual may be either highly or low in certain personality traits or in between these two ends of a spectrum. Despite the label is given for each personality traits, it is not necessarily specific and can be tangible based on the personality characteristics measured. Like personality traits, attitude cannot be evaluated through the naked eye. It should be interpreted from measurable responses. An attitude towards risk could be inferred in different types of responses, including Cognitive (perception), affective (feelings) and conative (intention) responses. These responses are similar to the findings by Hillson and MurrayWebster (2008) from their triple strand of influences, where they explained that perceptions of risk are divided into conscious, subconscious and affective factors. Some of these elements are contained in personality traits in the Big Five theory. For example, neuroticism is discussed as feelings and emotions of an individual, guided by self-conscious and impulses.

10.5.1 Extraversion

McCrae and Costa Jr (1997) and Leary, Reilly, and Brown (2009) defined an extrovert as a person who is active, optimistic, excitement seeking and socializes in big crowds. "Extraversion deliberate only positive information, which influences their assessment of the probability of success and instigated overconfidence in financial decision making". Extraversion often creates a trade-off and tends to capitalize on the money more in the stock market. People with a greater tendency towards extraversion are risk-takers and eventually they attain higher returns.

10.5.2 Openness to Experience

As defined by Martins (2002), individuals with an attribute of openness to experience

are broad-minded, resourceful, and creative. They have an appeal towards new thoughts, aesthetics, and novelty (Gunkel et al., 2010). Extraversion trade frequently and tend to invest more money in the stock market. “Openness in individuals promotes greater willingness to embrace unconventional rules of thumb prescribed in financial decision making”. Investors possessing this trait have a positive association with risk tolerance and prefer investing in stock. Investors having the “openness to experience” trait tend to take a higher risk than their counterparts.

10.5.3 Agreeableness

Agreeableness refers to cooperation, helpfulness, personal warmth, altruism, and sympathy toward others. Agreeable individuals rely on the financial analyst’s judgment and feel hard to make personal financial decisions. Agreeable persons tend to avoid conflicts with others and positively consider the information provided by others without any critical assessment.

10.5.4 Conscientiousness

Conscientiousness individuals possessing are punctual, persistent, determined, reliable, and well-organized and are not high risk-takers. Conscientiousness investors avoid depending on misconceptions and sensibly make their investment decisions. “Conscientious individuals are actively involved in decision making”. Conscientious investors do not rely on delusions and prudently make their investment decisions. This ability makes them more particular about the choice of investment and risk tolerance. Individuals with conscience personality have a positive relationship with their trading behaviour.

10.5.5 Neuroticism

Neurotic people lack conceptual understanding, critical thinking, Cognitive abilities, and analytical skills. These shortcomings make neurotic individuals anxious and afraid while taking risky decisions. Neurotic investors avoid indecision, are hostile towards risk, and avoid debt securities and foreign equities. As such, neurotic individuals approve portfolios with a low-risk appetite. Neurotic individuals avoid investment in foreign

securities and avoid uncertainty. Neuroticism has a negative relation to risky behaviour.

10.5.6 Risk Aversion

Risk is well-thought-out as a significant aspect of investment behaviour. Investors with a low-risk attitude invest not only in saving accounts but also prefer holding cash and investment in bonds. Likewise, those with a high-risk attitude choose trading more in derivatives and investments in stocks, contrary to low-risk ones. “Individuals risk behaviour determine their investment style”. Yet, many aspects influence an individual’s risk behaviour such as their past experiences, financial knowledge, market volatility, emotions, personal traits, and love for money.

10.6 SUMMARY

There is a long-standing and persistent belief that risk-taking is a stable personality trait, often referred to as risk attitude or risk preference. The belief implies that a given individual will take similar risks across a range of situations and that some people will be more risk-averse (or more risk-seeking) across situations than others. Risk attitude that shows cross-situational consistency to varying degrees and highlights several factors related to individual differences that are known to affect risk-taking. Risk attitude defined within the expected utility (EU) framework varies greatly across situations as a function of decision content and outcome framing. All types of risk-taking increased with higher levels of extraversion and neuroticism, openness to experience, self-assurance, and the ability to make decisions. Openness to problem solving and inner balance had a negative impact on risk-taking. Tolerance of frustration increased social risk-taking but decreased physical and financial risk-taking.

10.7 GLOSSARY

- **Risk aversion:** Risk aversion is a type of attitude where an individual gravitates toward certain, as opposed to uncertain, events.
- **Risk attitude:** It is a chosen response to uncertainty that matters, influenced by perception.

- **Extrovert:** Extrovert as a person who is active, optimistic, excitement seeking and socializes in big crowds.
- **Agreeableness:** Agreeable refers to cooperation, helpfulness, personal warmth, altruism, and sympathy toward others.

10.8 SELF ASSESSMENT QUESTIONS

1. Explain the term risk attitude.

2. Discuss the different types of risk attitudes.

10.9 LESSON END EXERCISE

1. Explain the Big Five personality traits.

2. Describe the relationship between risk attitude and personality of individual.

10.10 SUGGESTED READINGS

- Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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BEHAVIOURAL FACTORS AND FINANCIAL MARKETS

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**UNIT- III
LESSON - 11**

EFFICIENT MARKET HYPOTHESIS

STRUCTURE

- 11.1 Introduction
- 11.2 Objectives
- 11.3 Efficient Market Hypothesis
 - 11.3.1 Random Walk and Search for Theory
 - 11.3.2 Efficient Market
- 11.4 Assumptions of the Efficient Market Hypothesis
- 11.5 Forms of Efficiency
- 11.6 Misconceptions about the Efficient Market Hypothesis
- 11.7 Criticism of the Efficient Market Hypothesis
- 11.8 Summary
- 11.9 Glossary
- 11.10 Self Assessment Questions
- 11.11 Lesson End Exercises
- 11.12 Suggested Readings

11.1 INTRODUCTION

The Efficient Markets Hypothesis (EMH) that was proposed in the 1960s reached its height of dominance in the academic circles in the 1970s. Efficient Market Hypothesis is the cornerstone of modern financial theory. The pioneer of EMH was Eugene Fama. In his 1970 article entitled 'Efficient Capital Markets', Fama states that it is impossible to beat the market as financial markets are efficient regarding the distribution of information.

Benjamin Friedman refers to efficient markets hypothesis as a “credo,” a statement of faith and not a scientific proposition. For most financial economists, the efficient markets hypothesis is a central idea of modern finance that has profound implications.

11.2 OBJECTIVES

After studying this lesson, you should be able to know about:

- the meaning and assumptions of efficient market hypothesis
- the concept of random walk
- forms of efficiency
- misconceptions about EMH and its criticism.

11.3 EFFICIENT MARKET HYPOTHESIS

Efficient-market hypothesis (EMH) is a theory in financial economics which states that asset prices fully reflect all available information. A direct implication is that it is impossible to “beat the market” consistently on a risk-adjusted basis since market prices should only react to new information.

The efficient-market hypothesis was developed by **Eugene Fama** who argued that stocks always trade at their fair value, making it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices. As such, it should be impossible to outperform the overall market through expert stock selection or market timing, and that the only way an investor can possibly obtain higher returns is by chance or by purchasing riskier investments.

There are three variants of the hypothesis: “weak”, “semi-strong”, and “strong” form. The weak form of the EMH claims that trading information (levels and changes of prices and volumes) of traded assets (e.g., stocks, bonds, or property) are already incorporated in prices. If weak form efficiency holds then technical analysis cannot be used to generate superior returns. The semi-strong form of the EMH claims both that prices incorporate all publicly available information (which also includes information present in financial statements, other SEC filings etc.). If semi-strong form efficiency holds then neither technical analysis nor fundamental analysis can be used to generate superior returns. The strong form of the EMH additionally claims that prices incorporate all public and non-public (insider) information, and therefore even insiders cannot expect to earn superior returns (compared to the uninformed public) when they trade assets of which they have inside information.

For most financial economists, however the efficient markets hypothesis is a central idea of modern finance that has profound implications.

11.3.1 Random Walk and Search for Theory

In 1950s, pioneering work done by distinguished statisticians and physicists, such as Maurice Kendall, Harry Roberts, Osborne and others, found that stock prices behaved like a random walk. A random walk means that successive stock prices are independent and identically distributed. Therefore, strictly speaking, the stock price behaviour should be characterised as a sub- martingale, implying that the expected change in price can be positive because investors expect to be compensated for time and risk. Further, the expected return may change over time in response to change in risk. In short, random walk theory proclaims that stocks take a random and unpredictable path that makes all methods of predicting stock prices futile in the long run.

Search for Theory: When the empirical evidence in favour of the random walk hypothesis seemed overwhelming, the academic researchers asked the question: What is the economic process that produces a random walk? They concluded that the randomness of stock prices was the result of an efficient market. Broadly, the key links in the argument are as follows:

- Information is freely and instantaneously available to all the market participants.
- Keen competition among market participants more or less ensures that market prices will reflect intrinsic values. This means that they will fully impound all available information.
- Prices change only in response to new information that, by definition, is unrelated to previous information (otherwise it will not be new information).
- Since new information cannot be predicted in advance, price changes too cannot be forecast. Hence, prices behave like a random walk.

11.3.2 Efficient Market

Fama defined Efficient Market as, “A market where there are large numbers of rational profit maximisers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants”.

In other words, an efficient market is one in which the market price of a security is an unbiased estimate of its intrinsic value. Note that market efficiency does not imply that the market price equals intrinsic value at every point in time. All that it says is that the errors in the market prices are unbiased. This means that the price can deviate from the intrinsic value but the deviations are random and uncorrelated with any observable variable. If the deviations of market price from intrinsic value are random, it is not possible to consistently identify over or under-valued securities.

The EMH is so called as it was assumed that the capital market is efficient in processing information. This hypothesis is based on the idea that security prices are rationally determined. Changes occur in the stock price as a result of a change in the company, industry or economy. The information about these changes would alter the stock price immediately and there would be a shift to a new level. This movement can be either upward or downward, and is dependent on the type of information. It is argued that the shift in speculative stock prices always incorporates the best information and knowledge about fundamental values and the prices change only because of good and sensible information. Any further change in price of the stock will be based on other

new pieces of information which was hitherto not available. Thus, any change in the price of a stock, which constantly seeks equilibrium, is totally independent of earlier or future changes. Further, the current price fully reflects all available information about the stock.

The hypothesis says that the market for a stock is efficient if its price is always equal to its intrinsic value. The intrinsic value of a stock is the present value of cash flows that the stock can reasonably be expected to generate (for example dividends). The EMH is also concerned with the speed with which information is incorporated into the security prices. It is also believed that the past price sequence has the information about the future price movements too. Thus, by studying the pattern of price movements and trading accordingly, it is possible to earn appropriate returns. However, it may take several days or weeks before the impact of any new information can be assessed. This can lead to the price being volatile for a number of days before it adjusts to a new level. This also provides an opportunity to earn further returns.

11.4 ASSUMPTIONS OF THE EFFICIENT MARKET HYPOTHESIS

The efficient market hypothesis makes five important assumptions.

One assumption is that investors are rational. This does not require all investors to be rational, but it does require that the rational investors outweigh the irrational ones.

A second assumption is that rational investors have adequate funds. If rational investors are going to dominate the markets, they must have the funds necessary to take advantage of all investment opportunities. It is only by being able to trade shares, which requires resources, that they are able to incorporate information into share prices. The adequacy of funds could arise either from having money or from being able to borrow money. A related point is that rational investors should be able to sell shares short. Selling short means borrowing shares and selling those borrowed shares. The ability to sell is as important as the ability to buy in relation to ensuring that share prices reflect all relevant information. Rational market participants should be able to sell overpriced securities (shares and bonds) as well as being able to buy underpriced ones.

A third assumption is that information is available instantaneously to many investors and that rational investors immediately use the information to make good assessments of share prices. If some investors were able to make good assessments more quickly than others, they would be able to make profits from the information received. Although this assumption will not hold in its absolute form, a high degree of market efficiency would be achieved if a substantial number of rational investors analyse the information, and trade on it, within one day of the information being available.

A fourth assumption is that rational investors do not believe that markets are efficient. This is a paradox. The existence of market efficiency depends upon rational investors not realising that it exists. If rational investors believed that markets are efficient, they would not carry out investment analysis and trade on the basis of that analysis. Investment analysis is based on the belief that shares may be mispriced so that profit can be made by estimating the correct price and buying or selling accordingly. It is through investment analysis and trades based on that analysis that share prices come to reflect new information.

A fifth assumption is that transaction costs, market impact effects, and required compensation for risk are not large enough to deter trading at prices close to fundamental value. Transaction costs include brokers' commissions, bid-offer spreads, and taxes such as stamp duty. Market impact effects are the effects of an investor's own purchases and sales on the share price. An investor may require some additional expected profit to compensate for the possibility that their own analysis may provide an inaccurate forecast. These factors could lead to investors not trading unless their estimate of fundamental value is substantially different from the actual share price. Investors would react only to very important pieces of new information. In consequence smaller deviations of share prices from their fundamental values are not corrected. Less important news would not be acted upon. Share prices would remain at levels that do not reflect all relevant information. Shares would not be efficiently priced.

11.5 FORMS OF EFFICIENCY

The EMH considers efficiency in three different forms based on the type of information. The details of the various forms of efficiency are provided in Table 11.1.

S.No.	Forms	Description
1	Weak	Information regarding the past sequence of security movements is dealt with
2	Semi-Strong	Information that is publicly available is dealt with
3	Strong	Deals with all forms of information— public, private and inside

Table 11.1: Forms of Efficiency

In the strong form EMH, all available information, public as well as private, represents stale information. This means that even private information, sometimes described as inside information, cannot be used for earning superior risk-adjusted returns because such information quickly leaks out and gets reflected into prices. The strong – form EMH subsumes both the weak-form EMH and the semi-strong form EMH as shown in the figure 11.1.

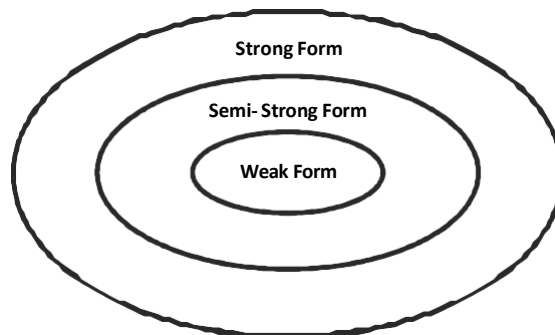


Figure 11.1: Various Forms of Efficiency

Rationality can mean that agents receive new information so as to update their beliefs correctly. Based on their beliefs, agents make choices about securities that are normatively acceptable.

The exposition of EMH is displayed in figure 11.2. The EMH has been subjected to a number of tests ever since it was propounded by Fama. The tests got a boost with the evolution of a new methodology known as Event Study. In Event Study, a sample of similar events that occurred in different companies at various points of time is obtained.

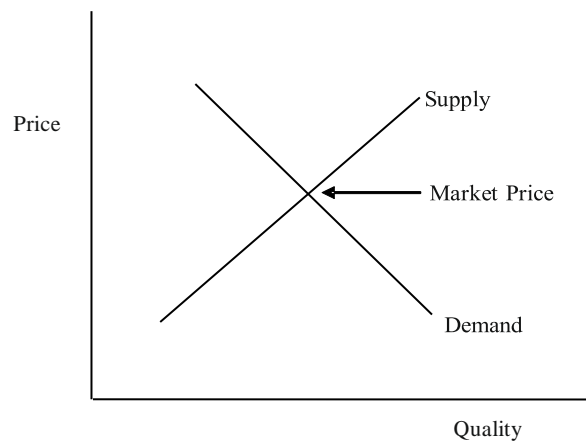


Figure 11.2: Tradition Exposition of the Efficient Markets Hypothesis

The average impact of these events on the stock price is then determined. Results indicated that the outcome depended on the efficiency of the market and the anticipation of the event by the market. Further, in consistence with the semi-strong form of market efficiency, many studies established that markets reacted quickly to new information. Studies on the performance of professional investors pointed towards the strong form or market efficiency.

The two main assumptions regarding finance theory so far discussed can be summarised as follows:

- **Market participants are rational:** Market participants aim at maximisation of positive function or utility, and minimisation of a negative function— cost or risk. They are well-informed and are capable of processing fresh data correctly and rapidly.
- **Financial markets are efficient:** The financial assets are perfect substitutes, and their current prices reflect all the available information accurately. The price is equal to the fundamental or intrinsic value, and is equal to the discounted sum of expected future cash flow. Due to this, financial assets can neither be overvalued nor undervalued. They are always traded at their fair values.

11.6 MISCONCEPTIONS ABOUT THE EFFICIENT MARKETS HYPOTHESIS

The efficient markets hypothesis has often been misunderstood. The common misconceptions about the efficient markets hypothesis are stated below along with the answers meant to dispel them.

Misconception	Answer
The efficient markets hypothesis implies that the market has perfect forecasting abilities.	The efficient markets hypothesis merely implies that prices impound all available information. This does not mean that the market possesses perfect forecasting abilities.
As prices tend to fluctuate, they would not reflect fair value.	Unless prices fluctuate, they would not reflect fair value. Since the future is uncertain, the market is continually surprised. As prices reflect these surprises, they fluctuate.
Inability of institutional portfolio managers to achieve superior investment performance implies that they lack competence.	In an efficient market, it is ordinarily not possible to achieve superior investment performance. Market efficiency exists because portfolio managers are doing their job well in a competitive setting.
The random movement of stock prices suggests that the stock market is irrational.	Randomness and irrationality are two different matters. If investors are rational and competitive, price changes are bound to be random.

11.7 CRITICISM OF THE EFFICIENT MARKETS HYPOTHESIS (EMH)

The Efficient Market Hypothesis has been criticised on several counts. Some of the criticisms are as follows:

1. In EMH it is assumed that investors make decisions based on the rational expectations. According to this hypothesis, all investors make investment decisions based on the same expectations. This notion has been questioned by

many. For it is pure common sense that security markets and trading would not be possible if all investors had the same level of expectations. Trading in stocks take place just because one investor creates a sales position based on his/her expectation that prices of the stock would drop. The buyer, in turn, buys on the pretext that prices of the particular stock would increase. Thus occurs trading in a particular stock.

2. The assumption of EMH that all participants have equal access to information is also questionable, as it is most unlikely.
3. Similarly, the US stock market crash in October 1987, followed by the unexplained increase of real estate prices during the period 2000 to 2005, the high degree of volatility experienced in the markets during 2008, etc., are all instances that have cast serious apprehensions on the rational behaviour of investors. These apprehensions made experts and researchers to focus their attention on the impact of human emotions, like greed, biases, irrational decision making, etc., on investment decisions. They considered the influence of human emotions on decision making to be a definite possibility. Thus, experiences and studies pointed towards the fact that investors neither behave rationally nor consider all the available information in the process of decision making.
4. Market imperfections like delay in information and transaction costs are unexplained.
5. Efficient market hypothesis deals with absolute price changes but not the relative price changes of the stocks.
6. Random movement of stock prices does not indicate the direction of movement.

11.8 SUMMARY

A market theory that evolved from a 1960's by Eugene Fama, the efficient market hypothesis (EMH) states that at any given time and in a liquid market, security prices fully reflect all available information. The EMH exists in various degrees: weak, semi-strong and strong, which addresses the inclusion of non-public information in market prices. This theory contends that since markets are efficient and current prices reflect

all information, attempts to outperform the market are essentially a game of chance rather than one of skill.

One of the major implications of an efficient market is that current prices change immediately as new information becomes available. An efficient market implies that the stock price would increase immediately when the information is available — not a year from now when the technology is implemented or even later when extra profits are received. In effect, the EMH says that stocks respond immediately to the NPV of new information.

11.9 GLOSSARY

- **Efficient Market:** Efficient market is that market where all pertinent information is available to all participants at the same time, and where prices respond immediately to available information. Stock markets are considered the best examples of efficient markets.
- **Intrinsic Value:** Intrinsic value refers to the value of a company, stock, currency or product determined through fundamental analysis without reference to its market value. It is also frequently called fundamental value.

11.10 SELF ASSESSMENT QUESTIONS

1. What is an efficient market?

2. What is random walk?

3. Discuss the various forms of efficiency.

11.11 LESSON END EXERCISES

1. Critically evaluate efficient market hypothesis.

2. Discuss the misconceptions surrounding the efficient market hypothesis.

11.12 SUGGESTED READINGS

1. Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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BEHAVIOURAL FACTORS AND FINANCIAL MARKETS

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LESSON - 12

FUNDAMENTAL INFORMATION AND FINANCIAL MARKETS

STRUCTURE

12.1 Introduction

12.2 Objectives

12.3 Fundamental Information and Financial Markets

12.3.1 Concept of Fundamental Information

12.3.2 Financial Markets: An Introduction

12.3.3 Role of Financial Markets

12.3.4 Functions of Financial Markets

12.3.5 Classification of Financial Markets

12.3.6 Distinction between Money Market and Capital Market

12.4 Summary

12.5 Glossary

12.6 Self Assessment Questions

12.7 Lesson End Exercises

12.8 Suggested Readings

12.1 INTRODUCTION

Financial markets are the centres or arrangements that provide facilities for buying and selling out financial claims and services. The participants on the demand and supply sides of these markets are financial institutions, agents, brokers, dealers, borrowers, lenders, savers, and others. Who are inter-linked by the laws, contracts, covenants and communication networks? The main organised markets in India are the money market and capital market. While the primary market deals in new issues, the secondary market is meant for trading in outstanding or existing securities. There are two components of the secondary market: Over the counter (OTC) market and the Exchange traded market. The government securities market is an OTC market. In an OTC market, spot trades are negotiated and traded for immediate delivery and payment while in the exchange trade market, trading takes place over a trading cycle in stock exchanges.

12.2 OBJECTIVES

After studying this lesson you should be able to:

- understand the meaning of fundamental information and the source of information
- explain the nature and functions of financial markets
- identify the types of financial markets
- distinguish between money market and capital market.

12.3 FUNDAMENTAL INFORMATION AND FINANCIAL MARKETS

Markets are influenced by information on the one hand and money flows on the other hands. If the information flows are perfect and free, and the markets adjust to these flows quickly and effectively, the markets are said to be perfect. If the information is imperfect or partial, the markets will be imperfect and the price formation will be unpredictable, haphazard and volatile.

The information whether perfect or imperfect has to be analysed to know its impact

on the market prices and forecast trades. For this purpose, analytical tools and forecasting ability are necessary. If the information is not perfect, a few inside information would gain at the expense of others. If the information is free and unbiased, the markets behave rationally and nobody can gain extra profits and normal returns are available to all whenever they enter the market.

12.3.1 Concept of Fundamental Information

Fundamental information refers to the information relating to the economic state of a company, industry or economy. In market analysis, fundamental information is related to the earnings prospects of the firm only.

Fundamental analyst insists that the investor should also be aware of the sources of information that are available to him while evaluating a firm's performance. This gives a fairly good idea of both the company's internal management as well as the analyst's opinion who makes projection of these firms without actually managing their funds. In India, the following sources of information are available to an investor for analyzing the records of the firm and ascertaining its past performances and an insight to its future projections:

- (a) **Annual Report:** Annual report indicates: the company's name, location of company's factories, number of shareholders, company's expansion programmes, analysis of company's operations in the current year, analysis of previous year's performance through consolidated balance sheets, company's prospects for the next year, the economic and business involvement of the firm, dividend policies, proposal for issue of right shares, bonus shares, debentures.
- (b) **Financial Dailies:** In India, the daily newspapers also give information about the financial news about the leading firms. These firms are generally quoted on the stock exchanges of the major centres in the country. Most important financial dailies in the country are 'Economic Times' and the 'Financial Express'. These papers give an in depth study of the share prices, quoted in the stock exchanges, and economic, business, commercial and industrial information about different firms from time to time. There are some investment magazines also and other

corporate magazines, which give details about the economic, industrial performance of companies. These may be listed as: Business World, Business India, Directors' Digest, Industrial Times, India Today, Economic and Political Weekly, Investments Today, and Investments India.

- (c) **Directories:** Besides, these sources of information there are important directories available to give information and also indications of growth shares and income shares. They also give case studies and analyse the performance of different firms with projection of future. Valuable guides which are sources of information also are listed below:
- (d) **Stock Exchange Directory:** This is bound in eighteen volumes and gives information about all listed public limited companies and major public sector corporations.
- (e) **Kothari's Economic and Industrial Guide of India:** This gives relevant financial information and analysis of more than 3,000 companies. It is designed in a manner to make the investor aware of the problems of investment and depicts the nature of investments available for current investment.
- (f) **Times of India Directory:** Time of India has also a directory which gives full information about many industrial companies and groups. It makes an analysis of the different companies on stock exchange.

The buyer of share should be careful in making an analysis of company and he should generally buy shares which are listed on the stock exchange. Listed shares have some kind of predictions from the stock exchange brokers of the solvency, profitability investment value and price of the shares. Moreover, listed shares' information is available, whereas the unlisted shares suffer from grave risk as no information is available on them. As a rule, the investor should also buy those investments which are actively traded on the stock exchange.

An active share is one which is transacted in the stock exchange at least three times a week. While activity of a share price will depend on the depressed or prosperous conditions of the market, yet the trend can be gauged by the investor by following the

rule of number of times it is transacted on the stock exchange. Inactive shares are priced at a very low rate and it gives the investor a chance of investing his money at a cheap rate but these shares have no value and the investor will find that his capital becomes eroded if he purchases these shares. A share is inactive because there are no buyers and this is why the prices are quoted at very low rates. It also indicates that since there are no buyers in the market it is not a worthwhile investment. Active shares offer attractive investments for the future. They are priced at higher rates. Investor is sure of either capital appreciation or good dividend income. In India, the price of a share rises in relation to dividend that is declared on it. Active shares can be discerned from two categories of listed shares, cleared securities and non-cleared securities. These securities are usually known in the stock exchange as Group A shares and Group B shares. Group A shares are considered to be the most active shares. Group B shares are generally negative in nature. Group A shares are periodically analysed by the stock exchange officials.

Fundamentalists, therefore, make a careful analysis of shares. According to them, there should be a preliminary screening of investment, the economic and industrial analysis and analysis of the company to find out its profitability and efficiency and a study of the different kinds of company's management.

12.3.2 Financial Markets: An Introduction

The term 'market' usually brings to mind a geographical place where people exchange goods and services. However, it is a narrow view of market and does not reflect that the term market includes mechanisms also. Financial market, like any other market; facilitates the exchange of financial assets among the dealers. In other words, it refers to place or mechanism where financial assets are sold and purchased. Further, financial market transaction may be at specific place or location, e.g. stock exchange or the same may be just through a particular mechanism like telephone, telex, or any other electronic media.

Financial markets facilitate trading in financial assets. These assets are also referred to as financial instruments or securities. Unlike goods or services, financial assets are

not consumed. These are claims against the money and enable their holders, upon disposing off the claims, to obtain consumable goods or services. Since financial assets are not consumed, what is bought and sold is their use for a particular period of time.

In other markets, goods and services are exchanged through price mechanism. Similarly in the financial markets, the price for the use of investible funds is the interest paid on a loan. The interest payable depends upon various factors like; size of the fund, length of the period of loan, risk involved, etc. Thus, the rate of interest, often known as discount rate, is the rate charged to obtain present funds in exchange for future funds.

12.3.3 Role of Financial Markets

All the countries, irrespective of their state of development, need funds for their economic development and growth. In the economy, these funds are obtained from the savers or 'surplus units (the units which have more income than their consumption)' which may be household individuals, business firms, public sector units, Central Government, State Governments, Local Governments, Semi-Governments, etc. There are certain investors or deficit units whose consumption or investment is more than their current income. Therefore, financial markets play a significant role in transferring the surplus from savers (lenders) to borrowers (investors). This process is known as 'transmission mechanism'.

In an economy, flow of surplus funds from surplus units to deficit units is essential for desired achievement of national goals and priorities. Thus, this flow must be in right direction and for productive purposes. For this, appropriate financial instruments and opportunities must be available. The financial markets provide the platform for such flow where each saver can find and exchange the appropriate financial assets as per his requirement. So, the efficiency of financial market depends upon how efficiently the flow of funds is managed in an economy. Further, the financial market must induce people to become producers/entrepreneurs and motivate individuals and institutions to save more.

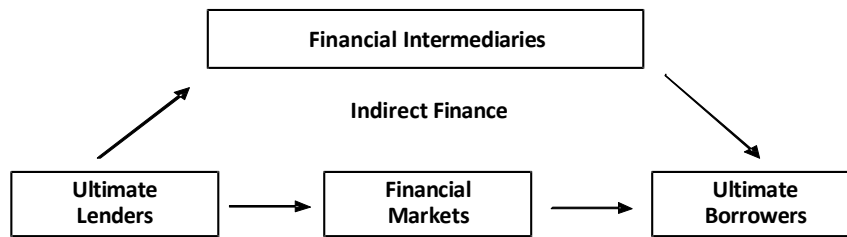


Figure 12.1: Flow of funds from lenders to borrowers

The Figure 12.1 is simplified form of the flow of funds from saving-surplus units (ultimate lenders) to saving-deficit units (ultimate borrowers). The flow of funds move from left to right, either directly through financial markets or indirectly through financial institutions. Against such flow, the ultimate borrowers issue the liabilities (also known as primary securities) to the ultimate lenders.

The financial markets not only help in the fast growth of industry and economy but also contribute to the society's well being and raising of the standard of living. So, financial markets should grow at a fast rate. Moreover, they should be efficient and more diversified. As rightly pointed out by a financial expert, "The more varied the vehicle by which savings can flow from ultimate savers to ultimate users of funds, the more efficient the financial markets or an economy tend to be". In brief, the financial market plays a significant role in the allocation of the economy's savings in efficient production of goods and services, and thus, assists in achieving the desired national objectives.'

12.3.4 Functions of Financial Markets

Functions of a financial market can be classified into two categories: economic functions, and financial functions.

a) Economic Functions: The economic functions of financial markets are:

- It facilitates the transfer of real economic resources from lenders to ultimate borrowers.
- Lenders earn interest/dividend on their surplus invisible funds, thereby increasing their earnings, and as a result, enhancing national income finally.

- Borrowers will have to use borrowed funds productively, if invested in new assets, and hence increasing their income and gross national products finally.
- By facilitating transfer of real resources, it serves the economy and finally the welfare of the general public.
- It provides a channel through which new savings flow into capital formation of a country.

b) *Financial Functions:* The financial functions of financial markets are as follows:

- It provides the borrowers with funds which they need to carry out their plans.
- It provides the lenders with earning assets so that their wealth may be held in a productive form without the necessity of direct ownership of real assets.
- It provides liquidity in the market through which the claims against money can be resold at any time, and thus, reconverts them into current funds.

In addition to the above, the financial markets perform three more economic functions:

First, the interaction of buyers and sellers in a financial market determines the price of the traded asset; or equivalently, the required return on a financial asset is determined. The inducement for firms to acquire funds depends on the required rate of return that investors demand, and it is this feature of financial markets that signals how the funds in the economy should be allocated among financial assets. This is called the price discovered process.

Second, financial markets provide a mechanism for an investor to sell a financial asset. Because of this feature, it is said that a financial market offers liquidity, an attractive feature when circumstances either force or motivate an investor to sell. In the absence of liquidity, the owner will be forced to hold a debt instrument till it matures and an equity instrument till the company is, either voluntarily or otherwise, liquidated. While all financial markets provide some form of liquidity, the degree of liquidity is one of the factors that characterize different markets.

The third economic function of a financial market is that it reduces the search and information costs of transacting. Search costs represent explicit cost, such as the money spent to advertise the desire to sell or purchase a financial asset, the implicit costs such as the value of time spent in locating a counterpart. The presence of some form of organised financial market reduces search costs. Information costs are those entailed with assessing the investment merits of a financial asset, that is, the amount and the likelihood of the cash flow expected to be generated. In an efficient market, prices reflect the aggregate information collected by all market participants.

The financial markets not only help in transfer of savings from new industry/ production, but also provide opportunities for financial investment, to earn income on surplus. In other words, these markets perform both financial and non-financial functions. The financial markets enable financing of not only physical capital formation, i.e., tangible fixed assets and inventories, but also of consumption expenditure. That's why, financial markets manage the flow of funds not only between individual savers and investors but also between institutional savers and investors.

12.3.5 Classification of Financial Markets

The financial market comprises: all banking and non-banking financial institutions, procedure and practices followed in these markets, and financial instruments for facilitating the flow of funds. The classification of financial markets in an economy is shown in figure 12.2. From the figure 12.2, you can see two classifications of financial markets. They are:

1. Primary and Secondary Markets; and
2. Money and Capital Markets

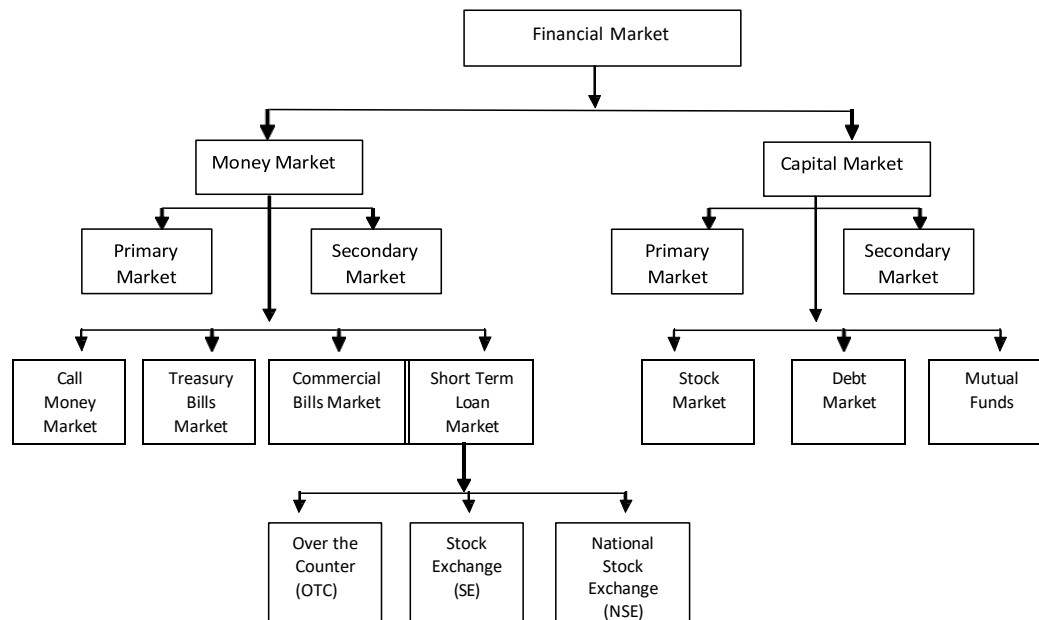


Figure 12.2: Structure of financial market

1) *Primary and Secondary Markets:*

Primary market deals with the new issues of securities while the markets for existing claims (financial assets) are known as Secondary Markets. In the primary market, the government or corporate sector issues securities that change hands from the issuer to owner. In a secondary market, there is no additional flow of funds for further investments. The transactions in the secondary market do not result in fresh capital being made available to the producers as they deal in existing securities. The secondary market renders a very important service to them.

If there is no active secondary market, most of the long term industrial securities would become nearly permanent investment in the hands of investors. Without organised market, the investors would have to make personal efforts for the sale and purchase of their securities. In the case of an inactive secondary market, the sellers would have to incur losses because true worth of the securities is not known. If there is no liquidity and marketability then investors would not have invested their funds in the securities.

Consequently, the companies would have faced a lot of problems in raising funds by issuing shares and debentures. Consequently the level of industrial development would have been lower. Thus, active secondary market stimulates the activity in the primary market also. The level of development in the secondary market determines the efficiency and growth of the primary market.

2) *Money and Capital Markets*

a) **Money Market:** The money market is the place or mechanism where short term instruments that mature in a year or earlier are traded. The money market facilitates short-term financing and assures the liquidity of short-term financial assets. The money market is a main place for Central bank activities. The money market is significant in indicating changes in short-term interest rates, monetary policy and availability of short-term credit.

The focus of money market is on providing a means by which individuals, institutions and government are able to rapidly adjust their actual liquidity position to the amount desired. It is a medium through which holders of temporary cash surpluses meet those with temporary cash deficits. Hence, an individual with a temporary excess of investible funds is able to use the money market as a place, where his funds may be stored/ invested for a short period of time and yield return on them. Similarly, individuals, institutions and government with a temporary shortfall of liquidity can raise funds in the money market for a short period of time. The money market assures borrowers that they can obtain short-term funds quickly and it assures lenders that they can convert their short term financial assets into cash. The central bank which is responsible for regulating and controlling the money supply in economy conducts most of its operations in the money market. The risk of capital losses (money risk) and risk of default are minimised in the money market. Money risk is low because the money market instruments are short-term in nature. This is so, because a change in interest rates does not effect their prices very much as the assured maturity is discounted over a short period of time. The risk of default or credit risk is low because money market instruments are mostly the liabilities of the government, central bank and commercial banks.

Money market meets the working capital requirements of industry, trade and commerce. Long term requirements of industries are not met by the money market instruments. The money market consists of specialised sub-markets and it consists of central banks, commercial banks, cooperative banks, saving banks, discount houses, acceptance houses, bill market, bullion market, etc. Some of the institutions may not be developed in money markets in some countries. The central bank occupies a pivotal position in the money market. It is regarded as 'presiding deity' of money markets. Its function is not only that of a watchdog of the monetary system but also of a promotional and development banker. The Central bank through quantitative credit control measures like bank rate, open market operations, reserves ratio and qualitative controls like; margin requirements, moral suasion, consumer credit control, regulates money and credit supply in a country.

The existence of a well-developed money market ensures that the money market instruments can be conveniently converted into money without incurring much loss. The money market provides various kinds of credit instruments which suits the various investors and thus augment the supply of funds.

b) **Capital Market:** Capital market is a market in which lenders or investors provide long term funds in exchange for financial assets offered by borrowers or holders. The primary purpose of capital market is to direct the flow of savings into long term investments (mostly for a period of one year and above). The distinction between the money and capital market is based on the difference in the period of maturity of the financial assets. The distinction of one year between money and capital market is arbitrary but one year dividing point is mostly accepted. The demand for long term funds comes from individuals, institutions, central government, state-governments, local self-government and private corporate sector. Funds are raised through issue of shares, debentures and bonds which constitute the new issue market. Apart from raising funds directly from savers, the deficit units obtain long term funds from public financial institutions and investment institutions also. The supply of funds mainly comes from individuals (household sector), institutions, banks and industrial financial institutions.

The capital market plays a significant role in the financial system. Savings and investment are vital for economic development and growth of an economy. Generally, units which save and invest are different, capital market provides a bridge by which savings of surplus units are transmitted into long term investments by deficit units.

The pace of economic development along with other things depends upon the rate of long term investment and capital formation in a country. The rate of capital formation depends upon the rate of savings, rate of investment and financial markets. The capital market plays a vital role in mobilising the savings and making them available to the enterprising investors. The primary capital market helps government and industrial concerns in raising funds by issuing various kinds of securities. The secondary market provides liquidity to the outstanding/existing securities.

An active capital market; through its price mechanism allocates the scarce financial resources to the most productive uses at a low cost. The system of allocation of funds works through incentives and penalties. Usually, the cost of capital is comparatively low for the large and efficient companies as their securities are subject to lesser risk. Share of high growth companies command a premium in the market while the companies with poor performance face problems in selling their securities and may have to issue securities at a discount to raise additional funds. The specified shares are much/more attractive than the non-specified shares.

As you can see from figure 12.2, there exists a primary and secondary market for money market instruments. Similarly, there exists a primary and secondary market for capital market instruments. All securities whether short-term or long-term are initially traded in the primary market, and then in the secondary market.

12.3.6 Distinction between Money Market and Capital Market

The capital market differs from the money market in various ways. They are summarised as follows.

- While money market relates to short-term funds, the capital market relates to long term funds.
- While money market deals with securities like treasury bills, commercial paper,

bills of exchange, deposit certificates etc., the capital market deals in shares, debentures, bonds and government securities.

- While participants in money market are commercial banks, non-banking finance companies, indigenous bankers, etc., the participants in capital market are stock brokers underwriters, mutual funds, financial institutions, and individual investors.
- While money market is regulated by the Reserve Bank of India, the capital market is regulated by the Central Government and Securities Exchange Board of India (SEBI).
- While the main components of money market are call money market, acceptance market and bill market, the main components of capital market are primary market and secondary market.

Nonetheless, both money market and capital market play an important role in meeting the financial needs of the business and are interdependent in many ways. Most of the institutions as serve money market as well as capital market, and funds freely flow between the two markets.

12.4 SUMMARY

A financial market is a place or mechanism where funds or savings are transferred from surplus units to deficit unit. These markets can be broadly classified into money markets and capital markets. Money markets deal with short term claims or financial assets, whereas capital markets deal with those financial assets which have maturity period of more than a year. These markets are influenced by information as well as by money flows. If the information flows are perfect and free, and the markets adjust to these flows quickly and effectively, the markets are said to be perfect. If the information is imperfect or partial, the markets will be imperfect and the price formation will be unpredictable, haphazard and volatile.

The information whether perfect or imperfect has to be analysed to know its impact on the market prices and forecast trades. For this purpose, analytical tools and forecasting ability are necessary. If the information is not perfect, a few inside

information would gain at the expense of others. If the information is free and unbiased, the markets behave rationally and nobody can gain extra profits and normal returns are available to all whenever they enter the market.

12.5 GLOSSARY

- **Fundamental Information:** It refers to the information relating to the economic state of a company, industry or economy.
- **Financial Market:** Financial market is a place which facilitates the exchange of financial assets among the dealers. In other words, it refers to place or mechanism where financial assets are sold and purchased.
- **Money Market:** The money market is the place or mechanism where short term instruments that mature in a year or earlier are traded. The money market facilitates short-term financing and assures the liquidity of short-term financial assets.
- **Capital Market:** Capital market is a market in which lenders or investors provide long term funds in exchange for financial assets offered by borrowers or holders.

12.6 SELF ASSESSMENT QUESTIONS

1. Define financial markets.

2. What do you mean by fundamental information?

3. Differentiate between money market and financial market.

12.7 LESSON END EXERCISES

1. What is a financial market? Explain its role and function.

2. Explain the meaning of 'Capital Market' and 'Money Market'. Also bring out the similarities and the differences between these two markets.

12.8 SUGGESTED READINGS

1. Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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BEHAVIOURAL FACTORS AND FINANCIAL MARKETS

**M.COM III SEM
MCOMFE355**

**UNIT- III
LESSON - 13**

INFORMATION AVAILABLE FOR MARKET PARTICIPANTS AND MARKET EFFICIENCY, MARKET PREDICTABILITY

STRUCTURE

- 13.1 Introduction
- 13.2 Objectives
- 13.3 Information Available for Market Participants and Market Efficiency
 - 13.3.1 Efficiency and Information
- 13.4 Market Predictability
 - 13.4.1 Gambler's Fallacy: A Case Study
 - 13.4.2 General Findings
 - 13.4.3 So What? Prediction and Performance
 - 13.4.4 Overconfidence
 - 13.4.5 Heuristic Diversity
- 13.5 Summary
- 13.6 Glossary
- 13.7 Self Assessment Questions
- 13.8 Lesson End Exercises
- 13.9 Suggested Readings

13.1 INTRODUCTION

Investors and market analysts depend on the timely and correct information for making investment decisions. In the absence of such information, their decisions will depend on hearsay and hunches. In order to enable the correct investments decisions to be made, investors need to know the sources of information. Because prices always accurately reflect information, they are good signals of value and encourage the best allocation of capital. If a market is efficient, information is fully and instantaneously reflected in prices.

An understanding of behaviour factors that impact the market shall decrease the vulnerability of investors. Ability to predict inefficient market behaviour improves financial decision making in such markets. Overconfident investors tend to underestimate the extent of possible losses, and therefore underestimate investment risks.

13.2 OBJECTIVES

After studying this lesson you should be able to:

- know about the information available for market participants
- meaning of efficient markets
- predict the market

13.3 INFORMATION AVAILABLE FOR MARKET PARTICIPANTS AND MARKET EFFICIENCY

Capital markets are crucial to the development and functioning of an economy because they perform a critical service. It is through efficient and well-performing capital markets that resources are allocated to their best use. Ideally, markets transfer funds from savers to borrowers with good investment opportunities. Borrowers may have opportunities that provide good returns based on their level of risk, but insufficient capital to proceed with such investment. With efficient capital markets, lenders are better off because they earn a higher risk-adjusted return, and borrowers are better off because they do not have to forgo profitable opportunities. Of course, well-

documented “mistakes” do occur, such as the Internet bubble of the late 1990s and the recent subprime financial crisis. It is always a matter of debate (ex post) whether those supplying capital were wise to do so at the time— given what they knew at the time.

13.3.1 Efficiency and Information

Eugene Fama has provided a careful description of an efficient market that has had a lasting influence on practitioners and academics in finance. According to Fama, “The primary role of the capital market is allocation of ownership of the economy’s capital stock.” In general terms, the idea is a market in which prices provide accurate signals for resource allocation: that is, a market in which firms can make production-investment decisions, and investors can choose among the securities that represent ownership of firms’ activities under the assumption that security prices at any time “fully reflect” all available information. A market in which prices always “fully reflect” available information is called “efficient.”

Because prices always accurately reflect information, they are good signals of value and encourage the best allocation of capital. If a market is efficient, information is fully and instantaneously reflected in prices.

Notice that the definition of an efficient market relies critically on information. Fama defined three versions of market efficiency to clarify what is intended by “all available information.” In the weak form, prices reflect all the information contained in historical returns. In the semi-strong form, prices reflect all publicly available information, including past earnings and earnings forecasts, everything in the publicly released financial statements (past and most recent), everything relevant appearing in the business press, and anything else considered relevant. In the strong form, prices even reflect information that is not publicly available, such as insiders’ information.

Notice that if prices always reflect all information, we must be assuming that the cost of information acquisition and generation is zero. Of course, we all know this is not reasonable. Thus, a better working definition of the EMH is that prices reflect all information such that the marginal benefit of acting on the information does not exceed

the marginal cost of acquiring the information. In other words, no investor can consistently generate excess returns.

In this context, it is important to note that excess means after all costs have been considered. Other than obvious trading costs, we must take into account the cost of acquiring information or undertaking analysis (or paying someone to do so on your behalf). For example, if a particular mutual fund is able to on average beat the market by 1.5% (on a gross basis), but charges a 1.5% management expense ratio (MER) to investors, which means that investors would only match the market's return, this is not evidence against the EMH.

13.4 MARKET PREDICTABILITY

An understanding of behaviour factors that impact the market shall decrease the vulnerability of investors. Ability to predict inefficient market behaviour improves financial decision making in such markets.

When it comes to predicting the market, how immune are Wall Street's strategists from heuristic-driven bias? Are they any different from the typical investor? And what illusions, if any, bias investors' predictions about where the market is headed?

13.4.1 Gambler's Fallacy: A Case Study

The gambler's Fallacy, also known as the Monte Carlo Fallacy, occurs when an individual erroneously believed that a certain random event is less likely or more likely to happen based on the outcome of a previous events or series of events.

Consider the predictions that strategists made in January 1997. Let's start with some background. The years 1995 and 1996 had resulted in spectacular back-to-back returns of 34 percent and 20 percent on the S&P 500.¹ In the wake of the 1996 national elections, the S&P 500 soared 7.5 percent during November, a move that prompted Federal Reserve chair Alan Greenspan to ask whether "irrational exuberance has unduly escalated asset values."

For Abby Joseph Cohen, cohead of the investment policy committee at Goldman Sachs, the market's strong performance corroborated the bullish forecasts she had

consistently been making. These forecasts had led Barron's to describe her as the "virtual maven of the nineties' bull market."

On January 1, 1997, the S&P 500 stood at 740. Cohen's target for the end of the year was 815 to 825, an 11.5 percent increase, predicated on projected earnings growth of 10 percent. Yet, the index ended the year at 970, up 31 percent!

Cohen had plenty of professional company in misgauging the market during 1997. In its issue of December 30, 1996, Barron's published the predictions of Wall Street's leading strategists for the mid-year and end-of-year values of the Dow Jones Industrial Average. In addition to Abby Joseph Cohen, this esteemed group included Marshall Acuff of Salomon Smith Barney, Charles Clough of Merrill Lynch, Edward Kerschner of PaineWebber, Elizabeth Mackay of Bear Sterns, David Shulman of Salomon, and Byron Wien of Morgan Stanley. Every single one underestimated the market's performance during 1997.

The Dow closed at 6448 in 1996 and at 7908 in 1997, a 22.6 percent increase. After the Dow surged by 33.5 percent in 1995 and 26 percent in 1996, could the strategists be faulted for not having anticipated a third spectacular year in a row? Strategists are prone to committing gambler's fallacy, a phenomenon whereby people inappropriately predict reversal pointed out that gambler's fallacy is regression to the mean gone overboard, and quoted Merrill Lynch's Robert Farrell in this connection. Farrell had predicted that future performance would be below average.

What does regression to the mean suggest about predictions in the wake of above-average performance? It implies that future performance will be closer to the mean, not that it will be below the mean in order to satisfy the law of averages.

In the wake of above-average performance in 1995 and 1996, did the strategists predict that 1997 would feature below-average performance? Indeed they did. They predicted that the Dow would actually decline by 0.2 percent in 1997, well below the 8.6 percent annual rate that the Dow had grown between 1972 and 1996.

13.4.2 General Findings

The instances of gambler's fallacy described above are not isolated cases. Werner

De Bondt (1991) has examined the market predictions collected by the late Joseph Livingston since 1952. De Bondt reports that, in accordance with gambler's fallacy, these predictions consistently are overly pessimistic after three-year bull markets and overly optimistic after three-year bear markets. As for accuracy, De Bondt concludes that market predictions are not "particularly useful."

13.4.3 So What? Prediction and Performance

Is there a downside to strategists succumbing to gambler's fallacy? That depends on how their predictions get used. Strategists also make recommendations about strategic asset allocation, the proportion of a portfolio devoted to equities, bonds, cash, and other assets. These recommendations are routinely available from sources such as Dow Jones News Service and Business Week. Not surprisingly, strategists' recommended equity allocations have a high positive correlation with their market predictions. So if strategists are unduly pessimistic in bull markets, the returns to the portfolios they recommend are less than they might have been.

Richard Bernstein, head of quantitative research at Merrill Lynch, suggests that the asset allocations recommended by Wall Street strategists do indeed reflect missed profit opportunities. In fact, he has developed an indicator based on the average recommended allocation to stocks. He issues a "buy" signal when this average drops below 50.4 percent, and a "sell" recommendation when it rises above 57.5 percent (R. Bernstein 1995). He considers the range in between as neutral. Consider the period between September 1997 and April 1998, when strategists increased their average equity allocation in a balanced portfolio from 48.1 percent to a four-year high of 54.5 percent. Wall Street Journal writer Greg Ip described Bernstein's perspective on this change as follows:

Mr. Bernstein considers that negative for stocks, but not unduly so. Indeed, gurus aren't so much turning more bullish, as easing their entrenched bearishness.

"Over the 13 years of data that we have, the average equity allocation is only 53.4%," says Mr. Bernstein, with the remainder in bonds or cash. But he notes that most survey participants consider a 60% stock allocation to be about neutral. "So through time, Wall Street is underweighted on equities. There's all this talk of the 'wall of

worry.’ “ There it is. The people who have the greatest incentive to sell equities are habitually bearish.

Kenneth Fisher and Meir Statman (1999b) confirm Richard Bernstein’s claims. They find that for every 1 percent decline in the recommended equity allocation by strategists, the S&P 500 has increased by 26 basis points.

13.4.4 Overconfidence

A study sponsored by PaineWebber, and administered by the Gallup Organization, found that experience is an important factor in investors’ expectations about the market. The results were summarized as follows in the July 8, 1998, Wall Street Journal: “As stock prices hover at or near records, a new poll indicates that inexperienced investors expect considerably higher returns on their portfolios than do longtime investors—and are more confident of their ability to beat the market.”

This finding is very interesting. Inexperienced investors are more confident that they will beat the market than are experienced investors. Given the difficulty that many investors actually have beating the market, novice investors may be not just confident, but overconfident.

How is overconfidence reflected in the predictions people make?

In order to review the basic issue, and set the stage for a discussion of overconfident predictions, let us consider the following five-question quiz. The first two questions pertain to general knowledge, and the remaining three to financial predictions.

You will be asked to give your best guess in answering each of the five questions. In addition to giving your best guess, consider a range—a low guess and a high guess—so that you feel 90 percent confident that the right answer will lie between your low guess and your high guess. Try not to make the range too narrow. Otherwise, you will appear overconfident. At the same time, try not to make the range between your low guess and high guess too wide. This will make you appear under confident. If you are well calibrated, you should expect that only one out of the five correct answers does not lie between your low guess and your high guess.

1. How long, in days, is the gestation period of an Asian elephant?
2. How deep, in feet, is the deepest known point in the ocean?
3. Figure 13.1 provides the share price chart for a particular security over a forty-eight-month period. What is your prediction for the share price value six months beyond this forty-eight-month period?

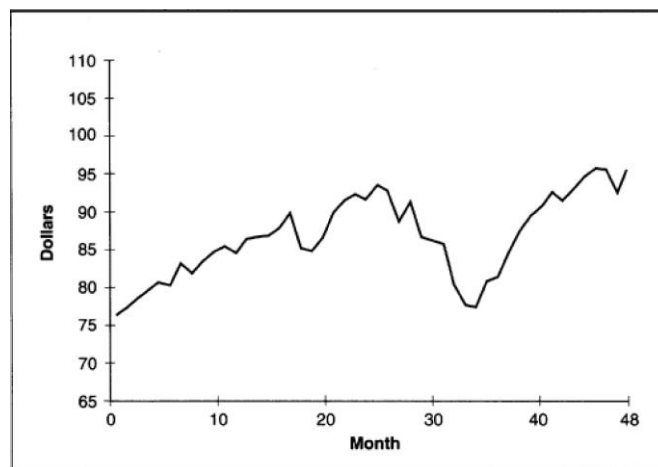


Figure 13.1 : Share price

4. Figure 13.2 provides the share price chart for a particular security over a forty-eight-month period. What is your prediction for the share price value six months beyond this forty-eight-month period?

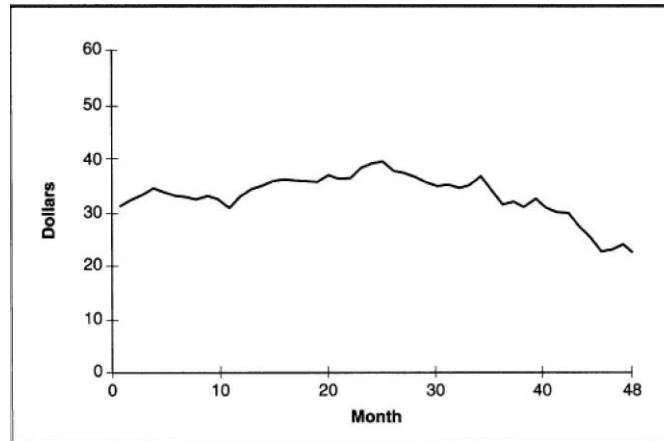


Figure 13.2: Share price

5. Figure 13.3 describes the dollar change in share price for a particular security over a forty-eight-month period. What is your prediction for the average change in the share price, per month, for the six months beyond this forty-eight-month period?

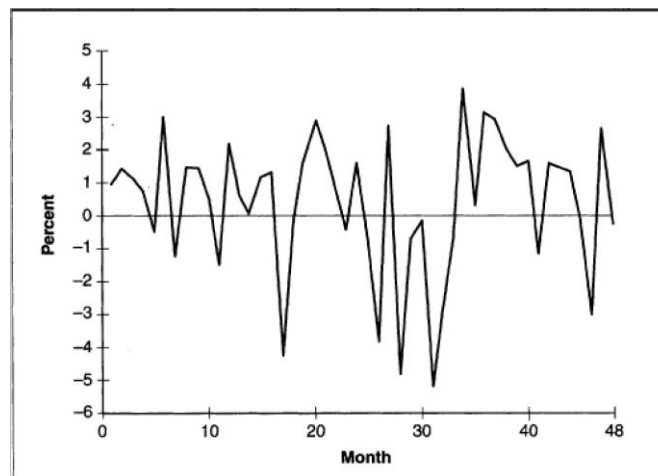


Figure 13.3 : Dollar change in share price

The answers are (1) 645 days, (2) 36,198 feet, (3) \$100.30, (4) \$30.83, and (5) \$0.83. Count an answer as a hit if the right response lies between your low guess and your high guess. Count an answer as a miss if the right response falls outside of the range between your low guess and your high guess. What score did you get?

Most people miss more than one out of the five questions in the preceding quiz. Actually, most miss four or even all five. Someone who is well calibrated should miss no more than one question. But the percentage of people who miss only one question is less than 1 percent. This means that the other 99 percent are overconfident. Overconfidence abounds.

Overconfident people get surprised more frequently than they anticipated. Take the strategists' predictions for 1997. On June 20, 1997, the Dow closed at 7796, well above the expectations of all seven analysts. On June 23, Barron's reinterviewed them, recorded their reactions to how the market had behaved during the first half of the year, and collected their predictions for the remainder of the year.

So how did the strategists react? The article quotes Smith Barney (now Salomon Smith Barney) stock strategist Marshall Acuff, who had the most optimistic prediction for the first half of 1997, as saying: "Certainly I've been surprised, everyone's been surprised. We've all been humbled."

So, where did the strategists' June revisions indicate the Dow would close at the end of 1997? At 6995, down 10.3 percent from its June value of 7796. Gambler's fallacy? The Dow closed 1997 at 7908.

Do strategists learn? Well at the end of 1997, Barron's elicited the Dow predictions of eight strategists, six of whom were repeats from the previous year. The average prediction was that the Dow would close 1998 at 8500, up 7.5 percent for the year. And what about Marshall Acuff, who, despite his optimism, expressed so much surprise in June 1997? He predicted that in 1998 the Dow would close at 8000, both at mid-year and at year-end, a 1.2 percent increase.

In reality the Dow closed on June 30 at 8952, up 13.2 percent, and ended 1998 at 9181, up 16.1 percent for the year. The surprises continued. Clearly, learning is a slow process.

13.4.5 Heuristic Diversity

Oh, how straightforward the world would be if investors committed just one type of error in predicting the market. Those who bet on trends extrapolate: they bet that

trends continue. Those who commit gambler's fallacy predict reversal. And both predictions stem from representativeness. For those who bet on trends, continuation is representative of what they perceive, while for those who commit gambler's fallacy, reversal is representative of what they perceive. The same heuristic, but different perceptions—that is what leads to these different predictions.

Interestingly, there are systematic differences in perceptions across groups, leading to systematic differences in their predictions. De Bondt (1998) points out that Wall Street strategists are prone to committing gambler's fallacy, whereas individual investors are prone to betting on trends.

13.5 SUMMARY

Capital markets are crucial to the development and functioning of an economy because they perform a critical service. It is through efficient and well-performing capital markets that resources are allocated to their best use. Ideally, markets transfer funds from savers to borrowers with good investment opportunities. Borrowers may have opportunities that provide good returns based on their level of risk, but insufficient capital to proceed with such investment. With efficient capital markets, lenders are better off because they earn a higher risk-adjusted return, and borrowers are better off because they do not have to forgo profitable opportunities.

The primary role of the capital market is allocation of ownership of the economy's capital stock." In general terms, the idea is a market in which prices provide accurate signals for resource allocation: that is, a market in which firms can make production-investment decisions, and investors can choose among the securities that represent ownership of firms' activities under the assumption that security prices at any time "fully reflect" all available information. A market in which prices always "fully reflect" available information is called "efficient."

13.6 GLOSSARY

- **Representativeness:** It is decision making based on stereotypes, characterizations that are treated as representative of all members of a group.

In investing, representativeness is a tendency to be more optimistic about investments that have performed well lately and more pessimistic about investments that have performed poorly.

- **Overconfidence:** It is a bias in which investors have too much faith in the precision of their estimates, causing them to underestimate the range of possibilities that actually exist. They tend to underestimate the extent of possible losses, and therefore underestimate investment risks.

13.7 SELF ASSESSMENT QUESTIONS

1. Write short note on efficiency and information.

2. How is overconfidence reflected in the predictions people make?

13.8 LESSON END EXERCISES

1. Discuss, in detail, the type of information available for market participants and market efficiency.

13.9 SUGGESTED READINGS

1. Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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BEHAVIOURAL FACTORS AND FINANCIAL MARKETS

**M.COM III SEM
MCOMFE355**

**UNIT- III
LESSON - 14**

LIMITS OF ARBITRAGE MODEL, ASSET MANAGEMENT AND BEHAVIOURAL FACTORS

STRUCTURE

- 14.1 Introduction
- 14.2 Objectives
- 14.3 Theoretical Requirements for Market Efficiency
- 14.4 Limits of Arbitrage Model
- 14.5 What Limits Arbitrage?
 - 14.5.1 Fundamental Risk
 - 14.5.2 Financing Risk/ Noise Trader Risk
 - 14.5.3 Implementation Costs
- 14.6 Concept of Asset Management
- 14.7 Asset Management and Behavioural Factors
- 14.8 Summary
- 14.9 Glossary
- 14.10 Self Assessment Questions
- 14.11 Lesson End Exercises
- 14.12 Suggested Readings

14.1 INTRODUCTION

The classical finance assumes that arbitrage is carried out by individual traders all taking small positions using their own capital. Under these assumptions, the greater the deviation of prices from fundamentals, the more aggressively arbitrage will be carried out, as the potential return is at its highest.

Arbitrage is “the simultaneous purchase and sale of the same, or essentially similar, security in two different markets at advantageously different prices.” Suppose that some security, say a stock, becomes over-priced in a market relative to its fundamental value as a result of correlated purchase by unsophisticated, or irrational, investors. This security now represents a bad buy, since its price exceeds the properly risk adjusted net present value of its cash flows or dividends.

Limits to arbitrage model states that in the real world, arbitrageurs such as financial institutions have limited access to funds, due to information or agency problems. If there is a “supply shock”, because of emergency sale of stocks by an investor, it causes the price of stock to drop and generate an opportunity for the arbitrageur. If the arbitrageur has ample supply of money, they would buy the stocks and stabilize the prices. But in lack of substantial money, the shock may not well absorbed and pricing difference may sustain for longer periods.

14.2 OBJECTIVES

After studying this lesson, you should be able to:

- know about the limits of arbitrage model
- comprehend what limits the arbitrage
- understand the meaning of asset management and different types of behavioural factors.

14.3 THEORETICAL REQUIREMENTS FOR MARKET EFFICIENCY

Market efficiency theoretically rests on three supports: investor rationality, uncorrelated errors, and unlimited arbitrage. Only one support is required for market efficiency. If all three fail, market efficiency can be called into question.

Support 1: All Investors Are Always Rational

The first potential support for market efficiency is investor rationality, specifically that all investors are always rational. Most would agree that this merits little discussion: its falseness is clear to all those who have had discussions with a few retail investors and have as a result observed that some investors at least some of the time execute trades on less than fully rational grounds. Even more sophisticated investors, if honest with themselves, will sometimes have to plead guilty in this regard. Fischer Black, in his 1986 American Finance Association Presidential Address, put it aptly:

People sometimes trade on information in the usual way. They are correct in expecting to make profits from these trades. On the other hand, people sometimes trade on noise as if it were information. If they expect to make profits from noise trading, they are incorrect.

Noise exists when trades are based on misinformation, that is, information not relevant for the valuation of securities. Noise (and the trading it induces) is not necessarily an unmitigated evil as it provides liquidity to markets. In fact, without noise, there would be very little trading because the informed would lack ready counterparties and they would only trade due to cash needs.

Support 2: Investor Errors Are Uncorrelated

People may trade on noise because they think they have useful information or simply because they enjoy trading. The behaviour of such people may be socially driven in that they may trade based on a rumor provided by a neighbor, friend, or coworker. They may even trade because they observe others trading and don't want to miss out on a good thing.

If the behaviour of such traders were random, there would be no cause for concern

about the efficiency of markets because their trades would cancel out. There would be negligible impact on prices. If traders' behaviour is correlated, they may drive prices farther and farther from fundamental value.

Social forces may also influence many of us. Investing in speculative assets is a social activity. Investors spend a substantial part of their leisure time discussing investments, Readings about investments, or gossiping about others' successes or failures in investing. It is thus plausible that investors' behaviour (and hence prices of speculative assets) would be influenced by social movements. Attitudes or fashions seem to fluctuate in many other popular topics of conversation, such as food, clothing, health, or politics. These fluctuations in attitude often occur widely in the population and often appear without any apparent logical reason. It is plausible that attitudes or fashions regarding investments would also change spontaneously or in arbitrary social reaction to some widely noted events.

Whether psychology or social forces (or some combination) are the key, when large numbers of investors simultaneously and erroneously value some or all securities in the same way, we say that sentiment is driving prices. One can therefore say that sentiment is noise that is correlated among many investors. A commonly used term (which we will adopt) to characterize such individuals is noise-traders.

Support 3: There Are No Limits To Arbitrage

Even if some investors sometimes act irrationally and their errors are correlated, provided smart-money investors are able to act in such a fashion so as to arbitrage away incorrect prices, market efficiency will remain intact. This is because any pricing gap between a relatively expensive security and a relatively cheap one will be vigorously capitalized on.

Before discussing why it is likely that there are significant limits to arbitrage, it is useful to briefly illustrate so-called "textbook arbitrage." Textbook arbitrage requires no money and entails no risk. In the real world, what might be closest is triangular arbitrage in foreign exchange markets.

To illustrate how this works, in May 2008 the following three foreign exchange rates among dollars, euros, and yen were observed (x will be explained):

Currency pair	Rate
¥/€	159.3403
€/ \$	0.6455
¥/ \$	x

where,

¥ = Yen

\$ = Us dollar

€ = Euro

There are two ways to convert dollars into yen: directly at x, or indirectly using euros as the bridge currency. A bridge currency works in the following way. First convert dollars to euros at 0.6455, and then convert euros to yen at 159.3403.

This indirect method yields $0.6455 * 159.3403 = 102.8543$. This figure has to be virtually identical to x. Were this not so, arbitrage would be profitable. To see this, what if, the ¥/\$ rate were 100? This would create a money machine. You could start with a borrowed \$1, turn this into €0.6455, and then turn this amount into ¥102.8543. Given a ¥/\$ rate of 100, you could now convert back to more than \$1, repaying the loan and obtaining a profit in addition. Of course all these numbers could be multiplied by millions, making us wealthy. The fact that this is not possible means that foreign exchange markets are priced so that triangular arbitrage is virtually never possible (and, if it is, occasionally, only for mere seconds).

14.4 LIMITS OF ARBITRAGE MODEL

Arbitrage is defined as “the simultaneous purchase and sale of the same, or essentially similar, security in two different markets at advantageously different prices.” Suppose that some security, say a stock, becomes over-priced in a market relative to its fundamental value as a result of correlated purchase by unsophisticated, or irrational, investors. This security now represents a bad buy, since its price exceeds the properly risk adjusted net present value of its cash flows or dividends. Noting this overpricing,

smart investors or arbitrageurs, would sell or even sell short this expensive security and simultaneously purchase other, 'essentially similar,' securities to hedge their risks. If such substitute securities are available and arbitrageurs are able to trade them, they can earn a profit, since they are short expensive securities and long the same, or very similar, but cheaper securities. The effect of this selling by arbitrageurs is to bring the price of the overpriced security down to its fundamental value. In fact, if arbitrage is quick and effective enough because substitute securities are readily available and the arbitrageurs are competing with each other to earn profits, the price of a security can never get far way from its fundamental value, and indeed arbitrageurs themselves are unable to earn much of an abnormal return. A similar argument applies to an undervalued security. To earn a profit, arbitrageurs would buy underpriced securities and sell short essentially similar securities to hedge their risk, thereby preventing the under-pricing from being either substantial or very long-lasting. The process of arbitrage brings security prices in line with their fundamental values even when some investors are not fully rational and their demands are correlated, as long as securities have close substitutes.

According to the assumptions of classical finance, arbitrage is carried out by individual traders all taking small positions using their own capital. Under these assumptions, the greater the deviation of prices from fundamentals, the more aggressively arbitrage will be carried out, as the potential return is at its highest.

Conditions of Arbitrage

Arbitrage is possible when one of three conditions is met:

- The same asset does not trade at the same price in all markets which means there should not be "the law of one price".
- Two assets with identical cash flows do not trade at the same price.
- An asset with a known price in the future does not today trade at its future price discounted at the risk-free interest rate or the asset has significant cost of storage; as such grains but not securities.

Limits to arbitrage model states that in the real world, arbitrageurs such as financial

institutions have limited access to funds, due to information or agency problems. If there is a “supply shock”, because of emergency sale of stocks by an investor, it causes the price of stock to drop and generate an opportunity for the arbitrageur. If the arbitrageur has ample supply of money, they would buy the stocks and stabilize the prices. But in lack of substantial money, the shock may not well absorbed and pricing difference may sustain for longer periods. Limit to arbitrage will rather amplify the crisis if arbitrageur already holds position in the stock. Now supply shock will further tighten the capital position of arbitrageur which may force him to sell the position further slashing down the prices.

Suppose the arbitrageur sells the position in some other market to settle the loss due to supply shock, the shock will transfer from one market to other, causing a “contagion effect”. The price opportunity created by the demand and supply disequilibrium will be encashed by an arbitrageur under perfect conditions when there is no crunch of liquidity. But when there is limit to arbitrage due to limited liquidity with arbitrageur, the opportunity is not encashed and the crunch of liquidity further increases with the arbitrageur. This is also an explanation of how liquidity dry ups are created and spread across the markets.

Limits to arbitrage is also confirmed by the availability of so called “Twin Stocks” in the security markets. Twin Stocks are the perfect substitutes to each other but are still traded at the prices which allow easy arbitrage profits.

14.5 WHAT LIMITS ARBITRAGE?

Arbitrageurs are forced to operate in complex markets where value is uncertain and correct hedges elusive. There are three main potential problems that an arbitrageur has to face. These are: fundamental risk, noise trader risk, and implementation costs.

1. Fundamental risk
2. Financing risk/ noise trader risk
 - Horizon risk
 - Margin risk
 - Short covering risk

3. Implementation costs

14.5.1 Fundamental Risk

Fundamental risk exists because of the potential for rational revaluation as new information arrives. Suppose, for example, that an arbitrageur believes a particular stock is overvalued in the market relative to the stock's expected future dividends. This arbitrageur would naturally short-sell the stock in the expectation that the price will be lower later when he purchases the stock to close the position. Even if he is correct in this belief based on available information, he is subject to risk. For one thing, new information that no one could have anticipated might suddenly arrive. If this is of a positive nature, the price will rise and a loss will be incurred. Such losses will require margin payments. Further, if realized dividends on the stock are higher than expected, the arbitrageur could face an additional cash crunch. Note that when shares are sold-short, the arbitrageur must cover the dividends paid on the stock because he has borrowed the stock from another investor. An arbitrageur may limit trading because of fear that the firm could perform unexpectedly well, in which case losses from short-selling would be incurred.

The use of substitutes and spread trading can be used to mitigate fundamental risk. Spread trading is the simultaneous purchase and sale of similar securities (sometimes even very close substitutes). You buy the one that you consider to be relatively cheap, and sell (or short-sell) the one that you consider to be relatively expensive, in the hope that the spread will narrow.

For example, one could simultaneously short-sell the overpriced security and buy with the proceeds the "market" (say, using stock index futures). Now if market-wide information causes all stocks to rise, gains on the market offset the losses from the short position. Of course, much information is likely to be of a firm-specific or industry-specific nature. If you believe that Merck, for example, is overvalued, you could hedge by going long on a basket of pharmaceuticals (excluding Merck). Now you would be hedged against both market and industry risk. Still, it is not possible to hedge against firm-specific risk here because there is no perfect substitute for Merck. Merck might unexpectedly announce success in a drug trial. This will affect Merck,

but not other pharmaceuticals. It is the fact that a perfect substitute rarely exists that makes arbitrage risky and hence less likely to eliminate mispricing.

14.5.2 Financing Risk/ Noise Trader Risk

This group of risks reflects that arbitrageurs know they are irrational noise traders in the market, and hence there is always the risk that the position may get worse purely because of the noise traders- as an arbitrageur you face uncertainty over the resale value of the assets that you're your position. We can break these risks down into three separate components. These are:

1. Horizon Risk

Horizon risk arises when the correction in the price of security takes place with delay as per the expected horizon. Horizon risk reduces the actual returns generated as compared to the estimated returns. If investors respond with delay or joins the rally with delay, then also the horizon risk may rise.

Even if prices are guaranteed to converge, they are not obliged to do so in a timely or indeed a smooth manner. Increasing the length of the path to convergence lowers the arbitrageur's return. In the case of parent company puzzle this is certainly a non-trivial issue. The minimum time horizon in the Mitchell, Pulvino and Stafford data is 1 day, the median 92 days and the maximum 2796 days.

Mitchell, Pulvino and Stafford offer the following numerical example. To see how the time horizon affects returns consider an investment expected to generate 15% over 92 trading days. This represents an annualized return of 47%. A decrease in the number of days until termination from 92 days to 46 days increases the annualized return to 238%. On the other hand, if we extend the time to converging termination to 138 days, the annualized return drops to a mere 14%.

2. Margin Risk

This is perhaps the best known and understood of the risks facing arbitrageurs. When a position moves against the arbitrageur, he is more than likely to face a margin call- a demand for a certain level of partial payment in the face of new value of the securities he is dealing in.

In the presence of noise traders (irrational investors) it should be clear that this is a significant handicap to arbitrageurs. If a position moves against them, just when the potential returns are increasing they find themselves having to reduce their exposure in order to meet the margin payment.

According to Lonstaff and Liu (2001) in markets where arbitrage is possible but risky, the optimal strategy is to take a smaller than maximum position, allowing himself room for potential margin calls.

3. *Short Covering Risk*

The third element of financing risk concerns the risk of involuntary liquidation. It refers to a situation whereby an arbitrageur borrows stock to short. When the available free float is small, stock lenders may find it difficult to maintain the level of supply to the arbitrageur. When the owner of a stock demands that the loaned stock be returned, the arbitrageurs have no choice but to liquidate their position prematurely.

14.5.3 Implementation Costs

Aside from fundamental risk and noise-trader risk, transaction costs can potentially obstruct arbitrage. Implementation costs refer to transaction costs such as commissions, bid-ask spread, premium costs for hot collateral in repurchase agreements, increased commissions for shorting securities among others. Other than monetary costs, there can also be legal constraints and accounting issues.

This category also includes the cost of finding and learning about a mispricing, as well as the cost of the resources needed to exploit it. In particular, finding mispricing can be expensive and time consuming. Learning about them will certainly require highly specialized labor. Finally exploiting mispricing furthermore requires state of the art technology and expensive IT systems that can trade at the high-frequency speed.

14.6 CONCEPT OF ASSET MANAGEMENT

The role of asset managers is to obtain for their customers a superior return on their capital, through investing this capital in global securities markets on their clients' behalf. 'Superior return' means adding value in the following ways:

- Making better investment decisions than their clients could, due to their research capacity and investment skill
- Providing a level of investment diversification through the pooling of funds that their clients could not achieve
- Using their breadth of knowledge and experience to fulfill the investment objectives of the fund.

The return on investment is compared to a benchmark, often constructed from the returns obtained by rival asset managers, this comparison being used by investors to assess the asset manager's performance. The asset manager is also responsible for ensuring that the client's individual preferences and needs are observed, for example level of risk appetite, liquidity needs, tax implications, etc. Asset managers usually look after more than one client, each client's capital being segregated into a 'fund' or 'portfolio'. Asset management is also referred to variously as 'investment management', 'fund management', and 'portfolio management'. The management of high worth individuals' assets is usually carried out by specialist private client departments, who face the challenge of managing a very large number of clients, especially when compared to pension fund managers. Investment management is not to be confused with 'investment banking,' which is a very different business, focusing much more on corporate clients and their financing needs (such as restricting a corporation's debt or equity). A key element in the asset management industry is regulation. In order for investors to have confidence in placing their capital with asset managers, it is essential that they view the industry as being properly regulated.

The types of fund management offered by asset managers are analogous to products in other industries. Asset managers are compared to their peers, with performance comparisons being frequently reported in the press, enabling the investing public make an informed decision with regard to their choice of asset manager.

There are really very few important differences between products. These differences emanating from the purpose of the fund (which in turn dictates which securities it can invest in), and the regulatory and tax rules with which the fund manager must comply.

The different types of products that are managed by assets managers are as follows :-

1. Segregated Funds

A segregated fund is a group of assets belonging to one particular client. In addition to holding securities such as equities, bonds and cash directly, it may also hold units of other funds.

2. Pension Fund Management

The key differential between pension funds and other types of funds is the tax advantage allowed to these fund types, with the proviso that investors are restricted from enjoying the benefits of their savings until they reach a qualifying retirement age.

An important factor in pension fund management is the 'age' of the pension fund, this being based on the average age of investors who are investing in the fund. This is important, since for 'young' pension funds the main objective will be to maximize long term growth through a high weighting in equities which have, historically, consistently outperformed other classes of assets in the long run. As the pension fund ages, higher weightings are generally allocated to bonds and cash in order that the risk of a sharp (if temporary) drop in equity markets when pensioners require their funds is minimized. Bonds and cash will also give the fund the liquidity required to pay investors' pension entitlements (these are usually converted from a lump sum received from the pension fund into an annuity to provide the investor with a regular income).

3. Life Fund Management

Life funds are long term investment plans designed to provide the owner with a lump sum at the end of a relatively long investment horizon (typically in excess of 15 years). These products are usually 'bundled' with life insurance and have traditionally been a poor short-term investment when customers have tried to cash the policies in the early years of the policy. This is because sales commission was taken out of the initial payments, leaving the investor with very little invested in the fund in the early years. Owing to the number of complaints received by regulators, asset management companies' representatives are now obliged to explain the pros and cons of each product fully. They are also required to give each customer a 'cooling off' period

during which they can change their mind regarding any products to which they may have subscribed.

4. Endowment Policies

Endowment policies are designed to pay off a client's mortgage after a specified number of years. Most make no actual commitment to actually pay the amount required. Rather, they state that based on an assumed annual return the capital invested will be sufficient to cover the required amount. The fund manager's objective will be to achieve the rate of return required to provide the investor with enough capital to repay the mortgage while taking the lowest possible risk.

5. Insurance Fund Management

Insurance funds represent the pooling of insurance companies' customers' premiums, and are held in a fund in order to meet claims arising out of policies issued by the insurance company. The fund manager is generally required to ensure that adequate cash can be made available when required to meet claims. In some instances fund managers are required to match the anticipated cash flows from claims (the liability stream) with cash flows from the funds. The stream of cash flows can come from bond coupons and redemptions and equity dividends, in addition to the sale of securities to meet cash requirements. As with most fund types, a proportion of the fund will be held in cash to meet any immediate requirements; however, this will drag the fund's performance down in the time of rising equity markets.

6. Private Client Portfolios

Private client portfolios represent the invested wealth of high net worth individuals. Private client fund managers are required to balance the client's requirement for long term growth with requirements for an income stream and liquidity to meet immediate cash requirements.

7. Hedge Funds

Hedge funds are basically funds which are leveraged, i.e, their exposure to global markets exceeds the capital invested in the fund. There are two main methods of achieving this leverage. The most obvious way is to use derivatives; the fund only

needs to cover derivative exchanges' margin requirements, and can therefore build very large position using a limited amount of capital. Another method is through selling short securities that the fund manager predicts will fall in value. The cash from sale of these securities not held by the fund manager is then used to purchase securities which the fund manager predicts will rise in value, thereby enormously reducing the overall capital requirement of the fund.

8. Unit Trusts

These funds are trust created to manage securities on behalf of a relatively large number of small investors. The fund is divided into units which are bought and sold by investors at the prevailing market rate, this being very closely related to the market value of the underlying securities in which the unit trust invests. Trading in units must be carried out through the fund manager (i.e. there is no secondary market). The number of units is variable, i.e. the amount of capital invested in the fund can change, such changes being known as unit creation for an increase in capital, and liquidation for a decrease. An important back office function is the administration of the buying, selling, creation and liquidation of units, in addition to the accurate pricing of the fund once or more per day, this being a regulatory requirement.

9. Investment Trusts

Investment trusts are companies formed for the specific purpose of investing in securities, having a fixed amount of capital (which under regulatory rules cannot change). They differ from unit trusts in that investors buy shares in this Investment Trust Company (ITC) rather than units of a unit trust fund. Since it is a company, the ITC can borrow additional money to invest, resulting in an overall geared position.

10. Open Ended Investment Companies (OEICs)

OEICs are recent innovation which varies very little from ITCs apart from their ability to vary their capital. As investors buy shares, the number of shares increases (ITCs, with their fixed capital, would experience a rise in their share price's value). Due to the comparative ease of administration many unit trusts have been converted to OEICs.

14.7 ASSET MANAGEMENT AND BEHAVIOURAL FACTORS

Behavioural field of finance views investors as irrational economic agents whose decisions are influenced by sentiment, emotions, fantasies, moods and feelings. That is, the investors have an emotional and personal relationship with their assets. This explains why some investors hold onto stocks even when their prices and the associated returns are falling. Behavioural finance thus seeks to explain why actual investor behaviour deviates from that expected from a rational economic agent.

Behavioural finance is the study of why individuals do not always make the decisions they are expected to make and why markets do not reliably behave as they are expected to behave. As market participants, individuals are affected by others' behaviour, which collectively affects market behaviour, which in turn affects all the participants in the market. Thus, people are not always rational and hence markets cannot be expected to be efficient.

An understanding of behavioural factors that impact the market shall decrease the vulnerability of investors. These behavioural factors are explained below:

- 1. Availability bias** occurs because investors rely on information to make informed decisions, but not all information is readily available. Investors tend to give more weight to more available information and to discount information that is brought to their attention less often. The stocks of corporations that get good press publicity, are deemed to do better than those of less publicized companies but in reality these —high-profile companies may actually have worse earnings and return potential.
- 2. Representativeness** is decision making based on stereotypes, characterizations that are treated as representative of all members of a group. In investing, representativeness is a tendency to be more optimistic about investments that have performed well lately and more pessimistic about investments that have performed poorly. Investors in their mind will stereotype the immediate past performance of investments as strong or weak. This representation then makes it hard to think of them in any other way or to analyze their potential. As a result, they may put too much emphasis on past performance and not enough on future prospects.

Objective investment decisions involve forming expectations about what will happen, making educated guesses by gathering as much information as possible and making as good use of it as possible.

In investment decision-making, representativeness bias can arise either from base-rate neglect or sample-size neglect.

- **Base-rate neglect:** Investors attempt to determine the potential success of an investment in a stock by contextualizing it in a familiar, easy-to-understand classification scheme. For example, an investor might categorize a stock as a “value stock” and draw quick conclusions about the risks and rewards that follow from that categorization. This reasoning ignores variables that can impact the success of the investment. Investors often embark on this erroneous path because they perceive it as an easy alternative to the diligent and more complicated research that’s actually required when evaluating an investment.
- **Sample-size neglect:** Investors fail to accurately consider the sample size of the data on which they are basing their judgments and incorrectly assume that small sample sizes are representative of populations. When people do not initially comprehend a phenomenon reflected in a series of data, they quickly link assumptions based on only a few of the available data points. Individuals prone to sample-size neglect are quick to treat properties reflected in such small samples as properties that accurately describe universal pools of data. However, the small sample examined may not be representative of the real data. This is also known as the “law of small numbers.”

Both types of representativeness bias can lead to significant investment mistakes.

3. Overconfidence is a bias in which investors have too much faith in the precision of their estimates, causing them to underestimate the range of possibilities that actually exist. They tend to underestimate the extent of possible losses, and therefore underestimate investment risks. Overconfidence also comes from the tendency to

attribute good results to good investor decisions and bad results to bad luck or bad markets.

4. Anchoring happens when investors cannot integrate new information into their thinking because they are too —anchored to their existing views. By devaluing new information, investors tend to underreact to changes or news and become less likely to act, even when it is in their interest.

5. Ambiguity aversion is the tendency to prefer the familiar to the unfamiliar or the known to the unknown. Avoiding ambiguity can lead to discounting opportunities with greater uncertainty in favor of —sure things. In that case, the bias against uncertainty may create an opportunity cost in the portfolio. Availability bias and ambiguity aversion can also result in a failure to diversify, as investors tend to —stick with what they know.

6. Framing Framing refers to the way we see alternatives and define the context in which we are making a decision. Investors framing determines how they imagine the problem, its possible solutions, and its connection with other situations. Every rational economic decision maker would prefer to avoid a loss, to have benefits be greater than costs, to reduce risk, and to have investments gain value.

7. Loss aversion refers to the tendency to loathe realizing a loss to the extent that you avoid it even when it is the better choice. How can it be rational for a loss to be the better choice? Say you buy stock for \$100 per share. Six months later, the stock price has fallen to \$63 per share. You decide not to sell the stock to avoid realizing the loss. If there is another stock with better earnings potential, however, your decision creates an opportunity cost. You pass up the better chance to increase value in the hopes that your original value will be regained. Your opportunity cost likely will be greater than the benefit of holding your stock, but you will do anything to avoid that loss. Loss aversion is an instance where a rational aversion leads you to underestimate a real cost, leading you to choose the lesser alternative. Loss aversion is also a form of regret aversion. Regret is a feeling of responsibility for loss or disappointment. Past decisions and their outcomes inform your current decisions, but regret can bias your decision making. Regret can anchor you too firmly in past

experience and hinder you from seeing new circumstances. Framing can affect your risk tolerance. You may be more willing to take risk to avoid a loss if you are loss averse, for example, or you may simply become unwilling to assume risk, depending on how you define the context.

8. Framing also influences how you manage making more than one decision simultaneously. If presented with multiple but separate choices, most people tend to decide on each separately, mentally segregating each decision. By framing choices as separate and unrelated, however, you may miss making the best decisions, which may involve comparing or combining choices. Lack of diversification or over diversification in a portfolio may also result.

A concept related to framing is **mental accounting**: the way individuals encode, describe, and assess economic outcomes when they make financial decisions. In financial behaviour, framing can lead to shortsighted views, narrow-minded assumptions, and restricted choices.

14.8 SUMMARY

Limits to arbitrage model states that in the real world, arbitrageurs such as financial institutions have limited access to funds, due to information or agency problems. If there is a “supply shock”, because of emergency sale of stocks by an investor, it causes the price of stock to drop and generate an opportunity for the arbitrageur. If the arbitrageur has ample supply of money, they would buy the stocks and stabilize the prices. But in lack of substantial money, the shock may not well absorbed and pricing difference may sustain for longer periods. Limit to arbitrage will rather amplify the crisis if arbitrageur already holds position in the stock. Arbitrageurs are forced to operate in complex markets where value is uncertain and correct hedges elusive. There are three main potential problems that the arbitrageurs have to face namely: fundamental risk, noise trader risk, and implementation costs.

Behavioural field of finance views investors as irrational economic agents whose decisions are influenced by sentiment, emotions, fantasies, moods and feelings. That is, the investors have an emotional and personal relationship with their assets. This

explains why some investors hold onto stocks even when their prices and the associated returns are falling. Behavioural finance thus seeks to explain why actual investor behaviour deviates from that expected from a rational economic agent.

14.9 GLOSSARY

- **Arbitrage:** It refers to the simultaneous purchase and sale of the same, or essentially similar, security in two different markets at advantageously different prices.
- **Arbitrageurs:** Arbitrageurs are defined as “type of investor who attempts to profit from price inefficiencies in the market by making simultaneous trades that offset each other and capturing risk-free profits.”
- **Short Selling:** Short selling is a transaction when investors sell shares that they do not own but they borrow the shares from an equity lender and deliver them to the buyer.

14.10 SELF ASSESSMENT QUESTIONS

1. Define arbitrage.

2. What is fundamental risk?

3. Write short note on asset management.

14.11 LESSON END EXERCISES

1. Explain limits to arbitrage model.

2. Discuss different types of behavioural factors.

14.12 SUGGESTED READINGS

1. Chandra, P. (2017). *Behavioural Finance*. Tata Mc Graw Hill Education, Chennai (India).
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BEHAVIOURAL FACTORS AND FINANCIAL MARKETS

**M.COM III SEM
MCOMFE355**

**UNIT- III
LESSON - 15**

ACTIVE PORTFOLIO MANAGEMENT: RETURN STATISTICS AND SOURCES OF SYSTEMATIC UNDERPERFORMANCE AND FUNDAMENTAL INFORMATION AND TECHNICAL ANALYSIS

STRUCTURE

- 15.1 Introduction
- 15.2 Objectives
- 15.3 Active Portfolio Management: Return Statistics and Sources of Systematic Underperformance
 - 15.3.1 Objectives of Active Portfolio Management
 - 15.3.2 Measuring Returns and Calculating Averages
 - 15.3.3 Time-Weighted Returns Versus Dollar-Weighted Returns
 - 15.3.4 Risk-Adjusted Performance Measures
- 15.4 Fundamental Information And Technical Analysis
 - 15.4.1 What is Fundamental Information Analysis?
 - 15.4.2 Concept of Technical Analysis
 - 15.4.3 Behavioural Finance and Technical Analysis
 - 15.4.4 Forecasting Techniques of Technical Analysis
 - 15.4.5 Other Technical Indicators

15.5 Summary

15.6 Glossary

15.7 Self Assessment Questions

15.8 Lesson End Exercises

15.9 Suggested Readings

15.1 INTRODUCTION

In order to evaluate the performance of a portfolio manager, we need to measure the returns of the portfolio and a way of comparing those returns to one or more benchmarks considering the risk involved. The first problem is not quite as trivial as it might seem, as it also implies the question of whether the past performance is indicative of future performance. The second process depends greatly on the context in which the comparison is made.

The job of a security analyst is to estimate the value of securities. If a security's estimated value is above its market price, the security analyst will recommend buying the stock; if the value is below the market price, the security should be sold before its price drops. Underpriced stocks are purchased until their price is bid up to equal their value; overpriced stocks are sold, driving their price down until it equals their value. There are two schools of thoughts as to how determines an overpriced or underpriced security. These are fundamental analysis and technical analysis.

15.2 OBJECTIVES

After studying this lesson, you should be able to:

- understand the meaning and objectives of active portfolio management
- indentify different methods of risk-adjusted performance evaluation
- differentiate between fundamental and technical analysis

15.3 ACTIVE PORTFOLIO MANAGEMENT: RETURN STATISTICS AND SOURCES OF SYSTEMATIC UNDERPERFORMANCE

Asset pricing under a portfolio theory approach assumes efficient markets, such that assets should be efficiently priced and the market portfolio represents the appropriate equity investment choice. Despite the efficient market hypothesis, there are reasons to believe that active management can have effective results.

15.3.1 Objectives of Active Portfolio Management

Following are the objectives of active portfolio management:

- **Equilibrium markets:** Market efficiency prevails when many investors are willing to depart from maximum diversification, or a passive strategy, by adding mispriced securities to their portfolios in the hope of realizing abnormal returns. The competition for such returns ensures that prices will be near their true value. Most managers will not beat the passive strategy on a risk adjusted basis. However, in the competition for rewards to investing, exceptional managers might beat the average forecasts built into market prices.
- **Shift to passive strategies:** Purely passive strategies are those that use only index funds and weight those funds by fixed proportions that do not vary in response to perceived market conditions. For example, a portfolio strategy that always places 60 percent in a stock market index fund, 30 percent in a bond index fund, and 10 percent in a money market fund is a purely passive strategy. If analysts cannot beat the passive strategy, investors will be smart enough to divert their funds from strategies entailing expensive analysis to less expensive passive strategies. With less capital under active management and less research being produced, prices will no longer reflect sophisticated forecasts. The potential profit resulting from research will then increase and active managers using this research will again have superior performance.
- **Increase in competition:** The lure into active management may be extremely strong because the potential profit from active strategies is enormous. At the same time, competition among the multitude of active managers creates the

force driving market prices to near-efficiency levels. Although enormous profits may be increasingly difficult to earn, decent profits to the better analysts should be the rule rather than the exception. For prices to remain efficient to some degree, some analysts must be able to eke out a reasonable profit.

- **Acid test:** If markets are not entirely efficient, investing in the market portfolio and in index funds will be suboptimal. The activities of thousands of investment professionals can then be justified not merely on the basis of protecting investors from their own mistakes and building portfolios that serve the interest of those investors; instead they will be able to identify departures in the pricing of assets from their inherent values and turn these into profits for investors. This may be through modification of asset allocations over time or by the over- and underweighting of assets in a diversified portfolio. This potential, if realized, certainly justifies the salaries of the analysts paid to determine the appropriate values of equities and bonds, and portfolio managers who determine their weights in active portfolios.
- **Predictive ability:** This predictive ability, if measured directly, rather than by fund performance, was shown to exist and when the predictions were used efficiently in portfolio design, the ability was sufficient to outperform index funds.
- **Client behaviour:** What does an investor expect from a professional portfolio manager, and how does this expectation affect the operation of the manager? If the client were risk neutral, that is, indifferent to risk, the answer would be straightforward. The investor would expect the portfolio manager to construct a portfolio with the highest possible expected rate of return. The portfolio manager follows this dictum and is judged by the realized average rate of return. When the client is risk-averse, the answer is more difficult. Without a normative theory of portfolio management, the manager would have to consult each client before making any portfolio decision in order to ascertain that reward (average return) is commensurate with risk.

15.3.2 Measuring Returns and Calculating Averages

In order to evaluate the performance of a portfolio manager, we will need both a

measurement of the returns of the portfolio and a way of comparing those returns to one or more benchmarks considering the risk involved. The first problem is not quite as trivial as it might seem, as it also implies the question of whether the past performance is indicative of future performance. The second process depends greatly on the context in which the comparison is made.

HPR (Holding Period Return) is the return generated by fund/ security from the date of holding to the date of selling. Suppose we evaluate the performance of a portfolio over a period of 5 years from 20 quarterly rates of return. The arithmetic average would be the best estimate of the expected rate of return of the portfolio for the next quarter. The geometric average, which can differ substantially from the arithmetic, is the constant quarterly return over the 20 quarters that would yield the same total or cumulative return.

The geometric average, r_G , for the 20-quarter investment period is computed from the quarterly rates of return as

$$1 + r_G = [(1 + r_1)(1 + r_2) \cdots (1 + r_{20})]^{1/20}$$

Each return has an equal weight in the geometric average. For this reason, the geometric average is referred to as a **time-weighted average**.

To set the stage for discussing the more subtle issues that follow, let us start with a trivial example. Consider a stock paying a dividend of \$2 annually that currently sells for \$50. You purchase the stock today and collect the \$2 dividend, and then you sell the stock for \$53 at year end. Your rate of return is

$$\text{Total Proceeds} / \text{Initial Investment} = (\text{Income} + \text{Capital gain}) / 50 = (2+3)/50 = 10\%$$

15.3.3 Time-Weighted Returns Versus Dollar-Weighted Returns

When we consider investments over a period during which cash was added to or withdrawn from the portfolio, measuring the rate of return becomes more difficult. To continue our example, suppose that you were to purchase a second share of the same stock at the end of the first year, and hold both shares until the end of year 2, at which point you sell each share for \$54. Total cash outlays are:

Time	Outlay
0	50 to purchase first share
1	53 to purchase second share a year later
	Proceeds
1	2 dividend from initially purchased share
2	4 dividend from the 2 shares held in the second year, plus 108 received from selling both shares at 54

Using the discounted cash flow (DCF) approach, we can solve for the average return over the 2 years by equating the present values of the cash inflows and outflows:

$$50 + 53 / (1+r) = 2 / (1+r) + 112 / (1+r)^2$$

resulting in $r = 7.117$ percent.

Which means when $r = 7.117$ percent, than present values of cash inflows and outflows will be equal.

This value is called the internal rate of return, or the **dollar-weighted rate of return** on the investment. It is —dollar-weighted because the stock's performance in the second year, when two shares of stock are held, has a greater influence on the average overall return than the first year return, when only one share is held.

Notice that the time-weighted (geometric average) return in this example is 7.83 percent:

$$r_1 = (53+2-50) / 50 = 10\% \text{ and } r_2 = (54+2-53) / 53 = 5.66\%$$

$$rG = (1.10 * 1.0566)^{1/2} - 1 = 0.0783 = 7.83\%$$

The dollar-weighted average was less than the time-weighted average in this example because the return in the second year, when more money was invested, was lower.

15.3.4 Risk-Adjusted Performance Measures

Risk Adjustment Techniques

Calculating average portfolio returns does not mean the task is done—returns must be adjusted for risk before they can be compared meaningfully. The simplest and most popular way to adjust returns for portfolio risk is to compare rates of return with those of other investment funds with similar risk characteristics. For example, high-yield bond portfolios are grouped into one —universe, growth stock, equity funds are grouped into another universe, and so on. Then the (usually time-weighted) average returns of each fund within the universe are ordered, and each portfolio manager receives a percentile ranking depending on relative performance within the comparison universe. For example, the manager with the ninth-best performance in a universe of 100 funds would be the 90th percentile manager: his performance was better than 90 percent of all competing funds over the evaluation period.

Methods of risk-adjusted performance evaluation using mean-variance criteria came on stage simultaneously with the capital asset pricing model. Jack Treynor, William Sharpe, and Michael Jensen recognized immediately the implications of the CAPM for rating the performance of managers.

1. Sharpe's measure:

Sharpe's measure divides average portfolio excess return over the sample period by the standard deviation of returns over that period. It measures the reward to-(total-) volatility tradeoff. Sharpe's index is explained in the following equation:

$$S_t = (R_t - R) / \text{Total risk} = \text{Risk Premium} / \text{Standard deviation}$$

Where, S_t = Sharpe's index

R_t = Expected average return from the portfolio

R = Risk less rate of return

2. Treynor's measure:

Like Sharpe's, Treynor's measure gives excess return per unit of risk, but uses

systematic risk instead of total risk. Treynor's index is explained in the following equation:

$$T_t = R_t - R / b_t$$

Where, T_t = Treynor's measure of portfolio performance

R_t = Return of portfolio

R = Risk less rate of return

b_t = Beta coefficient of the portfolio

3. Jensen's measure:

Jensen's measure is the average return on the portfolio over and above that predicted by the CAPM, given the portfolio's beta and the average market return. Jensen's measure is the portfolio's alpha value. Jensen's measure explained in the following equation:

$$R_t - R = a + b (R_m - R)$$

Where, R_t = Return of portfolio

R = Risk less return

a = Intercept the graph that measure the forecasting ability of the portfolio manager

b_t = Beta coefficient

R_m = Return of the market portfolio

4. Information ratio:

The information ratio divides the alpha of the portfolio by the nonsystematic risk of the portfolio. It measures abnormal return per unit of risk that in principle could be diversified away by holding a market index portfolio.

15.4 FUNDAMENTAL INFORMATION AND TECHNICAL ANALYSIS

The job of a security analyst is to estimate the value of securities. If a security's estimated value is above its market price, the security analyst will recommend buying the stock; if the value is below the market price, the security should be sold before its price drops. Underpriced stocks are purchased until their price is bid up to equal their value; overpriced stocks are sold, driving their price down until it equals their value. There are two schools of thoughts as to how determines an overpriced or underpriced security. These are fundamental analysis and technical analysis.

Fundamental analysis studies the fundamental facts affecting a stock's value. Fundamental analysts delve into companies' earnings, their management, earnings forecasts, the firms' competition, market conditions and many other business and economic factors. The second school of thought determines overpriced or underpriced security by studying the way security prices behave over time.

Technical analysis concentrates almost totally on charts of security- market prices and related summary statistics of security trading.

15.4.1 What is Fundamental Information Analysis?

Fundamental information refers to the information relating to the economic state of a company, industry or economy. In market analysis, fundamental information is related to the earnings prospects of the firm only.

Fundamental analysis relates to an examination of the intrinsic worth of the company, to find out whether the current market price is fair, overpriced or underpriced. This is done by studying the various aspects of the company (Company Analysis) in the background of the performance of industry to which the company belongs and the general economic and socio-political scenario of the country. Thus, the fundamental analysis of the share price involves three major steps:

- a. Economic factors and their analysis
- b. Industry analysis
- c. Company analysis

The logic of this three tier analysis is that the company performance depends not only on its own efforts and working but on the general industry and economic factors, which influence its performance. No company can work in vacuum. It is a part of the industry and the economy and its performance on these forces which are external to the company. As referred to earlier, studies have shown that a company's share price depends on the intrinsic or internal factors only to the extent of about one-half of the total forces and the rest is contributed by the external factors, namely, psychological and expectational factors regarding the company, relative to others in the industry and the sentiment in the market, which depends on the socio-economic and political forces operating on the market. This reflects the dictum that stock market is window of the economy and the totality forces operating on the economy would influence the stock market.

In the economy, some industries are expanding while others are stagnant and some contracting, depending on the demand and market conditions. The investor has to choose the growth industry and in that industry, choose the scrips undervalued as judged by his study and analysis.

15.4.2 Concept of Technical Analysis

Technical analysts believe that stock markets have a dynamic of their own, independent of outside economic forces. Technical analysis is the study of internal stock market information. Any relevant outside information is seen as being embodied in stock market data so that there is no need to look for information outside the market. Technical analysts study the market itself, not the external factors that might be reflected in the market prices and volumes. The information produced by the stock market, particularly in relation to prices and trading volumes, is what technical analysis is concerned with. Whereas fundamental analysis (such as dividend discount models and ratio analysis) uses economic data that is usually obtained from sources other than the stock market, technical analysis uses data from the stock market itself.

Technical analysts base trading decisions on prior price and volume data in order to determine past market trends and patterns from which predictions of future market behaviour are derived. Technical analysts usually attempt to forecast short-term price

movements. The methodology rests on the belief that stock market history tends to repeat itself. If a certain pattern of prices and volumes has previously been followed by particular price movements, it is suggested that a repetition of that pattern will be followed by similar price movements. Technical analysts assert that the study of past patterns of variables such as prices and trading volumes allows investors to identify times when particular stocks (or sectors, or the overall market) are likely to fall or rise in price. The focus tends to be on the timing of purchases and sales. Most technical analysts use charts of stock prices (and frequently also data on volumes of buying and selling).

Levy (1966) suggested that technical analysis is based on the following assumptions:

1. The market price of securities (such as shares and bonds) is determined by supply and demand.
2. Supply and demand are determined by numerous rational and irrational factors. These include both objective and subjective factors.
3. Apart from minor fluctuations the prices of individual securities, and the level of the market as a whole, tend to move in trends which persist for significant periods of time.
4. Trends change in reaction to shifts in supply and demand. These shifts in supply and demand can be detected in the action of the market itself.

Assumptions 3 and 4 are controversial. Supporters of the efficient market hypothesis (EMH) take the view that new information is very quickly reflected in security prices. If information is very quickly reflected in prices, trends do not have an opportunity to emerge. Technical analysts believe that new information does not arrive in the market at a single point in time; they take the view that new information comes to the market over a period of time. For example new information may be available first to insiders, second to professionals, and lastly to the public. As the information gradually becomes more widely available, the share price gradually moves to its new equilibrium price. Technical analysts look for the beginning of a movement from one equilibrium price to another without attempting to predict the new equilibrium price. They attempt to profit

from forecasting the direction of movement; that is they try to identify trends and profit from them.

Whatever the reason for a change in price, if the share price responds sufficiently slowly, a trend emerges. A slow response of prices to shifts in supply and demand provides the potential to profit from technical analysis.

15.4.3 Behavioural Finance and Technical Analysis

An alternative underpinning for the technical analysts' belief in trends comes from the theories of behavioural finance. Batchelor and Ramyar (2006) point to psychologists' findings on the illusion of control. People find it difficult to accept that events are random, and will imagine the existence of patterns among random events. The illusion of control is particularly likely in circumstances wherein people are expected to maintain an appearance of competence, for example amongst traders in financial markets. Fenton-O'Creevy et al. (2003) reported an experiment in which professional traders were given the task of using a computer mouse to control the position of a dot on a computer screen. Changes in the position of the dot were random, the mouse was not even connected to the computer, but the traders believed that they were influencing the position of the dot.

Behavioural finance suggests that people have a conservatism bias, which causes them to be slow to update their beliefs in response to new information. They might initially under-react to news so that prices will fully reflect new information only gradually. As a result there is momentum in stock market movements; in other words trends appear. The disposition effect can also slow adjustment to new information and thereby allow trends to emerge as gradual adjustment takes place. The disposition effect causes investors to be reluctant to sell losing positions. Since stocks that show losses are sold reluctantly and slowly, the downward price movement is gradual. Gradual price movement produces a trend.

Other behavioural finance theories that can explain some types of pattern examined by technical analysts are 'sample size neglect' and representativeness. It appears that many people treat a small sample as being just as indicative as a large one. They may trade on the basis of a short succession of pieces of news. For example a short run of

good company earnings news might cause share purchases that result in price increases when the length of the run of earnings news is insufficient to produce statistically significant conclusions. A company with a recent short run of good earnings news may be seen as representative of companies with strong long-run potential. The upward movement is reversed when the run of good news stops. So a pattern of momentum (trends) and reversals emerges.

Representativeness might be seen as judgement based on stereotypes. The mind makes the assumption that situations sharing similar characteristics are alike. A long-term upward price movement starts as a short-term upward price movement. Representativeness causes investors to assume that a short-term upward move is indicative of a forthcoming long-term upward trend (conversely for falls). Many investors buy shares that have recently experienced price rises. Investors like to buy recent winners since they believe that a past price trend is representative of a future price trend. Private investors tend to buy stocks that had risen in price during the three months prior to purchase.

There is research indicating that recent stock market performance affects attitude to risk, and hence the willingness to invest. A recent rise in share prices makes investors more risk tolerant, and hence more prepared to invest. A recent fall raises risk-aversion, and hence creates an inclination to sell. These changes in attitude to risk reinforce existing market movements, and thereby perpetuate trends. Price rises lead to share purchases and hence to further price rises; price falls result in sales which further depress prices. Momentum, the tendency for a market to continue to move in the current direction, is reinforced by changes in attitude to risk.

The sample size neglect bias (alternatively known as the law of small numbers) is associated with the 'gambler's fallacy'. The gambler's fallacy is the belief that if numbers appear at random, there is some mechanism that ensures that each number appears on the same number of occasions. There is a belief that a self-correcting mechanism exists to ensure this. For example people affected by the gambler's fallacy might expect that since the number 17 has not been drawn in a lottery for several weeks, it is likely to be drawn next time. Of course the likelihood of it being drawn continues to be based on a random process; the past frequency has no significance for future

occurrences. The gambler's fallacy may help to explain the reversal patterns that technical analysts look for. It may be the case that investors who are subject to the gambler's fallacy feel that a succession of rises must soon be followed by falls, or vice versa. If the gambler's fallacy leads to the belief that rises and falls are approximately equal in number, investors subject to this bias will tend to sell after a few rises (or buy after a few falls). Their trades may then cause the price reversals they expect.

Representativeness may help to explain the trends that technical analysts attempt to exploit. Technical analysts might be regarded as seeking to profit from the psychological biases, such as representativeness, of other investors. However technical analysts could also be subject to psychological biases. If representativeness is based on the assumption that situations sharing similar characteristics are alike, technical analysts who look for standard chart patterns that indicate future share price changes may be influenced by the representativeness bias. Looking for chart patterns that are repetitions of previous patterns might be looking for stereotypes on which to base judgements.

The proposition that markets exhibit trends may be interpreted as a view that markets have memory. Today's price behaves as if the market remembers previous price movements. This might be justified by observing that investors and traders have memories; and the market comprises investors and traders.

Benartzi and Thaler (1995) suggest that the reference price is the share price that an investor compares to the current share price. Investors anchor on their reference prices in that they measure profits and losses in relation to the reference price. It may be the case that a large number of investors, in a share, anchor on the same reference price; for example the highest price reached over the previous 12 months. This imparts memory to the market, which effectively remembers the reference price. This could help to explain the concept of trading ranges, which are much used by technical analysts. A trading range entails a price fluctuating around a central value, and within limits (the limits are known as support and resistance levels). The central value of a trading range may correspond to the reference price.

Zielonka (2004) gave support to the view that behavioural finance can provide a rationale for technical analysis. A sample of technical analysts was presented with a

number of technical analysis rules. The rules were of three types. Some were rules already used by technical analysts (and which could be explained in terms of behavioural finance principles). The second set of rules was invented by the researcher, and the rules were based on behavioural finance principles. The third set of rules was invented by the researcher, and was not based on principles of behavioural finance. The technical analysts saw the first two sets of rules as having high predictive power. The third set of rules was seen as having low predictive power. In other words the technical analysis rules based upon, and explicable in terms of, behavioural finance were seen as having strong predictive value whereas the rules not based on behavioural finance were not.

Behavioural finance can be used to explain the use of volume data by technical analysts. The evidence on overconfidence indicates that overconfidence is associated with high volumes of trading, and that overconfidence is also associated with rising stock prices.

15.4.4 Forecasting Techniques of Technical Analysis

1. Price Charts

The following exposition aims to describe some of the more frequently used charts.

Figure 15.1 shows a bar chart. For each day, or other chosen time interval, there is a vertical line. The top of the vertical line indicates the highest price reached during the day and the bottom shows the lowest price. There is a short horizontal line on each vertical line. This horizontal line indicates the closing price on the day. Japanese candlestick charts also indicate the opening price.

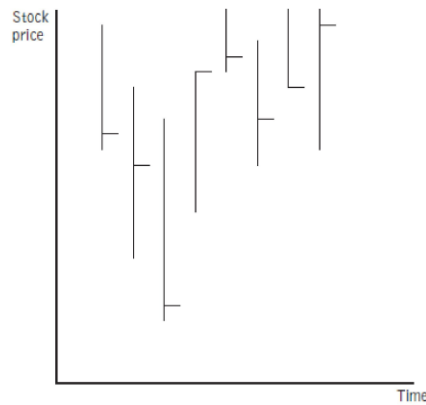


Figure 15.1: Bar charts

Marshall et al. (2006) examined the profitability of Japanese candlestick technical analysis using the stocks that comprised the Dow Jones Industrial Average over the period 1992–2002. They found that the candlestick trading strategies were not profitable; the candlestick analysis lacked predictive power. Figure 15.2 illustrates a line chart. It involves daily closing prices joined by straight lines to make a graph.



Figure 15.2: A line chart

Figure 15.3 illustrates a point-and-figure chart. A price interval is decided upon, for example 10p. For every successive one-interval increase in price, an X is entered in the same column (going upwards). If the stock price falls by 10p from a previous high, an O is entered in the next column. Each successive 10p price decline is then indicated

by a O (going downwards) in the same column. When the price rises by 10p above the lowest price, an X is entered in the next column. An unusual aspect of point-and-figure charts is that although the horizontal axis plots time, it is not in regular intervals of time.

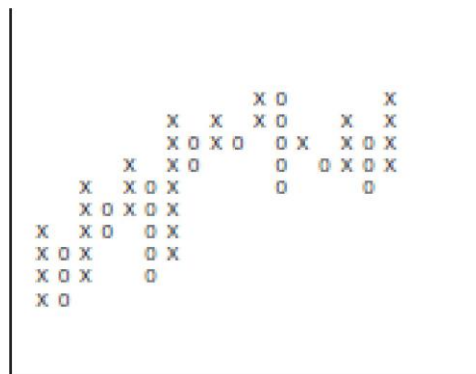


Figure 15.3: A point-and-figure chart

One aim is to find areas where price reversals are frequent since this is seen as presaging a substantial price movement (break out from a trading range). This would appear as a horizontal stretching out of the chart.

2. *Chart Patterns*

There are a vast number of chart patterns employed by technical analysts. What follows is merely indicative of some of the patterns. Line charts will be used for the examples.

Figure 15.4 illustrates a rising trend channel. The share price remains within the channel shown by the upward sloping parallel lines until point A. At point A, it breaks out of the channel in a downward direction. The chartist may interpret this as a signal to sell the stock since it is seen as forecasting a fall in the stock price. Trend channels could also be horizontal or downward sloping.

In these cases a breakout in the upward direction could be seen as indicative of a price rise, and would therefore be a buy signal. Horizontal trend channels with parallel bounds are sometimes referred to as trading ranges.

Behavioural finance provides reasons for thinking that trends are possible. Conservatism suggests that investors do not respond quickly to new information, since they take

time to change their opinions in the light of new evidence. In consequence price adjustments to new information may

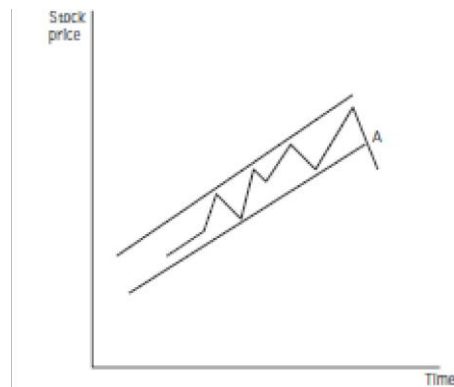


Figure 15.4: A rising trend channel

be gradual, and gradual adjustments provide trends. Confirmation bias, the tendency to give too little weight to evidence that contradicts an existing opinion, reinforces conservatism. Another source of an emerging trend may be the disposition effect, this is the preference for selling an investment that is showing a profit rather than one that is making a loss. This could hamper upward price adjustments and delay downward price movements. Price adjustments are thus slowed with the result that trends appear.

Once a trend has started representativeness and overconfidence could render it persistent. Representativeness can lead investors to believe that recent price movements are indicative of the future direction of price movements; it thus induces buying in a rising market and selling in a falling one. The result is positive feedback trading (buying because prices have risen and selling because they have fallen) which reinforces price trends. Overconfidence causes investors to forget that markets are uncertain and to believe too firmly in their forecasting powers. An overconfident investor may be inclined to invest (or disinvest) heavily on the basis of a view arising from representativeness.

The lines constituting the bounds of a trading range are not necessarily parallel. Figure 15.5 illustrates a triangle. In this case converging lines bound the series of stock prices. The upward breakout at point A might be interpreted as an indication of subsequent price rises.

Price channels are often interpreted in terms of the bounds providing limits to the extent of variation of share prices, such that share prices tend to remain within the bounds. The rationale may be in terms of investors seeing share prices as being too high when they rise above the higher bound (so shares are sold and as a result prices fall) and too low when they fall below the lower bound (so that investors buy and thereby push prices back up into the channel). It may be that investors who regret not having sold before the previous price fall regard a rise to the upper bound as providing a good selling opportunity, and investors who regret not having bought prior to the price rise see a price fall as providing a good buying opportunity. Such an interpretation would see the upper bound as a resistance level and the lower bound as a support level.

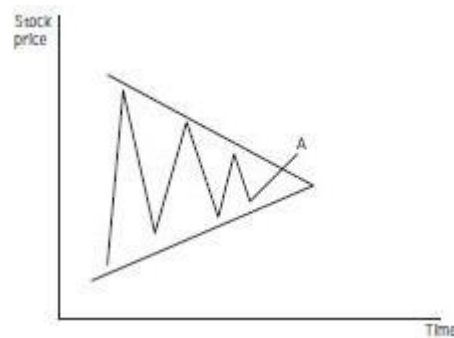


Figure 15.5: A triangle

These patterns may be based on horizontal price channels (trading ranges). Figure 15.6 illustrates such a channel. However sometimes the lower bound is seen as the resistance level, and the upper bound as the support level. Such support and resistance patterns may be based on the premise that people remember past share prices and may regret lost opportunities. Users of this approach suggest that for a period of time stock prices trade within the range bounded by the support and resistance levels. If the share price breaks out of the range in an upward direction people who had not previously bought regret not having done so. As a result they would buy if the price re-enters the trading range. There would be buying at the top of the trading range, the support level. This buying will tend to prevent the share price falling below the support level.

If the stock price falls below the bottom of the trading range, the investor regrets not having sold. Investors decide to sell if they can do so within the trading range. If the stock price returns to the trading range, many investors will sell. The bottom of the trading range becomes an upper limit to the share price. This is the resistance level. If the share price rises above the resistance level, many investors will sell with the result that prices fall.

It could be the case that the upper price is seen as the resistance level and the lower price as the support level, until the price makes a significant move out of the trading range. When that happens, the upper price level becomes the support or the lower price level becomes the resistance. Support and resistance levels reflect a market memory, which allows past price history to influence current price prospects.



Figure 15.6: A channel

If sufficient traders took the same view about the resistance and support levels of prices, the resistance and support levels could become self-fulfilling prophecies. Resistance and support levels emerge because traders believe in their existence and trade accordingly. The shared opinion might arise from the social influences identified by behavioural finance. People in a group have a tendency to conform to each others' opinions. Traders constitute a group of people who interact with one another and form shared opinions. Those shared opinions may include resistance and support levels.

Resistance and support levels could also be explained in terms of the behavioural finance concept of anchoring. Faced with uncertainty, which is frequently the case in financial markets, people will tend to anchor on numbers presented to them. Those numbers become benchmarks against which prices are compared. If a trader is presented with resistance and support price levels, anchoring could cause that trader to treat those levels as benchmarks. Trading is then conducted in relation to those benchmarks.

3. *Reversal Patterns*

Chartists frequently believe that when the direction of a share price (or market index) changes, characteristic chart patterns may develop as the turn occurs. The head-and-shoulders configuration illustrated by Figure 15.7 is one of those reversal patterns. The peak at C is the head, and the lower peaks at A and E are the shoulders. When the share price falls from E to a level below D, further price falls are forecast. In other words, such an eventuality constitutes a sell signal.

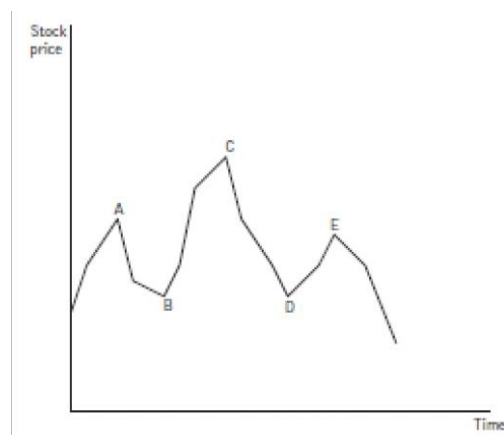


Figure 15.7: Head-and-shoulders configuration

The volume (quantity) of trading in shares may also play a role in the interpretation of a head and- shoulders pattern. It is suggested that the shoulder at A follows a substantial rise in the market and is based on a heavy volume of trading. The surge in prices to the head at C is expected to be accompanied by a lighter volume of trading. Following another correction (i.e. fall) the price rises again, to E, but on a much lighter volume of trading.

One explanation of the head-and-shoulders pattern is based on behavioural finance. Investors, under the influence of psychological biases such as representativeness and overconfidence, participate in positive feedback trading. That is, they invest on the basis that the recent direction of price movement will continue. Recent share price rises are seen as indicating future rises with the effect that investors buy more shares. These share purchases cause further increases in stock prices; the forecasts become

self-fulfilling. The result is an upward trend in share prices. Some investors, less influenced by the psychological biases, take profits periodically by selling shares. As a result there are dips in the share price. These dips are followed by a resumption of the upward trend as the psychological biases reassert their influence. Each new share price peak is higher than the previous one, and each new trough is higher than the previous trough.

A partial explanation of the process comes from the behavioural finance concept of anchoring. Mussweiler and Schneller (2003) examined the effects of charts with salient highs and salient lows. The peaks of a head-and-shoulders pattern are examples of salient highs. Mussweiler and Schneller found that both private and professional investors anchored on the salient highs and lows. Salient highs and lows became comparison standards to which price expectations were assimilated. They also found that the process of assimilation was based on a selective accessibility mechanism similar to the operation of a confirmation bias. Subsequent to salient high investors would look for, and give emphasis to, information that justified the expectation of a price rise. The converse followed a salient low. Investors anchor on peaks and expect them to be repeated; what goes up will go up again. Vice versa is for troughs.

A chartist may see the head-and-shoulders pattern as indicating that the psychological biases, causing the positive feedback trading, are losing their strength. The first sign is the failure of a trough to be higher than the previous one (point D, sometimes referred to as the neckline). The second sign is a peak below the previous peak (point E, a shoulder). The third sign is a fall in the share price below the previous trough (below D). The chartist may then conclude that the positive feedback trading, caused by psychological biases, has run its course and that there is no longer an upward impetus to the market. A peak below a previous peak could be seen as indicating that the anchoring effect is weakening, or that it is being dominated by an underlying downward trend. On the grounds that the psychological biases would have led to an unjustifiably high stock price, the trading message drawn by a chartist would be that shares should be sold since they are due for a fall in price. Converse reasoning would explain the use of reverse head-and-shoulders, which indicates that stock prices will rise and that therefore shares should be bought. Osler (1998) tested the head-and-shoulders pattern

on the Dow Jones Industrial Average and concluded that the pattern was not a useful predictor.

Figures 15.8 to 15.11 illustrate some other reversal patterns looked for by chartists. In each case the dotted line indicates the general pattern that the actual charts (unbroken lines) are interpreted as revealing.

4. *Moving Averages*

Technical analysts use not only prices relating to individual dates, but also moving averages. A moving average is an average of a series of previous prices, for example the average of the last 200 daily prices. (Each day the oldest price is removed from the calculation of the average and the most recent price introduced). Chart patterns can be based on moving averages as well as daily prices.

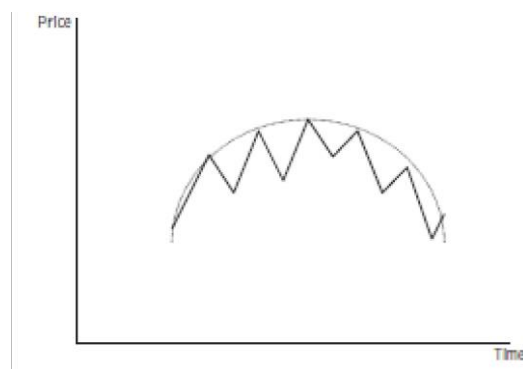


Figure 15.8: Rounding top reversal

One popular technique is to use moving averages and daily prices on the same chart. If the current price is a predetermined percentage above or below the moving average, a buy or sell

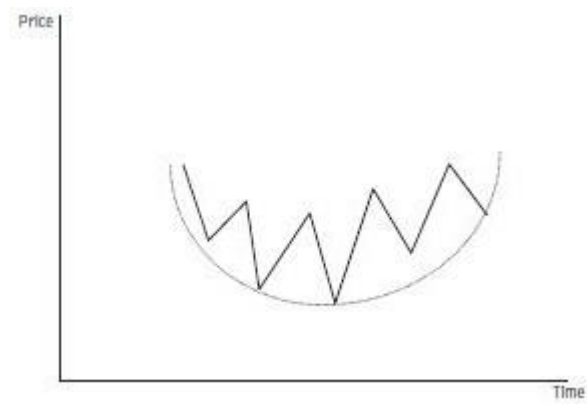


Figure 15.9: Rounding bottom reversal

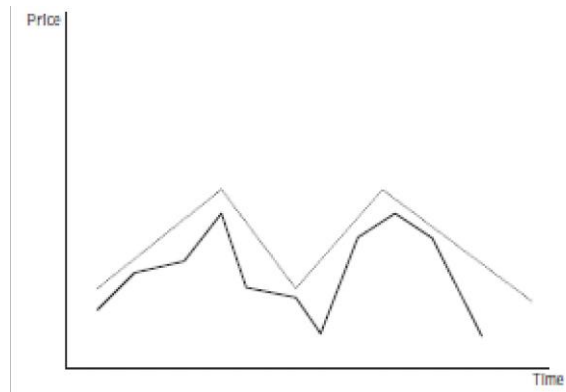


Figure 15.10 Double top reversal

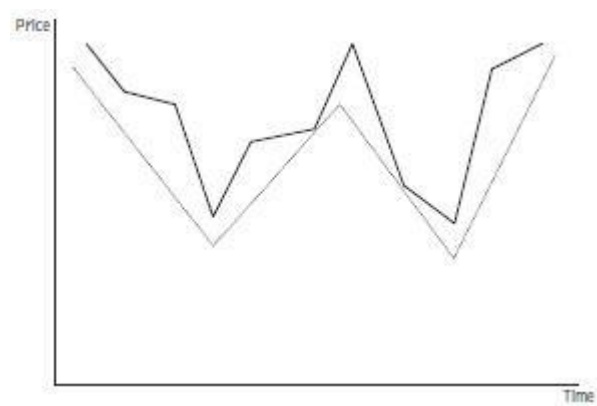


Figure 15.11: Double bottom reversal

signal may be indicated. For the market as a whole, the proportion of stocks currently above their moving average is seen as an indicator of general market sentiment. Points at which a chart of daily prices crosses a chart of moving averages are seen as significant. For example, a daily price chart that crosses a moving average chart from below might be seen as providing a buy signal. The signal may be dependent upon whether the moving average is rising or falling at the time. Each investor will have his or her individual trading rules.

5. *Dow Theory*

One of the oldest technical tools is the Dow theory. Its main purpose is to forecast the future direction of the overall stock market. The Dow theory is based on the belief that market movements are analogous to movements of the sea. It sees three simultaneous movements in the market. Daily or weekly fluctuations correspond to ripples. Secondary movements (which last a few months) are the waves. Primary trends of a year or more are analogous to tides. It is the primary trend that is referred to as either a bull or a bear market. The daily or weekly movements are seen as having little or no predictive value. However secondary movements in stock indices are used to forecast changes in the direction of the primary trend.

A bull market is characterised by both high and low points of successive secondary movements moving in an upward trend, especially if this were accompanied by rising volumes of stocks traded. Each new peak is above the previous peak, and each new trough is above the previous trough. Trading volume should increase with moves made in the direction of the primary trend; for a rising primary trend, volume should be heavier for advances than for falls. The market is sustained by rising support levels and would break through successively higher resistance levels. When the market eventually falls through a support level and then is unable to bounce back beyond a previous resistance level, the beginning of a bear market is signalled.

A bullish primary trend is seen as being initiated by informed investors, who anticipate a recovery. Subsequently uninformed investors start buying, thereby reinforcing the upward trend.

While the uninformed investors continue to buy, the informed investors start to sell. Sales by informed investors cause the temporary downturns (the waves).

6. *Elliot Wave Theory*

Elliot wave theory sees markets as moving in cycles. There are very long-run cycles that last many decades. Superimposed on these are cycles of shorter duration. In turn there are cycles of even shorter duration superimposed upon the latter cycles. This pattern of cycles within cycles continues down to cycles of very short duration.

Analysis of the Elliot cycles is based on waves. Each cycle has eight waves. Five waves carry the market up and three waves carry it down. At the end of the cycle the market is higher than at the beginning. This is illustrated by Figure 15.12. It can be seen that the first five waves include three up-waves and two down-waves. The peak is then followed by three waves, two of which are down-waves.

The pattern of waves entails a succession of support and resistance levels, in a similar way to Dow theory. Elliot wave theory assumes that markets are driven by investor psychology. After a fall in prices investor optimism is seen as growing slowly at first but later the optimism becomes excessive and leads to a bubble at which prices peak. The bubble bursts and the market is then carried lower in the wave pattern.

Elliot wave theory is sometimes supplemented by the use of Fibonacci numbers. Fibonacci numbers seem to fit the pattern of development of a range of natural phenomena from the reproduction of petals on a flower to the formation of galaxies. Some people believe that they can also explain stock market developments. Fibonacci numbers are taken from a sequence in which each number is found by adding together the previous two in the series. The sequence runs 1, 1, 2, 3, 5, 8, 13, 21, 34, and so forth. Users of the theory employ various combinations and ratios of Fibonacci numbers to predict market tops and bottoms, along with support and resistance levels.

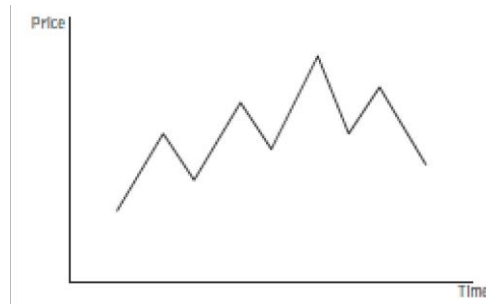


Figure 15.12: Waves

Elliot wave theory seems to lend itself to the use of Fibonacci numbers since it sees cycles as comprising eight waves, five on the upswing and three on the downswing. These are Fibonacci numbers.

15.4.5 Other Technical Indicators

The forecasting techniques of technical analysts are not limited to charts. Technical analysts also use filter rules, relative strength, and short interest ratios amongst many other indicators.

A filter rule states that an investor should buy when a stock price (or market index) has risen by a predetermined percentage above a previous low point. Conversely the investor should sell when the price or index falls by a particular percentage below a previous high. The percentages are at the discretion of the investor, but should be established prior to the market movements.

Relative strength is measured by the ratio of a stock price to a market index. Changes in the ratio are taken to indicate buying or selling opportunities. A momentum trader would take a rise in the ratio as a signal to buy the stock (and a fall as a signal to sell). A contrarian would interpret a rise in the ratio as a sell signal (and a fall as a buy signal).

The short interest ratio is the ratio of short sales (selling borrowed stock) to total trading. A rise in the ratio has two opposing interpretations. Some technical analysts see a rise in the ratio as indicative of bearish sentiment, and hence as constituting a sell signal. Others interpret a rise as a buy signal on the grounds that the short positions

will have to be covered by stock purchases. These stock purchases would tend to push up stock prices.

The trin statistic is the ratio of the average trading volume in declining stocks to average volume in rising stocks. Ratios above 1 are considered bearish on the grounds that a relatively high volume of trades in declining stocks is indicative of net selling pressure. Conversely ratios below 1 are seen as bullish. Apart from the trin statistic, generally trading volume is seen as indicative of the strength of a trend. A price movement accompanied by a relatively high quantity of trades is seen as more significant than one in a low volume market.

To a technical analyst the breadth of the market is the extent to which movement in a market index is reflected widely in the price movements of individual stocks. The most common measure of breadth is the difference between the number of stocks that rise and the number that fall. If the difference is large, the market movement is seen as strong since it is widespread. For example a market rise is regarded as stronger if a large majority of stocks are rising as opposed to the rise being the result of price increases for a few large capitalisation stocks.

Some technical analysts watch mutual fund cash holdings. If mutual funds (unit trusts and OEICs) have large cash holdings, technical analysts might forecast a market rise on the grounds that the cash will be used to buy shares. This demand for shares would tend to push prices up. Conversely low mutual fund cash holdings are seen as a bearish signal. There is little scope for purchases by mutual funds to support the market.

Another measure used by technical analysts is the put-call ratio. Put options give the right to sell shares at a specified price, and are bought by investors who expect share prices to fall. Call options give the right to buy shares at a specified price, and are bought by investors who expect share prices to rise. The ratio of puts bought to calls bought is used as an indicator of the expectations of investors. However technical analysts differ as to their interpretation of the ratio. Some see a high put-call ratio as bearish on the grounds that it indicates that investors (on balance) expect price falls. Other technical analysts take a contrarian view and see a high putcall ratio as a buy signal. Contrarian analysts base their analysis on the belief that investors are usually wrong.

Since there are many technical trading techniques, most technical analysts use a number of techniques (both chart and non-chart). It is typical for technical charts to contain several indicators.

Technicians often include as many price and volume indicators as are reasonable on one chart. It is unlikely that all the techniques point to the same conclusion. In the absence of consistency between the different indicators, a technical analyst is likely to use judgement to seek a consensus of the signals.

15.5 SUMMARY

Asset pricing under a portfolio theory approach assumes efficient markets, such that assets should be efficiently priced and the market portfolio represents the appropriate equity investment choice. Despite the efficient market hypothesis, there are reasons to believe that active management can have effective results.

There are two schools of thoughts as to how determines an overpriced or underpriced security. These are fundamental analysis and technical analysis.

Fundamental analysis studies the fundamental facts affecting a stock's value. Fundamental analysts delve into companies' earnings, their management, earnings forecasts, the firms' competition, market conditions and many other business and economic factors. The second school of thought determines overpriced or underpriced security by studying the way security prices behave over time.

Technical analysis concentrates almost totally on charts of security- market prices and related summary statistics of security trading.

15.6 GLOSSARY

- **Holding Period Return:** It is the return generated by fund/ security from the date of holding to the date of selling.
- **Fundamental Analysis:** Fundamental analysis relates to an examination of the intrinsic worth of the company, to find out whether the current market price is fair, overpriced or underpriced.

- **Technical Analysis:** Technical analysis is the study of internal stock market information.
- **Short Interest Ratio:** The short interest ratio is the ratio of short sales (selling borrowed stock) to total trading.

15.7 SELF ASSESSMENT QUESTIONS

1. How does technical analysis differ from fundamental analysis?

2. Mention the objectives of active portfolio management.

15.8 LESSON END EXERCISES

1. Explain various forecasting techniques of technical analysis.

2. Explain Dow theory and how is it used to determine the direction of stock market.

3. Write detailed note on fundamental information and technical analysis.

15.9 SUGGESTED READINGS

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BEHAVIOURAL CORPORATE FINANCE

**M.COM III SEM
MCOMFE355**

**UNIT- IV
LESSON - 16**

BEHAVIOURAL FACTORS AND CORPORATE DECISIONS ON CAPITAL STRUCTURE AND DIVIDEND POLICY

STRUCTURE

- 16.1 Introduction
- 16.2 Objectives
- 16.3 Behavioural Factors and Corporate Decisions on Capital Structure and Dividend Policy
 - 16.3.1 Behavioural Influences on Corporate Decision-Making
 - 16.3.2 Need for Behavioural Science to Improve Corporate Decision-Making
 - 16.3.3 Behavioural Factors and Corporate Decisions on Capital Structure
 - 16.3.4 Behavioural Factors and Corporate Decisions on Dividend Policy
- 16.4 Summary
- 16.5 Glossary
- 16.6 Self Assessment Questions
- 16.7 Lesson End Exercises
- 16.8 Suggested Readings

16.1 INTRODUCTION

Behavioural analysis of the corporate environment can inform the optimisation of internal information processing and decision-making. Some business services and consultancy

companies are advocating the value of incorporating Cognitive biases into strategic decision-making. Ensuring that managers and directors make better choices would enable businesses to achieve their goals more effectively. It would also improve compliance, which is especially important for heavily regulated industries, such as banking.

Corporate governance research has been increasingly dipping into the behavioural and Cognitive fields. Langevoort's work considers behavioural factors in the context of securities markets, corporate boards, and monitoring. Understanding behavioural biases that affect businesses is particularly important for big organisations. Multinational corporations and financial institutions are particularly vulnerable to biased decision making – the complexity of the organisation complicates the acquisition and processing of information. Awareness of the behavioural factors such as groupthink, confirmation bias, escalation, over optimism etc. allow senior corporate decision-makers in decision-making processes and ensure adequate dissemination and processing of information which would likely lead to a significant increase in the efficiency of corporate governance arrangements.

16.2 OBJECTIVES

After studying this lesson you should be able to:

- explain the importance of decisions regarding capital structure
- identify the behavioural factors that have bearing on determining the capital structure
- understand varied behavioural factors that influence dividend policy

16.3 BEHAVIOURAL FACTORS AND CORPORATE DECISIONS ON CAPITAL STRUCTURE AND DIVIDEND POLICY

16.3.1 Behavioural Influences on Corporate Decision-Making

Corporate governance research has been increasingly dipping into the behavioural and Cognitive fields. Langevoort's work considers behavioural factors in the context

of securities markets, corporate boards, and monitoring. Understanding behavioural biases that affect businesses is particularly important for big organisations. Multinational corporations and financial institutions are particularly vulnerable to biased decision making – the complexity of the organisation complicates the acquisition and processing of information. There are several heuristics and biases that are regularly discussed in relation to corporate decision-making. These are as follows:

- 1) **Over optimism:** It is considered to be a particularly strong influence, not in the least due to the corporate selection that generally favours optimistic individuals. Generally, optimism and confidence are beneficial for the organisations and facilitate effective and energetic working culture. However, over optimism and overconfidence can lead to excessive risk-taking with potentially disastrous consequences. Arguably, over optimism of the CEOs and senior management at major financial institutions was the driving force behind their aggressive risk-taking during the run-up to the 2008 financial crisis.
- 2) **Escalation:** Escalation of commitment is another powerful factor that can distort allocation of resources in a company. It reflects a behavioural pattern where an individual, when confronted with the negative outcome of a previous decision, tends to downplay the adverse consequences and increases risk-taking to avoid suffering a loss. In the corporate context, this bias results in significant degree of commitment to the decided upon course, which does not falter even at signs of trouble. The individuals involved in the decision making process will tend to interpret negative information positively, which will threaten effective internal communication and information processing in a company.
- 3) **Confirmation bias:** The confirmation bias leads decision-makers to misinterpret neutral information in a way that supports their previously formed beliefs. This bias may provide explanation for the merger decisions that have no or negative effects on profitability. Studies suggest that the way data is collected by the acquiring firms shifts the focus towards information favourable to the merger.
- 4) **Groupthink:** Groupthink is especially relevant in relation to board-level decision-making. It is a commonly shared view that group decision-making improves the

decision quality. However, this bias can effectively silence any dissent by imposing a presumption of unanimity within the group. To avoid the stress of re-evaluating a chosen stance, the group will tend to exclude or rationalise away any information contradicting it. This behavioural pattern weakens the evaluation of available information by the board members.

- 5) **Pluralistic:** Pluralistic ignorance is another factor potentially affecting boardroom decision-making. This social psychological bias causes all members of a group to uphold norms or rules that they themselves privately reject, but believe that all other members accept. This phenomenon provides insight into the failure of many boards to change the strategy in response to falling corporate performance.

Awareness of these behavioural factors would allow senior corporate decision-makers in decision-making processes and ensure adequate dissemination and processing of information. That would likely lead to a significant increase in the efficiency of corporate governance arrangements.

16.3.2 Need for Behavioural Science to Improve Corporate Decision-Making

Outcomes of corporate misconduct differ in their severity. From loss of profits to public condemnation and legal consequences for the employees involved, consequences of flawed decision-making can be disastrous. There might be a way to rectify those flaws by correcting systematic decision-making pitfalls, instead of focusing on individual failings.

Behavioural analysis of the corporate environment can inform the optimisation of internal information processing and decision-making. Some business services and consultancy companies are advocating the value of incorporating Cognitive biases into strategic decision-making. Ensuring that managers and directors make better choices would enable businesses to achieve their goals more effectively. It would also improve compliance, which is especially important for heavily regulated industries, such as banking.

Development of specific behavioural solutions requires empirical research into internal corporate processes.

16.3.3 Behavioural Factors and Corporate Decisions on Capital Structure

The capital structure that companies must choose in order to minimize the cost of capital is a question of great theoretical and practical interest. And it is one of the most controversial subjects in corporate finance to this day.

There are several approaches that comprise the theory of capital structure. Let us start with the *trade-off* and *pecking order* traditional theories.

1. Modigliani and Miller (1958) demonstrated that, in a frictionless and efficient market, managers' financing choices are unable to reduce the cost of capital. In this theory, usually called trade-off theory, the cost of the different financing options is so intertwined that there is no advantage in changing between them, for instance, substituting debt by equity or short-term debt by long-term debt. The conclusion is that the capital structure is irrelevant.

More than describing reality, trade-off theory allows us to identify the factors that can counter the model's conclusions and that can make the firm's capital structure relevant. Taxes and bankruptcy costs are two examples. The next logical step was to research the impact of those variables. Introducing debt fiscal effects and bankruptcy costs in trade-off theory enables us to determine the level of debt that minimises the cost of capital in the firm's capital structure. Put another way, there is now an optimal capital structure that is characterised by a debt ratio that should be pursued by the company. Dynamic adjustment models are another development of trade-off models. In these models, the trade-off prolongs over time and it is assumed that, although the company does not have an optimal capital structure at a given moment, this is caused by adjustment costs and other shocks that affect the debt ratio. Regardless of that, it is argued that the firm will tend towards the optimal capital structure even if the target changes over time.

2. In the pecking-order theory proposed by Myers and Majluf (1984) the assumption is that managers are better informed than investors know that and are thus

reluctant to buy securities (bonds and shares) issued by the company. Added to this, the manager is also aware of the investor's reluctance. In these conditions, companies will favour financing according to a ranking of the different sources of capital: first, they will try to use retained earnings (internal financing), then debt instruments and only in extreme circumstances will they issue shares. The capital structure is a result of the different options available to the manager in the mentioned circumstances and therefore in the pecking-order theory there is no optimal capital structure for the company.

In addition to the traditional theories and over time, new models have been created that can identify a high number of factors relevant to the determination of the capital structure. We refer to; for instance, models where the capital structure is designed to minimise the existing conflicts of interest between the several groups entitled to receive cash flows generated by the firm (stakeholders) including managers (agency theory) or to relay useful information to capital markets (signalling theory).

In the face of this proliferation of theoretical frameworks, what can we say about what really happens with companies' capital structures? On the relation between the theoretical and empirical components on capital structure studies we must highlight two issues.

1. First, it is necessary to note that empirical studies have not been able to clearly identify what capital structure determinants have proven to be more relevant in each context.

In other words, the capital structure of a firm's issue has to be resolved empirically as there are several theories that propose contradicting predictions (seldom) but also because they are complementary (in most cases), which does not define their application in particular contexts. The study of the impact of personal characteristics of managers in corporate finance choices can provide relevant leads towards that purpose.

2. Second, it should be noted that none of the traditional theories seem to hold in reality. More specifically, some empirical evidence, especially that which concerns the persistence of capital structures that are attributable to specific factors of the

company, finds no clear explanation in any of the existing theories. Traditional theories have a hard time explaining why companies that share the same fundamentals and belong to the same industry persist in resorting to different sources of financing. Companies' capital structures seem to depend more on specific factors than on factors that affect the majority of organisations. A number of contradictory empirical studies raise the question about the validity of every theoretical approach and has caused researchers to focus more keenly on the factors that really determine the capital structure. Among the factors that explain the decision on the business' finance looms the influence of the manager.

Deciding on the capital structure is to determine the corporate choice between debt and equity. When an organization chooses a capital structure suitable to its internal environment, several questions shall arise, whether it is optimum or not, does it had low Weighted average cost of capital (WACC), what is likely to be the impact of such debt equity ratio on value of the firm etc. Modigliani and Miller attempted to explain how firms choose their capital structure and whether an optimal capital structure actually exists, which contains both debt and equity. The behavioural factors influencing capital structure decisions can be broadly classified under two heads:

- Behavioural factors based on capital structure theories
- Behavioural factors based on type of management

Behavioural factors based on capital structure theories

- 1) ***Tax based theories and bankruptcy costs:*** Financial managers believe that tax saving is an important tool for maximization of firm value. When all things remains same, a firm's ability to save tax increase a projects cash generation capabilities. Anchored with this type of tendency managers get into a debt trap that can considerably increase their bankruptcy costs. Credit rating is completely ignored in such circumstances which results in increased cost of capital, leading to devaluation of entities securities. Overconfidence is also an important factor that encourages management to put heavy faith on debt capital. Executives fail to read the business cycles, over optimizes with past achievements does not care the raising degree of financial leverage (DOL) in the business.

- 2) ***Agency cost theories:*** Separation of management and ownership always carries agency cost, in the sense that management does not act in the best interest of owners. That means, at the time of taking decisions on capital structure, they give unnecessary importance to safety by ignoring the benefits of business. Instead of managing the risk, management tends to minimize the risk at the cost of owner's funds. This is the reason why, it was said that for management, equity is like a pillow and debt is a sword. This is the result of underestimating the entities capabilities due to over pessimism on the part of managerial behaviour.
- 3) ***Asymmetric information theories:*** Supply and demand factors relating flow of capital in capital markets is an important factor at a given point of time when capital is to be raised. Information about which is more accessible to management rather than investors. This asymmetric information leads to irrational behaviours. Availability heuristics drives investor's attitudes in stock markets as a response to capital structure decision taken by management. Suppose management raised further capital through issue of debt securities. Management had the analytical and researched information that currently there is good supply of debt capital and there are likely chances for RBI to raise interest rates in the economy. But the investors, who does had this information perceives increasing financial risk. Those with high risk aversion tendency will try to sell their holding to get away from perceived risk which really does not exists.

Behavioural factors based on type of management

Why managers make certain financing choices is also depending on type of management. Overconfidence as a particular behavioural bias in capital structure decisions is sources from following styles of management.

- 1) ***Owner-management:*** In this case, entrepreneurial nature of the managers tends to display overconfidence Cognitive biases more frequently than non entrepreneurial (employee) managers. This is mainly due to lack of minimum fear or greed creeping in mind to outperform in the market. Capital structures are found to be highly levered when the management is in the hands of founder or owners.

2) **Hired-management:** Opposite behaviour is exhibited by non entrepreneurial managers who actually avoid risks. They tend to show risk aversion, as they think it is unnecessary to do experiments for same level of return (managerial remuneration). They generally fear being fired out. Hence general tendency is that such organization remains unlevered or low levered. However, sometimes hired management assumes too risky decisions in structuring the capital by raising more debt capital for investing in highly risk projects (near to gambling). They take it as a last resort to help themselves before being fired by owners for current trend of losses. Thus loss aversion biases tunes capital structure.

16.3.4 Behavioural Factors and Corporate Decisions on Dividend Policy

Merton Miller and Franco Modigliani (MM) provided the standard neoclassical treatment for dividend policy. The central premise of the MM framework is that the value of a firm depends solely on its earnings power and is not influenced by the manner in which its earnings are split between dividends and retained earnings.

The substance of MM argument may be stated as follows: If a company retains earnings instead of giving it as dividends, the shareholders enjoy capital appreciation equal to the amount of earnings retained. If it distributes earnings by way of dividends instead of retaining it, the shareholders enjoy dividends equal in value to the amount by which his capital would have been appreciated had the company chosen to retain its earnings.

Hence, the division of earnings between dividends and retained earnings is irrelevant from the point of view of the shareholders.

Behavioural factors influencing payment of dividend

Despite the tax disadvantage of dividends and the issuance costs associated with external equity, firms pay dividends and investors generally regard such payments positively. Reasons for such behaviour can be analogized as under:

- 1) Investors behavioural preference for dividends
- 2) Information signaling
- 3) Clientele effect and

4) Agency costs

1. *Investor preference for dividends:* If taxes and transaction costs are ignored, dividends and capital receipts should be perfect substitutes. Yet there appears to be a strong demand or preference for dividends. Hersh Shefrin and Meir Statman offer explanations based on the behavioural principles of self control and aversion for regret. In essence, their argument is that investors have a preference for dividends due to behavioural reasons. Hence, dividends and capital receipts are not perfectly substitutable.

(a) **Self-control and Dividends:** Individuals often lack self control. So, they rely on rules and programmes which check their temptations. Smoking clinics, diet programmes and the like exist because they help in disciplining individuals with weak determination. In the realm of personal financial management, individuals would like to protect their principal from their spendthrift tendencies. A simple way to do this is to limit their spending to the dividend income so that the capital amount is maintained intact. Such a rule explains a preference for dividend by those who otherwise have difficulty in exercising self-control.

(b) **Aversion to Regret and Dividends:** Look at the following two cases:

- You receive Rs. 30,000 as dividend and use it to buy a television set.
- You sell a portion of your shares for 30000 and buy a television set.

The price of the stock rises sharply subsequently. In which case would we experience more regret? Although dividends and capital receipts are perfectly substitutable, when taxes and transaction costs are abstracted away, empirical evidence suggests that most people feel more regret when they sell the stock because they can readily imagine the consequences of that action. Hence, it is believed that persons who have an aversion to regret prefer dividend income to capital receipt, even though the two are perfect substitutes in finance theory. Hence there is a demand for dividend.

2. *Informational signaling:* Management often has significant information about

the prospects of the firm that it cannot disclose to investors. The information gap between management and shareholders generally causes stock prices to be less than what they would be under conditions of information symmetry.

How can firms that have promising prospects convey information credibly to the market? According to signaling theory, these firms need to take actions that cannot be easily imitated by firms that do not have such promising projects. One such action is to pay more dividends. Increasing dividends suggests to the market that the firm is confident to its earning prospects that will enable it to maintain higher dividend in future as well. This is a positive signal for the market and it has buoying effect on the stock prices.

By the same token, a decrease in dividends is perceived as a negative signal by the market because firms are reluctant to cut dividends. Consequently, such an action leads to a drop in stock prices.

By and large, the empirical evidence concerning market reaction to dividend increases and decreases is consistent with these stories.

3. ***Clientele effect:*** Investors have diverse preference. Some want more dividend income; others want more capital gains; still others want a balanced mix of dividend income and capital gains. Over a period of time, investors naturally migrate to firms which have a dividend policy that matches their preferences. The concentration of investors in companies with dividend policies that are matched to their preferences is called the clientele effect. The existence of a clientele effect implies that (a) firms get the investors they deserve and (b) it will be difficult for a firm to change an established dividend policy.
4. ***Agency costs:*** If shareholders have complete faith in the integrity and rationality of management, there is no reason why a company that has profitable investment opportunities should pay any dividend. In reality, however, shareholders rarely consider management as a perfect agent. They are concerned that management may squander money over uneconomic projects. And, that is where the relevance of dividends lies. Several scholars have argued that dividends can mitigate agency

costs. A firm that pays regular dividends can reduce managerial propensity to waste resources.

16.4 SUMMARY

Outcomes of corporate misconduct differ in their severity. From loss of profits to public condemnation and legal consequences for the employees involved, consequences of flawed decision-making can be disastrous. There might be a way to rectify those flaws by correcting systematic decision-making pitfalls, instead of focusing on individual failings. Behavioural analysis of the corporate environment can inform the optimisation of internal information processing and decision-making.

Deciding on the capital structure is to determine the corporate choice between debt and equity. When an organization chooses a capital structure suitable to its internal environment, several questions shall arise, whether it is optimum or not, does it have low WACC, what is likely to be the impact of such debt equity ratio on value of the firm etc. Modigliani and Miller attempted to explain how firms choose their capital structure and whether an optimal capital structure actually exists, which contains both debt and equity. The behavioural factors influencing capital structure decisions can be broadly classified under two heads: behavioural factors based on capital structure theories and behavioural factors based on type of management.

Despite the tax disadvantage of dividends and the issuance costs associated with external equity, firms pay dividends and investors generally regard such payments positively. Reasons for such behaviour are investors' behavioural preference for dividends, information signaling, clientele effect and agency costs.

16.5 GLOSSARY

- **Escalation:** It reflects a behavioural pattern where an individual, when confronted with the negative outcome of a previous decision, tends to downplay the adverse consequences and increases risk-taking to avoid suffering a loss.
- **Capital Structure:** Capital Structure (also known as Financial Structure) is the mix of various types of long-term sources of funds, namely debentures, bonds,

loans from financial institutions, preference shares and equity shares (including retained earnings).

- **Clientele Effect:** The concentration of investors in companies with dividend policies that are matched to their preferences is called the clientele effect.

16.6 SELF-ASSESSMENT QUESTIONS

1. What is capital structure? Explain the importance of capital structure and planning?

2. Mention different behavioural factors that influence corporate decision making.

16.7 LESSON END EXERCISES

1. Explain how different behavioural factors affect dividend decision.

2. Why are managers of firms likely to be overconfident when they make capital structure decisions?

16.8 SUGGESTED READINGS

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**UNIT- IV
LESSON - 17**

CAPITAL STRUCTURE DEPENDENCE ON MARKET TIMING

STRUCTURE

17.1 Introduction

17.2 Objectives

17.3 Determinants of Capital Structure

17.4 Capital Structure Dependence on Market Timing

17.5 Summary

17.6 Glossary

17.7 Self Assessment Questions

17.8 Lesson End Exercises

17.9 Suggested Readings

17.1 INTRODUCTION

Planning the capital structure is one of the most complex areas of financial decision making because of the inter-relationships among components of the capital structure and also its relationship to risk, return and value of the firm. Debt capital and ownership capital are the two basic components of capital. Equity capital, as one of the components of capitalization, comprises equity share capital and retained earnings. Preference share capital is another distinguishing component of total capital.

Capital structure is usually planned keeping in view the interests of the ordinary shareholders. The ordinary shareholders are the ultimate owners of the company and have the right to elect the directors. While developing an appropriate capital structure for his company, the financial manager should aim at maximising the long-term market price of equity shares. In practice, for most companies within an industry, there would be a range of appropriate capital structures within which there are not many differences in the market values of shares. A capital structure in this context can be determined empirically. For example, a company may be in an industry that has an average debt to total capital ratio of 60 per cent. It may be empirically found that the shareholders in general do not mind the company operating within a 15 per cent range of the industry's average capital structure. Thus, the appropriate capital structure for the company ranges between 45 per cent to 75 per cent debt to total capital ratio. The management of the company should try to seek the capital structure near the top of this range in order to make maximum use of favourable leverage, subject to other requirements such as flexibility, solvency, etc. A sound appropriate capital structure should have the following features:

1. **Profitability:** The capital structure of the company should be most advantageous, within the constraints. Maximum use of leverage at a minimum cost should be made.
2. **Solvency:** The use of excessive debt threatens the solvency of the company. Debt should be used judiciously.
3. **Flexibility:** The capital structure should be flexible to meet the changing conditions. It should be possible for a company to adapt its capital structure with minimum cost and delay if warranted by a changed situation. It should also be possible for the company to provide funds whenever needed to finance its profitable activities.

In other words, from the solvency point of view we need to approach capital structuring with due conservation. The debt capacity of the company which depends on its ability to generate future cash flows should not be exceeded. It should have enough cash to pay periodic fixed charges to creditors and the principal sum on maturity.

17.2 OBJECTIVES

After studying this lesson, you should be able to:

- identify the determinant of capital structure
- explain the relationship between market timing and capital structure

17.3 DETERMINANTS OF CAPITAL STRUCTURE

Capital structure has to be determined at the time a company is promoted. The initial capital structure should be designed very carefully. The management of the company should set a target capital structure and the subsequent financing decisions should be made with a view to achieve the target capital structure. Once a company has been formed and it has been in existence for some years, the financial manager then has to deal with the existing capital structure. The company may need funds to finance its activities continuously. Every time the funds have to be procured, the financial manager weighs the pros and cons of various sources of finance and selects most advantageous sources keeping in view the target capital structure: Thus the capital structure decision is a continuous one and has to be taken whenever a firm needs additional finance. Generally, the factors to be considered whenever a capital structure decision is taken are: (i) Leverage or Trading on equity, (ii) Cost of capital, (iii) Cash flow, (iv) Control, (v) Flexibility, (vi) Size of the company, (vii) Marketability, and (viii) Floatation costs.

- **Trading on Equity**

The word “equity” denotes the ownership of the company. Trading on equity denotes taking advantage of equity share capital to borrowed funds on reasonable basis. It refers to additional profits that equity shareholders earn because of issuance of debentures and preference shares. It is based on the thought that if the rate of dividend on preference capital and the rate of interest on borrowed capital is lower than the general rate of company’s earnings, equity shareholders are at advantage which means a company should go for a judicious blend of preference shares, equity shares as well as debentures. Trading on equity becomes more important when expectations of shareholders are high.

- **Cost of Capital**

Measuring the costs of various sources of funds is a complex subject and needs a separate treatment. Needless to say that it is desirable to minimise the cost of capital. Hence, cheaper sources should be preferred, other things remaining the same.

The cost of a source of finance is the minimum return expected by its suppliers. The expected return depends on the degree of risk assumed by investors. A high degree of risk is assumed by shareholders than debt-holders. In the case of debt-holders, the rate of interest is fixed and the company is legally bound to pay interest, whether it makes profits or not. For shareholders the rate of dividend is not fixed and the Board of Directors has no legal obligation to pay dividends even if the profits have been made by the company. The loan of debt-holders is returned within a prescribed period, while shareholders can get back their capital only when the company is wound up. This leads one to conclude that debt is a cheaper source of funds than equity. The tax deductibility of interest charges further reduces the cost of debt. The preference share capital is cheaper than equity capital, but is not as cheap as debt is. Thus, in order to minimise the overall cost of capital, a company should employ a large amount of debt.

- **Cash Flow**

One of the features of a sound capital structure is conservation. Conservation does not mean employing no debt or a small amount of debt. Conservatism is related to the assessment of the liability for fixed, charges, created by the use of debt or preference capital in the capital structure in the context of the firm's ability to generate cash to meet these fixed charges.

The fixed charges of a company include payment of interest, preference dividend and principal. The amount of fixed charges will be high if the company employs a large amount of debt or preference capital. Whenever a company thinks of raising additional debt, it should analyse its expected future cash flows to meet the fixed charges. It is obligatory to pay interest and return the principal amount of debt. If a company is not able to generate enough cash to meet its fixed obligations, it may have to face financial insolvency. The companies which expect large and stable cash inflows can employ a large amount of debt in their capital structure. It is somewhat risky to employ sources

of capital with fixed charges for companies whose cash inflows are unstable or unpredictable.

- **Control**

In designing the capital structure, sometimes the existing management is governed by its desire to continue control over the company. The existing management team may not only want to be elected to the Board of Directors but may also desire to manage the company without any outside interference.

The ordinary shareholders have the legal right to elect the directors of the company. If the company issues new shares, there is a risk of loss of control. This is not a very important consideration in case of a widely held company. The shares of such a company are widely scattered. Most of the shareholders are not interested in taking active part in the company's management. They do not have the time and urge to attend the meetings. They are simply interested in dividends and appreciation in the price of shares. The risk of loss of control can almost be avoided by distributing shares widely and in small lots.

Maintaining control however could be a significant question in the case of a closely held company. A shareholder or a group of shareholders could purchase all or most of the new shares and thus control the company. Fear of having to share control and thus being interfered by others often delays the decision of the closely held companies to go public. To avoid the risk of loss of control the companies may issue preference shares or raise debt capital.

Since holders of debt do not have voting right, it is often suggested that a company should use debt to avoid the loss of control. However, when a company uses large amounts of debt, lot of restrictions are imposed on it by the debt-holders to protect their interests. These restrictions curtail the freedom of the management to run the business. An excessive amount of debt may also cause bankruptcy, which means a complete loss of control.

- **Flexibility**

Flexibility means the firm's ability to adapt its capital structure to the needs of the

changing conditions. The capital structure of a firm is flexible if it has no difficulty in changing its capitalisation or sources of funds. Whenever needed the company should be able to raise funds without undue delay and cost to finance the profitable investments. The company should also be in a position to redeem its preference capital or debt whenever warranted by future conditions. The financial plan of the company should be flexible enough to change the composition of the capital structure. It should keep itself in a position to substitute one form of financing for another to economise on the use of funds.

- **Size of the Company**

The size of a company greatly influences the availability of funds from different sources. A small company may often find it difficult to raise long-term loans. If somehow it manages to obtain a long-term loan, it is available at a high rate of interest and on inconvenient terms. The highly restrictive covenants in loans agreements of small companies make their capital structure quite inflexible. The management thus cannot run business freely. Small companies, therefore, have to depend on owned capital and retained earnings for their long-term funds.

A large company has a greater degree of flexibility in designing its capital structure. It can obtain loans at easy terms and can also issue ordinary shares, preference shares and debentures to the public. A company should make the best use of its size in planning the capital structure.

- **Marketability**

Marketability here means the ability of the company to sell or market particular type of security in a particular period of time which in turn depends upon -the readiness of the investors to buy that security. Marketability may not influence the initial capital structure very much but it is an important consideration in deciding the appropriate timing of security issues. At one time, the market favours debenture issues and at another time, it may readily accept ordinary share issues. Due to the changing market sentiments, the company has to decide whether to raise funds through common shares or debt.

If the share market is depressed, the company should not issue ordinary shares but issue debt and wait to issue ordinary shares till the share market revives. During boom period in the share market, it may not be possible for the company to issue debentures successfully. Therefore, it should keep its debt capacity unutilised and issue ordinary shares to raise finances.

- **Floataction Cost**

Floataction cost are incurred when the funds are raised. Generally, the cost of floating a debt is less than the cost of floating an equity issue. This may encourage a company to use debt rather than issue ordinary shares. If the owner's capital is increased by retaining the earnings, no floataction costs are incurred. Floataction cost generally is not a very important factor influencing the capital structure of a company except in the case of small companies.

17.4 CAPITAL STRUCTURE DEPENDENCE ON MARKET TIMING

In corporate finance, "equity market timing" refers to the practice of issuing shares at high prices and repurchasing at low prices. The intention is to exploit temporary fluctuations in the cost of equity relative to the cost of other forms of capital. In the efficient and integrated capital markets studied by Modigliani and Miller (1958), the costs of different forms of capital do not vary independently, so there is no gain from opportunistically switching between equity and debt. In capital markets that are inefficient or segmented, by contrast, market timing benefits ongoing shareholders at the expense of entering and exiting ones. Managers thus have incentives to time the market if they think it is possible and if they care more about ongoing shareholders.

In practice, equity market timing appears to be an important aspect of real corporate financial policy. There is evidence for market timing in four different kinds of studies.

1. First, analyses of actual financing decisions show that firms tend to issue equity instead of debt when market value is high, relative to book value and past market values, and tend to repurchase equity when market value is low.
2. Second, analyses of long-run stock returns following corporate finance decisions suggest that equity market timing is successful on average. Firms issue equity

when the cost of equity is relatively low and repurchase equity when the cost is relatively high.

3. Third, analyses of earnings forecasts and realizations around equity issues suggest that firms tend to issue equity at times when investors are rather too enthusiastic about earnings prospects.
4. Fourth, and perhaps most convincing, managers admit to market timing in anonymous surveys.

Timing is always important in financing more particularly in a growing concern. Maneuverability principle is sought to be adhered in choosing the types of funds so as to enable the company to seize market opportunities and minimize cost of raising capital and obtain substantial savings. Important point that is to be kept in mind is to make the public offering of such securities as are greatly in demand. Depending on business cycles, demand of different types of securities oscillates. Equity share during boom is always welcome.

Baker and Wurgler introduced a —market – timing hypothesis for capital structure theory. In the context of capital structure, market timing refers to management's effort to take advantage of market conditions to minimize the cost of capital. A manager who is timing the market would choose to issue equity when stock prices are perceived to be overvalued and repurchase equity when stock prices are relatively low.

Market to Book Value Ratio: Market to book value ratio plays a significant role in market timing. This relative valuation of equity indicates there is strong, negative correlation between high levels of leverage and high market – to – book ratios. High ratio is an indication for predicting managers to issue stock and low ratio indicates possible buy-back of securities by management. This results in higher levels of debt when stock prices are relatively low and vice versa.

Long Term Impact: This practice of market timing has a persistent impact on long-term capital structure, leading to the conclusion that capital structure is related to historical market values.

Interest Rates: Market timing of capital structure is dependent on perceived interest rates. Firm's management issues significantly higher amounts of debt when long-term interest rates were perceived to be low relative to historical values. Although refinancing activities can explain some of this activity, non-refinancing activity is also considerably higher when interest rates are relatively low.

Results of Timing Strategies: Generally market-timing driven equity issuances are likely to be beneficial because stock prices tend to decline after the equity issuance. This resulted in a lower cost of equity for issuing firms relative to their non-issuing peers.

Firms that make accurate anticipation of future interest rates shall have decrease in the overall cost of debt. They do this by issuing long term debt during increasing interest rate predictions and short term debt in decreasing interest rate conditions.

17.5 SUMMARY

Capital structure is the composition of various sources of long-term finance in the total capitalisation of the company. The two main sources are ownership and creditor ship securities. Both types of securities as well as the long-term loans from financial institutions are used by most of the large industrial companies.

Capital structure planning, initially and on continuing basis, is of great importance to any company as it has a considerable bearing on its profitability. A wrong initial decision in this respect may prove quite costly for the company.

Many corporate financing decisions depend on market valuations. Firms tend to issue equity instead of debt when market value is high, relative to book value and past market values, and repurchase equity when market value is low. These relationships are strong and regular, apparent across business cycles and around the world.

In the market timing theory, managers may conclude that their stock is overvalued or undervalued and that outside investors will under-react to issue or repurchase announcements. This under-reaction leaves some room to exploit the perceived mispricing and thereby benefit ongoing shareholders.

17.6 GLOSSARY

- **Cost of Capital:** Cost of Capital is the (weighted) average cost of various sources of finance used by a company.
- **Equity Market Timing:** It refers to the practice of issuing shares at high prices and repurchasing at low prices. The intention is to exploit temporary fluctuations in the cost of equity relative to the cost of other forms of capital.
- **Financial Leverage:** Financial Leverage (or Trading on Equity) is an aspect of financial planning which enables the company to enhance the return on equity shares by using debt with lower fixed cost which is less than the overall return on investment. Financial leverage magnifies the effect of changes in EBIT (Earnings Before Interest and Taxes) on EPS (Earnings Per Share).
- **Trading on Equity:** Trading on equity denotes taking advantage of equity share capital to borrowed funds on reasonable basis. It refers to additional profits that equity shareholders earn because of issuance of debentures and preference shares

17.7 SELF ASSESSMENT QUESTIONS

1. Explain how market factors have impact on the decision-making of the investors.

2. What is the importance of the herding effect in decision making?

17.8 LESSON END EXERCISES

1. “Decision processes are Cognitive illusion.” Explain.

2. Explain how market timing affects capital structure decision.

17.9 SUGGESTED READINGS

1. Benartzi, S. and R. H. Thaler (1995). 'Myopic Loss Aversion and the Equity Premium Puzzle', Quarterly Journal of Economics, 110.
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**UNIT- IV
LESSON - 18**

SYSTEMATIC APPROACH USING BEHAVIOURAL FACTORS IN CORPORATE DECISION MAKING AND INVESTOR BEHAVIOUR, MECHANISMS OF EXTERNAL FACTORS INFLUENCE ON RISK PERCEPTION AND ATTITUDE

STRUCTURE

- 18.1 Introduction
- 18.2 Objectives
- 18.3 Systematic Approach Using Behavioural Factors in Corporate Decision Making
- 18.4 External Factors and Investor Behaviour
- 18.5 Mechanisms of External Factors Influence on Risk Perception and Attitude
- 18.6 Summary
- 18.7 Glossary
- 18.8 Self Assessment Questions
- 18.9 Lesson End Exercises
- 18.10 Suggested Readings

18.1 INTRODUCTION

From the previous lessons, we have come to know that behavioural finance theories are based on the psychology, and are able to have come to tell that individual investor's

behaviour is influenced by emotions and Cognitive errors. The regulators of stock market cannot discount the behaviour of individual investor as they play a very important role in the stock market because of their savings. The investment decision of individual in the stock market is influenced by several behavioural factors, characteristics of market participants as well as market outcomes. The two building blocks of behavioural finance are Cognitive psychology and the limits to arbitrage. Cognitive psychology refers to how people think in different situations and Limits to arbitrage refers to predicting in what conditions arbitrage forces will be effective and when they are not effective. The stock market irregularities are explained by behavioural finance because it proposes psychology based theories. In this lesson, stress is on external factors—how they affect the investor's behaviour?

18.2 OBJECTIVES

After studying this lesson, you should be able to:

- know about systematic approach of using behavioural factors in corporate decision-making
- understand how investor behaviour is affected by different external factors

18.3 SYSTEMATIC APPROACH USING BEHAVIOURAL FACTORS IN CORPORATE DECISION MAKING

A systematic approach to using behavioural factors assumes that rational managers need to work in the best interest of long terms investors. This is like rational mangers with irrational investors approach. Accordingly, managers recognize market inefficiencies or mispricing to make decisions that exploit or further encourage mispricing. The decisions that they take to maximize the short-term value of the firm, however, may lower the long-run value of the firm when prices converge to fundamental values. It appears that manager balance three objectives:

- 1) Fundamental value
- 2) Catering and
- 3) Market timing

The first goal is to maximize the intrinsic value of the firm. This means choosing and financing investment projects mean to increase the rationally risk-adjusted present value of future cash flows.

The second goal is to maximize the current market value of the firm. In a perfect (efficient) capital market, the first two objectives are the same, since market efficiency implies that price equals fundamental value. However, when there is mispricing, managers try to cater to short term investor demand by choosing investment projects or financing packages or other actions that maximize the appeal of the firm's securities to investors. Inter alia, catering may include:

- Investing in a particular technology that is currently in boom.
- Adopting a conglomerate structure or a single – segment structure depending on what the market fancies.
- Changing the name of the company. For instance, during the internet craze of late 1990's many companies changed their names to —dotcom names.
- Initiating dividends.
- Issuing bonus shares or splitting shares.

The third goal is to exploit the current mispricing for furthering the interest of existing, long term investors. This involves selling securities that are temporarily overpriced and repurchasing securities that are temporarily underpriced. Such a policy transfers wealth from the new or the outgoing investors to old or the ongoing long run investors. The wealth so transferred is realized as mispricing corrects itself in the long run.

Behavioural finance is based on human psychology and suggests that human decision processes are subject to several Cognitive illusions. These illusions are divided into four categories: heuristic theory, prospect theory, market factors, and herding effect.

Heuristic Approach

Heuristics theory finds an easy-going approach which helps in making decisions easier especially in complex and uncertain environment. This theory helps in sinking the complexity of evaluating probabilities and also helping in forecasting the values to

simpler judgments. In real life when there is limited time to take a decision, heuristic theory is very useful but in some situations they give a biased decision. Kahneman and Tversky have given the three factors which are related to heuristic theory as follows:

- Representativeness
- Availability bias
- Anchoring

Prospect Theory

Stock market is influenced by two types of decision-making, so we consider two different approaches for it—Expected Utility Theory (EUT) and prospect theory for different perspectives. Prospect theory is based on subjective decision-making which is influenced by the value system of the investors, whereas expected utility theory is based on investors' rational prospect.

- Prospect theory explains the individual decision-making processes. As decisions are affected by mental biases, which includes mental accounting, loss aversion, regret aversion.
- Expected utility theory governs the analysis of decision-making under risk. It considers two models relating to the behaviour of the investors, first is the normative model of rational behaviour and the descriptive model of economic behaviour. But this theory fails to explain why people react differently to similar situations on the context of losses or gains and people are also attracted towards both insurance and gambling.

Market Variables

Market factors also have a great impact on the decision-making of the investors. The behaviour of the investor affects the financial market, which we can now study through our approach of behavioural finance. If the perceptions related to behavioural finance are accurate, it is believed that the investors may react on over- or under changes in price or news; the effect of the past trends of the market in the future; a lack of attention to fundamentals underlying a stock; seasonal changes in price cycles, and

the focus on popular stocks. These market variables affect the decision-making of investors in the stock market. It is identified that the market variables which have great impact on the decision-making of the investors such as: price changes, market information, past trends of stocks, customer preference, over-reaction to price changes, and fundamentals of underlying stocks. These are some important factors of market which affects the decision of the investors.

Herding Effect

Herd behaviour describes how individuals in a group can act collectively without centralized direction. An integrated approach to herding describes two key issues, which are the mechanism of transmission of thoughts or behaviour between individuals and the patterns of connections between them. They suggested that bringing together diverse theoretical approaches of herding behaviour illuminates the applicability of the concept to many domains, ranging from Cognitive neuroscience to economics.

Herding effect explains that the investors believe on collective information as compared to private information which can result in the price deviation of the securities from fundamental value that can impact the investment. Herding impacts on stock price changes influence the attributes risk which untimely impact on the asset pricing theories. If the perception related to behavioural finance is accurate, herding can cause some emotional biases, including conformity, congruity and Cognitive conflict, the home bias and gossip. Most of the investors don't prefer herding but only prefer if it provides useful and reliable information.

It is identified about the stock investment decisions that can impact the investor: buying, selling, choice of stock, length of time to hold stock, and volume of stock to trade. He also concludes that the decisions of an investor related to buying and selling are affected by the decisions of others. Herding behaviour helps investors to take their own decisions which also help them to regret aversion. Therefore, herding effect also influences the decision-making of individual investment.

18.4 EXTERNAL FACTORS AND INVESTOR BEHAVIOUR

External factors affect behaviour of the investor according to the place, region, and

situation of the stock market. So, there are diverse reviews by the various researchers in different countries. Many researches reveal that factor influencing Greek investor behaviour on the Athens Stock Exchange is not based on single variable. Their purchase decision depends on the economic criteria with other different variables, namely the “Act on” variables. Some variables have significantly influenced the investor decision, such as corporate earnings, financial statement, status of firm, share prices, price movements of stock, feelings of firm’s product and services, etc., and some have least or no influence on the investor decision such as political party affiliations, friend and co-worker recommendations, perceived ethics of firm, family member opinions, etc.

The factors which have significant affect on investors are expected corporate earnings, get quick rich, stock marketability, government holdings, past performances of the firm of their stock, the creation of the organized financial market. And the factors which have least influence or influence on the investor decisions are gut feeling on the economy, family members opinion, expected losses in the international financial market, expected losses in other local investment.

In **Nigerian Capital** market the investors are influenced by get rich quick, future financial security, recent and past financial stock of the company, expected stock or dividend increment, recommendations by stock brokers, accounting information, publicity, ownership structure. Some investors are also influenced by age, marital status, educational qualification, gender. But investor decision relating to age, gender, marital status, educational qualification is different from the company’s past performance.

In **Pakistan**, the factors influencing the Karachi Stock exchange is educational qualification or we can say interest towards qualification, it is the most significant factor which has an impact on stock prices. Other factors are income, age, language, earning per share, foreign direct investment, and gross domestic product which have great impact on the stock prices.

In **Indian** markets, the factors affecting investors behaviour are age and gender, these are the main factors which decide the ability of the investor, how much risk is taken by the investor. Normally individual investors prefer investment according to their risk

preference, for example fixed deposits, PPF, NSC's, post office deposits, etc. and most of the investors take decisions using some source and by taking references from others.

From the above reviews given by different researchers, we can conclude that there are several determinants that influence the investor's behaviour in stock market. Some factors are very significantly influenced and common factors as compared to the least influenced factors which influence the behaviour of the investors. Factors can be grouped in different strata such as demographic, psychological, economic, and social. There are some significant factors which influence the investors behaviour. They are age, marital status, gender, herding, irrational thinking, over and under confidence, educational qualification, past performance of the company, dividend and bonus distributed by the firm, etc. On the other side of the coin there are several factors which have least impact on the individual investor's behaviour such as inflation, ethics of the firm, family members opinion, political party affiliation, publicity, trading opportunity, social responsibility, etc.

18.5 MECHANISMS OF EXTERNAL FACTORS INFLUENCE ON RISK PERCEPTION AND ATTITUDE

The investment decision of individual in the stock market is influenced by several behavioural factors, characteristics of market participants as well as market outcomes. The two building blocks of behavioural finance are Cognitive psychology and the limits to arbitrage. Cognitive psychology refers to how people think in different situations and Limits to arbitrage refers to predicting in what conditions arbitrage forces will be effective and when they are not effective.

Following are the list of factors that influence investors' risk perception and attitude.

Factors That Significantly Affect Investor Behaviour	Factors That Least Affect Investor Behaviour
<ul style="list-style-type: none"> • Expected corporate earnings • Irrational thinking • Age, gender, qualification, occupation, etc. • Accounting information • Dividends • Over and under confidence • Get rich quick • Herding • Friends and family opinions • Past performance of company • Cognitive bias • Risk factors • Bonus payments 	<ul style="list-style-type: none"> • Inflation • Economic expectation • Diversification needs • Ethics of the firm • Publicity • Social responsibility • Political affiliation

Table 18.1: Factors that Influence Investment Behaviour

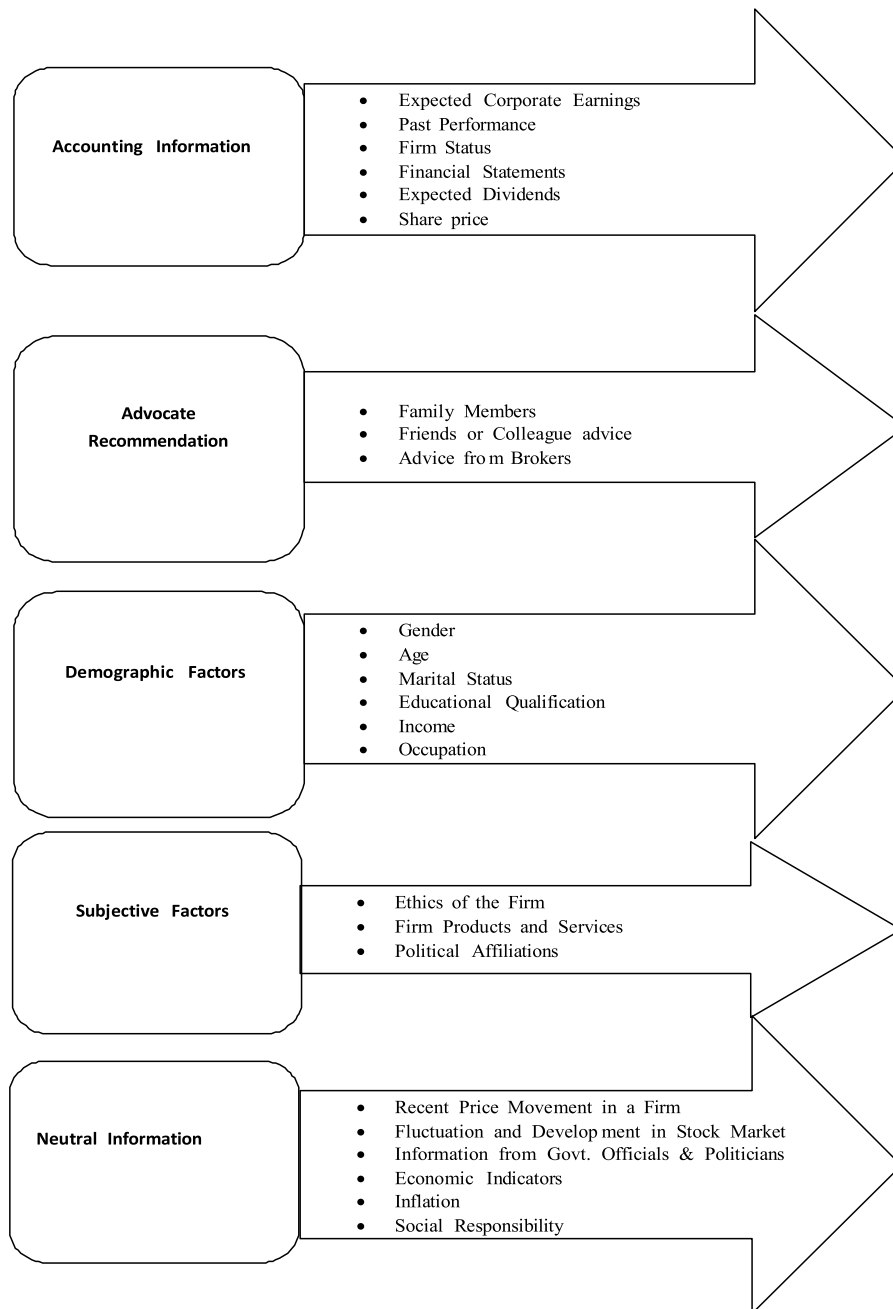


Figure 18.2: Classification of External Factors Influencing Investors Behaviour

18.6 SUMMARY

A systematic approach to using behavioural factors assumes that rational managers need to work in the best interest of long terms investors. This is like rational mangers with irrational investors approach. Accordingly, managers recognize market inefficiencies or mispricing to make decisions that exploit or further encourage mispricing. The decisions that they take to maximize the short-term value of the firm, however, may lower the long-run value of the firm when prices converge to fundamental values.

External factors affect behaviour of the investor according to the place, region, and situation of the stock market. The factors which have significant affect on investors are expected corporate earnings, get quick rich, stock marketability, government holdings, past performances of the firm of their stock, the creation of the organized financial market. And the factors which have least influence or influence on the investor decisions are gut feeling on the economy, family members opinion, expected losses in the international financial market, expected losses in other local investment.

18.7 GLOSSARY

- **Cognitive Psychology:** Cognitive psychology refers to how people think in different situations.
- **Herding Effect:** Herding effect explains that the investors believe on collective information as compared to private information which can result in the price deviation of the securities from fundamental value that can impact the investment.

18.8 SELF ASSESSMENT QUESTIONS

1. Write short note on Heuristic Approach.

2. What do you mean by herding effect?

18.9 LESSON END EXERCISES

1. “A systematic approach to using behavioural factors assumes that rational managers need to work in the best interest of long terms investors.” Explain.

2. Explain different factors influencing investors’ behaviour.

18.10 SUGGESTED READINGS

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**UNIT- IV
LESSON - 19**

CONNECTIONS TO HUMAN PSYCHOPHYSIOLOGY AND EMOTIONAL REGULATION

STRUCTURE

19.2 Introduction

19.2 Objectives

19.3 Psychology With Reference to Investors

19.4 Connections to Human Psychophysiology and Emotional Regulation

19.4.1 The Substance of Emotion

19.4.2 Theories of Emotions

19.4.3 Evolutionary Perspective on Emotions

19.4.4 Types and Dimensions of Emotions

19.4.5 Emotional Style

19.4.6 Emotions and Investing

19.4.7 Fairness, Reciprocity and Trust

19.4.8 Conformity

19.4.9 Psychology of Influence

19.4.10 Social Influence and Investing

19.5 Summary

19.6 Glossary

19.7 Self Assessment Questions

19.8 Lesson End Exercises

19.9 Suggested Readings

19.1 INTRODUCTION

The word, “psychology” is derived from two Greek words, “psyche” and “logos”. Psyche means “soul” and logos means “science”. Thus, psychology was first defined as the “science of soul”. It is today seen as an applied discipline to study the mental functions and behaviour of human beings. It systematically explores human judgments and behaviours in different situations. Psychology is concerned with all aspects of behaviour and with the thoughts, feelings, and motivations underlying that behaviour. It keeps its importance both as an academic discipline and a vital professional practice.

The role of psychology in behavioural finance is self-evident. Its relevance has been witnessed with reference to security market fluctuations and fluctuation in the mindset and strategies of the investors.

Market psychology works on the concept of behavioural analysis of financial markets. The concept of market psychology was proposed by James Gregory Savoldi. According to his observations and evidences collected, the behaviour of financial markets happen to be quite different as it is explained by various theories and models of traditional finance. Hence, to understand the trends and behaviour of financial markets, inputs from the field of psychology and economics were considered in traditional finance. It is evident that financial markets move in trends (Bullish and Bearish), which are actually outcomes of the “greed” and “fear” of the investors. Persistent greed leads to a bullish trend whereas fear of fall in stock prices leads to a bearish trend. Psychologists explain this tendency of greed and fear as investor’s emotions. If these human emotions in financial markets are studied for a longer period, we can predict the future.

19.2 OBJECTIVES

After studying this lesson, you should be able to:

- understand psychology with reference to investors
- comprehend the relationship between human psychophysiology and emotional regulation
- know different types and styles of emotion

19.3 PSYCHOLOGY WITH REFERENCE TO INVESTORS

Psychology explores human behaviour by adopting various approaches. These approaches are classified as follows:

- **Neurobiological Approach:** The brain is considered the main driver of behaviour.
- **Behavioural Approach:** The brain is considered as the “black box” that learns to respond to stimulus given to it.
- **Cognitive Approach:** In this approach, psychologists argue that the stimuli given to the brain is analysed and the response is given under the effect of various different situations, over a period of time develops one’s personality.
- **Psychoanalytical Approach:** It is based on various case studies of unconscious mental activities.
- **Phenomenological/Humanistic Approach:** It looks at human beings as ‘Free Agents’ who are free to choose their values, behaviour, and actions.
- **Eclectic Approach:** The incorporation of any of the above-mentioned approaches is called eclectic approach.

While studying behavioural finance, we believe in the Cognitive approach of psychology in which the investors, whose behaviour is under observation will respond according to their personality which are affected by different biases.

19.4 CONNECTIONS TO HUMAN PSYCHOPHYSIOLOGY AND EMOTIONAL REGULATION

Psychophysiology is the study of the interrelationships between mind and body. Neoclassical economics assumes that the “economic man” is a rational, self-centered decision maker. Recent research has shed light on another quality of the economic man, which is concerned with self-interested behaviour. Human behaviour is not entirely dictated by material self interest. It is also influenced by social forces and other regarding preferences such as fairness and reciprocity.

What is the source of emotions? We know that emotions are part of the human experience, but how do they arise? The source of emotion includes Cognitive, physiological, and evolutionary aspects. Thought processes and emotion should not be viewed as separate, opposing influences. Psychologists recognize that emotions include Cognitive, physiological, and overt behavioural elements. The reasoning of a person is the result of a complex interaction of the mind and body, and an understanding of the process must include all aspects of the being.

Evolutionary theories of emotion suggest that emotions are responses resulting from evolutionary conditioning. Though these responses may be useful, do we choose them or are they simply thrust upon us in response to a situation? Strictly speaking, we cannot choose our emotional response if an emotion is an innate response to a stimulus. Even if our emotions are not consciously chosen, we all have the ability to control the degree of an emotional response, at least to some extent. In the case of extreme emotional response, whether positive or negative, we are all better off if we take a step back and attempt to carefully consider the best response.

The psychological findings on emotion help us in exploring the role of emotions in financial decisions. The relationship between human psychophysiology and emotional regulation is discussed as under:

- The Substance of Emotion
- Theories of Emotions
- Evolutionary Perspective on Emotions

- Types and Dimensions of Emotions
- Emotional Style
- Emotions and Investing
- Fairness, Reciprocity and Trust
- Conformity
- Psychology of Influence
- Social Influence and Investing

19.4.1 The Substance of Emotion

Psychologists generally agree that such states as happiness, sadness, anger, interest, contempt, disgust, pride, fear, surprise, and regret are emotions. We can each create our own list of emotions, but we begin by asking: What exactly is an emotion? And how do emotions differ from other mental states? Although no features are unique to emotions, Jon Elster argues that six observable features allow us to define an emotion which are given below:

- **Cognitive antecedents:** In most cases, beliefs trigger an emotional response. For example, you become angry when another driver runs a red light and almost causes a collision because you believe the other driver is driving carelessly and has endangered your life. Notice how this emotion differs from hunger, another bodily state that arises because your stomach is empty. Though hunger may be triggered by a belief (such as “it is noon so I must be hungry for lunch”), it is generally triggered by a sensory signal (such as an empty feeling or growling), rather than a thought. Of course the distinction is not perfect, but it is generally understood that beliefs are important in the generation of emotions.
- **Intentional objects:** Emotions are about something like a person or situation. For example, you are angry with the driver who ran the light. In most cases, the object of the emotion is closely related to the belief that triggered the emotion. You are angry with the driver of the other car because he is reckless. Also note that the distinction between an emotion and a mood is important. An emotion is about something, whereas a mood is a general feeling that does not focus on

anything in particular. You are angry with the reckless driver, but you may also have been in a melancholy mood, in general, if you suffered from depression.

- **Physiological arousal:** Hormonal and nervous system changes accompany emotional responses. Your body actually goes through hormonal changes when you experience an emotion. During the near collision, you might feel your blood pressure rising.
- **Physiological expressions:** Emotions can be characterized by observable expressions that are associated with how a person functions. You may express your anger at the other driver by raising your voice or shaking your fist in his direction. Though some physiological responses are functional, others simply result from the situation. For example, an angry person's red face results from increased blood flow, but does not necessarily assist the person in resolving the problem. Many physical expressions associated with emotions are consistently observed characteristics. For example, if you saw a person with a red face and clenched fists, you might guess that he was angry. Notice, also, that the expressions are not necessarily unique and can result from very different emotions. A red face is also associated with embarrassment or feelings of shame. In addition to an angry reaction, a person might also clench his fists in a time of celebration or joy.
- **Valence:** Emotions can be rated on a scale with a neutral point in the center and positive and negative feelings on the endpoints. Valence is a psychological term that is used to rate feelings of pleasure and pain or happiness and unhappiness. You are feeling very negative toward the other driver. In many cases, emotions that are highly stimulating are also at the positive or negative endpoints for feelings. Notice that we can't always assume author's teenage daughter sometimes reports very strong feelings of boredom, an emotion low on valence.
- **Action tendencies:** Emotions are linked to action tendencies. When you experience an emotion, you often feel an urge to act a certain way. In some cases, you might even feel compelled to take action. You may have an impulse

to follow the reckless driver and give him a piece of your mind. Or, you might modify the initial urge to action and simply drive away, while carefully watching other drivers on your way home. This regulation of your action tendency can result with or without conscious choice. Your body might actually automatically inhibit your reaction. At the same time, social forces rein you in. For example, you might decide against chasing the reckless driver and telling him exactly what you think of him because you realize that others will see a seemingly out-of-control response.

Together, the six features just described help us define what an emotion is and differentiate emotions from other mental states.

Notice that many emotions can be regarded as negative (anger, contempt, disgust, fear, and sadness). Historically, researchers in psychology have focused on negative emotions. Positive emotions, such as happiness, have received much less attention. This differential attention may have resulted from a desire to prevent mental illness and make the world a better place. Recently, though, some psychologists argue that positive psychology has more promise in improving the quality of life and alleviating suffering. According to this new branch of the discipline, a focus on positive functioning will allow psychologists to develop a science that promotes positive growth in people and society.

It is equally important to understand what an emotion is not. As mentioned previously, mood is distinct from emotion. Like emotions, moods usually have positive or negative valence, but, unlike emotions, moods tend to persist for long periods of time. In addition, emotions and moods are distinct in that emotions arise in relation to an object or stimulus, whereas a mood is a general feeling not focusing on any particular item. In contrast to emotions and moods is affect, or how a person experiences a feeling. A person's affective assessment is the experience a person has in response to a stimulus. Affect is evaluative in that a person can say whether a stimulus is good or bad, positive or negative. Although affect reflects an evaluation it does not require (or preclude) a Cognitive response. For example, you might think that a rose smells good but not really be able to Cognitively evaluate why it smells good to you. We think of emotional processes as including affective reactions. Now that we know something about how

emotions are characterized, we turn to theories developed by psychologists to describe how emotions are experienced.

19.4.2 Theories of Emotions

If we understand where emotions come from and how they impact our behaviour, we will become better financial decision-makers. Can we control our emotions, or do they control us? Though sometimes emotions are characterized as simply irrational responses to a situation, psychologists do not regard thought processes and emotions as separate, opposing influences. Psychologists recognize that emotions include Cognitive, physiological, and overt behavioural elements.

Cognitive psychologists focus on specific mental processes, including conscious mental processes like thinking, speaking, problem solving, and learning. Early work on emotions explained emotions in terms of Cognitive processes so that an emotion is simply what we think about a situation. Taking a different perspective, in 1884, William James developed a prominent theory of emotion that remains influential today. This theory suggested that an emotion is a feeling resulting from an autonomic response. The autonomic nervous system governs our bodies' involuntary actions, such as sweating, shaking, and even fleeing. According to James, if you see a bear in the woods, you respond by freezing in your tracks and (initially) without emotion appraising the situation, and then you have the conscious feeling of fear. Notice that this differs from the simple explanation that when you see a bear in the woods you feel fear and then you respond. According to James, "we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be."

James's theory was dominant until another influential study by Walter Cannon. Cannon argued that physiological responses sometimes occur without emotion (e.g., sweaty palms). Although he agreed with James that emotions are different from other states of the mind because of how the body responds, Cannon did not agree that autonomic responses differentiated emotions because we can observe very similar responses with very different emotions (e.g., you might clench your fists in joy or anger). Cannon also argued that people's brains respond to a stimulus before their body takes action.

According to his theory, when you see a bear in the woods, your brain and nervous system simultaneously receive signals. You then experience the conscious feeling of fear and autonomic arousal at the same time (you are probably sweating when faced with a large bear).

Until the 1960s, emotions were used to describe how people behaved. Many psychologists were behaviourists and believed that their work should focus on observed behaviour, rather than mental processes. In other words, emotions were simply descriptions of observed behaviour, and psychologists devoted little attention to understanding the source of emotion—that is, until Stanley Schachter and Jerome Singer again raised the question of where emotions come from. They concluded that emotions are our brain's interpretation of a situation. Like James, they believed that autonomic responses are important, but at the same time, they questioned, as Cannon did, whether emotions can be differentiated simply by autonomic responses. Their solution was a model that included a Cognitive appraisal of the situation. When you see a bear in the woods, your body responds. Then your brain searches for an explanation to the arousal. Your brain recognizes that your body is responding to the bear, and you feel fear. You may want to run, but your emotions exert control, allowing you to remain calm and leave the area as quickly as possible. If you run, the bear will chase, which does not lead to the best outcome.

Though Schachter and Singer's model and appraisal theories remain powerful, in 1980, Robert Zajonc noted that an important piece was missing. He showed that sometimes people experience emotion without any Cognitive recognition of the stimulus. In experiments in which he used subliminal exposure to stimuli, Zajonc found that people seemed to like patterns they were previously exposed to but they could not reliably recognize. This finding is important because it suggests that emotions can develop independent of cognition.

19.4.3 Evolutionary Perspective on Emotions

Emotions are no different. Recently, some psychologists have returned to the contributions of Charles Darwin, which were made more than a hundred years ago. Darwin is best known for his theory of evolution and natural selection. According to

this theory, traits that contribute to the survival of a species become characteristics of the species in the long run. Less fit individuals do not survive, and fit parents pass their characteristics on to their offspring. Species that do not adapt this way become extinct. Darwin later argued that emotions, as well as physical traits, are inherited and have become innate.

Following Darwin, evolutionary theorists have also argued that our basic emotions have evolved to promote the survival of the species. At times, a situation demands a quick response and there is no time for deliberation. Indeed, many emotions are explained as rapid-fire innate responses to a stimulus, with cognition taking a smaller role. An adaptive role is served because emotions lead to appropriate action and communication.

According to the evolutionary perspective, the mind is crowded zoo of evolved, domain-specific programmes, each functionally specialized to solve a different adaptive problem that arose during hominid evolutionary history, such as heart rate regulation, predator vigilance, sleep management, foraging, mate choice, or face recognition. However, the existence of numerous micro-programmes itself creates an adaptive problem.

As Leda Cosmides and John Toby put it, “Programmes that are individually designed to solve specific adaptive problems could, if simultaneously activated, deliver outputs that conflict with one another, interfering with or nullifying each other’s functional products. For example, sleep and flight from a predator require mutually inconsistent actions, computations, and physiological states.”

To avoid such consequences, the mind needs super ordinate programmes that coordinate these individual programmes snapping each into the right configuration at the right time. Emotions are such super ordinate programmes. As Leda Cosmides and John Toby put it, “To behave functionally according to evolutionary standards, the mind’s many sub-programme need to be orchestrated so that their joint product at any given time is functionally coordinated, rather than cacophonous and self-defeating. This coordination is accomplished by a set of super ordinate programmes-the emotions.”

19.4.4 Types and Dimensions of Emotions

1) Plutchik's wheel of emotions

Emotions have been classified into various types or categories. According to Robert Plutchik, a psychologist who developed a psycho evolutionary theory of emotions, there are eight basic or primary emotions: joy, trust, fear, surprise, sadness, anticipation, anger and disgust. Each emotion has a polar opposite as shown below;

- Joy-Sadness
- Fear-Anger
- Anticipation- Surprise
- Disgust- Trust

Plutchik proposed the wheel of emotions, shown in figure, in order to illustrate the relationships among emotions. In this wheel, the intensity of emotion increases as one moves toward the center of the wheel and decreases as one moves outward.

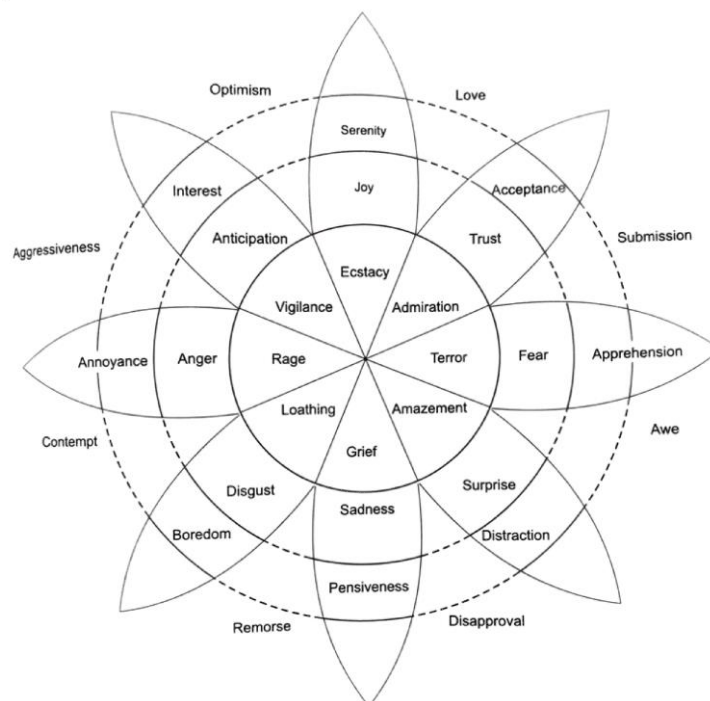


Figure 19.1: Plutchik's wheel of emotions

2) Two Dimensions of Emotions

Emotional experiences may be measured along two dimensions, viz., valence (how negative or positive the experience feels) and arousal (how energizing or enervating the experience feels). Figure 19.2 depicts two-dimensional coordinate map.

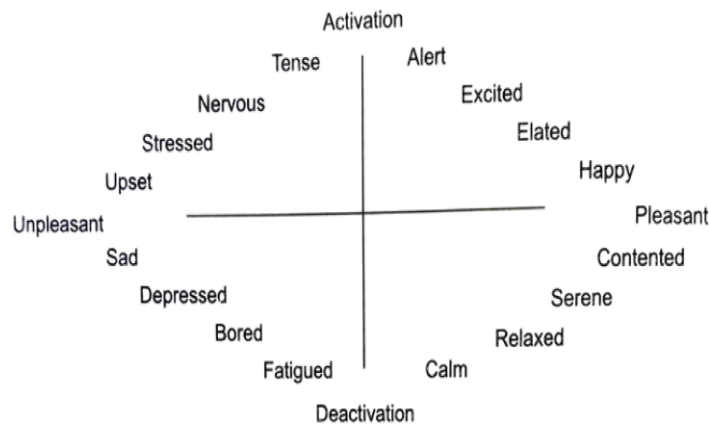


Figure 19.2: Two Dimensions of Emotions

3) Emotions and Affective Feelings

According to Jan Pankeep, a neuroscientist, there are seven primal emotions and affective feelings associated with them. They are as follows:

<i>Primal Emotions</i>	<i>Affective Feelings</i>
Seeking	Enthusiastic
Rage	Angered
Fear	Anxious
Lust	Arousal
Care	Tender and Loving
Panic	Lonely and Sad
Play	Joyous

Table 19.1: Primal Emotions and Affective Feelings

19.4.5 Emotional Style

According to neuroscientist Richard J. Davidson, each person has a unique emotional profile. As he put it, “Just as each person has a unique fingerprint and a unique face, each of us has a unique emotional profile, one that is so much a part of who we are and those who know us well can often predict how we will respond to an emotional challenge.”

Based on his research, Davidson identified six dimensions of Emotional Style in his classic work- *The Emotional Life of Your Brain* written with Sharon Begley. According to him, “Each of these six dimensions has a specific, identifiable neural signature- a good indication that they are real and not merely a theoretical construct.”

The six dimensions of Emotional Styles are as follows:

1. **Resilience style:** Does a person respond to a setback with determination or does he simply surrender helplessly? People at one end of this dimension recover quickly from adversity whereas people at the other end of this dimension recover very slowly.
2. **Outlook style:** Does a person have a sunny disposition and look at the brighter side of things or does he tend to be cynical or pessimistic? People at one end of this dimension may be characterized as positive types; those at the other, as negative types.
3. **Social intuition style:** Can a person read other people’s body language and voice tone and figure out whether they want to talk or be alone, whether they are stressed or relaxed. Or is a person puzzled by the outward manifestations of other people’s mental and emotional states? Socially intuitive types are at one end of this spectrum; socially puzzled types are at the other end.
4. **Self awareness style:** Is a person aware of his own thoughts and feelings and attuned to the messages of his body? Or does he act and react without knowing why he does, what he does because his inner self is opaque to his conscious mind? Self-aware people lie at one end of his spectrum; self-opaque people lie at the other end.

5. **Sensitivity to context style:** Does a person follow conventional rule of interaction so that he does not tell his boss the same dirty jokes he shares with his friends or engage in a date at a funeral service? Or is he baffled when someone points out his behaviour is inappropriate? Tuned in people are at one end of the spectrum of the sensitivity to context style; tuned out people lie at the other end.
6. **Attention style:** Can a person filter out emotional or other distractions and stay focused? Is he so absorbed in the TV show that he does not notice the whining of his dog? Or do his thoughts flit from what he is doing to the quarrel he had with his colleague in the morning or the anxiety about an upcoming presentation? Focused people are at one end of the attention spectrum; unfocused people are at the other end.

Emotionally a person is the product of different amounts of each of these six components. Since there are numerous ways to combine the six dimensions, there are countless emotional styles. Indeed, everyone is unique. As Davidson put it, “....each of us is a color-wheel combination of the resilience, outlook, social intuition, self awareness, context and attention dimensions of emotional styles, a unique blend that describes how you perceive the world and reacts to it, how you engage with others, and how you navigate the obstacle course of life.” An illustrative emotional style is given below:

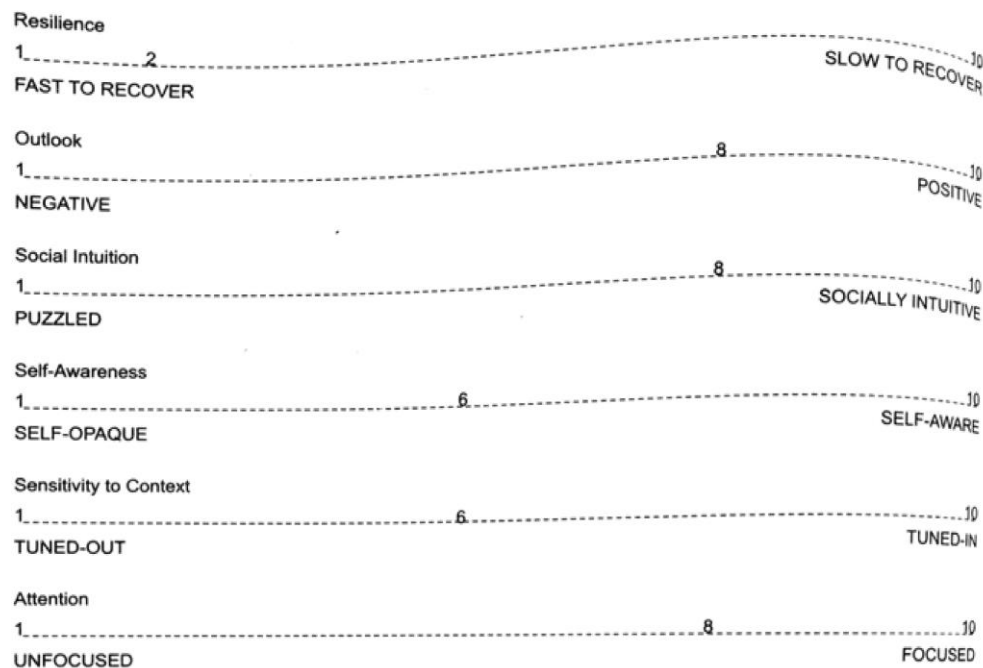


Figure 19.3: Emotional style

19.4.6 Emotions and Investing

Emotions have a bearing on risk tolerance, and risk tolerance influences portfolio selection. Investors experience a variety of emotions as they consider alternatives, decide how much risk to take, watch their decisions play out, assess whether the initial strategy needs modification, and finally learn how far they have succeeded in achieving their financial objectives.

The emotions experienced by the person with respect to investment may be expressed along an emotional time line as shown in figure 19.4. Investment decisions lie at the left end of the time line and investment goals at the right end. According to psychologist Lola Lopes, investors experience a variety of emotions, positive and negative. Positive emotions are shown above the time line and negative emotions below the time line. On the positive side, hope becomes anticipation which finally converts into pride. On

the negative side, fear turns into anxiety which finally transforms into regret.

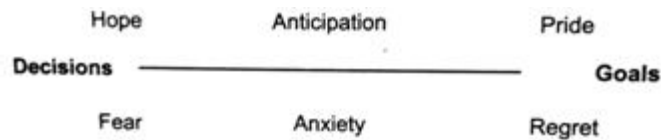


Figure 19.4: Emotional Time Line

Hope and fear have a bearing on how investors evaluate alternatives. Fear induces investors to look at the downside of the things, whereas hope causes them to look at the upside. The downside perspective emphasizes security; the upside perspective focuses on potential gains. According to Lopes, these two perspectives reside in everyone, as polar opposite. However, they are often not equally matched, as one pole tends to dominate the other. The relative importance of these conflicting emotions determines the tolerance for risk.

The Five Year Rule: Wall Street's conventional wisdom is that you should put money into stocks only when you are more than five years from your goal. What is the logic of this rule? The "five year rule" is scarcely a mean-variance strategy. It is driven by emotional considerations. Think about a situation where an investor has sufficient resources to achieve a major goal that is less than 5 years away by investing in safe fixed instruments. However, the investor allocates a substantial proportion of these resources to equities, only to discover that at the end of 5 years his equity investment has eroded in value and his goal has moved out of reach.

The dominant emotion in this case would be regret. Hence, the five year rule seems to be essentially a regret-minimization rule as historically very rarely have equities delivered a negative return over a five- year holding period.

19.4.7 Fairness, Reciprocity and Trust

Most people would accept with little argument the claim that fairness is valued in our society. At the same time, though, fewer people would accept the argument that fairness is important for financial decision-making. Nevertheless, in recent years some researchers contend that fairness, reciprocity, and trust are critical for business

transactions. At a basic level, trust is a prerequisite for an efficiently functioning economy. The costs of business and personal transactions are reduced significantly if people trust and treat each other fairly. Empirical evidence suggests that a large number of people trust and treat each other fairly, even when they are not likely to deal with in future. Tipping servers in restaurants is a commonplace example of fairness and trust. As long as the service is reasonably good, we normally tip the staff. The tip is not required, but most of us who eat out would consider it to be fair, and, on the other side, servers who are conscientious trust that patrons will recognize their efforts.

To understand fairness, reciprocity and trust, psychologists have designed various games or experiments. The important ones are:

1. Ultimatum Game
2. Dictator Game
3. The Trust Game

Ultimatum game: The participants in this game are divided equally into two groups put in two different Rooms- A and B. Each participant in Room A is randomly paired with someone in Room B. Neither will ever learn the identity of the other. Participants in Room A (proposers) have been given Rs1000 and the opportunity to send any portion of their Rs1000 to a randomly assigned participant in Room B (responders). Participants in Room A can send any amount—Rs 10, Rs 100, Rs 500, or whatever. Participants in Room B can choose to keep the amount sent, in which case the division proposed by A is final. Or, participants in Room B can reject the amount sent, in which case both individuals receive nothing.

If you are a proposer in Room A, how much do you send to your paired participant in Room B? Remember that if you can send Rs X and the participant in Room B accepts this offer, you keep Rs 1000- Rs X; if the participant rejects it, you both receive nothing.

This is called the ultimatum game, and traditional economic theory predicts that a self-interested respondent will accept any positive amount- something is better than nothing. A proposer who realizes this should make the smallest possible offer, Rs 1 in our example.

When people play the ultimatum game in experimental settings, on average, proposers send more than the minimum possible offer. Perhaps they realize that respondents will reject offers they perceive to be unfair. Typically half the time participants reject offers that are less than 20% of the proposer's endowment.

The results of the ultimatum game seem to be inconsistent with pure self-interest in two respects. First, contrary to the maximization of their self-interest, responders reject positive offers. Second, proposers' behaviour may indicate a taste for fairness as they, on average, send more than the minimum offer. This second conclusion could be premature because proposers may behave strategically and offer more than the minimum if they anticipate the retaliation of the respondents.

Dictator game: To separate the effects of fairness and strategy, another game has been proposed. This game is similar to the ultimatum game except the division proposed by the participants in Room A is final. This is called the dictator game because the receivers in Room B have no decision to make.

In the ultimatum game, all proposers make positive offers. This is understandable because the proposers were concerned with retaliation. What happens in the dictator game? Roughly two-thirds of the proposers in the dictator game make positive offers, even though there is no opportunity for retaliation or reputation building. This may be because people value fairness.

The trust game: A dictator game can be thought of as measuring pure altruism. There is another game, known as the trust game, which measures trust and reciprocity. It is described below:

One-half of the participants are completing the experiment in Room A and the other half in Room B. Each participant in Room A (investors) will be randomly paired with someone in Room B (trustees). Participants in each room are given Rs 1000. Investors then have the opportunity to send any portion of their Rs 1000 to a randomly assigned participant in Room B. Participants in Room A can send any amount- Rs 10, Rs 100, Rs 500, or whatever.

Each amount sent to Room B is increased three times. For example, if an investor in

Room A sends Rs 500 randomly assigned participant in Room B, the amount will be increased to Rs 1500. The trustee in Room B can decide how much amount of this to keep and how much of this to send back to Room A.

This is called the trust game because it measures how much the investors in Room A trust the trustees in Room B. It is also referred to as the investment game because the participants in Room A are “investing” the amount Rs X in participants in Room B.

In theory, the trustees in Room B should return nothing at all if they are purely self-interested. The investors in Room A will anticipate the motivations of those in Room B and send nothing.

With no trust, the investor in Room A would not send anything to his trustees in Room B and each participant ends up keeping the endowment amount of Rs 1000. So the total gain is Rs 2000. With complete trust, the total gain is Rs 4000 ($3 \times 1000 + 1000$) so, if there is trust, all participants can benefit potentially.

Typically, investors send about half of their endowment to trustees, though there is a lot of variation across people. Trustees typically return less than one-half of what they receive, implying that the reciprocity ratio is less than 50% most of the time. In fact, many trustees send less than one-third of what they receive, implying that trust does not pay for investors.

19.4.8 Conformity

Psychological studies of conformity suggest that people tend to conform to social pressure, real or imagery. In a classic experiment, researcher Solomon Asch asked students to consider the lines in Figure 19.5 and decide which of the lines A, B, or C is identical in length to the first line.

It seems obvious that the answer is line C, doesn't it? What if you were in a room with eight other university students who all said the answer was line A? Researcher Solomon Asch found that student participants conformed to an incorrect majority about one-third of the time. Three-fourths of the students conformed at least one time. Asch's experiment has been replicated many times, and because the level of conformity changes over time, psychologists believe that conformity reflects social norms and culture.

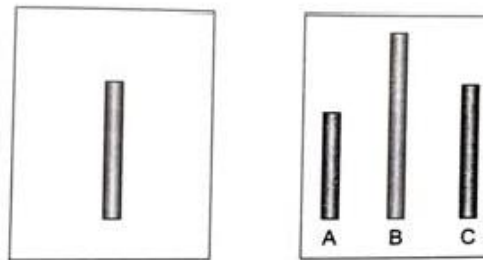


Figure 19.5: Asch test

An extreme form of conformity is groupthink. Groupthink can take hold in a small group of individuals who are insulated from outside influences. Group members may begin to think alike, while stressing loyalty and suppressing dissent. The group may ignore relevant information and believe they are invulnerable. One recent example of disastrous consequences attributed to groupthink was the Columbia explosion. NASA was warned by a panel that the shuttle had safety problems. Yet, NASA removed five of the nine members on the panel and went ahead with its plan to launch the shuttle. All seven crew members perished.

Fortunately, groupthink has warning signs and can be prevented and controlled. If you are a member of a group that ignores warnings, punishes dissenters, or seems invulnerable, remember that you are not. It is actually a good idea to encourage people to express their opinions, particularly opinions that are not consistent with the majority.

Though we may not normally face groupthink in our day-to-day lives, we all observe some degree of conforming behaviour among ourselves and others with whom we interact. People tend to evaluate themselves in comparison to others who are close to them. So, for example, a professional financial analyst considers his choices in relation to other analysts in his reference group. If financial decision-makers consider the behaviour of others before making a choice, we may observe herd behaviour. In the financial press, herding has a negative connotation, but herding might not be such a bad thing if you believe others have better information.

19.4.9 Psychology of Influence

Robert Cialdini identified a variety of social and other factors that influence behaviour of people. In particular, he looked at the following factors:

1. **Reciprocation:** The reciprocation principle says that a person tries to (or should try to) repay, in kind, what another person has given him. As Cialdini put it, “We are human because our ancestors learned to share their food and their skills in an honored network of obligations.” This is a unique adaptive mechanism of human beings facilitating the division of labour. Invoking this principle, free gifts and free samples are given to secure some reciprocal favour.
2. **Social proof:** To decide what to do, people look at what others are doing. Put differently, they look at social proof. That is why evangelical preachers seed their audience with “ringers”, who are instructed to come forward to give witness and donation; companies claim that their product is the “fastest growing” or “largest selling”; and bartenders often “salt” their tip jar. According to Cialdini, “We can see that social proof is most powerful for those who feel unfamiliar or unsure in a specific situation and who, consequently, must look outside of themselves for evidence of how best to behave there.”
3. **Liking:** As a rule, people prefer to say yes to the requests of someone they know and like. This simple rule is used in many ways by people to persuade others to comply with their requests. Here are some examples:
 - The Tupperware Home Parties Corporation arranges for its customers to buy from a friend rather than from an unknown salesperson. To enable this, they incentivize the hostess of Tupperware parties with a percentage of the take.
 - Joe Girard, the world’s “greatest car salesman,” sent a holiday greeting card each month to more than 13,000 former customers with a personal message. While the greeting card changed from month to month (Happy Christmas, Happy New Year and so on), the message was invariably “I Like you”.
4. **Obedience to authority:** People tend to respect authority. Authority may stem from a position of power or an advanced qualification that takes years of work and achievement or even something like superior clothing.

5. **Scarcity:** An opportunity appears more valuable when its availability is limited. The thought of losing something seems to motivate people more than the thought of gaining something of equal value. According to G.K. Chesterton, “The way to have anything was to realize that it might be lost.” Compliance practitioners use scarcity as a weapon for influencing behaviour.

Psychologist Jack Brehm developed a theory called psychological reactance theory. The core idea of this theory is that people hate to lose the freedom they already have. As Cialdini explained, “So when increasing scarcity- or anything else- interferes with our prior access to some item, we will react against the interference by wanting and trying to possess the item more than before.”

This theory explains impressive amounts of human behaviour. When something is restricted, censored, or banned, people crave more of it. As Cialdini put it, “The feeling of being in competition for scarce resources has powerful motivating properties. The ardor of an indifferent lover surges with the appearance of a rival.” He added, “Shoppers at big close-out or bargain sales report being caught up emotionally in the event. Charged by the crush of competitors, they swarm and struggle to claim merchandise they could otherwise disdain.”

19.4.10 Social Influence and Investing

Investing has become an integral part of social life. Not only do we invest, but we also like to talk about them. People discuss investments with their friends, coworkers, neighbors, family members, or even strangers through the web. This has created an interesting paradox. While you want to invest independently, you also want to go by the consensus view. Indeed the popular consensus acts like social pressure.

- **Herd instincts and overreaction:** There is a natural desire on the part of human beings to be a part of a group. So people tend to herd together. Moving with the herd, however, magnifies the psychological biases. It induces one to decide on the “feel” of the herd rather than on rigorous independent analysis. This tendency is accentuated in the case of decisions involving high uncertainty.

The heightened sensitivity to what others are doing squares well with a recent theory about fads, trends and crowd behaviour. In a 1992 paper in the *Journal of Political*

Economy, Sushil Bikhchandani, David Hirshleifer, and Ivo Welsh referred to a phenomenon called information cascade. Essentially, their theory says that large trends or fads begin when individuals ignore their private information, but take cues from the actions of others. Imagine a traffic jam on a highway and you find that the driver ahead of you suddenly takes little used exit. Even if you are not sure whether it will save you time, you are likely to follow him. A few others follow you and this, in turn, leads to more people imitating that behaviour.

What is interesting about this story is that a small bit of new information can cause a rapid and wholesale change in behaviour. As Bikhchandani et al. wrote, “If even a little new information arrives, suggesting that a different course of action is optimal, or if people even suspect that underlying circumstances have changed (whether or not they really have), the social equilibrium may radically shift.”

This observation appears very apt for financial markets which are constantly bombarded by new information. In such markets information cascades lead investors to overreact to both good and bad news. That’s how a stock market bubble- and, in the opposite direction, a stock market crash- get started. Eventually, however, the market corrects itself, but it also reminds us that the market is often wrong.

The herd mentality means that financial assets are unlike other goods. The demand for them tends to increase when price rises. As an *Economist* put it, “To the extent that investors worry about valuation, they tend to be extremely flexible; expectations of future profits are adjusted higher until the price can be justified. Or ‘alternative’ valuation measures are dreamed up (during the internet era, there was ‘price-to-click’) that make the price look reasonable.”

Conversely, when confidence falters and prices decline, there are many sellers and few buyers, pushing prices downwards.

- **Conspicuous consumption:** There is another kind of irrationality induced by a desire to impress others. In his recent book *Luxury Fever*, Frank analysed the vigour with which people pursue goals that are incongruent with their happiness. Frank referred to the pursuit of conspicuous consumption- consumption of things that are considered

as makers of a person's relative success. Conspicuous consumption tends to be a zero-sum game.

Inconspicuous consumption, on the other hand, refers to goods and activities that are inherently valuable, that are not bought to show off or achieve status, and that are consumed more privately.

The message of Frank's book is that happiness depends on inconspicuous consumption, not conspicuous consumption. Endorsing this view moral psychology Jonathan Haidt writes in his insightful book Happiness Hypothesis, "Stop trying to keep up with the Joneses. Stop wasting your money on conspicuous consumption. As a first step work less, earn less, accumulate less, and consume more family time, vacations, and other enjoyable activities."

19.5 SUMMARY

The role of psychology in behavioural finance is self-evident. Its relevance has been witnessed with reference to security market fluctuations and fluctuation in the mindset and strategies of the investors. Psychophysiology is the study of the interrelationships between mind and body.

What is the source of emotions? We know that emotions are part of the human experience, but how do they arise? The source of emotion includes Cognitive, physiological, and evolutionary aspects. Thought processes and emotion should not be viewed as separate, opposing influences. Psychologists recognize that emotions include Cognitive, physiological, and overt behavioural elements. Examples of common emotions are anger, contempt, disgust, fear, happiness, sadness, regret, and surprise. Early theories of emotion focused on whether autonomic responses defined emotions and how the brain processes information. More recently, theorists recognize that evolution is an important determinant of emotions. Emotions promote communication both within and across cultures and species.

Scientists have been able to associate human functions with specific parts of the brain. The cerebrum is what distinguishes the human brain from those of other vertebrate animals. The ability to plan for the future is critical to the advancement of the human

species. Decision-making actually suffers without emotion. Emotions push us to make a decision when timing is critical. Emotions help us to make better decisions because they allow us to better evaluate information. Although we might not always choose our emotions, we can regulate their intensity.

19.6 GLOSSARY

- **Conformity:** It refers to the tendency to give in to real or imagined social pressure.
- **Group think:** Groupthink is an extreme form of conformity where group members begin to think alike, stress loyalty, and discourage dissent.
- **Herdin:** It is the tendency to use the behaviour of others as an input into one's decisions, which, on a large scale, can lead to a multitude of correlated financial decisions
- **Market psychology:** Market psychology is defined as the overall sentiment of the market. Optimism, pessimism, fear, greed, and various cycles of market are study areas of market psychology.
- **Psychophysiology:** It is the study of the interrelationships between mind and body.

19.7 SELF ASSESSMENT QUESTIONS

1. Explain the relationship between conformity and groupthink.

2. Differentiate between dictator and ultimatum games.

19.8 LESSON END EXERCISE

1. Describe the connection between human psychophysiology and emotional regulation.

19.9 SUGGESTED READINGS

1. Marshall, B. R.; M. R. Young, and L. C. Rose (2006). ‘*Candlestick Technical Trading Strategies: Can They Create Value for Investors?*’, Journal of Banking and Finance, 30.
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BEHAVIOURAL CORPORATE FINANCE

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UNIT- IV
LESSON - 20

ACTIVE AND PASSIVE PORTFOLIO MANAGEMENT, SOURCE OF SYSTEMATIC UNDERPERFORMANCE

STRUCTURE

- 20.1 Introduction
- 20.2 Objectives
- 20.3 Active and Passive Portfolio Management
 - 20.3.1 Meaning of Active Portfolio Management
 - 20.3.2 Meaning of Passive Portfolio Management
- 20.4 Portfolio Construction
- 20.5 Active Portfolio Management: Source of Systematic Underperformance
- 20.6 Strategies to Adopt if Portfolio is Underperforming
- 20.7 Summary
- 20.8 Glossary
- 20.9 Self Assessment Questions
- 20.10 Lesson End Exercises
- 20.11 Suggested Readings

20.1 INTRODUCTION

One of the major advances in the investment field during the past few decades has been the recognition that one cannot create an optimum investment portfolio by simply combining numerous individual securities that have desirable risk–return characteristics.

Specifically, it has been shown that an investor must consider the relationship among the investments to build an optimum portfolio that will meet investment objectives. The recognition of how to create an optimum portfolio was demonstrated in the derivation of portfolio theory. One basic assumption of portfolio theory is that investors want to maximize the returns from the total set of investments for a given level of risk. To understand such an assumption requires certain ground rules. First, your portfolio should include all of your assets and liabilities, not only your marketable securities but also your car, house, and less marketable investments such as coins, stamps, art, antiques, and furniture. The full spectrum of investments must be considered because the returns from all these investments interact, and this relationship among the returns for assets in the portfolio is important. Hence, a good portfolio is not simply a collection of individually good investments.

20.2 OBJECTIVES

After studying this lesson, you should be able to:

- differentiate between active and passive portfolio management
- understand the sources of systematic underperformance of active portfolio management

20.3 ACTIVE AND PASSIVE PORTFOLIO MANAGEMENT

The art of investing is evolving into the science of investing. This evolution has been happening slowly and will continue for some time. The direction is clear; the pace varies. As new generations of increasingly scientific investment managers come to the task, they will rely more on analysis, process, and structure than on intuition, advice, and whim. This does not mean that heroic personal investment insights are a thing of

the past. It means that managers will increasingly capture and apply those insights in a systematic fashion.

A portfolio manager faces a number of choices in relation to portfolio construction. In particular there is the choice between active and passive management. This choice may be made in relation to each of a number of stages of portfolio construction.

20.3.1 Meaning of Active Portfolio Management

Active portfolio management attempts to outperform the market by choosing investments that are likely to show high returns. The market is often proxied by a broad-based stock index, such as the S&P 500 or the FTSE All-Share Index. Active portfolio managers believe that they have the ability to identify the individual securities (shares and bonds), sectors, or asset classes (shares and bonds are the main asset classes) that will perform relatively well. In effect this involves the belief that the fund manager has superior knowledge or understanding that provides a forecasting ability that is better than that of other market participants. Asset prices reflect the market consensus forecasts, active portfolio managers believe that they have the ability to produce forecasts that are better than the market consensus. Active portfolio managers take the view that they can identify situations in which the consensus of other investors is incorrect as to what the price of a security should be. Active fund managers may alternatively (or additionally) take the view that they can successfully time markets.

Market timing is the attempt to identify points where the market is about to rise or about to fall. The fund manager would aim to sell before falls and buy before rises. Market timing is alternatively known as tactical asset allocation.

20.3.2 Meaning of Passive Portfolio Management

Portfolio managers who employ a passive style do not seek to outperform the market. They operate as if either assets are fairly priced or it is not possible to make profits from any mispricing.

Passive management can take one of three forms: a buy-and-hold strategy, responsive portfolio changes, and index tracking.

1. In the buy-and-hold strategy of passive management, the fund manager buys a portfolio of securities and holds them for the duration of the investment horizon (the investment horizon is the period for which the investment will be held). While the portfolio is held no attempt is made to change its composition. There may be a dimension of active management in the original construction of the portfolio, but thereafter the portfolio is left unaltered.
2. A second form of passive management involves portfolio changes, but not changes that result from the fund manager taking views that differ from the market consensus. This type of passive management entails adjusting the composition of the portfolio in response to three types of change.

The three factors whose variations can lead to alterations in the portfolio are the risk-free interest rate, the consensus view on the risk and return characteristics of the market portfolio, and the degree of risk-aversion exhibited by the investors on whose behalf the fund is managed. This form of passive fund management entails holding a combination of a risk-free investment (such as a bank deposit) and a portfolio of risky securities (which is likely to be the portfolio corresponding to a stock index). A rise in the risk-free interest rate would cause an increase in the proportion of the fund held on deposit. A rise in the (market consensus) expected return on the portfolio of securities, or a fall in the consensus expectation of risk, would cause the fund manager to switch money from deposits into the portfolio of securities. Increased risk-aversion on the part of the investors in the fund would lead to the manager increasing deposits as a proportion of the fund.

The relative proportions of risk-free and risky investments (e.g. bank deposits relative to shares) within the fund are subject to frequent change, but not as a result of the portfolio manager trying to outperform the market by forecasting asset price movements.

3. A third type of passive management entails the attempt to track the performance of a stock index. Such funds are known as index funds or tracker funds. Index funds give up the possibility of outperforming an index for the security of not underperforming. An index (tracker) fund aims to replicate the performance of a

stock index. The emergence of index funds arose from the observation that actively managed funds fail, on average, to outperform stock indices. This is related to the issue of market efficiency.

20.4 PORTFOLIO CONSTRUCTION

The construction of a portfolio may involve one stage, two stages, three stages, or possibly even more. The fund manager must decide on the number of stages and their nature. There is also a choice between active and passive management at each stage (and if passive, which type of passive management).

A one-stage process involves the portfolio manager seeking the optimum portfolio from the entire range of securities available (or under consideration). This could be achieved by employing the Markowitz equations or Sharpe's single index model. Alternatively a stock index portfolio might be used. In reality many fund managers would employ less formal procedures. If the optimum portfolio is amended in the light of the manager's market forecasts, or is affected by such forecasts, the strategy would be an active one. The strategy would be an active one if the manager takes bets on individual securities (or sectors or asset classes). A passive strategy would be uninfluenced by any forecasts that the fund manager may make.

A two-stage process might involve the optimisation process being divided into separate stock selection (and bond selection) and asset allocation stages. In the first stage a stock portfolio is decided upon, and simultaneously a bond portfolio is established. These two separate portfolios can be derived using the types of approach indicated for the one-stage process (Markowitz diversification, index portfolios, etc.). In the second (asset allocation) stage the fund manager seeks an optimum combination of the stock and bond portfolios. This could be based on Markowitz optimisation, or a less formal procedure. The operation could additionally involve portfolios of investments in asset classes other than stocks and bonds, for example real estate and money market instruments. The fund manager has the choice between active and passive styles at each of the two stages.

A three-stage process might introduce a sector allocation (sector rotation) decision

between the stock selection and asset allocation stages. Stocks may be divided into sectors such as oils, banks, insurance, pharmaceuticals, utilities, construction, retailers, and so on. Bonds may be divided according to types of issuer, maturity, and credit rating. The fund manager might seek an optimum portfolio for each sector or division. An optimum portfolio of the sector portfolios would then constitute the stock portfolio. Likewise a portfolio of various bond portfolios (one for each chosen category of bond) would be constructed. The stock and bond portfolios would then be combined to form the portfolio of risky assets. The fund manager might then choose to combine this with a holding of risk-free assets (such as deposits or Treasury bills). An active manager would then deviate from such a base portfolio by increasing the proportion held in some assets, and decreasing the weighting in others, according to the manager's forecasts of relative performance.

If the fund manager includes foreign securities in the portfolio there would be more stages. Separate portfolios might be created for each country. There would then be a portfolio of country portfolios.

An approach that involves determining first the asset allocation, then the sector allocation, and finally the stock selection is referred to as a top-down strategy. An approach that seeks undervalued investments, irrespective of sector or asset class, is known as bottom-up. In the top-down strategy, a passive approach at the asset allocation and sector allocation stages may involve determining percentage allocations for each asset or sector (perhaps allowing the fund manager a limited amount of discretion to vary the percentages on the basis of market views, in which case the strategy is a hybrid between passive and active.

As prices change the original percentages are disturbed. For example an increase in share prices relative to bond prices raises the proportion of the portfolio in shares relative to the proportion in bonds. The fund manager then faces a choice between two alternative passive strategies. One strategy, a form of buy-and-hold, would be to accept the new proportions and not carry out any buying and selling transactions. Another strategy would be to sell shares and buy bonds in order to restore the original percentage allocations.

20.5 ACTIVE PORTFOLIO MANAGEMENT: SOURCE OF SYSTEMATIC UNDERPERFORMANCE

Since the 1960s, the financial markets have undergone a process of professionalism that has resulted in a hyper-educated, hyper-competitive industry. Portfolio management is a zero-sum game that requires fund managers to out-skill other fund managers to make a profit. The sources of underperformance of active portfolio are given below:

- **Average Active Fund Manager**

One of the reasons for poor performance of portfolio is the average active fund manager does not have an edge in their market. In a less professional or less informed market, active fund managers were able to triumph. But according to S&P Global's Indices Versus Active (SPIVA) scorecard-being one of the 15-25% that outperforms passive funds is incredibly tough.

- **Long-Term Problems**

Additionally, there are drawbacks to active funds that limit how conducive they are to the ups and downs of long-term success. Long-term stock market success often requires the will to hold on to a poorly performing but high potential stock in the short term. However, it is easy to lose investor confidence — or the fund manager job — during these downswings.

Additionally, funds that do outperform their benchmark over 15 years spend 60-80% of that time underperforming. These statistics require an iron will and the understanding of investors.

- **Active Fund Managers Mitigate Risk**

Another explanation for this chronic underperformance is detailed in Rob Isbitts' excellent Forbes column. He speculates that the real reason active fund managers cannot outperform the S&P 500 is that a) they are not trying to b) if they did, they would be out of business. Isbitts explains that risk management is the main reason for active funds underperformance and makes the point that active fund managers are averse to the exposure of taking a position of the entire index.

- **Taxes**

Active funds need to time the market to turn a profit. Buying and selling incur transactions costs that affect the fund's returns. Additionally, profits lead to capital gains that are passed on to the shareholder.

- **Fees**

Active funds have fees that consume into the returns. Fund managers charge 1-2% per year in management fees, compared to 0.1-0.2% for passive indexing. Additionally, sales charges can apply when one buy or sell the fund, frequently totalling around 4-8%. These charges compound over the years and negatively affect returns.

20.6 STRATEGIES TO ADOPT IF PORTFOLIO IS UNDERPERFORMING

Equity markets are inherently volatile by nature. It must be noted that short term volatility is not necessarily indicative of long term trend. There are many variable factors that affect the performance of markets many of which are beyond the comprehension of a common investor. Markets generally behave like an oscillating pendulum- never ever resting at the equilibrium. Volatility in markets, in general, is then passed on to the individual portfolios. In such a scenario, there is possibility of underperformance of one's portfolio vis-a-vis the benchmark. Ahead of comparing the performance of a portfolio, ensure that it is pitted against the right benchmark, else the whole assessment exercise is in vain. The asset allocation of the portfolio is to be decided at the beginning of investing keeping in view the objectives to be achieved. First rule to make an all weather portfolio is to select stocks after making proper due diligence about the business, management and future potential of the business.

To start with one should dig deeper to understand the reasons for underperformance of the portfolio. One of the common reasons for divergence in the performance of a portfolio is the constituents- a portfolio may not necessarily mirror the constituents and weightage associated with every stock in the benchmark. One would have to bear with the deviation in portfolio's performance due to this reason if one wants to retain the distinctiveness of his portfolio from the benchmark.

Another reason for underperformance can be allocation in the portfolio- the distribution of 'growth' and 'value' stocks/ sectors in the portfolio. In the rising markets, the 'growth' stocks outperform the markets, command high or extremely high valuations. In intermittent corrections, these stocks happen to witness rerating in their valuations, hence see a correction in prices, which may or may not be sharp. There is probability of portfolio underperformance if it is highly skewed towards growth stocks. The excesses that are built in terms of high or extremely high valuations in rising phase of bull markets are tempered during intermittent corrections to bring it closer to the reality or even maybe on the other side. It would be a prudent call to analyze the valuation of the growth stocks in such turbulent times and if the long term growth story is intact, one must look at adding more at different price points with long term investment horizon. One must take help of the financial advisor to assess the valuation and the investment rationale of the stock and do the needful. Similarly, if a value stock is available below the previous purchase price and the investment rationale is intact, does it require a rethink on adding more?

Markets have tendency to exhibit irrational exuberance on either side of equilibrium and so does the market participants. The general behaviour of market participants never changes. Time and again, it has been statistically proven that the investors follow a herd mentality; they turn greedy when they should have turned cautious and vice-versa. Investors end up making irrational and illogical decisions with their investments especially in wake of event which many a times happens to be extraneous to the country/ stock market/ specific stock. They tend to overreact to the events without giving due consideration of its impact on fundamentals of the stock. The markets react to reasons which are beyond the comprehension of an average investor and many a time the investor extends the same analogy to the specific stocks in his portfolio without giving a thought to whether the changed conditions have led to any changes in the fundamentals of the company. An investor has to undertake due diligence of fundamentals of specific event on the stock/ investment before taking any hasty decision. He should not panic, practice patience, have faith in his investment and avoid unnecessary churning of his portfolio, if the event that leads to market volatility has little to do with the future prospects of the investment. It has been proven time and

again that the investments held for long periods tend to exhibit lower volatility than those held for shorter periods. The longer you invest, the more likely you will be able to weather lows in the market.

To conclude, the investor should not get carried away by the short term volatility of the markets and the temporary underperformance of the portfolio if he is convinced about the potential and prospects of the stocks in it. Use the opportunity to recheck the fundamentals and if convinced about its potential infuse more funds to add at lower levels thereby taking the advantage of lower prices to average the acquisition cost.

20.7 SUMMARY

The construction of a portfolio may involve one stage, two stages, three stages, or possibly even more. The fund manager must decide on the number of stages and their nature. There is also a choice between active and passive management at each stage (and if passive, which type of passive management). Active portfolio management attempts to outperform the market by choosing investments that are likely to show high returns while portfolio managers who employ a passive style do not seek to outperform the market.

20.8 GLOSSARY

- **Active investment management:** It represents fund management that entails stock selection and/or market timing in an attempt to outperform the market.
- **Bond:** A security sold in order to raise capital. Bonds normally provide the buyer with a fixed income flow plus the return of the initial capital on the maturity date of the bond. Bonds are debts of the issuer.
- **Buy-and-hold strategy:** Purchase of a portfolio which is held unchanged for the full investment horizon.
- **Growth stocks:** Shares whose prices are expected to rise relatively rapidly. They tend to be characterised by high price-earnings ratios.

- **Value stocks:** Shares that are believed to be underpriced. They tend to be characterised by low price-earnings ratios.

20.9 SELF ASSESSMENT QUESTIONS

1. Define buy-and-hold strategy.

2. What do you mean by index tracking?

20.10 LESSON END EXERCISE

1. Differentiate between active and passive portfolio management.

2. Explain the sources of systematic underperformance of active portfolio management.

20.11 SUGGESTED READINGS

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Prof. Sandeep Kour Tandon

Co-ordinator, M.Com

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BEHAVIOURAL FINANCE

Written by :

Dr. Sumeet Kour
Lecturer, PG Deptt.
of Commerce
University of Jammu, Jammu.

Editing and Proof Readings by :

Prof. Sandeep Kour Tandon
Co-ordinator, M.Com
Room No. 111, 1st Floor,
DD&OE, University of Jammu

Ms. Shriya Gupta
Teacher Incharge M.Com.,
Room No. 205, IInd Floor
DD&OE, University of
Jammu, Jammu.

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