BEHAVIOURAL FINANCE (4th Semester)

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UNIT - II

Introduction to Behavioural Finance:

Traditionally, economics and finance have focused on models that assume rationality. The behavioural insights have emerged from the application in finance and economics of insights from experimental psychology. Behavioural finance is relatively a new field which seeks to provide explanation for people's economic decisions. It is a combination of behavioural and cognitive psychological theory with conventional economics and finance.

An underlying assumption of behavioural finance is that, the information structure and characteristics of market participants systematically influence the individual's investment decisions as well as market outcomes. Investor, as a human being, processes information using shortcuts and emotional filters. This process influences financial decision makers such that they act seemingly in irrational manner, and make suboptimal decision, violate traditional finance claim of rationality. The impact of this suboptimal financial decision has ramification for the efficiency of capital markets, personal wealth, and the performance of corporations. Irrational decision could be either due to processing of wrong information or interpretation with inconsistent decisions.

Behaviour finance focuses upon how investors interpret and act on information to make informed investment decisions. Investors do not always behave in a rational, predictable and an unbiased manner indicated by the quantitative models. Behavioural Finance places an emphasis upon investor behaviour leading to various market anomalies.

Standard (Traditional) Finance

Standard finance is the body of knowledge built on the pillars of the arbitrage principles of Miller and Modigliani, the portfolio principles of Markowitz, capital assets pricing model (CAPM) of William Sharpe, Linter and Black, and option pricing model of Black and Scholes, and Merton. (Statman,1999). This approach considers market to be efficient using models in which agents are 'rational'. Rationality means two things:

• First when they receive new information, agents update their beliefs correctly, in the manner described by Bayes's law.

• Second, given their beliefs, agents make choices that are normatively acceptable, in the sense that they are consistent with Savage's notion of Subjective Expected Utility Theory (SEU).

According to standard finance pricing model, people value wealth, the presumption is that investor act carefully and objectively while making financial decisions. Financial economists assumed that people behaved rationally, when making financial decisions. Researchers in psychology discovered that economic decisions are often made in a seemingly irrational manner.

Over past decade, the field of behavioural finance has evolved to consider how personal and social psychology influence financial decisions and the behaviour of financial market. According to Hirschey and Nofsinger "Behavioural finance is study of cognitive errors and emotions in financial decisions". Three basic argument of EMH:

- Investors are rational and by implication securities are valued rationally.
- Investor takes careful account of all available information before making investment decisions.
- And decision makers always pursue self-interest.

Traditional models in finance can be caricatured as follows: "If investors are rational, and if markets are efficient, then investors ought to be behaving as follows."

Evolution of Behavioural Finance

Standard finance theory is accepted world-wide from market level perspective. But in 1960s and 1970s, new wave in field of finance has been started by psychologist, study of heuristics found many biases and limit to cognitive resources, through examining economic decisions.

It was started by study of Slovic (1969,1972) studied stock brokers and investors. Slovic (1972) states the money Game: "You are—face it—a bunch of emotions, prejudices, and twitches, and this is all very well as long as you know it. Successful speculators do not necessarily have a complete portrait of themselves, warts and all, in their own mind, but they do have the ability to stop abruptly when their intuition and what is happening out there are suddenly out of kilter. If you don't know who you are, this is an expensive place to find out."

Recognition of the contribution that behavioural analysis is now significant in financial economics was reflected in 2002 with Awards of the Nobel Prize in economics to professor of psychology, Daniel Kahneman, where he detailed the heuristics and biases that occur when making decisions under uncertainty. The most important change in this direction happened, when their next research came into economics field, which is prospect theory (1979) for which they received Noble Price in year 2002.This work has grown out of a series of experiments that have led to strong conclusions about the biases that affect how individuals take decisions and how they form preferences. Now main stream financial economist realised that investor can behave irrationally. Instead human brain often processes information using shortcuts and emotional filters.

The American Finance Association held its first behavioural finance session at its 1984 annual meeting. In next year, Debondt and Thaler (1985) published a behavioural based paper on investors' overreaction to news. They explained investor Overreaction Hypothesis opposes to EMH. They rejected'regression to mean of price', operating in extreme highs and lows balance each other.It is followed by Shefrin and Statman (1985) publication of paper on Disposition effect. They put it as Disposition effect that suggests that investors relate to past winners differently than past losers. Odean applied the disposition effect in vivo context. In year 2000, Shefrin described how these psychology papers influenced the field of finance.

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The beginning of this psychology based finance research coincided with the start of many empirical findings that raised doubt on fundamental of standard finance theory & EMH. Behavioural finance encompasses research that drops the traditional assumption of expected utility maximization with rational investors in efficient market.

CONCEPT OF BEHAVIOURAL FINANCE:

Definition of Behavioural Finance:

Linter G.(1998) has defined behavioural finance as being study of how human interprets and act on information to make informed investment decisions. (Linter,1998)

Gilovich (1999) have referred to behavioural finance as behavioural economics and further defined behavioural economics as combining twin discipline of psychology and economics to explain why and how people make seemingly irrational or illogical decisions when they save,

According to Shefrin "Behavioural Finance is the application of psychology to financial behaviour-the behaviour of practitioner."(Shefrin, 2000)

According to Fromlet "Behavioural finance closely combines individual behaviour and market phenomena and uses knowledge taken from both the psychological field and financial theory" (Fromlet, 2001)

Behavioural finance is new approach to financial markets that argues that some financial phenomena can be understood by using models where some agents are not fully rational.

Assumptions of Behavioural Finance:

• **Loss aversion:** The characteristics of seeking to limit the size of the potential loss rather than seeking to minimise the variability of the potential returns.

• **Bounded rationality:** The manner in which human being behave, limits their rationality.

• **Denial of risk:** They may know statistical odds but refuse to believe these odds.

Meaning of Behavioural Finance:

Behavioural finance is a discipline that attempts to explain and increase understanding regarding how the cognitive errors (mental mistakes) and emotions of investors influence the decision making process. It integrates the field of psychology, sociology, and other behavioural sciences to explain individual behaviour, to examine group behaviour, and to predict financial markets.38According to behavioural finance people are not always rational: many investors fail to diversify trade too much, and seem to selling winners and holding losers. Not only that, but they deviate from rationality in predictable ways.

Individual investor and their behaviour had received lot of consideration and focus of interest of many scientists not only being confided only to economist, but, due to the inclusion of the findings and the methodology of psychology into financial studies. Despite many debates, this has slowly led to the establishment of behavioural economics and behavioural finance as widely recognised sub-disciplines.

Behavioural finance promises to make economic model better at explaining systematic investor decisions. Taking into consideration their emotions and cognitive errors and how these influence decision making. So behavioural finance is not a branch of standard finance; it is replacement offering a better model of investor psychological decision process.

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'.
According to behavioural finance, investor's behaviour in market depends on psychological principles of decision making, which explains why people buy and sell investments. It focuses on how investors interpret information and act on information to implement their financial investment decisions. In short psychological process and biases influences investors decision making and influence the market outcomes.

Characteristics of Behavioural Finance:

Four Key Themes- Heuristics, Framing, Emotions and Market Impact characterized the Field of Behavioural Finance. These themes are integrated into review and application of investments, corporations, markets, regulations, and educations-research.

1. Heuristics
2. Framing
3. Emotions
4. Market Impact

1. Heuristics: Heuristics are referred as rule of thumb, which applies in decision making to reduce the cognitive resources to solve a problem. These are mental shortcuts that simplify the complex methods to make a judgment. Investor as a decision maker confronts a set of choices within certainty and limited ability to quantify results. This leads identification and understanding of all heuristics that affect financial decision making. Some of heuristics are representativeness, anchoring & adjustments, familiarity, overconfidence, regret aversion, conservatism, mental accounting, availability, ambiguity aversion and effect. Heuristics help to make decision.

2. Framing: The perceptions of choices that people have are strongly influenced by how these choices are framed. It means choices depend on how question is framed, even though the objective facts remain constant. Psychologists refer this behaviour as a' frame dependence'. As Glaser, Langer, Reynders and Weber (2007) show that investors forecast of the stock market depends on whether they are given and asked to forecast future prices or future return. So it is how framing has adversely affected people's choices.

3. Emotions: Emotions and associated human unconscious needs, fantasies, and fears drive much decision of human beings. How these needs, fantasies, and fears influence financial decision? Behavioural finance recognise the role Keynes's "animal spirit" plays in explaining investor choices, and thus shaping financial markets (Akerlof and Shiller, 2009). Underlying premises is that our feeling determine psychic reality affect investment judgment.

4. Market Impact: Do the Cognitive errors and biases of individuals and groups of people affect market and market prices? Indeed, main attraction of behavioural finance field was that market prices did not appear to be fair. How market anomalies fed an interest in the possibility that they could be explained by psychology? Standard finance argues that investors' mistakes would not affect market prices because when prices deviate from fundamental value, rational investor would exploit the mispricing for their own profit. But who are those who keep the market efficient? Even institutional investor exhibits the inefficiency. And other limit to this is arbitrage.(Shleifer and Vishny, 1997; Barberies and Thaler,2003)43. This prevents rational investor from correcting price deviations from fundamental value. This leaves open the possibility that correlated cognitive errors of investor could affect market prices.

Similarity and Differences between Standard Finance and Behavioural Finance:

Traditional Finance incorporates no element of human psychology; Behavioural Finance usually incorporates almost no elements, relying on economic theory. Finance institution place people in complex settings that are best described in terms of information, incentives, and actions that can be taken –building block of economic theory. Thus, behavioural studies include only small elements of psychology, integrated into economic theory needed to understand the institution itself. In this way, Behavioural Finance adds only wrinkle to standard finance, which is to alter some of one or more facets of an assumption which is the very foundation of economic theory: how do individual behave?

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 recognises 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 influenced 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, recognises 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 of 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.

• EMH views that price follow random walk, though prices fluctuate to extremes, they are brought back to equilibrium in time. While behavioural finance views that prices are pushed by investors to unsustainable levels in both direction. 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.

Behavioural finance questions whether the behavioural assumptions underlying the EMH are true. Another aspect of behavioural finance concerns how investors form expectations regarding the future and how these expectations are transformed into security prices. By considering that investors may not always act in wealth maximising manner and that investors may have biased expectations. Behavioural finance may be able to explain some of the anomalies to EMH that have been reported in finance literature.

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 phenomena 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

Behavioural Finance and Investment Decisions:

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 investors is to make investment decision, 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 becomes 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. Therefore, behavioural finance helps the investors as well as the market participants to understand biases and other psychological constraints in their interplay in market. Thus, behavioural finance application can be illustrated as:

The Behavioural Finance Decision Makers

The Individuals	The Groups	An Organizations
Small investors	Portfolio of Investors (Mutual Funds)	A Financial Institutions
Portfolio Managers	A Group of Investors	A Non Profit Entity

Behavioural finance approach attempts to explain and increase understanding of reasoning patterns of investors, including the emotional processes involved and degree to which they influence the decision making process. Essentially, it attempts to explain the what, why and how finance and investing, form human perspective. These help investors to minimize or eliminate the psychological biases in investment decisions.

BUILDING BLOCKS OF BEHAVIOURAL FINANCE

Behavioural Finance has two building blocks:

- Market Inefficiency (Limits to Arbitrage)
- Cognitive Psychology

MARKET INEFFICIENCY (LIMITS TO ARBITRAGE)

The theory of limited arbitrage shows that if irrational traders cause deviations from fundamental value, rational traders will often be powerless to do anything about it. Arbitrage is an investment strategy that offers riskless profits at no cost. The hypothesis that actual prices reflect fundamental values is the Efficient Markets Hypothesis (EMH). In an efficient market, there is "no free lunch": No investment strategy can earn excess risk-adjusted average returns, or average returns greater than are warranted for its risk.

Behavioral finance argues that some features of asset prices are most plausibly interpreted as deviations from fundamental value, and that these deviations are brought about by the presence of traders who are not fully rational. Both "prices are right" and "there is no free lunch" are true in an efficient market; "no free lunch" can also be true in an inefficient market.

Arbitrage is indeed limited. The evidence of mispricing is simultaneously evidence of limited arbitrage, and it is not hard to see why arbitrage might be limited in this case. The price of the share changes even though its fundamental value does not. The soft spots of investment practice are the claims of active managers that they can beat the market. Many investment professionals have embraced behavioral finance as an ally against standard finance. Finance has no tests powerful enough to distinguish market inefficiency from bad asset-pricing models. The best practice is to accept market efficiency in the beat-the-market sense and reject it in the rational-prices sense.

The BAPM (Behavioral Asset-Pricing Model) features the market interaction of two groups of traders, namely, information traders (ones who populate the standard CAPM; free of cognitive errors and have mean-variance preferences) and noise traders (live outside the CAPM, commit cognitive errors, and do not have strict mean-variance preferences). All asset-pricing models are versions of the old reliable supply-and-demand model. Demand and supply are determined by utilitarian characteristics (such as production costs and prices of substitutes) and value-expressive characteristics (such as tastes). For CAPM, demand and supply are determined by the utilitarian beta. However, the characteristics of BAPM are utilitarian and value-expressive traits. Demand-side preferences for utilitarian and value-expressive characteristics are not sufficient for price differentials. The supply side also matters.

Meanwhile, portfolios recommended by financial advisors commonly have a structure that is very different from the standard finance structure of mean-variance portfolios. Mean-variance investors evaluate portfolios as a whole; they consider covariance between assets as they construct their portfolios; also have consistent attitudes toward risk; always averse to risk. Behavioral investors consider building portfolios as pyramids of assets, layer by layer. The layers are associated with particular goals and particular attitudes toward risk.

COGNITIVE PSYCHOLOGY

Psychology is the second building block of behavioral finance. Behavioral economists typically turn to the extensive experimental evidence compiled by cognitive psychologists on the biases that arise when people form beliefs, and on people's preferences, or on how they make decisions, given their beliefs. The following portion discusses the recent development of psychology theories, which are directly related to behavioral finance field.

Beliefs: In terms of people's beliefs, there are several psychological factors that affect investors' decision-making process:

(1) Overconfidence: People are poorly calibrated when estimating probabilities. The confidence intervals people assign to their estimates of quantities are far too narrow. Overconfidence may in part stem from two other biases: self-attribution and hindsight bias. For example, investors might become overconfident after several quarters of investing success.
(2) Optimism and Wishful Thinking: Most people display unrealistically rosy views of their abilities and prospects. Over 90% people surveyed predict that tasks will be completed much sooner than they actually are.
(3) Representativeness: Much of the time, representativeness is a helpful heuristic, but it can generate some severe biases. Representativeness also leads to another bias, sample size neglect. Sample size neglect means that in cases where people do not initially know the data-generating process, they will tend to infer it too quickly on the basis of too few data. The belief that even small samples will reflect the properties of the parent population is sometimes known as the "law of small numbers"; in situations where people do know the data-generating process in advance, the law of small numbers generates a gambler's fallacy effect.
(4) Belief Perseverance: Once people have formed an opinion, they cling to it too tightly and for too long. People are reluctant to search for evidence that contradicts their beliefs; second, even if they find such evidence, they treat it with excessive scepticism.
(5) Anchoring: When forming estimates, people often start with some initial, possibly arbitrary value, and then adjust away from it. People "anchor" too much on the initial value.
(6) Availability Biases: When judging the probability of an event, people often search their memories for relevant information. While this is a perfectly sensible procedure, it can produce biased estimates because not all memories are equally retrievable or "available".

Preferences: An essential ingredient of any model trying to understand asset prices or trading behaviour is an assumption about investor preferences. The vast majority of models assume that investors evaluate gambles according to the expected utility framework. Utility is defined over gains and losses rather than over final wealth positions, an idea first proposed by Markowitz. Specifically, prospect theory has no aspirations as a normative theory: it simply tries to capture people's attitudes to risky gambles as parsimoniously as possible. Prospect theory could explain why people made different choices in situations with identical final wealth levels. This illustrates an important feature of the theory, namely that it can accommodate the effects of problem description, or of framing. Such effects are powerful. No normative theory of choice can accommodate such behaviour since a first principle of rational choice is that choices should be independent of the problem description or representation. The classic experiment described by Ellsberg (1961) suggests that people do not like situations where they are uncertain about the probability distribution of a gamble. Such situations are known as situations of ambiguity, and the general dislike for them, as ambiguity aversion.

THEORETICAL FRAMEWORK OF BEHAVIOURAL BIASES

Psychologists have documented systematic patterns of bias on how people form views and take decisions. These biases influence how decision makers form investment opinions, and then how investors take investment decisions.

Information processing may be correct but individual tend to make less rational decisions using that information. Nevertheless, most of the financial decisions are driven by people's emotions and associated universal human unconscious needs, fears and psychological traits.

Thus bias arises and it can be divided into **(i) Prospect theory and Framing (ii) Heuristics and (iii) other biases.** These biases sit deep within our psyche and as fundamental parts of human nature; they affect all types of investors, both professionals as well as private.

The heuristic decision process by which the investors find things out for themselves usually by trial and error, leads to the development of rules of thumb. These decision are those with which humans attempt to make mental shortcuts. These practices however can result in poor decision results that also apply to individual investment decision process.

When individuals are faced with complex judgments involving statistical probability, frequency or incomplete information, many individuals usually utilise limited number of heuristics that reduce the decision to simper task. Psychological biases or heuristics that can affect decision making are explained in following section.

(i) FRAME DEPENDENCE AND PROSPECT THEORY:

FRAMING

The term Frame dependence means the way people behave depends on the way that their decision problems are framed. There is much evidence that variation in the framing of options, in terms of gains and losses, yield systematically different preference.

Framing is the way in which a question is structured with regard to the issue being evaluated. Economists argue that framing is transparent; implying that investors can see through all the different ways cash flows might be described. According to Modigliani and Miller approach "if you transfer a dollar from your right pocket to your left pocket, you are no wealthier". Franco put it as "Frame independent investors pay attention to changes in their total wealth".

In reality, behaviour is frame dependent. This means that, the form used to describe a problem has bearing on decision making. Frame dependence stems from mix of cognitive and emotional factors. The Cognitive aspects relate to how people organise information mentally, in a coding losses and profits.

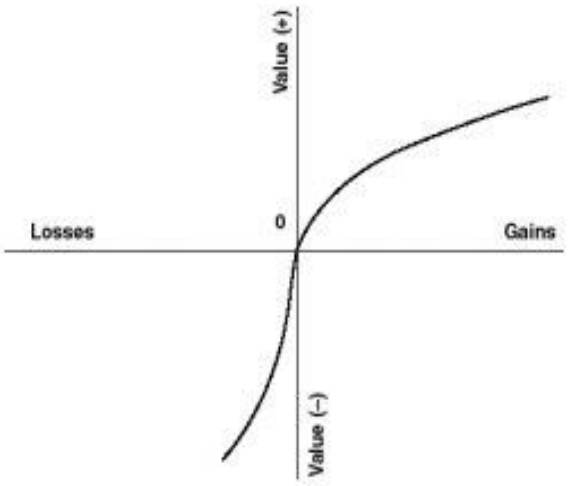
PROSPECT THEORY:

Prospect theory has done more to bring psychology into the heart of economic analysis than any other approach. It theorizes how an individual or group of individuals behaves, 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 then 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.

"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 n 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."



Note: This figure presents a visual representation of prospect theory and shows an S shaped value function.

The above figure shows value function- this 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.

Mental Accounting:

Mental accounting describes the tendency of people to place particular events into different mental accounts based on superficial attributes. People separate money and financial risk into 'mental accounts' putting wealth into various buckets. They place their money into separate parts on a variety of subjective criteria, like the source of money, and intend of each account, which has an often irrational and detrimental effect on their consumption decision and other behaviours. For example, investors may feel free to take risk in their own account rather than their children. Mental accounting manifests itself in investors' behaviour in following ways:

• Investors have a tendency to ride losers as they are reluctant to realize losses. Mentally, they treat unrealized 'paper loss' and realised 'loss' differently, although from a rational economic point of view they are same.

• Investors often integrate the sale of losers so that the feeling of regret is confined to one time period.

• Investors tend to stagger the sale of winners over time to prolong favourable experience.

• People are more venturesome with money received as bonus but very conservative with money set aside for children's education.

• Investors often have irrational preference for stocks paying high dividends, because they don't mind spending the dividend income, but are not inclined to sell a few shares and 'dip into the capital'.

So, 'mental accounting' refers to how individuals mentally integrate different parts of their wealth. Even over monitoring of portfolio is the result of this biasness. That reflects the way in which investors assign sums of money to different actual or notional accounts for different purposes with varying degrees of risk tolerance upon the importance of achieving the particular objective.

Loss Aversion:

Loss Aversion is a pervasive phenomenon in human decision making under risk and uncertainty, according to which people are more sensitive to losses than gains. A typical financial example is in investor's difficulty to realize losses. This phenomenon is called 'Get-evenities' that is, people hope that markets will work in their advantage and they will be able to terminate their investment without incurring losses.

The human tendency to take extreme measures to avoid loss leads to some behaviour that can inhibit investment success. So the human attitude to risk and reward can be very complex and subtle, which changes over time and in different circumstances.

Disposition Effect:

The disposition effect refers to the pattern that people avoid realizing paper losses and seek to realize paper gains. The disposition effect manifests itself in lots of small gains being realized, and few small losses. Regret aversion and pride seeking behaviour can cause investors to be predisposed to selling winners too early and riding losers too long. This is referred as Disposition effect. People dislike incurring losses much more than they enjoy making gains, and people are willing to gamble in the domain of losses, investor will hold onto stocks that have lost values and will be eager to sell stocks that have risen in value. They called this the disposition effect.

(ii) HEURISTICS AND BIASES:

Representativeness:

Representative heuristic is a judgment based on stereotypes. It is also referred as drawing conclusions from little data. Representativeness refers to the tendency to form judgment based on stereotypes. For example, you may form an opinion about a student to perform academically in college on the basis of how he has performed academically in school. While representativeness may be a good rule of thumb, it can also lead people astray.

Representative bias occurs when it is required to assess the probability of an object. A belonging to B. The heuristic rule says that if object A is highly representative of class B, the probability of A originating from B is judged as high, and vice versa. Representativeness refers to our tendency to evaluate how likely something is with reference to how closely it resembles something rather than using probabilities.

Actions which is explaining representativeness bias:

• Investors often try to detect patterns in data which is random number.
• Investors extrapolate past returns which actually follow randomness.
• Investors may be drawn to MFs with good track record because such funds are believed to be representative of well –performing funds. They forget that even unskilled manager can earn higher return by chance.
• Investors are overly optimistic about past winners.
• Good companies -good stock syndrome.

This heuristic leads people to judge the stock market changes as bull or bear market without valuing that the likelihood that particular sequences happen rarely. In the same way it could lead the investors to be more optimistic about the past winners and more pessimistic about the past losers which may assume that a recent trend in price movements will definitely continue into the future. It may also result in individual investors developing too much attention to popular stocks that have recently been performing well.

Representativeness can cause investors to overreact to new information, i.e. investors give new information too much weight in forming their expectation about future.

Overconfidence:

Confidence can be described as the "belief in oneself and one's abilities with full conviction" while "overconfidence can be taken one step further in which overconfidence talks this self – reliant behaviour to an extreme. As a human being people have tendency to overestimate their skills and predictions for success.

Overconfidence stems partly from illusion of knowledge. The human mind is perhaps designed to extract as much information as possible from what is available.

They may not be aware that the available information is not adequate to develop an accurate forecast in uncertain situations. Investment with overconfidence, can lead to inappropriate or risky investments. Overconfidence causes investors to overestimate their knowledge, underestimate risks, and exaggerate their ability to control events.

Overconfidence will result in:

• Mistaking luck for skill
• Too much risk
• Too much trading

So people tend to overestimate their belief and ability. Overconfidence suggests that investors overestimate their ability to predict market events, and because of this they often take risk without actually receiving proportionate returns.

SAB & Confirmation Bias:

Self-attributionbias theory is attributed to Heider , who observed how people tend to attribute successful outcome from decisions to their own actions and bad outcome to external factors.

SAB emerge from two important human traits: Self-protecting and Self enhancement. Self-protecting, which is the desire to have positive self-image and self enhancement, which is the desire for others to see us positively.

It can be difficult to encounter something or someone without having pre-conceived opinion. This first impression can be hard to shake because people also tend to selectively filter any pay more attention to information that supports their opinions, while ignoring or rationalizing the rest. This type of selective thinking is often referred to as the confirmation bias.

Confirmation bias is the people's desire to find information that agrees with their existing view. Any information that conflicts with the null is ignored, whilst information that reinforces the null is over-weighted. In investing, the confirmation bias suggests that an investor would be more likely to look for information that supports their original ideas about an investment rather than seek out information that contradicts it. Due to this kind of investor's tendency, it often results into wrong decision.

Availability Bias:

According to availability bias, people tend to base their decisions more on recent information rather than any detailed study of past events and thereby become biased to that latest news.

In investment world, people often made decisions based on the information readily available and do not take pain to go for any detailed analysis. 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.

This heuristic is used to evaluate the frequency or likelihood of an event on the basis of how quickly instances or association come to mind. Availability is a cognitive heuristic in which a decision maker relies upon knowledge that is readily available rather than examine other alternatives or procedures.

Cognitive Dissonance:

A form of self-deception stems from the fact that people seek consistency. The mental discord, that arises when the memory of an event conflicts with a positive self-perception or conflict between perception and reality. Cognitive Dissonance is the mental conflicts that people experience when they are presented with evidence that their belief or assumptions are wrong; people have an incredible degree of self-denial. They will effectively jump through mental hoops in order to reduce or avoid inconsistencies.

Conservatism:

Conservatism is a tendency to cling tenaciously to a view or a forecast. Once the position has been stated most people find it very hard to move away from the view. When movement does occur it is only very slow, which creates under-reaction to events.

Another bias is conservatism, which arises when it is widely recognised that the available data are insufficient to support strong conclusions. In this case, it is a common error to place too little weight on the available evidence, or even to disregard it and to rely solely on prior expectations. In this way, individuals demonstrate a reluctance to search for evidence that contradict their previous views, because they are reluctant to change their own judgment.

When things have changed, people tend to be slow to adjust to the changes. In other words, they prefer to stay on the ways things have normally been. This is what conservatism is all about.

Such bias would give rise to momentum in stock market return. The investors take very conservative approach to changing their minds after taking a decision, despite new contradictory information. For example, investors also tend to look at short term investment performance and believe it will continue, rather than lake a long view.

Regret Aversion:

Regret is the emotion individual feels if they can easily imagine having acted in a way that would have led to a more favourable outcome. Classical e.g. of it is fall in price of investment. Regret is the emotion experienced for not having made the right decision. It is the feeling of responsibility for loss. It is also related with preference for dividend in financing consumer expenditures, because selling a stock that may rise in the future carries a huge potential for regret.

Regret avoidance is the tendency to avoid actions of interest that could create discomfort over prior decisions. This explained why investors defer selling losing positions. In order to avoid the stress associated with admitting a mistake, the investor holds onto the losing position and hopes for recovery.

At the same time, they sell the stock that have gone up in order to feel regret if the prices later fall. This regret avoidance can also be explained when individuals tend to have more regret over the same losses in small stocks rather than the good ones. As buying a small stocks would be more of their own decisions which is 'out of favour' to others. When investors lost on small stocks, they feel guiltier than losing on larger ones. Hence small stocks require higher rate of return to make a buying decisions.

Anchoring and Adjustment:

Anchoring can be explained as the tendency to attach or 'anchor' our thought to a reference point even though it may have no logical relevance to the decision at hand. Although it may seem an unlikely phenomenon, anchoring is fairly prevalent in situation where people are dealing with concepts that are new or novel.

After forming an opinion, people are often unwilling to change it, even though they receive new information that is relevant. Suppose that investors have formed and opinion that company X has above average long term earnings prospect. Suddenly, X reports much lower earning that expected. Thanks to anchoring (conservatism), investors will persist in the belief that the company is above average and will not react sufficiently to bad news.

Aversion to Ambiguity: (Familiarity Bias)

Familiarity bias is an inclination or prejudice that alters an individuals' perception of risk. Familiarity is a mental short-cut that treats the familiar things as better than less familiar things. People are comfortable with things that are familiar to them. The human brain often uses the familiarity short cuts in choosing investments. That is why people tend to invest more in the stock of their neighbour companies, employer companies, as well as domestic companies.

People are fearful of ambiguous situations where they feel that they have little information about the possible outcomes. In experiments, people are more inclined to bet when they know the probabilities of various outcomes that when they are ignorant of the same. In the world of

investments, aversion to ambiguity means investors are wary of stocks than they feel they don't understand. On the other side it means investors have a preference for familiar assets. This is manifested in home country bias, local company bias, and own company bias.

(iii) OTHER BIASES:

Innumeracy:

Innumeracy refers to people confuse between nominal change and real change. People find difficulty in figuring out probabilities. They also give attention to big numbers and give less weight to small figures. Moreover people tend to ignore the base rate and consider only case rate, which reflect the most recent experience. They tend to estimate the likelihood of event on the basis of past example and how frequently that event has occurred.

Innumeracy can be explained in following actions:
• People are unable to differentiate between nominal change and real change.
• People have difficulty in figuring out true probabilities.
• People are more attentive to big numbers.
• People miss frequency of happening past stories.
• People generally ignore base rate.

Affect:

The affect heuristic concerns 'goodness' and 'badness'. Affective responses to a stimulus occur rapidly and automatically: note how quickly you sense the feelings associated with the stimulus words treasure or hate.

Illusion:

A Natural way for people to think about money is in terms of nominal rather than inflation-adjusted values. Thus under hyperinflation people will view nominal wage increase more favourably than it really is.

Behavioural Portfolios:

While investors understand the principle of diversification, they don't form portfolios in the manner suggested by Harry Markowitz portfolio theory. According to Hersh Shefrin and Meir Statman, the psychological tendencies of investors prod them to build their portfolios as pyramid of assets as under:

• Investors have several goals such as safety, income, and growth, often in that sequence.
• Each layer in the pyramid represents assets meant to meet a particular goal.
• Investors have separate mental accounts for each investments goal and they are willing to assume different levels of risk for each goal.
• The asset allocation of an investor's portfolio is determined by the amount of money assigned to each assets class by the mental accounts.

Limitations/Criticisms of Behavioural Finance:

Although behavioural finance had been gaining support in recent years, it is not without its critics. Some supporter of EMH and standard finance theory criticise the behavioural finance approach.

Critics of behavioural finance contend that behavioural finance is more a collection of anomalies than true branch of finance and these anomalies will eventually be priced out of the market or explained by appeal to market microstructure arguments. However, a distinction should be noted between individual biases and social biases; the former can be averaged out by the market, while the other can create feedback loops that the market further from the equilibrium of the 'fair price'.

Another argument is found in explanations of the equity premium puzzle. It is argued that the puzzle simply arises due to entry barriers, that have traditionally impeded entry by individuals into the stock market, and that returns between stock and bonds should stabilize as electronic resources open up the stock market to a greater number of traders.

Others contend that most personal investment funds are managed through superannuation funds, so the effect of these putative barriers to entry would be minimal. In addition, professional investors and fund managers seem to hold more bonds than one would expect given return differentials.

Even though there are some anomalies that cannot be explained by modern financial theory, market efficiency should not be totally abandoned in favour of behavioural finance. Many of the findings in behavioural finance itself appear to be collection of anomalies that can be explained by market. It is observed that, the problem with the general area of behavioural finance is that it only serves as a complement to general economics at the moment; mostly because it is quite a new area.

UNIT: III

RATIONALITY IN INVESTMENT DECISION:

A decision-making is based on making choices that result in the most optimal level of benefit or utility for the individual. Most conventional theories are created and used under the assumption all individuals taking part in an action/activity are behaving rationally. Rational behaviour does not necessarily always involve receiving the most monetary or material benefit because the satisfaction received could be purely emotional. For a decision to be deemed rational, it must make logical sense, and often the decision is made without significant emotional response over the choice. Rational behaviour also does not necessarily require a person to attempt to get the highest return as it does allow for the consideration of risk. A person's aversion to risk may be considered rational at multiple levels depending on her exact goals and circumstances.

Investment in stock markets is fraught with biases, as investor sentiment and behaviour is likely to impact the investment decision-making process. Investing is not considered to be an exact science, as the human element involved in investing is ubiquitous and often unpredictable. Traditional finance models assume that market participants are rational and that their decision-making is efficient and unbiased. Mentioned below are some common investor biases and suggestions on how to deal with them.

Conservatism Bias and The Status Quo Bias: Investors who succumb to the conservatism bias tend to place more emphasis on the information used to form their original forecast than on new information. As a result, any new information that the investor receives is overshadowed by the information originally used to arrive at the forecast, leading investors to hold on to losing or winning positions for longer than feasible. A corollary to the conservatism bias is the status quo bias exhibited by investors who show an unwillingness to alter their current asset allocation rather than make a value-enhancing decision. This leads to undiversified portfolios and a higher probability of the investor missing the proverbial "bus". It is a trap which most investors fall into, primarily because processing the new information without a bias requires one to accept that the previous information was either incorrect or is no longer valid.

The best way to avoid this behavioural trap is to always be amenable to new information, especially if it is contesting our existing hypothesis. Rather than look at new information in the same light as the previous one, an investor should carefully examine the new information to determine its value.

Anchoring and Adjustment Bias: Such investors seem to be anchored to previously forecast values and even with the receipt of new information, tend to stay close to their original forecast. The best way to tackle this bias is to view new information first in isolation, determine its impact on our forecasts and then integrate it with a previous forecast. I believe that this would help the investor in gaining a more holistic perspective.

Confirmation Bias: In such case, investors only notice information that agrees with their existing perceptions. They are constantly looking for confirming evidence while discounting or even ignoring evidence that contradicts existing perceptions. This can lead to skewed and undiversified portfolios. The best way to avoid falling into this trap is to actively seek out information that seems to contradict existing perceptions and analyse it carefully.

Greed & Fear: Over the years I have observed that most investors are influenced by the twin evils of greed and fear. Greed makes us hold on to losing positions till they take the shirt off our backs and fear makes one avoid or exit winning positions, way before their true potential has been realised.

Often investors tend to react with extreme emotion when confronted with losses. Such investors, in an effort to avoid more losses, become risk seekers. On the other extreme are investors who, after taking severe losses start suffering from the regret aversion bias by showing a tendency to stay focused on low-risk investments? Many investors who completely exit the markets after enduring significant losses and only re-enter with low risk, low return investments. They tend to pass up perfectly good opportunities, as a result of which their portfolios have limited upside.

At the other end of the spectrum are investors who have developed such a level of over-confidence in their ability to forecast and pick the winning stocks that they refuse to book profits even after the investment has exceeded its target price and they have no new information to support a further upside. The best way to avoid these emotional biases is to trade or invest with discipline and not pull the trigger during extreme market movements. It is also prudent to seek the help of professionals like mutual funds managers who are trained to invest in markets and are governed by strict regulatory rules and code of ethics.

RATIONAL DECISION MAKING PROCESS

Rational decision making is a multi-step process for making choices between alternatives. The process of rational decision making favours logic, objectivity, and analysis over subjectivity and insight. The word “rational” in this context does not mean sane or clear-headed as it does in the colloquial sense. The approach follows a sequential and formal path of activities. This path includes:

- Formulating a goal(s)
- Identifying the criteria for making the decision
- Identifying alternatives
- Performing analysis
- Making a final decision

Assumptions of the Rationality in Decision-Making: The rational model of decision making assumes that people will make choices that maximize benefits and minimize any costs. The idea of rational choice is easy to see in financial theory. For example, most people want to get the most useful products at the lowest price; because of this, they will judge the benefits of a certain

object (for example, how useful is it or how attractive is it) compared to those of similar objects. They will then compare prices (or costs). In general, people will choose the object that provides the greatest reward at the lowest cost.

The rationality also assumes:

- An individual has full and perfect information on which to base a choice.
- Measurable criteria exist for which data can be collected and analysed.
- An individual has the cognitive ability, time, and resources to evaluate each alternative against the others.
- The rational-decision-making model does not consider factors that cannot be quantified, such as ethical concerns or the value of altruism. It leaves out consideration of personal feelings, loyalties, or sense of obligation. Its objectivity creates a bias toward the preference for facts, data and analysis over intuition or desires.

Critiques Rationality in Decision-Making

Critics of Rationality in Decision-Making claim that this model makes unrealistic and over-simplified assumptions. Their objections to the rational model include:

- People rarely have full (or perfect) information. For example, the information might not be available, the person might not be able to access it, or it might take too much time or too many resources to acquire. More complex models rely on probability in order to describe outcomes rather than the assumption that a person will always know all outcomes.
- Individual rationality is limited by their ability to conduct analysis and think through competing alternatives. The more complex a decision, the greater the limits are to making completely rational choices.
- Rather than always seeking to optimize benefits while minimizing costs, people are often willing to choose an acceptable option rather than the optimal one. This is especially true when it is difficult to precisely measure and assess factors among the selection criteria.

ELLSBERG'S PARADOXES

Human beings crave certainty and loath ambiguity. People naturally gravitate towards the "sure thing" versus another option where the outcome is uncertain. Sometimes this is true even when the uncertain path may have huge upside.

Investors are hard-wired to avoid ambiguity wherever possible, and this tendency to shy away from ambiguities in decision-making is called the Ellsberg Paradox. The example, which Daniel Ellsberg (of the Pentagon Papers fame), used to demonstrate the paradox involves an urn and red, black, and yellow balls.

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 is our final decision.

Applications Ellsberg's Paradoxes in Finance:

The Ellsberg paradox shows us that can depart from rational decision-making, as informed by probabilities, since we are averse to ambiguity and avoid probabilities when they are difficult to assess. The degree of incompleteness of the market reaction increases monotonically with the level of information uncertainty, suggesting that investors tend to underreact more to new information when there is more ambiguity with respect to its implications for firm value. How might this be reflected in the market?

We might favour preferred stock, with a dividend stream that has pay-outs of specific, fixed amounts, over an investment in common stock with more ambiguous pay-outs, including dividend increases and appreciation potential, which is hard to assess. Such a preference may be unduly affected by our aversion to ambiguity, rather than by a strictly rational assessment of each security, leading us to make the wrong decision.

The paradox demonstrates that when faced with a "sure thing," we can sometimes overweight its value relative to other opportunities, since the possibility of downside outcomes is highly salient, and available to us. In other words, our concern about the possibility of a bad outcome is not consistent with its probability; we overweight the risks when certainty is an option.

By Bhagavan Behera

Consider a tender offer from a firm. You bought the stock at $5, and it has traded up to $10, and today, the company offers to repurchase your stock for today's $10. You have recently done valuation research suggesting that the intrinsic value of the firm is actually $15. Yet, because you have a "bird in hand," an offer to buy out your entire position at the $10 price, you conclude that you want to sell. Why? I would be too painful to see the stock trade back down below $10 and to have to sell at such a lower price, when you could have sold it at $10, which is a "sure thing." In this case, you would be overemphasizing the downside risk, and discounting your own research, since you have a certain outcome available to you, which is distorting your judgment.

Decision makers, like physicians, patients, equity investors, and so on, prefer certainty, rather than complexity and ambiguity. This sometimes causes many decision makers to choose options that contravene the expected utility of the problem. That is, the certainty Effect contributes to risk aversion and will lead people make choices that inconsistent with expected utility theory.

4 Ways the Ellsberg Paradox Inhibits in Decision-Making:

1. Investors' stick with a known situation, even if it's bad for them: The Ellsberg Paradox suggests a reason: Human beings are so risk averse that we choose to stick with bad situations rather than face uncertainty. Uncertainty is scary. But is fear of the unknown going to keep you stuck in a situation you know is making you miserable?

2. Investors Can't Embrace Change: When change is outside of your control, the psychological barriers are even worse. Embracing change is one of the key strategies to live an agile lifestyle. Because the world around us is changing so quickly, only the agile among us will thrive. But being agile means getting comfortable with the vast amount of stuff that's outside your control. And that's hard.

3. Investors Aim Low and Settle for Mediocre Results: That's how many of us treat our lives. We stay in mindless corporate jobs for the "security" and climb the ladders others set out for us, never thinking what heights we could reach if we were just a bit more comfortable with uncertainty.

4. People Talk Out of Everything: While you're struggling with all this ambiguity, the other people in your life definitely won't get it. From the outside looking in, they'll never understand why you want to give up your high-prestige Fortune 500 job for the chaotic uncertainty of being an entrepreneur or an artist. Because they don't know the toll it's taking on you mentally, physically, or emotionally, they compare the things they can measure (salary, benefits, etc.) and figure you're crazy for going with the unknown.

By Bhagavan Behera

MARKET BUBBLES

Bubbles typically refer to a situation where assets or financial instruments see a rapid increase in price – an increase in price which is driven by speculative demand and are unsustainable in the long run. At a certain price, the bubble 'bursts' and prices come down to a level which more closely reflects the fundamental economic value. A bubble strongly implies that psychological factors such as irrational exuberance and over-confidence play a role in increasing the value of the asset.

A bubble is a type of investing phenomenon that demonstrates the most basic type of "emotional investing. It is characterized by rapid escalation of asset prices followed by a contraction. It is formed 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 selloff occurs, causing the bubble to deflate

A bubble may be defined loosely as a sharp rise in price of an asset or a range of assets in a continuous process, with the initial rise generating expectations of further rises and attracting new buyers – generally speculators interested in profits from trading in the asset rather than its use of earning capacity. The rise is usually followed by reverse expectations and a sharp decline in price often resulting in a financial crisis.

The most important phases of bubble formation (Five Steps of a Bubble) are as follows:

1) Initial Rise, Expectations of Further Rises: Kindleberger (2000) found the origins of this in an exogenous shock (displacement) Different Aspects of Bubbles affecting the economy, modifying economic outlook in a positive way. This can be different in different eras; either quantitative, like the discovery of a new continent, or qualitative, like a technical invention enhancing the effectiveness of production.

2) New Buyers: The demand for shares increases; more and more participants take part in trading, and the activity of the players grows.

3) Speculation: Investors do not buy with the aim of receiving dividend income, rather price gains. Although this definition has weak points mentioned earlier, it will be used as a starting point in our studies, in the sense that the proportion of longterm investors aiming to receive dividend income decreases along with the average investment period.

4) Price Decline: The collapse of prices and the whole of the market may occur suddenly or gradually, with players leaving the market.

5) Financial Crisis: Although Kindleberger did not consider this to be a necessary consequence, the following discussion of historical examples will account for the positive and negative macroeconomic impacts as well, such impacts lending an economic weight to the phenomenon.

By Bhagavan Behera

CAUSES OF BUBBLES

Usually, bubbles start for some good economic reasons. For example in the early 2000s, low-interest rates and economic growth encouraged people to buy a house. In 1990s internet stocks did offer good potential growth for this new business. However, rising prices and rising demand can create a dynamic where positive news encourages people to take more risks and prices raise more than they should. Some factors that can cause bubbles:

- **Irrational Exuberance:** In certain circumstances, investors can buy assets because of strong psychological pressures which encourage them to ignore the fundamental value of the asset and believe that prices will keep rising.
- **Herding Behaviour:** People often assume the majority can't be wrong. If banks and well-established financial leaders are buying, they assume it must be a good investment. (the economics of herding and irrationality)
- **Short Termism:** People make decisions based on short-term rather than the long-term.
- **Adaptive Expectations:** People often judge the state of a market and economy by what has happened in the recent past.
- **Hope they can beat the market:** People believe they can beat the market and get out before the bubble pops.
- **Cognitive Dissonance:** A filtering out of the bad news and looking for views which reinforce their beliefs.
- **Financial Instability Hypothesis:** The theory that periods of economic prosperity cause investors to be increasingly reckless leading to financial instability.
- **Monetary Policy:** Sometimes bubbles occur as an indirect consequence of monetary policy. For example, the FED's decision to keep interest rates in the US low encouraged the credit bubble of the 2000s. Excess liquidity can more easily lead to bubbles because people need somewhere to put their money.
- **Global Imbalances:** Some argue the US financial bubble of the 2000s was caused by an inflow of currency from abroad. The US ran a trade deficit and attracted hot money inflows, leading to higher demand for US securities. This kept interest rates lower and values of US higher than they otherwise would be

DIFFERENT TYPES OF BUBBLES

- **Market Bubble**: When a particular market sees a rapid increase in price. For example, this could be a housing bubble.
- **Commodity Bubble**: When the price of one commodity or several commodities increases in price. For example, we might see a speculative bubble in the price of gold, e.g. in the 1970s and 1980.
- **Stock Market Bubble:** When the value of stocks and shares increase rapidly, e.g. prices increase faster than earnings. A stock market bubble is vulnerable to a crash, where market traders come to feel the bubble prices are over-inflated.

By Bhagavan Behera

- **Credit Bubbles:** A rapid growth in consumer and business credit to finance higher consumer spending.
- **Economic Boom/Bubble:** Related to the concept of market bubbles is the idea of a general economic boom. A boom implies that the economy expands at an unsustainably fast rate, leading to inflation (e.g. aggregate demand grows faster than productive capacity). Ultimately an economic boom usually proves unsustainable. There may be a strong link between market bubbles and an economic boom. For example, a house price bubble may cause rising wealth and confidence leading to higher consumer spending and economic growth. In turn, the higher economic growth feeds the housing boom.

IDENTIFYING STOCK MARKET BUBBLES

A stock market boom can be described as a bubble if there is high probability of a large scale fall in share prices. Stock market crash is not triggered by fundamental news or by a certain level of share overvaluation. Instead, it happens because of a drastic change in the behavior of market players. This is why the necessary and sufficient conditions for the bursting of a given asset price bubble, applicable in practice, cannot be provided with the tools of mathematical economics. A market crash will ensue with a high likelihood if noise trading becomes dominant, the signals of which are to be found in the following stochastic factors:

• **Increasing effect of leverage:** As a direct consequence, more money is at the disposal of investors (see previous paragraph). If investors borrow to buy shares, have the opportunity to postpone payment, or making a purchase without full financial cover, it is impossible for them to realize long-term profit on that particular stock, i.e., they are unable to make dividend payment. This means a short sale constraint shortening the average investment period. The due date of debt repayment is private information incurring, on the one hand, deduction problem and noise trading. On the other, if there is an increasing pool of leveraged shareholders, repayment date and a short sale constraint will more likely be due at a given moment, amplifying the degree of the price fall.

• **Increasing activity on part of the economic policy**: Economic policy, and monetary policy in particular, can directly influence the conditions of credit, bond and money markets connected to stock markets, thus making the state a protagonist in the stock market. Intended monetary expansion or restriction is always a signal, as it attempts to stimulate or curb the rise of prices. For example, the frequent and tendentious revisions of the base rate convey a series of signals towards market players. In theory, the opportunity cost of shares (the rise in bond yields) prompts investors to lower the share of stocks in their portfolios. Sometimes, however, investors are late and inaccurate in integrating signals of the economic policy into their expectations, increasing the volume of noise in the market.

• **Increasing number of corporate scandals, fraud and corruption:** Share price rise augments the power and influence of executives, while directly affecting their wealth through managerial stock options. Information asymmetry enables them to use methods verging on fraud to maintain

the trust of owners-shareholders if corporate performance is not contributing positively to the share price. The disclosure of such cases may undermine trust, causing a change in investor behavior and prompting the sales of the shares of other companies.

• **Fundamentally unjustifiable co-movement of share prices:** The co-movement of different shares or investments may signal a dominance of noise trading. When investors do not evaluate a given asset based on its expected future yield, i.e., do not evaluate an enterprise based on the probability of its future success, and instead they make simplifications and use rules of thumb, a fundamentally unjustifiable share price co-movement may ensue. If this co-movement increases, price fluctuation may signal a dominance of noise trading, forecasting a stock market collapse.

The last characteristic of stock market bubbles is that the boom and subsequent crash must have an impact on the economy. Only then will the natural instability of stock markets become a factor affecting economy, without which the concept of a bubble would be weightless. By negative impact we mean a slowdown in economic growth or a decline in consumption and/or investment. However, a bubble may carry positive impacts as well which display themselves either during the boom or following the crash, in the long run.

One such effect is the facilitation of capital issue for a given industry allowing a better financing of riskier solutions and developments. After a crash, the framework surrounding the stock market may also change, bringing about legal, regulatory and institutional evolution as a consequence of the collapse. If a stock market boom has no impact on the economy of a country or on related regulation and institutional structure, we contest such a phenomenon can be called a bubble.

Initial displacement, distinct price rise, new buyers (increasing trade volume) all are direct traits of a bubble, while leverage, the large number of economic policy signals, corporate scandals, fraud and corruption are indirect indicators of the phenomenon.

HISTORY OF BUBBLES

The Dutch Tulip Mania: To this day, the Dutch tulip mania remains the yardstick by which speculative bubbles are measured, because of the total disconnect between the fundamental value of a tulip and the price that a prized specimen could fetch in Holland in the 1630s.

The vivid colors of tulips and the seven years it takes to grow them led to their increasing popularity among the Dutch in the 1600s. As demand for them grew, tulip prices rose, and professional growers became willing to pay increasingly higher prices for them. Tulip mania peaked in 1636-37, and tulip contracts were selling for more than 10-times the annual income of skilled craftsmen. The tulip bubble collapsed from February 1637. Within months, tulips were selling for 1/100th of their peak prices.

Mississippi and South Sea Companies: The first large-scale stock market speculations of a new era of economic history, capitalism based on free-for-all entrepreneurship, were happening simultaneously in France and England: those regarding the French Mississippi Company and the English South Sea Company. These cases, described as the first major stock market bubbles, are characterized by the emergence of three new factors. The first new factor was, as opposed to

earlier cases, the wide availability of issued shares. Secondly, state debt financing lay in the background of both enterprises. Thirdly, these bubbles were strongly connected to government activity and signs of fraud and deception were recognizable in both of them.

South Sea Bubble 1711-1720: A company set up to profit from British trade with South America. The price of shares rose rapidly, but with the company failing to make any real profit, share prices collapsed in 1720 and returned to pre-issue levels.

The Crashes of 1929 and 1987: A recurring phenomenon of stock markets is when investor attention turns to specific companies or industries, widespread speculation ensues, and the process runs full circle with a significant price decline. Of such declines, the US stock market crashes of 1929 and 1987, and the so-called Dotcom speculation connected to the latest technological revolution are the examples remembered most vividly in economic circles. The following two chapters will present the characteristics of these cases, and the contradictions of their economic evaluation.

The Dotcom Bubble: The dotcoms took the world by storm in the late 1990s, rising faster than any industry in recent memory. Despite the fact that most internet companies had limited physical assets, many were given huge valuations on the stock market initially. Investors began directing a large number of funds to companies without a proven track record of profitability based on speculation regarding the industry as a whole. Many dotcoms focused on growth and brand recognition with the goal of acquiring the largest amount of market share possible with significantly less regard for the actual product being offered. The **NASDAQ** surged to a historical high in March of 2000.

Once many dotcoms began to report a lack of profits, the dotcom bubble burst in 2001. Some investors began to quickly move their funds to other investment vehicles due to these reports, resulting in a sell off and subsequent fall in stock prices. A significant amount of the funds invested were lost. As a result, a mild recession set in within the United States and other foreign nations.

Internet Bubble: The last great stock market boom in economic history, lasting from the middle of the 1990s until the millennium, was hallmarked by the rise of the Internet. This “Internet bubble” burst in 2000, bringing about the crisis of the infotech-sector. Yet again, emphasizing the irrational overvaluation of share offers an inadequate explanation being too vague and hard to support by facts. The large scale rise and sudden fall of information technology, communications and Internet shares can be tied to several different factors. In the following paragraphs, this bubble phenomenon will be analyzed focusing on Internet-related IT-firms.

Subprime Meltdown: The subprime meltdown was the sharp increase in high-risk mortgages that went into default beginning in 2007, contributing to the most severe recession in decades. The housing boom of the mid-2000s – combined with low interest rates at the time – prompted many lenders to offer home loans to individuals with poor credit. When the real estate bubble burst, many borrowers were unable to make payments on their subprime mortgages.
