CHAPTER-1 INTRODUCTION

Behavioural finance is a newly emerging field which has gained considerable popularity in the last few decades. This field is based on the premise that human beings are irrational and they make decisions using emotional filters and mental short cuts. For many years, finance scholars did not pay much attention to the possibility of financial agents not being rational. It was only after evidence of irrationality started accumulating, that the finance scholars started paying attention to the irrationality of financial market participants. The field of behavioural finance was seriously acknowledged by finance scholars after Daniel Kahneman and Vernon Smith won a Nobel Prize for their work on behavioural finance in 2002. Financial economists finally started paying attention to the proposition that the human brain processes information using shortcuts and emotional filters while making all kinds of decisions, including investment decisions (Hirschey & Nofsinger, 2010).

Popular traditional finance theories such as the Efficient market hypothesis assume that financial market agents are rational and the price of financial securities reflect their true fundamental value as these securities are priced by rational agents after weighing in and evaluating all the available information. So the prices of financial securities are always right; they don’t follow any past pattern and therefore no investor can beat the market. However, it has been proven time and again that the real world financial market agents do not always behave in a rational manner. They are heavily influenced by their emotions and cognitive limitations; use shortcuts and emotional filters while processing information and make irrational decisions.

As more and more people in India invest in the stock market through direct equities, it becomes important to ensure that the investors make well informed and rational decisions. It is also important to make investors aware about their behavioural biases so that they can make decisions without being influenced by these biases.

This chapter provides an introduction to behavioural finance, a brief history and evolution of behavioural finance, key themes in behavioural finance, and an introduction to various behavioural biases.
1.1 INTRODUCTION TO BEHAVIOURAL FINANCE

The field of behavioural finance attempts to combine finance and psychology in order to provide a plausible explanation for how financial markets work and how financial market agents behave. The emergence of this field can be attributed to the inability of traditional finance models to explain the empirical financial market patterns. Behavioural finance proposes that the anomalies observed in the real world can be explained by relaxing some of the assumptions of traditional finance theories and models.

Behavioural finance postulates that human beings use a variety of shortcuts and filters while making economic decisions. The human brain is not a machine and it doesn’t work like a computer. Instead, the human brain uses various irrational processes in order to make decisions under the conditions of uncertainty. These processes lead to many decision mistakes. These mistakes are systematic and can be predicted. They are prevalent not only among individual investors but also among managers and institutional investors. These suboptimal financial decisions adversely affect the efficiency of capital markets, personal wealth, and the performance of corporations. Many crashes and bubbles, which continue to occur in the financial markets around the world from time to time, validate the presence of behavioural and emotional factors in financial decision making.

One of the earliest evidence of investors’ irrationality is the Dutch Tulip bubble, popularly known as ‘Tulip Mania’. During the Dutch Golden Age, a new flower ‘Tulip’ was introduced in the Netherlands. The Dutch people became enamoured with this exotic flower and started investing their money in it. As time went by, investments in tulips became a craze which pushed the prices of these flowers higher and higher. At the peak of tulip mania, a single bulb of this flower sold at an extravagant price which was more than 10 times the annual income of a skilled worker. When people finally realized that they have spent a huge part of their income on a flower bulb, the market finally collapsed. People started to get rid of their tulip stocks as quickly as possible and the price of the tulips crashed, leading to heavy losses (Dash, 2001).

Such instances pose a serious question on the rationality of investors. In the tulip mania bubble, investors got overexcited and saw tremendous value in a flower bulb
and pushed the prices up to unbelievably high levels. The bubble finally burst when investors realized their mistakes and started selling the flower bulbs out of panic. The tulip mania bubble is a very good demonstration of how the decisions of investors are influenced by their emotions. These emotions can be traced back to various behavioural biases such as herd mentality.

The question of investors’ rationality has been raised by many scholars and researchers in the past. The traditional finance theories revolve around a widely accepted approach of ‘fully rational agent’ where decision making is based solely on the available data, the information processing ability of investors and mathematically proven concepts. This approach of ‘fully rational agent’ was considered the backbone of financial decision making until its predictions did not prove to be in line with actual market conditions (Prosad, 2014).

In an ideal situation, where the fully rational approach is applicable, the financial markets are efficient in terms of information. When markets are efficient, securities are priced by incorporating all the information available in the market and as a result, securities are fairly priced. However, evidence suggests that in the real world, ideal conditions are often violated and it is reflected in the form of market inefficiencies. The proponents of Behavioural Finance argue that financial market agents, which include individual investors, are considerably influenced by their sentiments and are susceptible to make cognitive errors. Investors may lack self control, be overconfident about their abilities, miscalibrate information, overreact to new information or exhibit herd behaviour (Statman, 2012).

All these errors can lead to market inefficiencies and can manifest in the form of anomalies like speculative bubbles, overreaction or underreaction. Some of the noteworthy examples of these inefficiencies are the dot-com bubble of the 1990s (Cooper, Dimitrov, & Rau, 2001) and the real estate bubble of 2006 (Zhou & Sornette, 2006). The dot-com bubble is the internet boom which occurred during the period 1997 to 2000. The madness of the crowds of investors during this phase was so out of control that companies could increase their share prices by adding just an ‘e’ prefix or a ‘.com’ suffix to their names. This bubble collapsed in 1999-2001 when many of the dot com companies could not survive and eventually failed and went out
of business. Even the most stable companies like Cisco and Amazon suffered when the bubble burst (Masnick, 2003).

The 2006 US Subprime crisis is another example of how the irrationality of investors can lead to a global financial meltdown. In 2006, increase in speculation in the United States housing market gave rise to the bubble popularly known as the Subprime mortgage crisis, this time in the real estate sector (Shiller, 2000). The bubble ultimately burst in 2007 and this ultimately led to the global financial crisis which lasted from 2007 to 2009 (Holt, 2009). The presence of these anomalies proves that the financial decision making process involves more than a rational agent. Thus, it became essential to understand such anomalies. The quest to understand such anomalies which could not be explained by the rational agent framework, gave rise to behavioural finance.

All these crises and bubbles give an important insight into what could happen when financial market agents start behaving irrationally. Entire economies and markets collapse and people suffer huge wealth losses. Institutional investors are professional investors and they proactively make efforts to protect themselves against such financial crises. However, it’s usually the individual investors who bear the brunt of financial market collapse and are the worst hit among all the stake holders during financial crises. All this can be traced back to decision errors of investors which may be caused due to using shortcuts and emotional filters while making decisions.

Scholars like Mackay (1852) and Le Bon (1896) were the first ones to discuss the herd mentality of individual investors. So research on investor behaviour can be traced back to the 18th century. Selden (1912) wrote a book titled “Psychology of the Stock Market” in which he discussed the linkage between the market movements and the sentiment and attitude of investors. Major breakthrough in the area of behavioural finance came when psychologists Daniel Kahneman and Amos Tversky developed Prospect Theory. The field of behavioural finance took off after the introduction of Prospect Theory.

The field of behavioural finance mainly deals with the impact of psychology on the behaviour of financial market participants and its impact on the stock market (Sewell, 2010)
According to Statman (2012), in traditional finance, investors are rational whereas in behavioural finance, investors are normal. The field of behavioural finance takes a departure from the homo-economicus assumption and acknowledges the fact that human beings are influenced by their emotions, cognitive limitations and many psychological factors. This is a more appropriate approach to provide a plausible explanation for how financial markets and its participants behave.

Investors are influenced by a variety of behavioural biases. Behavioural biases are rules of thumb of mental shortcuts that people use to simplify the decision-making process. These biases may lead to investment mistakes and wealth erosion. Behavioural biases can be divided into two categories; frame dependent biases and heuristic driven biases. Understanding these biases is very important in order to understand the psychology of investors. It is essential to understand investor psychology as psychology makes them susceptible to making biased decisions. These biased decisions can prove to be disastrous for the investors. If these mistakes occur on a wider level, it can lead to financial market crises such as the subprime crisis. In order to avoid such mistakes, it is imperative to investigate and identify which biases influence investors and how these biases may cause them to make mistakes. If investors are made aware about this phenomenon, they can avoid making such mistakes in the future. If investors are aware about the factors which drive their decision making, they can make better decisions in the future. Research about investor behaviour becomes imperative in this regard.

Developed countries like the US and Europe do a lot of research on behavioural finance. However, in India behavioural finance is still an under researched field. It is still in the infancy stage. The Indian stock market has grown tremendously post liberalization. India has a large salary class and with the interest rates on fixed deposits on a decline, Indian investors are expected to increase their exposure to the stock market for investment. Indian stock market is largely driven by the FII inflows and outflows. Volatility is prevalent in the Indian stock market. During Subprime crisis, BSE SENSEX crossed 21000 mark on January 8, 2008. On March 9, 2009, SENSEX tumbled and hit a low of 8160 points. In November 2010, SENSEX again crossed 20,000 mark. This clearly shows how sentiments can shift in the stock market from positive to negative to again positive. In this type of uncertainty and volatility, it becomes difficult for the investors to behave rationally. So it is essential to understand
the behaviour of Individual investors and to investigate whether or not it is influenced by behavioural biases. Investors can become successful in the stock market if they are aware about these behavioural biases. According to Parikh (2011), rational and successful investment is all about restraining and channelizing emotions such as greed and fear by understanding behavioural finance.

1.2 A BRIEF HISTORY AND EVOLUTION OF BEHAVIOURAL FINANCE

In order to truly understand behaviour finance, it is important to explain the progression of the theories of behavioural finance from the traditional framework.

1.2.1 Investor Behaviour: A Traditional Approach

The concept of ‘Utility’ dates back to the 18th century. According to Bernoulli (1954), utility measures the satisfaction that people derive from the consumption of a good or service. Another very popular concept, which underlies most of the traditional finance theories, is the concept of homo economicus. This concept was introduced by John Stuart Mill in the mid 18th century. Homo economicus is an individual who tries to maximize his or her financial wealth or utility subject to the constraints he or she faces. Homo economicus are assumed to have perfect rationality; they have perfect information, and are driven by perfect self interest. Moreover, the objective of homo economicus is to find solutions which maximize their marginal utility given the various constraints they face. The traditional financial framework was developed based on these assumptions.

Traditional finance framework attempts to find explanations to real life financial problems by using mathematics. As a result, the standard finance theories are based on the assumption of rationality of financial market participants. Barberis and Thaler (2003) have defined rationality as having two aspects. First when agents receive new information, they update their beliefs correctly according to Bayes’ law and given these beliefs, agents take decisions that are normatively acceptable and which would maximize their expected utility.

Another important concept in standard finance is the notion of ‘Expected Utility Theory’ which was given by Von Neumann and Morgenstern (1944). According to this theory, when market participants have to make decisions under a situation of risk,
they do so by comparing the values of the expected utility of all the possible alternatives available to them. If an investor is rational, he or she will make decisions so as to maximize his or her expected utility. Expected utility theory classifies market agents or decision makers into three categories, i.e. risk averse, risk neutral and risk loving individuals. This theory proposes that a risk averse person would be willing to take lesser risk for the same amount of utility as compared to a risk loving person. Expected utility theory attempts to explain how the behaviour of person will differ according to the level of their risk tolerance. This theory was very popular for decades and was widely used in financial literature pertaining to decision making under risk.

The Markowitz portfolio theory and the capital asset pricing model (CAPM) are the cornerstones of traditional finance framework. These theories are also based on the rational agent assumption. The portfolio theory was introduced by Markowitz, for constructing an optimal portfolio. According to Markowitz (1952), an optimal portfolio is one which maximizes expected return for a given amount of risk or which minimizes risk for a given amount of expected return. An optimal portfolio can be created by combining several risky securities and a risk free asset. Markowitz introduced the concept of portfolio diversification. The concept of diversification says that an investor can reduce the portfolio risk by selecting stocks that are perfectly negatively correlated or that do not move together. This basically means that if stocks do not move together, they are not affected by the same factors. According to Markowitz, the risk of a particular stock should not be assessed in isolation, but it should be assessed in terms of how much the risk of that particular stock contributes to the risk of the overall portfolio. Portfolio risk can be eliminated by selecting stocks that are not perfectly correlated i.e. through the process of diversification. Markowitz portfolio theory paved the way for one most the most popular asset pricing models in finance called the capital asset pricing model (CAPM).

The capital asset pricing model provides an explanation for the relationship between the risk of an asset and the expected return of that asset. This model was developed by Sharpe (1964), Lintner (1965) and Mossin (1966). The model provides an estimate about the expected returns of risky assets which have not yet been traded in the stock market. The CAPM describes a linear relationship between the systematic risk and the expected return of a security. The CAPM is based on many assumptions. Following are the assumptions of capital asset pricing model.
• All the investors are rational which means that the investors will try to maximize the risk-return trade off of their portfolio.
• All the investors have identical time horizons or holding period.
• Another assumption of CAPM is the wealth of a single investor is very small relative to the total wealth of all investors and as a result the prices of securities are not affected by the trade of a single investor. So as per CAPM, there is perfect competition in the market and investors are price takers as they don’t have the power to affect security prices with their trades.
• One of the assumptions of this model is that investors do not invest in assets that are not traded on the market. Investors invest only in financial securities that are publically traded.
• Transaction costs and taxes are non-existent in the market
• Investors can borrow or lend funds of any amount at a risk-free rate of interest.
• All investors have homogeneous expectations as they evaluate securities in the same manner.
• To create a well diversified portfolio, investors must emulate the market portfolio as it incorporates important and relevant information about all the publically traded securities and is considered to be efficient. All the assets in the market portfolio are fairly priced.

The CAPM became and continues to be one of the most widely accepted asset pricing models mainly due to its simplicity. However, many studies have found asset pricing models such as CAPM to be inadequate. When researchers began to find evidence that was contrary to the predictions of CAPM, traditional finance fraternity started considering other asset pricing models.

Another theory which is at the heart of traditional finance framework is the efficient market hypothesis (EMH) given by Fama (1970). Many asset pricing models are also based on this hypothesis. Efficient financial market is the one in which the security prices are always right, i.e. they reflect all the available information. As a result, no investors can beat the market in an efficient market. In an efficient market, financial market participants are rational; have all the available information and they take actions to maximize their profits. An investor cannot hope to earn abnormal returns in an efficient market. One notable difference between EMH and other standard finance theories is that EMH accepts the presence of irrational investors known as the noise
traders and it also accepts that the actions of these noise traders can distort security prices. However, the theory goes on to say that these distortions are short lived and will be corrected by rational arbitrageurs who will try to take advantage of these distortions. Like all other financial theories, the EMH is also based on many assumptions. Following are some of the assumptions of the efficient market hypothesis.

- One of the assumptions of the EMH is the rationality of investors. According to the EMH, investors assess the value of the security after incorporating all the available information.
- The EMH also assumes that even if there are irrational noise traders in the market, they trade randomly and as a result their trades cancel each other out and they are not able to affect the security prices. Moreover, the price distortions caused by irrational investors are corrected by the actions of arbitrageurs and security prices ultimately move back to their fair value.

EMH received a lot of empirical success initially. The studies on EMH mainly focussed on two aspects. They first considered how security prices are affected by new information. Whenever there is new information about securities, it will be incorporated correctly and quickly in security prices and there will not be any price trends or corrections after the initial price change which was caused by new information. According to the EMH, the prices of securities reflect their fundamental value. The second aspect of the empirical studies focuses on the fact that the security prices will change only when there is news related to the fundamental value of the security. Since in an efficient market, security prices move only because of new information, price trends do not exist and old information is of no value. Fama (1970) has talked about three types of market efficiencies; weak, semi-strong, and strong.

Weak form of market efficiency means no investor can earn superior returns by trading on the basis of past information. So in this form of market efficiency, prices reflect all the past information and technical analysis cannot be profitable.

Semi-strong form of market efficiency means that no investor can beat the market and earn superior returns based on any public information. This means that security prices reflect past information as well as any latest public information. Any public
information gets incorporated into security prices as soon as it becomes public. So, fundamental analysis cannot be profitable in semi-strong form of market efficiency.

Strong form of market efficiency implies that no investor can earn superior abnormal returns based on any insider information as insider information gets out pretty quickly and gets incorporated into security prices. So, even insider trading cannot be profitable in strong form of market efficiency.

Despite the early empirical success of EMH, it did not survive further empirical scrutiny. CAPM also did not survive empirical scrutiny. Some of the studies found that either the markets were not as sufficient as they were once believed to be or perhaps asset pricing models such as CAPM were not adequate. The studies that followed analyzed the decision making and behaviour of financial market participants. These studies found that individual investors, employees, and even professionals such as analysts behave in ways that defy the assumptions made by traditional finance models. Their behaviour is influenced largely by psychological biases and cognitive errors.

For the longest time, these theories were used to explain the behaviour of investors and financial markets. However, research has shown that explanations provided by these theories are violated time and again. These theories place too much burden on human behaviour. Moreover, they are based on certain assumptions about how financial market participants should behave rather than how they actually behave. These are oversimplified assumptions and they don’t hold true in the real world financial markets. As a result, researchers felt the need to develop theories and models which recognized the irrational behaviour and biased decisions of the financial market participants. This ultimately led to the emergence of behavioural finance.

1.2.2 Investor Behaviour: Behavioural Finance Approach

Theories that were considered to be the pillars of traditional finance could not provide adequate explanations for some of the market anomalies. One of the noteworthy examples of these anomalies is the financial market bubbles. A bubble is a phenomenon when market participants get too excited about a particular security or investment object and push up its prices way above the fundamental value. Eventually, the bubble bursts and there is a sharp fall in the prices. If investors behave rationally in an efficient market then such a phenomenon should not take place.
Experts like Mackay try to provide an explanation for bubbles. According to Mackay (1852), herd mentality of investors leads to such bubbles in the financial markets. Stock market bubbles such as the dot com bubble or the sub-prime crisis question the validity and applicability of standard finance theories.

According to Statman (2008), standard finance theories are based on four basic assumptions. Investors are rational; they formulate their portfolios based on mean variance framework; financial markets are efficient; expected returns of an asset are a function of only risk. Behavioural finance postulates that all these assumptions are not realistic. According to behavioural finance, investors are not rational, rather they are normal and they do not design their portfolio based on mean variance considerations. Behavioural finance goes on to say that even when the markets are difficult to beat, they are not efficient and expected returns are a function of many factors, not just risk alone (Statman, 2008).

Influence of emotions on decision-making was discussed by Adam Smith in his books Wealth of Nations and Theory of Moral Sentiments in 1776 and 1759 respectively. In his work, Adam smith has talked about the notion of an ‘invisible hand’ that guides individuals while making economic, social and financial decisions. Sentiments such as pride, shame, insecurity and egotism play an important role in decision-making (Smith, 1759). Another scholar who discussed the influence of emotions on decision-making was Bentham. Human beings are concerned with happiness and as a result when human beings make decisions, these decisions cannot be completely devoid of emotions (Bentham, 1789). These scholars have basically discussed the influence of psychology on the economic behaviour of individuals.

Keynes was yet another scholar who was critical of the concept of homo economicus. Keynes talked about the influence of sentiments on human behaviour and called it the ‘animal spirits’ of individuals. It is impossible for human beings to have complete information of every situation while they try to maximize their expected utility (Keynes, 1967). A theory which talks about this notion was developed by Simon in 1955. This theory is known as ‘the theory of bounded rationality’. Bounded rationality is a more realistic version of the expected utility theory. This theory acknowledges the fact that human beings have limitations. Bounded rationality theory states that the rationality of human beings is bounded or constrained by the information that they
possess and their cognitive limitations (Simon, 1955). Selden (1912) identified that the stock price movements on the stock exchanges depend upon the mental attitude of investors.

Another notable concept in this regard was introduced by Festinger, Reicken, and Schachter (1956). Cognitive dissonance is a phenomenon which takes place when two cognitions that are simultaneously held are not consistent with each other. When human beings are affected by cognitive dissonance, it makes them feel restless and unpleasant and they try to reduce or avoid this dissonance by changing their beliefs (Festinger et al, 1956).

When individuals have to make decisions under uncertainty, certain mental processes are a part of this phenomenon. Raiffa has done significant work in this area by examining three approaches of decision-making. These approaches present a realistic view of the thought processes that are involved in decision-making under uncertainty (Raiffa, 1968). Following are the three approaches discussed by Raiffa

1. The first approach is called the ‘Normative Approach’. This approach is about providing an ideal solution for a decision. So, this approach is all about rational decision making.
2. The second approach is the ‘Descriptive Approach’. This approach is concerned with how people actually make decisions in real life situations. So this is a practical approach.
3. The third approach is called the ‘Prescriptive Approach’. This approach seeks to give various tools and practical advice to people. This approach assumes that practical advice and tools can help individuals make decisions that are very similar to the normative approach.

The concept of Prospect theory was introduced by psychologists Daniel Kahneman and Amos Tversky in 1979. This theory gave behavioural finance a mainstream focus. The concept of prospect theory was introduced for analyzing decision making under uncertainty (Kahneman & Tversky, 1979). Prospect theory is considered to be an alternative model for expected utility theory. Prospect theory attempts to explain how individuals evaluate gains and losses. According to prospect theory, individuals sometimes exhibit risk loving behaviour and sometimes exhibit risk avoiding or risk averse behaviour. This happens because individuals tend to give lower weightage to
probable outcomes compared to the outcomes that are certain. Because of this, people become risk seeking for alternatives with sure losses and risk averse for alternatives with sure gains, which is termed as ‘certainty effect’. Individuals consider gains and losses rather than considering the impact of those gains and losses on their total wealth. Two thoughts processes occur here. First is editing. Here the possible investment alternatives are ranked based on heuristics or rules of thumb. Second process is evaluation. Here a reference point or anchor is used to determine gain or loss. Moreover, prospect theory goes on to say that losses are more painful than gains of the same magnitude. This happens because individuals tend to be risk averse. They very sensitive to losses compared to gains.

Prospect theory provides value function which is a replacement for the utility function of expected utility theory. This theory uses decision weights as a function of probability.

Figure 1.1 – Prospect Theory Value Function
(Source - https://en.wikipedia.org/wiki/Prospect_theory#/media/File:Valuefun.jpg)

From figure 1.1, it can be seen that value function for loss is steeper compared to gains. This is because people are more sensitive to losses. A loss of Rs. 100 is more painful than a gain of the same amount. Value function also appears to be convex for losses while it is concave for gains. Tversky and Kahneman derive the pattern of risk attitudes of individuals based on this value function. Individual are risk seeking for
gains that have low probability; they are risk averse for gains that have high probability; they are risk seeking for losses that have high probability, and they are risk averse for losses with low probability (Tversky & Kahneman, 1992).

Prospect theory proved to be path breaking for the field of behavioural finance. Many behavioural biases such as loss aversion, disposition effect and framing have been derived from prospect theory.

The expected utility theory was one of the first theories that was questioned by scholars. As previously discussed, scholars such as Simon (1955), Raiffa, (1968) and Kahneman and Tversky (1979) offered alternative models to the expected utility theory. Soon after, theories of capital asset pricing model, Markowitz model and efficient market hypothesis also started being questioned as many researchers found flaws in these theories as well.

In 1985, two scholars developed a model which relaxed some of the assumptions of the capital asset pricing model. Shefrin and Statman (1994) developed a model called behavioural asset pricing model (BAPM). This model introduced the concept of behavioural betas. According to this model, there are two types of traders in the market, informational traders and noise traders. Informational traders are rational and behave as per the CAPM whereas noise traders behave irrationally and make cognitive mistakes. BAPM attempts to explain the interaction between the rational traders and the irrational noise traders. BAPM determines the expected returns of the securities with the help of their behavioural betas. Standard asset pricing models determine the expected return of a financial security for a given point in time. They do not provide expected return of a financial security over a period of time. It is very important to develop such a model as such models might be able to provide an explanation for stock market bubbles (Statman, 1999).

Another noteworthy theory in behavioural finance which was provided as an alternative for Markowitz portfolio theory is the behavioural portfolio theory (BPT) given by Shefrin and Statman (2011). According to Markowitz model, investors build a mean variance portfolio and they try to achieve an optimum risk-return trade-off. In Markowitz model, the investors have a consistent risk attitude. However, BPT postulates that behavioural investors, i.e. investors who are not fully rational,
formulate their portfolios layer by layer just like pyramids of assets. Each of these layers represents a different risk attitude and a different goal (Shefrin & Statman, 2011). Behavioural portfolio theory attempts to explain the different attitude of investors towards risk and the behaviour that is associated with that different risk attitude.

Efficient market hypothesis and its predictions also started getting challenged by scholars. Shleifer (2000) attempted to study financial market from a behavioural finance point of view. According to Shleifer, it is not possible for investors to be completely rational. Investors do not trade on relevant information, in fact majority of the investors consider irrelevant information or trade in noise. These investors are susceptible to various behavioural biases such as overreaction, disposition effect, narrow framing, representativeness and overreaction. This is contrary to EMH which says that irrational noise traders trade randomly and their trades cancel each other out. As a result, the trades of irrational noise traders have no impact on security prices. Shleifer (2000) says that irrational noise traders do not trade randomly. Noise traders could buy and sell same securities at the same time thereby making their irrationality systematic. Arbitrage is not as riskless as proposed by the EMH. In real world financial markets, arbitrage is a very risky process and therefore is limited. As a result arbitrageurs may not be able to eliminate the distortions caused by noise traders. Moreover, substitute for a security may not be available, which is an essential condition for arbitrage. All these constraints make arbitrage very risky and undesirable. As a result, mispricing can prolong and markets can continue to remain inefficient for a considerable period of time.

Shiller (2000) examined the swings in Dow Jones industrial average by using a behavioural approach of financial market participants. The author emphasized on the influence that psychological factors, investor perception and cultural factors had in creating a bubble in Dow Jones Industrial Average during late 90’s. Shiller (1981) says that stock markets are way more volatile and this volatility cannot be explained by standard financial models and theories.

Based on the discussion till now, it can be stated that stock market anomalies cannot be explained by standard financial theories and models. As a result, researchers have started incorporating behavioural factors into traditional finance theories to provide a
plausible and realistic explanation about how stock markets behave. Lo (2004; 2012) has developed the concept of adaptive market hypothesis as an alternative to efficient market hypothesis (EMH). According to Lo (2012), efficient market hypothesis is not wrong, it is incomplete. He further goes on to say that behavioural biases such as overreaction, disposition effect, overconfidence and so on are not contrary to rational economic theories. If financial markets are viewed from an evolutionary biology perspective, we can get a more accurate and deeper insight into how they behave.

1.3 BEHAVIOURAL FINANCE KEY THEMES

Four key themes can be considered the foundations of behavioural finance. These themes are heuristics, framing, emotions, and market inefficiency.

1.3.1 Heuristics

Heuristics are called rules of thumb that are used by people to reduce the cognitive efforts and resources required to find solutions to a complex problem. Heuristics are basically mental shortcuts that simplify the complex decision-making process. When Investors have to make decisions, they are exposed to many alternatives which are uncertain. Investors usually have limited ability to quantify the likelihood of the results associated with each of these alternatives. Under such a situation, investors tend to use rules of thumb or heuristics to simplify the decision-making process. Some of the popular heuristics are representativeness, anchoring, overconfidence, status quo, mental accounting etc. Behavioural finance believes that financial market practitioners make mistakes because they rely on heuristics to process data and to make financial decisions. One example of a popular rule of thumb is: ‘past performance is the best predictor of future performance, so invest in a stock or mutual fund having the best performance in the last five years’. Such heuristics or rules of thumbs lead to investment mistakes which can prove to be costly.

1.3.2 Framing

Framing is another important theme in behavioural finance. Sometimes people make different choices for the same decision problem when the decision problem is framed differently. This behaviour is referred to as frame dependence by the psychologists. Investors’ predictions about the stock market differ depending on whether they are asked to forecast future prices or future returns (Glaser, Langer, Reynders, & Weber, 2007). Behavioural Finance also states that investors’ perceptions about risk and
return are also greatly influenced by how decision problems are framed. Traditional finance assumes that investors consider all the decisions through transparent and objective view of risk and return which means that the decisions of investors are not affected by how they are framed, as long as the objective facts remain the same.

1.3.3 Emotions

Human beings are emotional organisms. Human behaviour is influenced by emotions and sentiments. Behavioural finance acknowledges this fact. Moreover, the field endorses the role that Keynes’ ‘animal spirits’ play in explaining investor choices and behaviour and how this shapes financial markets (Akerlof & Shiller, 2009). Our feelings determine our investment decisions and judgements in a subtle way. Emotional decision making may help in explaining why bubbles are created and why markets break down from time to time.

1.3.4 Market Inefficiency

As previously discussed, traditional finance assumes market efficiency which means that security prices are determined by rational investors and reflect all the available information in the market. Therefore security prices are right and investors cannot beat the market. But research has shown that cognitive errors and behavioural biases of individual investors and groups of people influence the market prices and push them away from their fundamental value. According to the EMH, if there is a mispricing in the market, it would be corrected by rational traders. In real world, institutional investors may be considered rational traders. Institutional investors have enough knowledge and financial resources to keep the markets efficient. However, it has been observed that institutional investors tend to go with the flow and may end up deepening the mispricing and the market inefficiency. Arbitrage is a risky and costly process and involves many risks such as fundamental risk, noise trader risk and implementation costs (Barberies & Thaler, 2003). These limits may prevent arbitrageurs from correcting the mispricing. Moreover, if the mistakes of investors are correlated, irrational noise traders could affect market prices. It is important to state that market inefficiency is a result of behavioural biases of investors.
1.4 APPLICATIONS OF BEHAVIOURAL FINANCE

Behavioural finance doesn’t focus only on finding and understanding the behaviour of financial market participants and how it affects markets. Behavioural finance also focuses on the possibility of overcoming these cognitive errors and helping investors to make better decisions. Awareness about behavioural biases can help people to avoid their investment mistakes. Following points highlight the applications of behavioural finance.

1.4.1 Markets
Markets are a mechanism for distributing wealth in the society. The health and future prospects of an economy are directly affected by the functioning of markets. The field of behavioural finance studies how behavioural biases and cognitive mistakes of market participants affect the functioning of market. Behavioural finance studies why markets might be inefficient and how to make markets more efficient.

1.4.2 Corporations
In corporations, managers or a group of top level officers make crucial decisions involving a lot of money. If these managers or top level officers are prone to behavioural biases, it will affect shareholders and many other stakeholders in the corporation. The biases of top level executives cannot be corrected by arbitrage. This makes behavioural finance even more important for corporate finance. Managers have to take many important decisions about capital budgeting, dividend policy, financing, corporate governance, mergers and acquisitions etc. If managers are made aware about behavioural biases and mistakes, they can make unbiased decisions and add value to the company.

1.4.3 Regulatory Environment
Behavioural finance has applications in regulatory environment and policymaking as well. The heuristics and behavioural biases that affect investors, managers and market can also affect policy and law makers. New regulation and policy tend to overreact to financial events plus a well-designed policy can help people overcome their biases to make better choices (Baker & Nofsinger, 2010). Behavioural finance provides a discussion on the psychological influences in regulation and policy and describes how cultural factors, including religion, affect financial laws and development (Baker & Nofsinger, 2010).
1.4.4 Individual Investors
A lot of research has been done to document the biases of individual investors and how these biases affect the financial wealth of individual investors. Researchers have also attempted to identify factors which cause individual investors to take biased decisions. Factors such as cognitive limitations, experience and learning have been found to play an important role in financial decision-making. Experts who have done research in this area have also provided recommendations on how to overcome these biases and make better investment decisions. So, behaviour finance can be applied to overcome behavioural biases of individual investors.

1.5 BEHAVIOURAL BIASES OF INVESTORS
Recent literature has found that individual investors are affected by a variety of behavioural biases. These biases cause investors to make investment mistakes and it may end up harming their financial wealth. Shefrin (2000) classifies behavioural biases in two broad categories. Heuristic driven biases and frame dependent biases.

Heuristic driven biases: As described earlier, heuristics are rules of thumb that are used by people to make decisions or to make judgements. Investors often use rules of thumb to process information and to make decisions. For example, it’s a general belief that the future performance of a stock can be predicted based on past performance of that stock. Investors may buy a stock simply based on its superior past performance. This may lead to inferior returns. Anchoring, representativeness, overconfidence, herding, naive reinforcement learning and availability are some examples of heuristic driven biases.

Frame dependent biases: Framing is a phenomenon which causes investors to make two different choices for the same decision problem if the decision problem is framed differently. This means that the decision process of investors is affected by the way decision problems are framed. Mental accounting, loss aversion and disposition effect are some of the frame dependent biases.

Following is a brief introduction of some of these behavioural biases.

1.5.1 Anchoring
According to Tversky and Kahneman (1974), while forming estimates and predictions, people usually start with some initial arbitrary value or anchor and then
adjust away from that anchor. So anchoring describes the human tendency to rely too much on the initial piece of information or the anchor while making decisions. When investors are affected by this bias, they have a tendency to interpret subsequent information around the anchor. For example when investors start tracking price of a stock, the price that they see for the first time becomes an anchor for them. As a result, subsequent price changes are viewed around the initial price, which is the anchor. So even if the stock is overpriced, if it is priced below the initial price or the anchor, investors might be willing to invest in that stock.

Anchoring may cause financial market participants to take incorrect decisions. Anchoring may lead investors to take decisions based on irrelevant facts and statistics. For example some investors tend to buy stocks of blue chip companies whose prices have considerably fallen. The fall in price may be due to deteriorating fundamentals of the companies but investors may still go ahead and buy that stock as they use the previous ‘high’ price of the stock as anchor and base their decision on this anchor.

1.5.2 Availability
Availability bias refers to the tendency of people to take decisions based on events or situations that they can easily recall. Availability bias causes people to judge the likelihood of an event or outcome based on how easily information or event related to that event comes to mind. As a result, people may think that the events which they can easily recall are more frequent and have a greater probability of happening. This causes people to overestimate the probability of similar events occurring in the future. For example, investors may judge the quality of an investment based on information that was recently in the news, ignoring other relevant facts (Tversky & Kahneman, 1974). Tversky and Kahneman (1974) give examples of different ways in which availability may provide practical cues for assessing frequencies and probabilities. They say that people find it easy to recall recent events compared to earlier events or experiences. So, recent events are more available to individuals as they are fresh in their memory. So, basically availability bias causes people to over-weigh current information rather than considering all the relevant information.

1.5.3 Disposition effect
Disposition effect is a heuristic which causes investors to hold on to poorly performing stocks for too long and sell well performing stocks too soon. This happens
as investors find it very difficult to accept losses. Disposition effect is based on prospect theory. According to prospect theory, people are more sensitive to losses than gains. The pleasure that investors derive by earning a gain of Rs.1000 is much less compared to the pain that they experience if they incur a loss of the same amount. Shefrin and Statman (1985) say that people are eager to gamble in the domain of losses and that is the reason why they hold on to losing stocks and sell winning stocks.

Disposition effect can be explained with the help of value function of prospect theory. According to prospect theory value function, investors become risk averse after a significantly large gain in value and start thinking about how to sustain the value they have already gained. However, investors become risk seeking after incurring a loss and they stick to the loss position. Moreover, Kahneman and Tversky (1979) also found that when investors close a loss making position they feel the regret of making a bad investment decision and in order to avoid this regret, they may hold on to the loss making position for a long time. In contrast, when investors close a profitable position, they feel proud of themselves and that’s why investors may sell well performing stocks too quickly.

1.5.4 Herd behaviour

Herd behaviour is a heuristic wherein people mimic the actions of a crowd without doing any thorough analysis. In stock market, herding takes place when investors follow the actions of a herd of investors without doing any kind of thorough analysis.

Herd behaviour may create stock market bubbles if investors drive prices of an asset way above its fundamental value. One of the motivations behind herding could be the general notion that if so many people are doing it, it must be right. Apart from this, the fear of making a wrong decision by going against the crowds also motivates people to imitate the action of others.

According to Caparrelli, D’Arcangelis, and Cassuto (2004), there are two types of herding, intentional herding and spurious herding. When investors arbitrarily copy actions of others by changing their minds and completely neglecting all the relevant information, it is called intentional herding. When a group of people who have similar information and share similar beliefs take similar decisions, it is called spurious herding.
Herding is a very powerful bias. When investors start mimicking each others’ actions, the cumulative impact of their herd behaviour is intensified and it may lead to stock market bubbles or crashes depending on the direction of the price movement. Herding has been observed in individual investors, trade analysts, portfolio managers and CEOs. Herding can have a drastic effect on the stock market.

1.5.5 Limited Attention

Limited attention is a heuristic which causes people to take decisions based on very limited and often irrelevant information. Standard finance models assume that people make decisions after rationally evaluating all the relevant information. However, in real life, people are bombarded with a plethora of information. Due to their cognitive limitations, people filter out the information and retain only limited information through mental processes that are often automatic and unconscious. So, people generally use limited attention heuristic to deal with information overload.

When investors have to make a decision about which stocks to buy, they are faced with thousands of alternatives. In order to simplify the process of stock selection, investors purchase stocks that have recently caught their attention. They tend to buy stocks of companies that are constantly in the limelight (Baber & Odean, 2008). This leads them to make suboptimal financial decisions. Limited attention has been found to be responsible for many other empirical findings. Many studies have argued that limited attention may cause underreaction to public news or stock return co-movements.

Limited attention is caused by cognitive constraints of people and the vast amount of information available in today’s world. Individual investors are not the only ones who are affected by limited attention bias. Research shows that analysts and mutual fund managers also sometimes neglect relevant information.

1.5.6 Mental Accounting

According to Thaler (1999), mental accounting refers to a set of cognitive operations used by people to organize, evaluate and keep track of their financial activities. Mental accounting has three aspects to it. The first aspect focuses on how individuals make and subsequently evaluate decisions. Second aspect of mental accounting focuses on assigning every activity to separate mental accounts. This means that each
activity will be assigned to a separate mental account. The third and final aspect of mental accounting focuses on how frequently individuals evaluate these separate mental accounts.

Mental accounting is a bias which basically simplifies the complex decision problems. Investors tend to segregate information related to their portfolio into different mental accounts. So investors create a separate mental account for each stock in their portfolio. Rather than evaluating the performance of their portfolio as a whole, they evaluate the performance of each item in their portfolio separately. Moreover, Thaler (1999) states that investors evaluate their decisions frequently. This causes them to make choices which they would not have made had they evaluated their decisions over longer horizons.

So, by using mental accounting, investors consider decision problems one at a time; they tend to bracket the decisions narrowly, and they also tend to evaluate their decisions very frequently. As mentioned earlier, investors also tend to use different mental accounts for different decisions.

1.5.7 Naïve Reinforcement learning

Naive reinforcement learning is a heuristic whereby people tend to repeat past behaviours that resulted in pleasure and avoid past behaviours that resulted in pain. It can be referred to as a ‘win-stay, lose-shift’ heuristic. Naive reinforcement learning causes people to extrapolate from their own personal experience rather than basing their decisions on relevant data. Individuals tend to give more weightage to strategies that resulted in success in the past. Many researchers have found evidence of the effects of this heuristic.

Carroll, Choi, Laibson, Madrian, and Metrick (2009) document that individual investors who experience rewarding outcomes from saving in their 401(k) increase their 401(k) savings rate more than investors who have a less rewarding experience. Strahilevitz, Odean, and Barber (2011) find that investors are more likely to repurchase a stock that they previously sold for a profit than one previously sold for a loss. Kaustia and Knupfer (2008) document that investors are more likely to subscribe to initial public offerings (IPOs) if their personal experience with IPO investments has been profitable.
1.5.8 Overconfidence
Overconfidence bias causes people to have too much confidence in their skills and abilities. People who suffer from overconfidence bias tend to believe that they are better than others and hence can take superior decisions. Overconfident individuals also tend to believe that the information they possess is superior. Because of their belief of having superior skills and superior information, overconfident investors are willing to take more risk. Researchers have also found that overconfident investors trade excessively in the stock market and end up earning low returns.

Overconfidence is believed to be stemmed from two tendencies. The first one is illusion of knowledge. Overconfident investors tend to believe that they have superior knowledge and superior ability to predict the stock returns. The second tendency underlying overconfidence is the illusion of control. Overconfident individuals tend to believe that they have control over the stock market outcomes.

Confidence is important to succeed in life but overconfidence can become problematic. Overconfidence may lead to unrealistic expectations and may become a barrier to effective decision making (Bazerman & Moore, 2009).

1.5.9 Representativeness
When individuals have to make judgements in uncertain situations, they do so by searching for familiar patterns and assuming that future patterns will be similar to past patterns. People do this without sufficiently considering the reasons behind this pattern or the probability of the pattern repeating itself (Shiller, 2000). Tversky and Kahneman (1974) define representative heuristic as a phenomenon wherein people try to look for a pattern in a series of random events.

Representativeness bias causes people to stereotype. People usually stereotype so that they can view the world as more organized than it actually is. Representative bias may cause people to draw conclusions or generalizations based on a very small amount of information. This phenomenon is known as the law of small numbers.

Representative bias is seen in investor behaviour when investors judge a company based on the recent performance of that company’s stock or when investors consider
companies which are perceived to have competent mangers or good recent returns to be good companies and invest in those companies.

1.5.10 Status Quo Bias
According to Samuelson and Zeckhauser (1988), status quo bias refers to the tendency of people to stick to their previous decisions despite a change in their environment. Status quo bias is seen in individuals who prefer the current state of affairs or who want things to stay relatively the same. Samuelson and Zeckhauser (1988) argue that status quo bias may work for the investors when transaction costs are high or when high calculations are required but the researchers found evidence for status quo bias even in a setting with minimal transaction costs and calculations.

Brown and Kagel (2009) provide some very important insights into the status quo bias based on experimental evidence. Laboratory experiment conducted by the authors provided evidence that status quo bias exists across individuals overtime and this bias is independent of stock performance. They also found that status quo bias exists even in environments where the costs of identifying better performing scrips are low. Brown and Kagel (2009) argue that the reluctance of individuals to receive new information which might question their skills and abilities may lead to status quo bias.

Researchers have also found that people fall prey to this bias when the available alternatives are vague or inconsistent with their beliefs. Status quo bias can be seen in investors with inherited stock positions. Such investors are hesitant to change their inherited stock positions.

The research evidence shown in this section indicates that behavioural biases do influence the behaviour of individual investors and can have far reaching effects on the stock market. This study focuses on eight behavioural biases namely, anchoring, availability, disposition effect, herding, mental accounting, naive reinforcement learning, overconfidence and representativeness. This study tries to capture the presence of behavioural biases in individual investors through scenario based questions.