Chapter 3

Theoretical Framework

3.1 Introduction

Traditional Theory of Finance assumes that (a) Investors are impeccably rational i.e. they deduce the accessible information correctly and homogenously, and (b) Markets are perfect i.e. all the important facts and figures are mirrored in share prices instantly and completely. The assumption of perfect markets has originated from “Efficient Market Hypothesis” (also known as Random Walk Theory) which states that every time a latest information arises, it blowouts so swiftly that stock prices instantly mirror the changes. Thus, no specific investment approach can deliver more than average returns as the effect of available information has already been exhibited in the shares prices. From the past few decades, a number of asset pricing models has been developed and tested which includes Capital Asset Pricing Model (CAPM), Modigliani-Miller Theorem and many more. All these models assumed that, as people in general give importance to money, they act rationally while taking financial decisions. Although these traditional finance models has transformed the research in finance, but still there are many disparities left which are not explained by them. Moreover, Traditional finance is not able to justify various issues like (a) if nobody can gain more than average returns, then why individual investors trade? (b) If markets are perfect, then why returns corresponding to stocks fluctuate.

3.2 Efficient Market Hypothesis

According to “Efficient Market Hypothesis” [proposed by E.Fama (1965)], a market is said to be efficient when it consists of immense number of investors acting rationally, all of them attempting to anticipate future market value of shares, and latest
information is freely available to all the investors. Moreover, in an efficient market, a battle among knowledgeable investors leads to a situation where, over a period of time, real price of securities mirror the effect of information that has already been made available and also of the events that are likely to take place in future. EMH is based on three theoretical premises (a) investors act rationally (b) if some investors act irrationally, their trades did not affect securities prices. (b) Rational arbitrageurs tend to cancel out the effect of irrational investors. The Efficient Market Hypothesis (EMH) has been an important finance model for over 4 decades but has been criticized a lot too. Fama figure out three forms of Efficient Market Hypothesis:

(i) **Weak Form Efficiency**: The weak form of efficient market hypothesis proclaims that current price of securities assimilate all the past data related to market prices and returns. Thus, making it impossible to spot undervalued securities and earn more than average returns by analysing historical data. It also makes technical analysis fruitless as it is very tough to earn money on the information that is uniformly available to all.

(ii) **Semi-strong Form Efficiency**: The semi-strong form of market efficiency proposes that current price of securities assimilate all publicly accessible information. Publicly accessible information incorporates not only past stock prices, but also contains data announced in financial statements (such as income statements, dividend announcements, mergers and acquisitions) and likelihood of macroeconomic factors (inflation, employment, etc.). The assumption of semi-strong market efficiency, that nobody can gain above average returns using publicly available information, is quite powerful than weak form efficiency. Thus, this form of efficiency makes fundamental analysis useless.
(iii) **Strong Form Efficiency:** The strong form of market efficiency proposes that current price of securities assimilate all information, both public and private (insider information). Thus, the main difference between semi-strong and strong form efficiency is that in former case, one can earn more profits by having insider’s information which is not possible in latter case. In other words, it states that even company’s management people cannot gain by purchasing their own company’s shares just by having information of the events likely to occur in future. Thus, this form of efficiency makes not only fundamental and technical analysis fruitless but also insider information becomes worthless for anticipating future stock prices and to earn above average returns.

Plenty of valuations are placed on weak and semi-strong form efficiency as there are proofs that people having insider’s information earn abnormal returns during trading. Many studies have also argued that efficient markets do not exist as there is a cost associated with information, and prices do not imitate the publicly available information, because if it did, it will leave no motivation for investors to spend their money to buy securities. Moreover, investors tend to take decision based on what they think as appropriate information which might be immaterial, diverging the actual share prices away from its fair value.

On the other hand, there are various theories attempting to explain the misconception of Efficient Market Hypothesis but none of them are perfect. In realism, share markets are neither fully perfect nor completely inefficient. However, some markets are efficient to a certain level, some less and some more than others. Although, CAPM, EMH and other traditional finance theories helped a lot in anticipating and explaining various events, but until now, there are many popular events and anomalies that are
never explained by these traditional finance theories like Bandwagon Effect (unexpected good or bad news leads panic buying or selling), stock market crashes, dot com bubble Sub-prime mortgage crisis, January effect (in which share price increases in the month of January without any reasons), Winner’s Curse (in which winning large amount in auction tends to outpace the intrinsic value of share and many more. And because of this a new theory was required which can explain the reasons behind these events. At the same time researchers in psychology found that while making financial investment decisions involving money, investors tend to behave in irrational manner. Subconscious errors and intense emotions can make investors to take bad financial investment decisions. Thus, academicians and researchers were incited to view investor’s psychology for finding the reasons behind their irrational and illogical behavior and because of this the concept of Behavioral Finance came into existence.

3.3 Behavioral Finance

Behavioral finance is a relatively new concept of finance, which combines traditional finance theory and various behavioral aspects to the decision making process. In other words, behavioral finance studies how the investor’s behavior in the share market is shaped by psychological factors and how it affect their decision making process. It paves a way to explain why it is justifiable to think that markets are inefficient. Since past few decades, many studies on investor’s psychology are done and found that the discomfort of losing money is almost double than the pleasure of earning money. Behavioral Finance tries to analyse why and how emotional and psychological errors impact the decision making of investors leading to stock market crashes. It is also seen from the past few events that even small adjustment in markets results in crashes
due to investor’s overreaction who tend to make imprudent decisions to refrain losing money rather than focusing on fundamentals of the company. Therefore, it is not necessary that whatever decision an investor takes is in his full conscious. Rather, emotions such as greed and anxiety play an important role in decision making process.

The basis behind behavioral finance is that behavioral biases, influence investors, lead to misinterpretation of information and faculty conclusions even if the information is accurate. These behavioral biases gave birth to various investment strategies that take advantage of irrational behavior of investors. Although investment strategies encashing emotions have existed from past few decades, behavioral finance concentrates on finding psychological errors repeatedly made by investors.

3.4 Background and Development

The CAPM (Capital Asset Pricing Model), Arbitrage Pricing Theory (APT) and Modern Portfolio Theory (MPT) are the quantifiable models that are dependent on rational expectations theories. But there is a lot of research that shows results against this theory and behavioral finance theory has turned up in response to the trouble confronted by traditional finance theory. It contended that investment decisions are not always taken rationally, and it tries to comprehend market scenario by easing two principles of traditional finance, that is, (a) investors are unsuccessful in amending their feelings perfectly (b) there is a systematized deflection from the standardized process of investment decision making.

There are three main key stone in behavioral finance – (a) Limits to arbitrage – which contends that it can be problematic for rational investors to reverse the disturbance
created by less rational investors. (b) Psychology – it contends that investors are prone to few biases, tends to make wrong beliefs and preferences, thus making faulty financial decisions. (c) Sociology – it contends that only few investment decisions are made in seclusion whereas large number of investment decisions are made due to social interaction that repudiate the basic presumption that investors take decisions without getting influenced by outside forces.

Behavioral Finance, a drastic change in financial research, is a scholarly work of Daniel Kahneman and Amos Tversky who are known as Fathers of Behavioral Finance. During 1960s, they both researched on contrasting areas and worked together in 1970s to set up what used to be a yardstick in the field. Their fundamental step was to acclimatize emotional experiments in the decision making theories. They further tried to discriminate standardized solution to a problem from the actual result they collected through experiments. Moreover, Amos Tversky’s Mathematical work on the standardized theory and Daniel Kahneman’s work on difference in psychological and traditional finance theories results integrated perfectly to assist the objective.

3.5 Behavioral Theories

In order to demonstrate various psychological errors made by investors while taking investment decisions, behavioral economists used the information of human cognitive psychological theories from sociology and psychology. The two major theories that play an important part in behavioral finance are:
3.5.1 Prospect Theory

Prospect theory, a behavioral model (formulated by Amos Tversky and Daniel Kahneman in 1979), presumes that losses and gains are admired differently, and thus investors take decisions based on anticipated gains rather than anticipated losses. In other words, it shows how investors choose between alternatives that includes risk and uncertainty. It exhibits that investor's judge their decisions in terms of expected utility corresponding to a reference point as compared to real outcomes. Prospect theory was evolved by giving risky options, and it reveals that investors are loss-averse, and if two choices are given to them, both equal, with one given in terms of probable gains and the other in terms of probable losses, the former option will be preferred. As investors hate losses more than the equal amount of gain and they are more inclined to take risks, so as to avoid losses.

Moreover, Prospect Theory exhibits how investors administer risk and uncertainty. In brief, the theory unfolds the probable inconsistency in investor’s behavior while determining risk under uncertainty. It states that investors are not always risk-averse; rather they are risk-takers in losses and risk-averse in gains. Investors give considerable importance to the results that are supposed to be more evident than that are considered simply probable. This effect is known as “certainty effect”. Moreover, the value maximization function considered in Prospect Theory is dissimilar to that used in Modern Portfolio Theory (MPT). In MPT, the wealth maximization function is grounded on the net position while in prospect theory it took losses and gains into consideration. An important feature of prospect theory is that investors have a tendency to see the final result as gains and losses, instead of final net wealth. As far as the investment in stocks is concerned, investors consider the purchase price of the
stock as a reference point. The fundamental part of the prospect theory is the S-shaped value function shown in below mentioned figure:

![Prospect Theory Value Function](image)

**Figure 3.1 Prospect Theory Value Function**

The above value function is described in respect of fluctuations in wealth instead of final results. The value function is concave in the gain region and convex in loss region, revealing risk-averse nature of investor in the gains area and risk seeking nature in the losses area. A thought-provoking property of this value function is that it is steep at the reference point. This infers that when the distance to the reference point is huge, any change in losses or gains has a minor influence on the value experienced by the investor. Prospect theory contends that at the time of choosing amongst gambles, investors calculate the losses and gains for each single gamble and choose the one that have highest probable utility. Same is the case in financial market; this advocates that investors calculate probable gains and losses of their holdings and adding the one with the highest probable utility in their assets portfolio.
3.5.2 Heuristics

Heuristics are simple time saving rules of thumb which explicate how investors make investment decisions, move to a judgment and resolve problems, usually when confronting complicated problems or partial information. However, this rule of thumb goes well in most of the situations, but in some cases it leads to systematized cognitive biases. Fathers of behavioral finance, Tversky and Kanheman pinpoint the impact of investor’s heuristics on investment decision making process. Tversky describe heuristic as a plan of action, which can be used in multiple problems, that generally but not always gives a right solution. Investors usually use heuristics (shortcuts) to shorten complicated problem in much more simple subjective actions.

Human beings are not so proficient that they can manage all the information that is available on daily basis. They gain experience in the process of doing something, and this experience provides a basis of how something works. This practice originates rules of thumb that can be used later when alike situation arises in future. These rules of thumb are particularly important in today’s trading, when the availability of the information has increased considerably. However, the most appealing feature of this is that it helps in saving valuable time but that is too dependent on prior events experience.

3.6 Behavioral Biases

Investors are prone to numerous behavioral biases that results in psychological errors and faulty decision making. Investors make probable, non-efficient choices when they came across with problematic and ambiguous decisions by using rules of thumb. Behavioral biases, theoretically, are characterized in the same way as systematized
errors in forming judgment. Researchers, over a period of time, extricate an extended list of explicit biases; applied these biases to individual investor behavior to check how it changes their decisions. These biases are often referred as heuristics, thinking, judgments, cognitive and psychological errors by various researchers. Although this type of bias classification is useful—but the fundamental theory about why investors are prone to these biases has not been formed. Various behavioral biases which are considered in present research are:

3.6.1 Overconfidence Bias

Overconfidence bias can be epitomized as groundless faith in one’s knowledge, cognitive reasoning and judgments. Various researchers have found that overconfidence makes investors to exaggerate their knowledge, undervalue risks, and overestimate their capability to dominate events. In short, investors believe that they are clever and have excelling information than they actually possesses. Same is the case in stock market. Investors tend to be overconfident of their own intelligence when it is related to choosing stocks, and to take decision when to get in or exit a position. Investors exhibiting overconfidence behavior tend to engage in enormous trading that leads to poor returns and thus, they also fail in diversifying their portfolio properly.

Barber and Odean (2001) conducted an empirical study on overconfidence in which they segregated investors on the basis of gender and found that males are not only overconfident but they also trade more frequently than females. They also found that men tend to sell of their positions at wrong time leading high trading costs. On the other hand, women normally trade less and exercises “buy and hold” strategy causing lower trading costs. Moreover, it is not possible for individual investors to have
excelling information as compared to professionals; thus, they have to analyse the information using their own instinct leading overestimation of their knowledge.

3.6.2 Representativeness Bias

Representativeness bias is the estimation of future events based on finite set of information or facts; also known as small sample neglect. Moreover, representativeness bias is a judgment grounded on over dependence on recent performance as investors think that the recent trend will continue in future also. This bias has many consequences to investment decision making. For example, at the time of making investment decisions, investors categorize an investment as good or bad on the basis of its latest performance. Therefore, they purchase stocks when their prices rises envisaging those rises to last and overlook stocks when their prices falls below their fundamental values. But these companies proved to be bad investment in certain cases.

In other words, representativeness bias is an instrument that the brain adapts to segregate things swiftly. The brain presumes that events with a few identical features are likely to be identical even though they actually differ in reality. Although representativeness assists the brain in arranging and processing large amount of data rapidly, it is an alternative that causes overreaction of investors to the recent information. Representativeness leads to poor decision making in financial markets. For example, if a company’s financial statement shows poor results over a period of time, investors will become disappointed with it. They will form a perception that the company has the features of a useless company, and like most of the loss making companies, it will carry on to deliver bad results in near future. Thus, it can be seen here that investors tend to exaggerate past and unconstructive information and
overlook improvement indications. Despite of the fact that the company might be self-assured to deliver good results, but still the company is ignored leading to undervaluation of its stock.

3.6.3 Herd Behavior

Herd behavior in financial markets can be described as collective imitation leading to merging of numerous investors’ actions. This is the most frequent mistake in which investors are likely to follow majority’s investment decisions. That is why, in share market, when an investor thinks that it is the best time to buy or sell a position and he should take action immediately, he come across with strong peer and psychological pressure that abstain him to do so. Herd behavior is a mind-set portrait by the paucity of individual decision-making or understanding, leading investors to think and move in similar manner as the majority of the investors do. There are various examples which show that investors are drawn towards the identical investments merely because others are also investing in those stocks and believing that they must be having some extra knowledge that former does not.

Moreover, the main driving force after herd behavior is the investor’s fear of regret for losing out a good investment opportunity and how others will see their investment decisions often results in large controversial rallies, selloffs and market crashes. There are many examples which show that investors in share market follow herd behavior. For instance, dotcom bubble in 1990s is a best example of the consequence of herd behavior in the advancement and successive burst of IT industry’s bubble. Another example is Reliance Power IPO that came in 2008 where most of the investors subscribed to it even though they didn’t have complete information of the IPO. Some researchers also found that herd behavior is not only limited to individual investors,
rather analysts were exhibiting this bias in an equally likely manner. For example, whenever an analyst amended his investment recommendations, other analyst’s also tend to change their recommendations. This happens because investors are living in a society and they tend to quest for recognition from other group as well rather than being isolated.

3.6.4 Anchoring Bias

Anchoring is the propensity to attach or to anchor one’s thinking to a reference point—regardless of the fact that it may not have any sensible relevance to the current decision. For example in share market investments, some investors are more inclined to purchase a stock that has gone down substantially from its recent highs. They anchor on its recent highs that the stock has attained and are of the view that this low price offers them a good investment opportunity. In other words, anchoring is a mindset to hold on to a notion and then employing it as a reference point for forming future perception. Anchoring exists when an investor allow an explicit information restrict his intellectual decision-making process. They usually base their investment decisions on the initial source of information to which they come across, example, the price at which a stock is purchased, and have problem in modifying or changing their perspective.

According to Kahneman and Tversky, Anchoring is a cognitive heuristic which arises when investors bestow superfluous importance to intellectual anchors leading to irrational and faulty decision making. Most of the investors still anchor on the sub-prime mortgage crisis in 2008 as a poor experience. This brought a higher intensity of anxiety among investors, which makes them to underestimate equities as they are extravagantly loss averse. Investors who are exposed to this bias are more prone to the
anchors at the time of responding important questions like, “Is this a right time to buy or sell off a position?”

3.6.5 Cognitive Dissonance Bias

Cognitive Dissonance is the psychological stress or displeasure experienced by an investor who possesses two or more conflicting beliefs, thought or principles at the same time; carry out an action that is paradoxical to one or more beliefs, thought or principles; or is antagonized by new information that clashes with current beliefs, thought of principles. In other words, Cognitive Dissonance is the mental conflict that investor faces when they are conferred with the proof that their judgment and expectations are wrong. Moreover, when an investor came across with a situation wherein he has to select among two alternatives, it is probable that some contention will follow subsequently a decision has been taken. The unfavourable aspects of the alternative he picked are likely to be more apparent while the positive aspects of the neglected alternative will give fire to the conflict. This will lead to questioning of investor’s beliefs in the investment decision he has taken.

Further, there are two recognized facets of Cognitive Dissonance that is connected to investment decision making. (a) Choosy perception: In this, investors consider only that information which confirm their thinking; thus devising an imperfect glimpse of the real situation. (b) Choosy decision-making: In this, investors are inclined to strengthen commitments made earlier in spite of the fact that it is evident that it is the inaccurate thing to do. This happens on account of commitment to the initial decision compelling the investor to justify his actions, regardless of the fact that these behavior leads to irrational decision making.
3.6.6 Regret Aversion Bias

Investors tend to exhibit regret aversion bias when they fail to take decision due to the fear that it will result in poor outcome. Regret aversion tries to explain why investors deny accepting to themselves that they have made a wrong investment decision. Investors who are prone to this bias are reluctant in selling stocks that have declined in value so as to forego the regret of making wrong investment decision and pain of incurring the loss. The basis of regret aversion is the propensity that investors dislike accepting their mistakes. Moreover, because of this bias, investors may avoid taking investment decisions just because of the fear that whatsoever decision they take, it will be irrational. Regret averse investors are likely to avoid pain originating from two types of mistakes- (a) Errors of commission – buying/investing in wrong stocks (b) Errors of omission- not buying the right stocks at right moment. Moreover, investors find it easier to go after the crowd and buy the favoured stock because if the goes down afterwards, it can be justified that everyone has purchased it. And going opposite of traditional knowledge is tough as it increases the likelihood of regret feeling if decisions turn out to be wrong. Further, due to fear of regret, investors tend to hold positions that have gone down in the expectation that it will become valuable again or sell winners too early to get the profits to prevent them turning into losses.

3.6.7 Loss Aversion

Loss aversion is the tendency of investors to prevent losses even for probable gains. Therefore, investors usually hold onto loss making stocks for a longer period of time than they should, as selling them would result in loss; contrarily, it will be just a “paper loss”. Loss Aversion is associated with marginal utility of money, where in 1st rupee is more treasured than additional rupees. Loss aversion is an inescapable
phenomenon, according to which investors are more emotional to losses than gains. According to Kahneman and Tversky, the impact of a loss on investor’s enjoyment is much powerful than the impact of same amount of gain. For example, if given an option between (a) a certain gain of Rs. 1000 and (b) a 70% chance of getting Rs. 800 and a 20% change of getting nothing; most of the investors would go with the first choice. On the contrary, if given an option to make a choice between losses (a) a certain loss of Rs. 1000 and (b) 80% change of losing Rs. 800 and 20% chance of having no loss; most of the investors would go with the second option as they would like to take a chance if they could avoid losses.

3.7 Summary

This section provides a brief summary of the evolution of behavioral finance owing to the imperfections of traditional finance theory (EMH). EMH exclaims that investors are perfectly rational and whatever information comes in market it is fully reflected in share prices. But there are various events like dot com bubble, financial crisis 2008 which shows that investors do not behave rationally always rather they involve emotions while taking investment decisions. This irrational behavior of investors gave rise to many behavioral biases namely loss aversion bias, regret aversion bias, herding bias, overconfidence bias, representativeness bias, anchoring bias and cognitive dissonance bias. A lot of research has already been done on these biases worldwide showing heterogeneous results and a brief summary of literature has been given in chapter 4.