

FINANCIAL ENGINEERING: A STRATEGIC FRAMEWORK FOR FINANCIAL INNOVATION IN MUTUAL FUNDS

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Doctor of Philosophy

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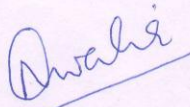


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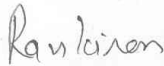
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"I wish to thank you from the bottom of my heart but for you my heart has no bottom"

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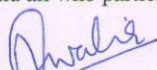
I am endeavoring to express my deep thanks to the Almighty as whatever I have achieved is because God always answered my sincere prayers and bestowed me with contentment, satisfaction and courage to solve the complexities of life. I just pray to him to ignore my mistakes and be with me throughout my life. Thanks for always standing by me whenever I need you. May your name be exalted, honoured and glorified "*Jai Mata Di*".

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ABBREVIATIONS

Abbreviation	Full Form
AES	Average Experienced Score
ANOVA	Analysis of Variance
AMCs	Asset Management Companies
AMFI	Association of Mutual Funds in India
AMEX	American stock exchange
APS	Average Perceived Score
AR	Annual Return
AUM	Assets Under Management
CAGR	compounded Annual Growth Rate
CAPM	Capital Asset Pricing Model
CI	Continuous Improvement
DEA	Data Envelopment Analysis
Df	Degree of Freedom
DJIAI	Dow Jones Industrial Average Index
DV	Dependent variable
EMH	Efficient Market Hypothesis
EU-E	Expected Utility-Entropy
FCM	Fuzzy Control Model
FDI	Foreign direct investment
FININOV	Financial Innovation
FMI	Financial Market Intermediaries
ICICIPBF	ICICI Prudential Balanced Fund
ICICIPEF	ICICI Prudential Equity Fund
ICICIPIF	ICICI Prudential Income Fund
ICT	Information and Communication Technology
IRPA	Investors' Risk Perception Analysis
IT	Information Technology
LSL	Lower Specification Limit
MNCs	Multi- National Companies
MF	Mutual Funds
MFIs	Mutual Fund Intermediaries
MvRA	Market volatility Risk Analysis
NAV	Net Asset Value
NYSE	New York Stock Exchange
PCM	Performance Change Measure
PPF	Public provident Fund
PO	Post office schemes
PS	Preference Score
RELEF	Reliance Equity Fund
RELBF	Reliance Balanced Fund

Abbreviation	Full Form
RELIF	Reliance Income Fund
RoI	Return on Investment
S&P	Standard & Poors
SBIMBF	SBI Magnum Balanced Fund
SBIMEF	SBI Magnum Equity Fund
SBIMIF	SBI Magnum Income Fund
SD	Standard Deviation
SEBI	Securities exchange board of India
TR	Total Return
USP	Unique Selling Proposition
USL	Upper Specification Limit
UTIBF	UTI Balanced Fund
UTIEF	UTI Equity Fund
UTIIF	UTI Income Fund
VaR	Value at Risk

ABSTRACT

Desire for exceptionally high returns with minimal risk has been the foremost priority of a human being whenever he faces dilemma among investment avenues. Traditionally, Indian investors used to restrict their investment choice to risk free securities but in the last two decades financial markets have come up with an entirely new face. Among the several financial avenues prevailing in India, mutual funds have been admitted as the preferred choice because being flexible security it suits the self-designed boundaries of investors. Intensified competition and involvement of private players in the race of mutual funds have forced professional managers to bring innovation in mutual funds. Thus, mutual funds industry has moved from offering a handful of schemes like equity, debt or balanced funds to liquid, money market, sector specific funds, index funds and gilt edged funds.

Mutual funds comprise of the strongest band of Indian financial market but have not attracted much attention, despite their efforts to continuously design new schemes. Moreover, in India sufficient work has not been done to identify the reasons why mutual funds have not been able to embed their footprints even after half a century of inception. Thus, the prime concern of this research is to identify how truly mutual fund investors appreciate this investment including identification of factors that fosters gap in investors' expectations from security returns and actual portfolio management by mutual funds through Investor's Risk Perception Analysis (IRPA). A well-structured comprehensive questionnaire has been designed which seeks to identify the factors responsible for creating gap in investors' perception. Special emphasis has been given to identify mutual fund's disclosure practices and investors' perception about working of AMCs, as it ultimately set base for determining the risk perception.

A five point Likert scale has been employed for assessing the risk perception through questionnaire. The data was analyzed using ANOVA, Chi-square and Multiple regression analysis. Results indicate that although investors admit Mutual funds as a risky investment but still optimistic about the returns they will get on their investment. Moreover, results of canonical correlation reveals that investors' risk perception is significantly correlated with their psychological and demographic factors.

Presence of rationality in human behavior always allows for acceptance of a minimum risk whereby Random Walk Hypothesis (RWH) suggests that markets have random movements which can not be predicted. Thus, crucial decision for mutual fund AMCs is to use the available information and translate that information using their skills so that investors' trust can be maintained. For identifying current flaws in Mutual funds' working secondary data for selected funds has been used and compared. An attempt has been made to examine the working style of mutual fund AMCs which they use to assume calculated risk as well as their capability to manage market volatility. For this purpose four mutual funds viz. SBI Mutual fund, UTI Mutual Fund, ICICI Prudential Mutual fund and Reliance Mutual fund were selected and examined. Statistical non parametric test has been applied to judge the randomness of mutual fund price movements. Further, mutual funds' performance has been accessed during bullish and bearish trend. Results of the study have revealed that AMCs differ in their investment style to design portfolio mix and their stock selection superiority enables them to yield different returns. Moreover, it has also been revealed that mutual funds show underperformance to manage market volatility. Thus, a systematic methodology has been developed that will ensure better financial returns and ultimately help in risk management.

Thus, empirical results of primary survey and result analysis of mutual fund working have been synthesized and finally a multidimensional strategic framework "FININOV" has been proposed that will allow financial products to be designed/ restructured so that mutual funds' service style matches with investors' expectations. This framework will also ensure the fine tuning of existing mutual funds to improve its value on risk-return calculus in response to changing market conditions. Application of research results for proliferation of mutual funds at base level has been highlighted in Indian context.

CHAPTER I

INTRODUCTION

1.1 Emerging need of Financial Engineering

With the evolution of information and communication technology (ICT), financial data are being generated, accumulated and transmitted at an unprecedented rate. It is high time to analyze these data and unveil some extremely valuable information that can support financial decision making to turn challenging stones into opportunities. Financial engineering as a phenomenon fosters product/process innovation in financial industry using the risk management techniques and concentrates on minute details of information that can affect, measure and predict changes in stock market. Financial innovation being the lifeblood of financial engineering seeks to adapt the existing financial instruments and develop new ones to enable financial market participants to cope more effectively with the changing world. Application of financial engineering practices in the present scenario is highly relevant because the investors are becoming more aware and demanding. Thus, it becomes imperative to inculcate financial engineering practices among financial market intermediaries to stimulate inherited risk present in financial products, and in chorus will ensure restructured cash flows. Successful implementation of financial engineering methodology will ensure promising value added services to the investors by introducing innovation in the existing financial products and processes. Presently, many investors are tempted by the highly volatile stock market returns with illusion in their mind that by investing in stock market securities they can get multiple results on their investment. However, investing in stock market without concrete knowledge may eventually put their investment in reverse gear.

Innovative financial product and market designs, improved computer and telecommunication technologies and advances in theory of finance during past quarter century have led to dramatic changes in the structure of financial markets. Automated approaches designed by new technology and data mining are helping investors in strategic planning and investment decision making by uncovering the hidden patterns to predict the future trends and behavior of financial markets. IT enabled genetic algorithm and IT software are also helping in financial applications. Financial engineering as a key to superior performance endorse

dynamic strategies for risk management, portfolio management and introduction of innovations in existing financial products. Financial engineering can contribute significantly in the developed countries as well as developing countries. (Merton, 2001)

1.2 Financial innovation

Innovation includes the act of invention and diffusion of new product, services or ideas. Financial innovation has been a critical component of financial landscape over the centuries. Since Miller (1986) financial markets have continued to produce a multitude of new products including many new forms of derivatives, risk shifting financial instruments, exchange traded funds and variant of tax deductible equity. However, a broad view on financial innovation reveals that innovation is an ongoing process, as vibrant financial environment continuously encourage its participants to come up with the innovation in order to penetrate untapped market. Further, financial innovations intend to remove market imperfections like taxes, excess cost, information asymmetry etc., as intermediaries move in a limited regulatory environment. Financial innovations put forth the diversity in existing practices that pave the way for intermediaries to adopt it for competitive edge.

Financial innovations have become the central driving force that takes any financial system towards economic efficiency. Indian capital market has shown a spurt in growth with financial innovations becoming a regular feature leading to change in investors' preferences for new fangled financial innovations. Financial innovation raises the efficiency of financial intermediation by increasing the variety of financial products and services, resulting in improved matching of the needs of individual savers with those of firms raising funds for expanding future products (Chou, 2007). Financial innovation comprises of three broad areas ranging from financial products, financial processes and decisions but the overall success of all financial innovation depends upon its commercial value generation. It will be incomplete if any innovation in financial markets focuses merely on commercial value and ignores investors' risk appetite. A complete chain of financial innovation should endeavor to align investors' objective and intermediaries' constraint. Any missing connection between these two will hamper capturing gains from innovation.

1.3 Mutual funds

Mutual funds are recognized as a mechanism of pooling together the investment of unsophisticated investors and turn it in the hands of professionally managed fund managers for consistent return along-with the capital appreciation. This is the reason that over the time Indian investors have started shifting towards mutual funds instead of traditional financial avenues. The active involvement of mutual funds in economic development can be witnessed from dominant presence of mutual funds in the world- wide capital and money market. During the last two decades mutual funds have entered into a world of exciting innovative products. These products are now tailor made to suit the specific needs of the investors.

Mutual funds put forward a way out to investors to approach most of the schemes and get well-diversified portfolio because investors with small savings neither have sufficient expertise nor have the means for diversification. Mutual funds as blessed with professional management use their diligent skills for efficient resource allocation leading to the enhancement of overall market efficiency, bringing transparency and above all ensuring risk management. Although mutual funds are coming up with many new diversified faces and as a result Indian mutual fund industry has been growing exceptionally well on the back of country's booming economy but still mutual funds need to create more lucrative solutions to suit investors' expectations.

Although risk and return are the two prime concerns for selecting any mutual fund, yet investors also consider sale charges, fund manager's reputation, fund history, management fees, clarity in disclosure, and recommendation from media before finalizing their investment decision. Investors mainly rely on advertised strategies of fund managers, while investing their fund and are tempted by the overpromising tendency of agents to attract more investors. So an organized and robust system is required that can restrict AMCs to deviate from their committed and advertised promises. Thus, for making mutual funds more successful, AMCs should endeavor to access the risk an individual investor is willing to take and make certain that the collection of assets fulfill their expectations.

1.4 Innovations in mutual funds: Indian scenario

Financial innovations have become the central driving force taking any financial system towards economic efficiency. Indian capital market has shown a spurt in growth with financial innovations becoming a regular feature leading to change in investors' preferences for new fangled financial innovations. Mutual funds industry has already entered into the world of exciting innovations where AMCs are coming up with new financial products, aligning them with customer expectations. Intensified competition and involvement of private players in the race of mutual funds have forced professional managers to bring innovation in mutual funds and as a result the mutual funds industry has moved from offering a handful of schemes like equity, debt or balanced funds to liquid, money market, sector specific funds, index funds and gilt edged funds. Besides this mutual funds have introduced some specific funds like children plans, education plans, insurance linked plans, and exchange traded funds to suit varied needs of investors.

With increased risk appetite, enhanced income level and improved awareness Indian investors have preferred mutual fund as an investment to traditional investments in government securities. Although mutual funds are responding very rapidly in understanding the mystery of consumer's mind, yet they are following this race in their endeavor to differentiate their product and to respond to market volatility. With financial innovations taking the lead in the Indian capital markets, AMCs were encouraged to come up with added schemes to suit investors' requirement and the industry widened its dimensions from providing only debt and equity funds to gilt edged funds, index funds, sector funds etc. This resulted in increasing the number of schemes operating, as the schemes increased from 284 to 451 during the period of 1999-2005. A visible growth of mutual fund innovations can be traced from 956 schemes currently operating in India. The key reason of this speedy growth can be attributed to the higher saving pattern in India as Indian investors are admitted to be highly future conscious as compared to those of other developing nations.

In addition to this improved lucidity in regulatory framework has gained the trust of Indian investors. Although there was hardly any increase in number of AMCs operating during last ten years as it rose from 31 in 1999 to 33 in 2009 but these AMCs adopted innovative ideas to lure a large number of investors and net Assets under management (AUM) increased from \$16111 million in march 1999 to \$ 99651 million in march 2009. Spontaneous growth of AUM in Indian mutual fund industry can be clearly seen from year ending 2003, with AUM of \$16719 million increasing to \$ 126225 million in year ending 2008. Indian mutual fund industry has shown a dramatic change during last two decades where participation of private sector funds has added new vistas to the traditional perception of investors. Private players entered into mutual fund industry with a wide range of fund choices in 1993. This not only intensified competition but also helped mutual fund industry touch new heights.

As revealed by the data in 1999 private funds contribution was merely 9.97% in total net assets, it increased to 51.77% in 2003, and currently in year ending March 2009 contribution of private players in net assets has been 80.4%. Private sector mutual funds tapped investors from various sectors with their swift and smart plans and as a result within a very short period of time they were able to mobilize 34.55% of the total funds mobilized by mutual fund industry, but UTI alone was maintaining its monopoly position holding 58.09% of total funds mobilized. Innovative plans by private sector funds proved their well-structured planning and in the year ending March 2000 position of private sector funds in terms of fund mobilized increased to 71.39% whereas share of UTI reduced to 22.36% for mobilization of funds. During the year ending March 2008 out of total funds mobilized by mutual fund industry 84.68% were mobilized by private sector funds as against 7.55% by all public sector mutual funds (except UTI).

1.5 Investors' rationality: Risk return trade off

Uncertainty in investment decision prevails when Mutual fund AMCs skills and knowledge fail to have proper access to decision relevant information due to complexity of financial markets. On the other side, risk averse behavior of investors reflects the choice of investors to avoid risk or take negligible risk. So, whenever an individual investor is given option to go for guaranteed return with probability one which are comparatively less than gambling return

with probability less than one, chances are that he may go for guaranteed return. Simonson and Tversky (1992) proposed that the choice of consumer is generally influenced by a set of alternatives under consideration. Thus, at the time of designing a product, managers should not only consider its attribute value but its likely position in the choice set as well. They explained context effect and accordingly people given choices A, B and C generally find B as more attractive than A and C whereas those given choice of B, C and D will prefer C over B and D. Benartzi and Thaler (2002) conducted research on retired investors who had the information regarding the expected outcome from their portfolios and the study revealed that investors prefer median portfolio than the one they select for themselves. They propounded that when choice problems are hard, people avoid extremes and take the help of a simple rule of the thumb.

Investors are generally more careful while making investment decision and presence of rationality in every investor demands higher return at the minimum risk, but when markets are efficient it is not possible to gain abnormal returns. Risk is generally, associated differently with various applications differently but in common it means negative connotation such as harm or loss or some undesirable action. Although different literature available on risk defines it variedly but in common the word risk refers to situations in which a decision is made the consequences of which depend on the outcomes of future events having known probabilities (Lopes, 1987).

1.6 Overview of the research

This comprehensive study focuses on identifying the implicit expectations of investors from mutual funds along with AMC's practices to leverage the use of financial information for hedging risk. In the first stage primary data was collected from investors to facilitate Investors' Risk Perception Analysis (IRPA). IRPA aims at identifying critical service gaps in existing mutual funds' system and perception set by investors towards presence of risk in mutual funds. In the second stage, secondary data of four prominent mutual funds operating in India viz. SBI mutual fund, UTI mutual fund, ICICI mutual fund and Reliance mutual fund was collected to identify current financial flaws in the existing funds and further extend it to analyze the skills of the fund managers which they use to frame strategies for assuming

calculated risk. Finally, the study proposes a systematic methodology to foster innovation that can satisfy investors' expectations.

1.6.1 Motivation for the study

In India, limited work has been done on identifying the reasons why mutual funds have not been able to embed their footprints even after half a century of inception. A simple look at mutual funds data reveals the fact that as compared to developed countries Asset under Management (AUM) in India are fractions of their funds. In India, the investors are becoming increasingly aware and are always looking forward for new financial avenues to invest their funds, and on the other side, the financial institutions are rather on high alert to tap this opportunity. Thus, with financial markets becoming more exhaustive, financial products seek new innovations and to some extent innovations are also visible in designing mutual funds portfolio but these changes need to be aligned with investors' requirement. Thus, it has become imperative to study mutual funds from a different angle, i.e., to focus on investors' expectations and develop a FININOV for inducing investor oriented service quality in designing the mutual funds.

1.6.2 Research objectives

- To identify and establish linkage between factors responsible for creating gap in investors' expectations from security returns and actual portfolio management by mutual funds through Investor's Risk Perception Analysis (IRPA).
- To identify current financial flaws in prevailing mutual funds and propose a roadmap for portfolio selection and critically analyze important parameters that will ensure better financial returns on portfolio and can eventually help in risk management.
- To evolve a multidimensional strategic framework "FININOV" which will allow existing financial products to be overhauled/ restructured.

1.6.3 Research hypotheses

Growth of alternative investment avenues is luring more investors looking for organized professionals with whom their savings can be entrusted. Ultimate objective of mutual fund

AMCs is to maintain a balance between risk and return. AMCs job of portfolio management deals with untapped future opportunities through stock market mechanism requiring high degree of precision in identifying the scope to predict market movements. An additional problem faced by AMCs is to manage the varied expectations of investors. Goetzmann and Peles (1997) found that about 50% of growth funds were misclassified and Kim *et. al.* (2000) opine that on an average only 46% of mutual fund performs as per stated objectives. These misclassifications result in creating a huge gap between investor's expectations and AMCs perception. Thus, fund managers have to be very cautious in expressing their views on market movement and finally selecting stock based on their estimations. Based on the above premises the following hypotheses have been formulated:

- H₁: Despite mutual funds' commitment to assume calculated risk, investors may consider mutual fund as a risky investment.
- H₂: Experienced investors may have more confidence regarding expected return from mutual funds.

Study by Jain (1982); Sarkar and Majumdar (1995); Anand and Murgiah (2004) studied the performance of mutual funds and concluded that funds have shown underperformance in terms of return on investment. Gruber (1996); Korkeamaki and Smythe, (2004) conducted empirical research on mutual fund performance for the specialized services offered by them and found them poor for the level of fee charged. They revealed that additional returns on mutual funds did not compensate investors in terms of additional fee charged by them for their professional services. The following hypotheses have been formulated for evaluating the performance of mutual funds:

- H₃: Comparative performance of mutual funds to manage risk return trade off may vary significantly.
- H₄: Despite the professional skills fund managers possess, mutual funds may not be able to reduce risk from market volatility.

1.7 Significance of the study

Financial sector has witnessed a great transformation especially after globalization and as a result now the investors in India have a number of opportunities to invest. Now anyone can see the investors shifting their funds from traditional investment sources to emerging innovative financial products. Further, risk appetite of investors is also increasing in anticipation of superior returns and the financial intermediaries need to understand the varied level of risk that different strata of investors can afford and accordingly use their professional diligence. A major problem identified in this complete process is that fund managers are engaged in designing new schemes to lure untapped investors without understanding the need to align these innovations with investors' expectations. So, the present research has been undertaken with the objective to match investors' expectations and investment styles of mutual fund AMCs. The study aims to propose a systematic roadmap that mutual fund AMCs should follow before introducing any innovative funds or redesigning the existing funds.

The emerging and booming financial sector in India can foresee a clean road provided it is supported by adequate research to overcome the hindrances. Though admitted as most demanding and rewarding financial avenues and backed by government support and foreign direct investment (FDI), mutual funds still have not been able to come up to their booming stage. The present research provides analytical outcome in the form of identifying mysterious expectation of investors. The study also examines the current working style of mutual fund AMCs. The uniqueness of this exhaustive study is the coverage of the dual aspects as it has got relevance for both ends of the financial sector. The initial outcome of this research can privilege the corporate sector in identifying the unexpressed investors' expectations so that they can modify their existing methodology to match it with the investors' expectations. Further, this proposed work will be of great help in guiding existing AMCs and individual investors by providing them with a practical framework on portfolio management and add up some risk management techniques.

1.8 Organization of the Thesis

The thesis is divided into six broad chapters which are:

Chapter 1 – Introduction

This chapter is introductory in nature that builds the foundation of the complete research. This chapter covers the broad overview of research aspects along with an initial dose of present scenario. Finally, it outlines the objectives with which the whole research has been carried out.

Chapter II – Review of literature

This chapter presents results of different empirical and descriptive research studies carried out in the area of mutual funds. The review helps to know the emphasis and direction of earlier research covering the time periods of the studies, the scope and limitations of the earlier studies conducted, the conclusions drawn from these studies, the objectives fulfilled and the benefits that have accrued from these studies. It helps to identify the gaps in the earlier studies, avoids duplication of efforts and finally encourages to focus in the right direction. Basic review of literature is divided into studies relating to investors' rationality: risk return trade off, studies pertaining to Mutual funds in India and studies relating to risk management.

Chapter III – Research Design and Methodology

This chapter highlights the research methodology used for analyzing the data collected through a structured questionnaire. As the study uses both primary and secondary data, complete description of the sample taken, research procedures and measurement tool have also been explained in this chapter.

Chapter IV - Investors' Risk Perception Analysis (IRPA)

This chapter uncovers the hidden expectations and broad perception of mutual fund investors. Although risk is a commonly used financial terminology, but still it carries varied meaning for different persons. As a rational investor, every investor wishes to pick securities that assure him promising returns at the lowest risk level. Mutual funds are best suited for the investors, who don't possess professional expertise of investment dynamics but are tempted by multiple returns on investment in short time, as offered by the stock markets. Thus, this chapter highlights the results of primary data collected to analyze the risk perception of investors

towards mutual funds and explore if investors are confident of getting the expected returns from investment in mutual funds.

Chapter V – Analysis of Financial performance of Mutual funds

This chapter focuses on measuring the financial performance of four mutual funds under the study viz. SBI Mutual fund, UTI Mutual fund, ICICI Prudential Mutual fund and Reliance Mutual fund. Although, past performance of fund is an important parameter in selecting a particular AMC for investment, yet some other parameters that should be considered are knowledge and diligence of fund managers. These help in deciding the asset mix for funds, and result in significant difference in a financial performance of the fund compared to other funds. This chapter makes use of Beta (β), Fama, Sharpe (S_i), Treynor (T_i) as a risk to examine to measures the variability of fund in terms of return provided. An effort has been made to find out whether the fund managers are able to provide return over and above the risk free return and expected return. In addition to this the role of fund managers' stock selection ability to distinguish their performance has also been highlighted. This chapter synthesized the overall results and finally a strategic framework "FININOV" has been proposed whereby AMCs are encouraged to innovate new funds aligning their practices with investors' perception.

Chapter VI – Discussion and Conclusion

This chapter explicates the summary of research results along with recommendations and limitations. Discussions of existing research findings on the related issues which the present findings support and extend have also been highlighted. Further, the major learning results from the survey and comprehensive outcome of the secondary data have been presented. In the subsequent section of this chapter suggestions for future research are also presented.

Finally, a comprehensive list of references used and appendices related to research methodology and design complete this study.

1.9 Concluding remarks

A systematized and well-structured attempt has been made to make this study exhaustive for proposing the orderly roadmap which mutual fund AMCs should adopt for financial innovations and overall portfolio management. Although, in a India large number of mutual funds are offering varied schemes to suit investors' needs but the present study restricts to mainly four mutual funds with Equity-Growth schemes, Balance-Growth schemes, and Income-Growth schemes. Similarly due to limitation of time and resource Investors' Risk Perception Analysis (IRPA) was carried out on 400 investors, i.e., 100 respondents from four funds under the study. Final emphasis of this analysis was to develop a systematic roadmap which mutual fund AMCs should follow before restructuring any existing fund or developing an entirely new scheme.

Review of Literature is a prerequisite for a systematic research process and the next chapter is devoted to the same.

CHAPTER II

REVIEW OF LITERATURE

One of the prerequisites for developing well-structured hypotheses is review of literature that enables the researcher to avoid pit falls and difficulties experienced by predecessors and help him draw a well-designed plot in the area of his interest. To have a proper perspective of the subject it is essential to have a bird's eye view of the findings of other academic researchers. Thus, the planning and execution of any research study should be preceded by a thorough review of literature in related fields, since it helps to familiarize with the work that has been done in that area, eliminates the possibility of unnecessary duplication of efforts and provides valuable information on research technique.

The purpose of this chapter is to summarize scholarly and analytical research on the working style of mutual fund AMC's, as well as to gain knowledge on investors' behavior towards risk and return. Most of the studies on the present work can be classified as under:

2.1 Investors' Risk Perception

Risk generally carries a negative connotation such as possibility of harm, loss, destruction or an undesirable event. Slovic (1967) explained risk as probability of loss in terms of measurement of risk. He propounded that an individual's decision on risk is determined by a person's belief about the relative importance of probabilities and limitations of his ability to act on the basis of these beliefs. Whereas, Miller (1977) provided that risk has an association with "divergence of opinion", in which due to uncertainty potential investor in a stock develop different judgments of expected return and risk. The author endeavored to explore implications of a market with restricted short selling in which investors have different estimates of return from investing in risky securities. Kaplan and Garrick (1981) endeavored to provide suggestions towards a conceptual framework for quantifying the notion of risk and accordingly, expressed risk as a factor of uncertainty and potential loss that can occur, i.e.,

$$\textit{Risk} = \textit{Uncertainty} + \textit{Damage}$$

Their emphasis on the idea of ‘Triplets of risk’ is to provide a complete and quantitative definition of risk which suggests that any definition of risk is incomplete if it ignores its future consequences. The study has used Bayes’ theorem in this connection and discussed the notion of “relative risk”, “relativity of risk” and “acceptability of risk”. Another view point on risk was highlighted in study by Elmiger and Kim (2003) explaining risk as combination of potential loss and gain. This concept of risk highlighted risk as trade – off that every investor has to make between higher rewards that come with higher risk which he has to bear as a consequence of danger.

Thus,
$$\text{Risk} = \text{Danger} + \text{opportunity}$$

Risk associated with any outcome is generally understood as the probability of negative outcome. Lopes (1987) explained risk as a situation in which a decision is made whose consequences depend upon the outcome of future events having known probabilities. Her explicative mechanism mainly reflects the psychology of personality, where she explored risk seeking and risk averse participants. The study concluded that risk is considered as product of consequences of an event and probability of its occurrence.

$$\text{Risk} = \text{Consequences} * \text{probability of Occurrence}$$

Risk taking process involves selection of option that has fair chances of negative outcome. Brehmer (1987) analyzed influence of culture on risk perception and proposed that judgment of risk depends upon the context in which judgment is made. He classified risks into two major types viz. objective risk that come from an expert judgment and psychological risk which emphasize on an emotional and motivational concepts. Existing literature provides different aspects associated with measuring risk in different terms. Steil (1993) suggested risk measurement in term of two components, i.e., realizing target return and eliminating potential losses on the other side.

Olsen (1997) studied securities return between the period of 1965-1990 and provided that risk can be measured in terms of below target return and potential for huge losses, thus managers consider downside risk more significant than overall volatility. According to his study investment risk is a function of four attributes: potential for a large loss, the potential for a

below target return, the feeling of control and the perceived level of knowledge. Examining the results of investment managers' risk perception the study concluded that results are consistent with the implications of S Shaped value function of prospect theory.

Olsen and Troughton (2000) focused on the managers' tendency to interpret risk and argued on the issue of ambiguity premium and found that professional investors are ambiguity averse and hence, observed market returns should reflect ambiguity premiums as well as risk premiums. They propounded that a large sample of financial professionals identified risk as the chance of incurring a large loss and further, added that managers differently interpreted the meaning of quantitative risk attributes when they had or did not have knowledge about the name of company.

Researchers have tried differently to understand and quantify risk. Extensive literature on use of accounting information to estimate and predict risk is available in sample of work by (Ball and Brown, 1969; Beaver *et. al.* 1970; Ferris *et. al.* (1990); Martikainen and Pavo, 1990; Ciancanelli *et. al.* 2001). Eskew (1979) reexamined the forecasts of market risks by accounting models and concluded that these models tend to yield better forecasting results than models based on past market information alone. Study by Elgers (1980) contradicted the results of earlier studies and provided that accounting risk measures do not improve upon the market based systematic risk predictions. He propounded that the result as provided by previous studies may be due to the instability over time of systematic risk, coupled with a fortuitous "shrinking effect" of the ordinary least square regression model.

Risk perception of investors reflects their individual judgment, which they define differently by understanding the varied characteristics of investment avenues (Singh, R. and Bhowal, 2010). This study highlights the risk perception of employees towards equity shares which concludes that risk perception of employees for equity shares of their company is lower than equity shares of other company. Study by Haslem (2003) explained that investor's risk is situational, multi -dimensional judgment process that depends upon specific characteristics of financial product. Thus, understanding risk is a psychological phenomenon and individuals interpret risk differently based on their different ways to estimate risk. Blaylock (1985) explained that individuals differ in the style of perceiving that can affect their decision to

accept or reject a particular decision. According to him the following factors determines individual's risk perception:

- a) Cognitive style : an individual's preferred mode of evaluating information for a particular decision
- b) Environment: the situation in which decision is made
- c) Traditional risk measures: evaluating risk

Risk attitude of individual investor has received growing attention from behavioral finance because investors differ in their investment decision with reference to their social base and opportunities available in the financial markets. Investors generally have a wide range of choice while making investment decision and they adopt different parameters to finalize their investment decision that may involve risk. Although more options may provide extensive choice to investors yet simultaneously they increase the complexity of investment decision that may lead to '*decision paralysis*' (Iyenger and Lepper, 2000). Their findings suggested that mere presence of additional option may hamper the decision makers' ability to identify the option that best matches with their requirements. In addition study by Chernev (2003) and Schwartz (2004) also provided that increased choice among alternatives may create confusion among consumer. Study by Kida *et. al.* (2010) revealed a very significant finding in the context of paradox of choice which provides that this phenomenon may not exist when experienced investors make their investment decisions and thus, it exists only for participants who are less experienced with investment decision.

Individuals differ in their decision to assume risk under various decisions. Prospect theory on risk taking behavior as proposed by Kahneman and Tversky (1979) has presented two themes for individuals' preference on risky choices. The first theme is concerned with how prospects are perceived and second theme involves judgmental principle which is used to evaluate gains and losses and the weighting of uncertain outcome. They proposed that investors are loss averse in which they are more concerned with losses than gains and as a result they assign more weightage to avoid losses than achieving gains.

A different approach on investors' risk perception was suggested by Clotfelder and Cook (1993) who observed lottery number choices in a fixed payoff and provided that people are subject to Gambler's Fallacy where they believe that gain and loss, head and tail, red and black will alternate. They used data from Maryland daily number game and found a clear and consistent tendency for the amount of bet on a certain number falls sharply immediately after it is drawn and then gradually recovers its former tendency after some months. Investors also differ in their choice for assuming risk in different time periods.

Anderson and Settle (1996) studied the behavior of investors in different time horizons and provided that long term investors allocate greater percentage of their funds to risky investment than short term investors. They conducted an experiment on the ability of potential investors to project risk and return information and found them risk averse in creating portfolio for one year period than planning horizon of 10 years. Olsen (1997) used survey data generated from two groups of sophisticated investors, i.e., professional portfolio managers and wealthy investors who are actively involved in managing their portfolios and demonstrated that perceived risk is a multi-attribute phenomenon. He revealed four potential risk factors that included potential for large losses, potential for below target return, feeling of control and level of knowledge about investment.

Simonson and Tversky (1992) proposed that the choice of the consumer is generally influenced by a set of alternatives under consideration. Thus, at the time of designing a product managers should not only consider its attribute value but also its likely position in the choice set. He explained context effect and accordingly if people are given choices A, B and C, generally they find B as more attractive than A and C whereas those given choice of B, C and D will prefer C over B and D. Benartzi and Thaler (2002) conducted research on retired investors especially those who had the information regarding the expected outcome from their portfolios. The researcher revealed that investors prefer median portfolio than the one they select for themselves. They propounded that when choice problems are hard, people avoid extremes and take help of a simple rule of thumb. Their explanation that investors do not have well defined preferences supported earlier views and they found that when people have three choices ranging from lowest risk to highest risk they generally follow the middle option.

Macgregor *et.al* (1999) used psychometric paradigm to study the relationship between financial judgment and risk/return relationship. This study revealed that professional financial advisors conceptualize the risk of various assets in term of prices and volatility and this is also influenced by characteristics of specific investment class. Sortino (2001) in his research propounded that investors do not seek highest return for a given level of risk rather they want to maximize a satisfying strategy. Generally, given the complexity of problem of choosing an appropriate portfolio to fit one's own circumstances and personal risk preferences people tend to follow simple strategies.

Risk is a major factor that shapes investors' investment decision including financial and investment decisions (Yang and Qiu, 2005) because it is the risk that determines the probable return he can get. A positive relationship between risk and return reveals that investors who will assume high risk will be compensated by the additional returns generated out of it. They proposed an Expected Utility – Entropy (EU – E) as a measure of risk which reflects an individuals' intuitive attitude towards risk.

Although different measures have been propounded in existing literature on risk taking behavior but the fact that final level of risk assumed by any individual varies significantly with demographic features like age, income, education, knowledge etc. cannot be ignored. Even scholars do not have same consensus on defining the risk but from time to time a wide range of description has been developed according to sample of work by (Slovic, 1966; Payne, 1973; Weber, 1988; Savvides, 1994). There have been a lot of studies concerning the demographic effects on taking risk. Some of these studies are cited below. The following sections provide a detail of studies that provide an insight into factors that affect risk perception.

2.1.1 Gender

Early work on risk perception explained that children are highly under pressure during childhood for behaving according to culture sex roles and thus women have a lower propensity to assume risk (Slovic, 1966; Byrnes *et. al.*, 1999). Sunden and Surette (1998) explored the investment behavior of women investors and concluded that women held a large

proportion of wealth in financial assets with less volatility. Finucane *et. al.* (2000) also endeavored to identify relationship between gender and risk and proposed that females tend to take less risk than males. Research by Barber and Odean (2001); Olsen and Cox (2001); Bernasek and Shwiff (2001); Dwyer (2002) and Schubert (2006) reported that women show less confidence than men in the area of finance decision making. These studies have not properly explained the reason why women are risk averse, only the broad reason for this has been attributed to be the social factors.

2.1.2 Education

An investor's education level also guides him in selecting the optimal risk option. Baker and Haslem (1974); Crimmon and Wehrung (1990); Mankiw and Zeldes (1991); Haliassos and Bertaut (1995); Grimes and Snively (1999) opine that well educated investors show higher degree of willingness to take risk. Schooley and Worden (1999) are of the opinion that investors with high school diplomas are more risk averse and prefer to invest in fixed income securities. Christiansen (2008) found that highly educated investors are less risk averse and prefer to invest in stock and bonds.

2.1.3 Age

Age is considered as the most important determinant of human decision making. Investors are considered to vary for different risk preferences at different age level. Generally considering the time span of investment, young investors have sufficient time to recover losses on their investment in comparison to old age investor. As a result old age investors are more conservative in risk taking than young investors. Few studies on age wise risk taking behavior support that as the age of investors increases they prefer to invest in safe securities. Research by Morin and Suarez (1983); Bodie *et. al.* (1992); Riley and Chow (1992) and Palsson (1996) concluded that people in old age prefer to invest in less risky securities so they rebalance their portfolios in favor of fixed income securities. Steinberg (2005) highlighted the individuals' ability to understand risk in accordance to development stage. Contrary to it study by Heaton and Lucas (2000) found positive relationship between investors' age and percentage of equity in the portfolios but when people retire they reduce the weightage of equity in total portfolio.

However, Feng and Seasholes (2007); Ajmi (2008) found no significant relationship between age and percentage of equity in total portfolio.

2.1.4 Income

Income level of any individual plays a significant role in determining his risk appetite. Income and preferred higher risk level are positively associated [Blume (1978); Riley and Chow (1992); cicchetti and Dubin (1994); Shaw (1996) and Bernheim *et. al.* (2001)]. Study by MacCrimmon and Wehrung (1986); Ajmi (2008) propounded that the upper income investors and millionaires tend to take greater risk than lower income investors. Contrary to it study by Schooley and Worden (1999) explained that wealthy investors are more conservative with their money whereas low income people are willing to assume more risky payoffs.

2.1.5 Marital status

Investment managers also consider marital status as an important determinant in understanding the risk tolerance level of investors. Unmarried investors do not have huge savings to lose and moreover they have less family obligation than married investors. Thus, they can afford to take more risk than married investors [Roszkowski (1993); Lazzarone, (1996)]. Bernasek and Shwiff (2001) explained that marital status plays an important role in giving direction to the risk perception as investment decision of a couple reflects the combined risk preferences which they assume keeping in mind their future obligations. On the contrary, some studies failed to find any significant relationship between risk perception and marital status [Masters, (1989) and Haliassos and Bertaut (1995)].

Table 2.1 A Summary of research studies on Risk Perception			
Broad Category	Study(Year)	Relevant issues	Conclusions
Risk Perception and Decision making			
Risk Perception and measurement	Paul Slovic and S. Lichtenstein (1967)	Probability and Payoffs	Risk is trade- off between probability attached with the action and person's limitation
	R. Ball and P. Brown (1969)	Systematic risk	Accounting information help significantly in assessing the risk.
	E.M. Miller (1977)	Risk and Uncertainty	Investors perceive risk differently because of presence of uncertainty in stock market
Risky decisions	Daniel Kahneman and Amos Tversky (1979)	Choice among the risky alternatives	Risky decisions involve two stages: editing and evaluation. Whereby individual step in first step following some heuristic and in second phase they are concerned with utility
Risk quantification	Stanley Kaplan and B. John Garrick (1981)	Set of triplet	Any assessment of risk is incomplete if it fails to answer: a) What can go wrong? b) Likelihood of happening c) Consequences
	J.M. Gahlon (1981)	Leverage	Accounting data helps in predicting presence of risk
Risk perception	B. Blaylock (1985)	Behavioral differences	An individual's behavior determines his final decision to accept or reject risk
	L.L. Lopes (1987)	Behavior of risk participants	Risk averse people look more at downside (possible loss) whereas risk seekers at upside (potential gain)
Risk judgment	Berndt Brehmer (1987)	Objective and Psychology risks	Cultural Backgrounds significantly influence the risk perception of an individual
Risk estimation	Teppo Martikainen and Paavoyli-olli (1990)	Testing arbitrage pricing theory	Presents a method to test APT using accounting information
Risky choices	I. Simonson and A. Tversky (1992)	Context effects	Share of a product increases when it is mid option
Risk measurement	B. Steil (1993)	Decision making under uncertainty	Institutions define target for decision makers where they are risk taker below the target level and risk averse above the target level.
Risk estimation	Charles Clotfelter and Phil Cook (1993)	Popularity of winning no.	With passage of time winning number is as popular as an average number
Risky decision	Barry F. Anderson and John W. Settle (1996)	Long term v/s short term planning	Investors are more risk averse while investing for short term horizon than long term horizon
Risk measurement	Robert, A. Olsen (1997)	Downside risk	Risk can be measured in term of potential for huge losses
	R.A. Olsen and G.H. Troughton (2000)	Role of ambiguity in investment decision	Risk is a function of 'coming up short' than return variability
Risky decision	D.G. MacGregor, P.Slovic, D. Dreman and	Stock buying behavior	Individual's judgment of financial performance is strongly related to

	M. Berry (2000)		affective evaluation of them.
Risk Estimation	P. Ciancanelli, A. Coulson and I. Thomson (2001)	Financial tools	Accounting information is helpful in estimating risk
Risk perception	Frank Sortino (2001)	Downside risk and Minimal Acceptable Return (MAR)	Investors do not seek highest return on investment (ROI) but seek simple strategies to reduce risk
Risk measurement	G Elmiger and S. S. Kim (2003)	Risk metric	Trade -off that provides higher risk means higher reward
Risk perception and individual's behavior	John Haslem (2003)	Investment risk	Investors' judgment on risk depends upon characteristics of financial products.
	Chernev,A. (2003)	Decision choices	Choice set may create confusion among consumers and may delay decision
	J. Yang and W. Qiu (2005)	Expected utility	Investment decision of an individual is subject to his risk perception
	Kida, <i>et.al.</i> (2010)	Paradox of choice	Experienced investors prefer to have extensive choice for making their investment decisions than less experienced investors.
Gender and Risk perception			
Risk Taking behavior	P.Slovic (1966)	Decision making game	Sex differences distinguishes the risk taking behavior
	Annika Sunden and Brian Surette (1998)	Portfolio composition of women investors	Women investors prefer less volatile stock
	J.P Byrnes, D.C. Miller and W. D. Schafer (1999)	womens' risk taking behavior	Women take less risk than men
	Melissa Finucane <i>et al.</i> (2000)	Gender differences, Racial differences	Men rate a wide range of hazards less risky than women
	B. M. Barber and T. Odean (2001)	Women's confidence in financial matters	Women are less confident than men
	R.A. Olsen and C. M. Cox (2001)	Risk perception of professional men and women managers	Professional investment managers respond differently according to their gender
	R. Schubert (2006)	Gender differences	Women are less sensitive to probabilities and more pessimistic about gains than men
Education and risk perception			
Risk taking behavior	H. K. Baker and J.A. Haslem (1974)	Higher education and high risk	An individual's education level influences his risk tolerance
	N. G. Mankiw and Stephon. P Zeldes (1991)	Equity premium puzzle	Well educated investors assume high degree of risk
	M. Haliassos and C.C. Bertaut (1995)	Risk Tolerance	Individuals employed professionally assume high risk
	D.K. Schooley and D.D. Worden (1999)	Risk Preference	Investors with high school diploma are risk averse
	C. Christiansen <i>et. al.</i> (2008)	Preference in investment decision	Educated investors prefer investment in highly risky stock
Age wise risk perception			
Risk taking behavior	Z. Bodie, R.C Merton and W. F. Samuelson	Investment strategies	Old age investors are risk averse and prefer fixed income securities

	(1992)	Relationship of age and equity investment	Positive relation between age and investment in equity
	J. Heaton and D. Lucas (2000)		Age significantly determines the individuals decision to assume risk
	Steinberg. L (2005)		No significant relationship exists between age and investment risk taking
	Lei Feng and M S. Seasholes (2007)		Determining investors' risk tolerance as per their age is complex relationship
	Ajmi, Jasim. Y(2008)	Risk tolerance and demographic	
Income wise risk Perception			
Risk taking behavior	M.Blume (1978)	Risk preferences	Wealthy investors prefer higher risk
	K.R.MacCrimmon and D.A.Wehrung (1986)	Decision of risk taking according to income	Risk attitude varies with individual's income level
	W. B .Riley and K. B. Chow (1992)	Personal factors	Income and educational attainments affect risk taking decision
	C.J. Cicchetti and J.A. Dubin (1994)	Demographic features	
	K.L.Shaw (1996)	Factors in accepting risk	Higher income level encourages high risk
	D.K.Schooley and D.D.Worden(1999)	Demographic base and acceptable level of risk	Investors with financial responsibilities hold higher percentage of equity
	Ajmi, Jasim. Y. (2008)	Risk tolerance and income	Investors with high income have more risk appetite than low income investors.

2.2 Investors' knowledge and expectations

After an analysis of consumers' attitude regarding risk perception, this part of review has focused on studies covering investors' knowledge and expectations. Consumers' expectations play a significant role in widening perceptual gap. Moreover, when these expectations are designed by a consumer with little knowledge, they are sure to direct him towards dissatisfaction. According to Oliver (1981) expectations are consumer defined probabilities of occurrence of positive and negative events if the consumer engages in some behavior while Swan and Trawick (1980) consider consumer expectations as estimate of anticipated performance level. Thus, expectations are viewed as desires or wants of consumer about what they expect a service provider to offer (Parasuraman, Zeithamal and Berry, 1988). This study provided that consumers have a vague picture of product and services offered by manufacturer or service provider and they expect the product/ services to be delivered in the same manner.

The expectation construct has been viewed as playing a key role in customer evaluation of service quality (Gronroos 1982; Parasuraman, Zeithamal and Berry 1985, 1988) which takes into account customers' expectations about how a service provider should perform and how he actually performs. Study by Laukkanen (2006) explored the customer perceived value of financial services and explained that varied attributes present in a product or service facilitate customer's achievement of desired end-state and the indicative facts of study show that electronic services create value for customers in service consumption.

The new marketing philosophy and strategies place special emphasis on recognition of customer needs to provide high level of quality services (Harrison, 2000). However, understanding what customers expect and to restructure the organizational policies accordingly is a tough job. Study by Smith (2003) provides that major changes in the overall organization structure to meet customer expectations require huge investment of time and resources. Moreover, it is also evident that many change programs often fail to meet expectations. The reason for this failure is the presence of ambiguity among the investors. Similarly, majority of investors investing in mutual fund themselves are not clear about the objective and constraints of their investment. In addition to this most important critical gap that exists in this process is lack of awareness about presence of risk elements in mutual fund investment.

Presence of rationality among the customers always seeks perfect performance. But lack of awareness on the part of consumers restrict their action to evaluate the service quality in a proper way that ultimately set a way to associate negative satisfaction for services offered. Study by Alba and Hutchinson (1987) proposed that consumers' knowledge has two main components, i.e., familiarity and expertise where expertise means ability to perform product related tasks and familiarity refers to the number of product related experiences that have been accumulated by the consumer. But generally, investors concentrate on quantified statements (as provided by their service provider) in order to finalize their investment decision and ignore evaluation of many qualitative factors. Study by Krumsiek (1997) also highlighted the lack of awareness on the part of investors and provided that mutual fund investors mainly concentrate on historical data of risk and return but ignore their management practices. They

also revealed that 66% investors cannot confidently name even a single company in which their mutual fund invests.

Immaturity of investors to invest without proper evaluation of securities has also been highlighted by Shiller (1993) who provided that many investors do not have data analysis and interpretation skills and they rely on objective sources for decision making. This lack of awareness on the part of investors creates gaps between their expected risk return trade-off. Many research studies propounded that investors use historical data to finalize their investment decisions. Sample of work by [Elton and Gruber, (1981); Kane *et. al.* (1990); Patel *et. al.* (1992); De Bondt, (1993); Durell, (2001)] provided that investors perceive high stock market returns in the past to predict high future return, however, there is no support for this belief in the data (Fama and French, 1988). Further, evidence by Fisher and Statman (2000) have also shown that individual investor's stock market return expectations are positively correlated with past returns. According to them investors make use of past information to finalize their purchase decisions.

Study by Alexander *et. al.* (1996) also emphasized the need of improving investors' literacy towards mutual funds through prospectus, as their survey results pointed out that 40% investors never used prospectus to obtain information. Moreover, the respondents revealed that they consider prospectus as the fifth best source to obtain information regarding mutual funds. They also reported that only 18.9% of the respondents could provide an estimate of expenses for their largest mutual fund holding, whereas 57% stated they were not aware of mutual fund charges at the time of purchase decision.

Hirshleifer (2001) categorized different types of cognitive errors that investors make, i.e., self-deception, occur because people tend to think that they are better than they really are; heuristic simplification, which occurs because individuals have limited attention, memory and processing capabilities, disposition effect where individuals are prone to sell their winners too quickly and hold on to their losers too long. Kahneman and Riepe (1998) studied the various aspects of investors' psychology and propounded that as investment decisions are made in highly complex situations that force decision maker to rely on intuition. The study highlights that individual psychology to understand risks determines the level of negative feelings

among the investors as losing investors who believe that they should have anticipated the loss feel worse than those who believe that failure or loss could not be predicted. Thus, the differences in individual psychology direct them to adopt different measures that may reduce risk to maximum extent. Based on these differences investors may turn out to be momentum investors who have philosophy to buy past winners or contrarian investors.

2.3 Innovation

Any business to succeed in the long run will have to adopt dynamism in terms of introducing innovations in their business processes. Business is driven by customer demands, which have a tendency to keep changing. Thus, the success of a business enterprise is guided by the strategic orientation of the organization towards its customers, competitors and internal customers (employees) and the relationship between these significant components (Panda 2001). New financial product and market designs, improved computer and telecommunication technologies and advances in theory of finance during past quarter century have led to dramatic changes in the structure of mutual fund industry. Study by Miller (1986) provided that financial markets have continued to produce multiple of new products ranging from derivatives, alternative risk transfer products, exchange traded funds etc. Factors that foster these innovations are influenced by the complexity of financial markets. Although companies are using ICT enabled tools to replace human interaction in services, certain aspects like courtesy, friendliness, care, commitment etc. cannot ignore the need of human responsiveness (Cox, 2001).

Limited literature is available on the history of financial innovation but it clearly demonstrates that the creation of new financial products and processes has been an ongoing part of economies for at least the past four centuries, if not longer (Tufano, 1995). According to Suzuki (1986) financial innovation is fighter promoted when the financial authorities recognize the obsolescence of existing statutory framework and deregulate the essential part of it. Financial system of any country comprises of regulatory bodies, financial institutions, financial products and financial markets and whenever the regulatory bodies try to interfere and restrict the actions of financial intermediaries, to sustain their position in the financial market, mutual funds (FMI) are required to come up with innovative and more lucrative

solutions. Literature available on financial innovations has proved that regulatory restraints encourage innovations (Ben-Horim, 1977).

Study by Kane (1978) has described the process of avoiding regulations, as “*loophole mining*”. This suggests that when regulatory constraints are so burdensome that large profits can be made by avoiding them, financial innovations are more likely to occur. These financial innovations may look for searching either entirely new product or making some structural changes in already built financial products to focus on investors’ requirement. Financial innovation in case of mutual funds is an ongoing process but innovation and success are not parallel to each other. An innovation to be feasible is also determined by the size of organization that is introducing it. A large size of enterprise implies that product supported by adequate innovation is more likely to yield greater return (Schumpeter 1950). In contrast to this, study by Scherer (1984) has suggested that smaller firms with only modest level of market power are more likely to be rapid innovators. Allen and Santomero (1997) discussed the changed role of financial intermediaries for risk trading and participation costs. The results suggest that the focus of financial intermediaries has shifted from reducing transaction cost to transfer and redistribute risk, which in turn fosters innovation.

Sen *et. al.* (2004) identified the need of induced innovations that the firm managers are required to introduce to survive in intensified competitive pressure. Their study provided the strategy of adopting online trading that competitive firms need to include in order to improve service quality. However, they provided that traditional firms can preempt competition from new firms by improving the features as convenience, personalized after sale services and trust.

The rate of innovation in financial products is also directed by the growth in saving rates of investors. Study by Varma (2002) provided that the reforms have altered the competitive structure of the various industries in the financial sector. Earlier Indian consumer had low income resulting in poor saving rate. But post liberalization period witnessed upsurge in volume of savings and hence, investment companies are required to continuously introduce new products in an effort to attract new investor and maximize assets under management (AUM) (Kohrana and Servaes, 1999). Study by Odean (1999) suggested that investors, like consumers, are driven by fashion and thus, without understanding the heterogeneity of

consumers, designing a new product will be futile. He further provided that investors' choice for investment in mutual funds is generally guided by the advertisements of the concerned fund. So, whenever investors evaluate each stock or fund they are likely to consider stock or fund that has been extensively advertised.

Mutual fund intermediaries (MFIs) have understood the benefits of introducing innovation in mutual funds and as a result they are coming up with different diversified portfolios. Diversification of mutual fund scheme is attributed to increased competition among mutual fund players as is evident from the fact that resources mobilized by mutual funds have increased manifold especially in the private sector (Vidya Shankar, 1990). Study by Sumalatha (2008) also concluded that concentration has declined in the mutual fund industry and competition has intensified during 2003-2006. The reforms in the equity market have enabled the market to leap from a pure-equity market in 1990 to innovative financial products in the form of risk transferring instruments i.e., derivatives and fund management products like mutual funds and exchange traded funds (Thomas 2005).

Study by Anderson and Breedon (2000) endeavored to relate stock market volatility with innovations. They examined fifty years of asset price volatility in the United Kingdom and reported that volatility of stocks was high in 1970s which was a period of high inflation but afterward followed a downtrend. However, in an effort to identify the cause of price volatility no link could be established with the innovations.

2.4 Mutual fund performance and investment style

Mutual fund intermediaries (MFIs) have responsibility to manage the entrusted funds that ignorant investors have put in their hands. The working style of mutual fund AMCs has direct impact on risk-return calculus that they have promised to deliver. In this context, Mamaysky and Spiegel (2002) developed a theory on Financial Market Intermediaries (FMIs). These FMIs act like individuals endowed with a utility function and then they developed a theoretical supportive model on FMIs trading styles and their effect on asset prices. Nanda and Narayanan (2000) in their research on mutual fund industry have focused on their idea that mutual fund managers are potentially well informed agents and in such models investors

either seek best managers for their funds or an incentive contract to obtain the best possible performance. On the other side, the working philosophy of AMCs will determine their ability to provide satisfaction to investors, which will in turn construct investors' future decisions to invest in mutual funds.

2.4.1 Performance analysis

Accelerated growth pace of Indian mutual fund industry has drawn attention of many global investors but most of the research studies have focused on growth patterns of developed markets only. The study by Fernando *et. al.* (2003) reveals the fact that in most of the developing nation mutual funds grew explosively during 1990s. According to this study equity funds mainly dominated in Anglo America, while bond funds mainly dominated in Europe; however Asian continent remained an exception. Mutual funds in India have reported a significant growth since their inception, yet they have not been able to embed their presence in the world wide mutual funds' market.

Analyzing the performance of mutual fund is a critical issue. Different researchers have used varied parameters to evaluate fund schemes with respect to their ability to generate returns and skills to reduce risk. Jain (1982) evaluated performance of Unit Trust of India (UTI) during 1965 -1980 including the profitability aspects of Unit Scheme 1964, Unit Scheme 1971 and Unit Scheme 1976. He concluded that its real rate of return have been low indicating overall poor performance of UTI schemes. There has been no significant increase in the profitability over the years. Haslem (1988) evaluated the fund performance by comparing the fund return with the return on market portfolio along – with the comparable risk. The fund's systemic risk beta coefficient is used to compare portfolio risk relative to the market risk. He concluded that risk adjusted performance profile of two heterogeneous value cluster are the major factors differentiating their performance from growth cluster.

Study by Grinblatt and Titman (1993) analyzed mutual fund performance dealing with the issue of benchmark estimation with respect to market timings. Their findings reported that not all mutual fund managers achieved superior performance, but those who achieved it, exhibited this ability persistently. Their study has reported that superior performance of funds is

predictable as those funds that performed well in the first half of the sample period continued the trend in the second half of the sample period whereas those funds who exhibited negative performance in the first half of the sample period continued to lag behind in the second half as well.

Sarkar and Majumdar (1995) closely watched the performance of five close ended growth schemes for a period from 1991 to 1993 and found the fund performance to be poor in terms of alpha. They concluded that during this period mutual funds were not able to manage volatility. Gupta and Sehgal (1996) performed the benchmark comparison of 80 mutual fund schemes during the period 1992-1996 in terms of diversification and consistency of performance and concluded that industry performed well during this period. The study highlighted that income – growth schemes were the best performers and consistently outperformed the market index. However, regarding consistency between measures and fund objectives, beta has been inconsistent with expectations. Gruber (1996); Korkeamaki and Smythe (2004) conducted empirical research on mutual fund performance for the specialized services offered by them and found them poor for the level of fee charged. They revealed that additional returns on mutual funds did not compensate investors in term of additional fee charged by them for their professional services.

Study by Kothari and Jerold (2001) revealed the empirical properties of performance measures for mutual funds. In their research they have used simulated fund portfolios and tracked their performance over time taking random and random stratified samples of NYSE and AMEX securities. The results show that it is easy to detect abnormal performance and market timings when none exists. Mishra and Rehman (2001) measured mutual fund performance using lower partial moments. Risk from lower partial moment is measured by taking into account only those states in which return is below a pre-specified target rate. Bertin *et. al.* (2004) explained that mutual fund performance is positively related to price ratio variables and negatively related to market capitalization, expense ratio and number of funds under management.

Anand and Murugaiah (2004) conducted empirical research on mutual funds' performance and their study results revealed the fact that during the study period majority of schemes have

shown underperformance in comparison with risk free return. They reported that the mutual funds were not able to compensate the investors for additional risk they have taken by investing in mutual funds. The study concludes that the influence of market factors was more severe during the negative performance of the funds, while the impact of the selectivity skills of fund manager was more than the other factors on fund performance during the time generating positive returns.

Existing literature enlist different measures for performance evaluation of mutual funds. Bello (2005) matched a sample of 42 socially responsible funds with randomly selected conventional funds of approximately equal net assets, to investigate difference in characteristics of assets held, degree of portfolio diversification and effect of diversification on fund performance. The study concludes that socially responsible mutual funds do not differ significantly from conventional funds in any of these attributes. Moreover, his findings revealed that both group of funds underperform during 1994 to 2001. Baer *et. al.* (2006) enlisted some factors such as fund industry concentration, family cross-subsidization, market timings and management structure effect fund performance.

Panwar and Madhumati (2006) studied sample of public sector sponsored and private sector sponsored funds to investigate the differences in characteristic of asset held, portfolio diversification and variable effect of diversification on fund performance during 2002-2005. The research results revealed that private sector funds do not differ significantly in terms of mean return but differ significantly in terms of average standard deviation and average covariance whereas Gupta and Aggarwal (2007) carried out research on quarterly returns performance of equity diversified funds for a period from 2002-2006 using Capital Asset Pricing Model (CAPM) and Fama-French model and they find that the results from both these models are contrasting. Azmi (2008) studied Egyptian mutual funds during 1999-2003 and provided the selection criteria that could put forth the best result in selecting mutual funds are: fund managed by a woman, an open end fund, growth objective and expense ratio. According to the study gender of a fund manager significantly affects its performance.

2.4.2 Investment style and strategies

Mutual fund investment is generally preferred by investors because of its ability to diversify funds in various sectors and thus reducing the possibility of unsystematic risk. Based on different investment objectives fund managers have to use their specialized skills and adopt varied investment styles. Study by Sharpe (1992) classified the investment style of fund managers into two categories. Category based style is based on portfolio's and benchmark's current/historic holdings, whereas return based style suggest that a portfolio's return is linearly related to the return on the number of factors. Brown and Goetzmann (1997) proposed a new manager style that outperforms the classifications based on risk measures and analogue portfolios.

Chan *et. al.* (2002) employed two procedures for style identification. The first one included characteristics of fund portfolio holding and the other is based on estimated loadings from factor model. According to the researcher size and book to market value growth are descriptors of fund style and the results highlighted that most fund cluster around a broad benchmark and very rarely do fund managers decide to take extreme positions and those who do are more likely to favor growth stock and provide high past returns over low past return. They also provided that consistency exists in style of fund managers although funds with poor past performance are likely to change styles.

Mutual funds may select momentum trading or contagion trading depending upon the market trends. Momentum trading refers to positive feedback trading, i.e., in purchasing the stocks that have performed well in the past and selling the stock that are facing downtrend. In short, momentum trading believes in buying the winners and selling the losers. Contagion trading is a cross country phenomenon which follows sale of securities in one country when asset prices are falling in another country. Study by Jegadeesh and Titman (1993); Asness *et. al.* (1997); Grundy and Martin (2001); and Griffin, Ji and Martin (2003) found that strategy of buying past winners and selling losers generate significant positive return. They concluded that stocks that had performed well in the immediate past tended to perform well in the immediate future. They also found that profitability of relative strength strategy is not due to systematic risk and is associated with delayed price reaction to firm specific information.

Kaminsky *et. al.* (2004) studied portfolios of US mutual funds and found that international funds do engage in momentum trading in both crisis and non – crisis periods. They further added that contemporaneous momentum trading is strong during crises period whereas lagged momentum trading is strong during non-momentum period. They also added that managers and investors also practice contagion trading, i.e., they sell (buy) assets from one country when asset prices fall (rise) in another country.

Performance of mutual fund is also affected by stock selection ability and fund managers' perception towards composition of risky securities in the portfolio. Study by Rao (2006) provides an analysis of 419 open ended mutual fund schemes for their financial performance and investment style during 2005-06. Results of the study reflect that for 17 growth plans return is higher than dividend plan under same AMC. Gottesman and Morey (2006) conducted research to find relationship between manager's education and mutual fund performance and concluded that managers with higher intelligent level acquire advance knowledge on market movements and can use these skills to get superior performance. Recent study by Joshi, *et. al.* (2009) focused on importance of intellectual capital (IC) of Australian Banks during the time period 2005-2007. Their study realizes the importance of IC policies and how they help in value creation. The results of this study assist the managers of Australian banks in the design and practice of investment strategies

Study by Brown *et. al.* (2008) used both returns and holding based data to examine whether investors would get benefit by selecting mutual fund where managers tend to maintain consistent investment style, than those funds where investment style vary significantly. The results show that deciding to maintain a consistent investment style is an important aspect of portfolio management process. According to their findings on an average more style consistent funds significantly outperform the less style consistent funds on a risk-adjusted basis. A recent study by Eichholtz *et. al.* (2009) analyzed the performance of 402 real estate mutual funds world -wide during 1997- 2007 and found that up to 92% of performance of real estate mutual funds can be attributed to the investment style of fund managers, i.e., funds are invested according to their mandate and scope.

2.4.3 Performance measures and persistence

Generally it is assumed that highly risky investment may yield higher return than ordinary investment avenues. Existing literature provides an insight on different measures used to measure market volatility and variation in returns. Treynor (1965) and Sharpe (1966) provided a specialized index to measure superfluous returns by equity funds. Treynor index provides ratio of return generated by the fund over and above risk free rate of return and Beta associated with it. Sharpe index provides ratio of return generated by the fund over and above risk free rate of return and total risk associated. In this regard they differ in their evaluation criteria as Treynor used only systematic risk to measure portfolio performance but Sharpe used total risk to evaluate fund performance.

Jensen (1967) derived a risk-adjusted measure of portfolio performance that estimates how much a manager's forecast ability contributes to fund's returns. This measure evaluates the returns that the fund has generated over the returns actually expected out of fund at given level of systematic risk. Fama (1972) extended the Jensen measure and provided a different approach to measure performance of mutual funds and accordingly he developed a measure in the form of comparing actual realized return and expected portfolio return along with the total risk associated. Study by Haslem (1988) provided that fund's systematic risk beta coefficient can be used to compare portfolio risk relative to market risk.

Investment in equity funds is the obvious choice of high-risk profile investors. Often the choice of equity shares is guided by the recent past performance of shares. Existing literature also provides sufficient evidence that investors in mutual funds do react to past performance [Ippolito (1992); Goetzmann and Peles (1997); Sirri and Tufano (1998) and Christoffersen (2001)]. Over the past few decades huge literature has propounded contradictory results on mutual fund performance persistence among mutual fund managers. Research by Hendricks *et. al.* (1993) ; Carhart (1997) and Bollen and Bussen (2005) investigated the predictability of US mutual funds and concluded that past performance does not persist except in very short run whereas Gruber (1996) explained that past performance can be a predictor of future performance. Positive performance persistence among mutual fund managers was supported by Grinblatt and Titman (1992), Goetzmann (1994) and Dulta (2002). On the other hand Brown *et al.* (1982), Lehman and Modest (1987), Manlkiel (1995), Carhart (1997) attribute negative performance and persistence to benchmark error. There is also an evidence of the

‘smart money’ phenomenon which shows that some investors are able to identify funds with a better future performance by using past performance information (Gruber (1996) and Zheng (1999)).

Abinzano *et. al.* (2010) used stochastic dominance technique to study whether managerial skills vary across fund managers in European equity funds and concluded that style adjusted returns are consistent with varying degree of managerial skills which can not be explained by impact of choice of style adjusted procedure, country fee policy, fund age and fund size. The results highlight persistence of approximately one year which is attributable to differences in risk exposure between loser and winner portfolio.

Despite the reason that Indian mutual fund industry possesses high potential, limited research has been conducted to study the working of mutual funds and which relative measure should be used to measure their performance. Huge literature available on predicting stock market returns has proved that generally investors consider stock’s past returns to decide future returns (Bondt, 1993) and past returns are positively correlated with investor’s expectations from future return (Fisher *et. al.* 2000), but return alone cannot be used as a measure of evaluating the performance of mutual funds as common highlighted stocks are taken into portfolio for cosmetic purposes (Neal, 2001). Return ambiguity and changes in risk perception of individual investor affect action taken in risky financial market. Based on different investment objectives, fund managers have to use their specialized skills and adopt varied investment styles.

Murthi *et. al.* (1997) addressed mutual fund performance with respect to problem of selecting right measure of performance and formulated a new index based on data envelopment analysis (DEA). Their study compared results with traditional indices of performance and concluded that all mutual funds are mean variance efficient. Bhattacharjee and Roy (2006) refined and developed Performance Change Measure (PCM) and applied it on 50 Indian mutual funds over a period of 26 months. This study endeavors to find out whether without using any benchmark selected mutual funds are able to provide above normal returns. The study highlights that these are positive signals of information asymmetry in the market with mutual manager having superior information about the stock as a whole. PCM also indicated

the fact that on average mutual funds provide excessive returns, but only when period of investment is fairly long. Carhart (2007) argues that generally academicians focus on abnormal return while measuring the performance of mutual funds whereas before going in for analysis of abnormal return, a model should be used that quantifies the risk return relationship from investing in various sectors of stock market.

2.4.4 Portfolio management

Portfolio management deals with the problem of how to derive technical decision rules for buying, holding and selling both risky and riskless assets over time in consistency with investor's preferences. Portfolio management is a dynamic decision process where existing products are revived and accelerated and further new products are evaluated, prioritized and selected (Cooper et. al., 1999). Markowitz (1952) suggested portfolio selection model where return on portfolio is measured by expected value of random portfolio return and associated risk is quantified by the variance or standard deviation. He emphasized that portfolio selection includes a two stage model. The first stage starts with observation and experience and ends with belief about future performance whereas the second stage starts with relevant beliefs about future performance and ends with choice of portfolio.

Keith Ambachtsheer (1972) developed a chart (Table 2.2) that guides investors on developing investment strategy. The upper left hand corner of this table suggest active management strategy in which managers try to distinguish and identify the securities that have scope to outperform in the market whereas lower right hand corner suggest passive management strategy in which investors hold the portfolio that is allocated exactly the way the whole market is allocated. Lower left and upper right hand corners suggest mix of two strategies based on the specific skills. Active portfolio managers believe that buy and sell points can be identified and thus, they continuously assess and monitor their portfolios whereas passive portfolio managers are risk averse and select securities very carefully to create a well-diversified portfolio and further make very minor adjustments in the created portfolio throughout the long run holding.

Table 2.2 Portfolio management strategies			
		Ability to forecast overall market	
		Good	Poor
Ability to select under-valued securities	Good	1. Concentrate holdings in selected undervalued securities rather than diversify 2. Shift beta above and below desired long-term average, based on market forecasts	1. Concentrate holdings in selected undervalued securities rather than diversify 2. Keep beta stable at desired long-term average
	Poor	1. Hold a broadly diversified list of securities 2. Shift beta above and below desired long-term average, based on market forecasts.	1. Hold a broadly diversified list of securities 2. Keep beta stable at desired long-term average

Based on the individual choice fund managers may adopt active portfolio management strategy or passive portfolio management strategy. Active portfolio style provides that manager must use available information and forecasting techniques to evaluate portfolio whereas passive portfolio management strategy relies mainly on diversification only. Study by Ibbotson and Brinson (1987); Pynnonen (1995) and Engstrom (2004) admitted that active portfolio managers are able to gain more above average return than ordinary investors because of their ability to forecast market more accurately. Thus, managers may opt for active management, in which managers try to distinguish and identify the securities that have scope to outperform in the market or they may move towards adopting passive management style in which they hold the portfolio that is allocated exactly the way whole market is allocated.

Maginn and Tuttle (1983) provided a flow chart (see figure 2.1) of sequential steps for developing a portfolio management strategy. The main focus of this flowchart has been to attain optimal portfolio to satisfy investors' objective. According to them investor must develop initial strategy rather than deciding which stock to buy or sell as this strategy will determine purchase and sell decision.

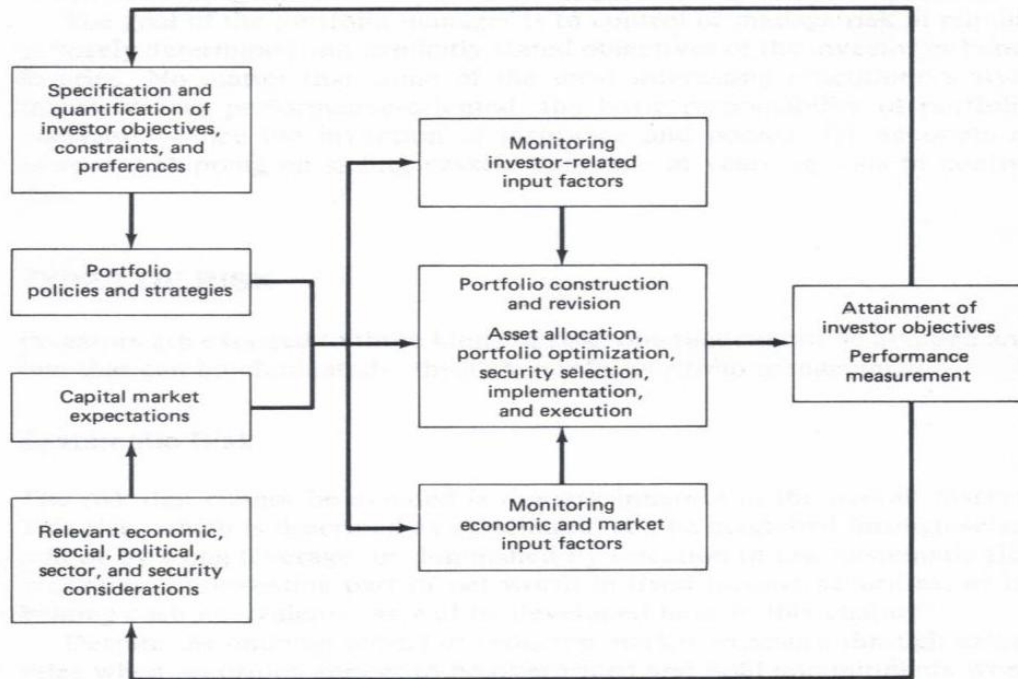


Figure 2.1 Procedure for portfolio management

Existing literature also provide application of optimization techniques for portfolio management. Study by Speranza (1993); Cover and Ordentlich (1996); Yaniv (1998) and Hung *et. al.* (1999) suggested return based strategy relying on return of portfolio and aiming at maximizing the return of portfolio by applying linear programming technique. Young (1998) also provided linear programming model maximizing the minimum return or minimizing the maximum loss, and applied it to the stock indices of eight countries from January 1991 to December 1995. He further added that minimax model will provide more appropriate results than mean variance methodology when data is skewed and normally distributed.

Black (1972) and Elton and Gruber (1995) propose that optimal portfolio can be obtained by maximizing the slope of line that joins the point of risk free return and the efficient frontier. Selection of optimal portfolio requires development of intelligent systems to analyze large financial data and extract information relevant to the problem (Koverlerchuk and Vityaev, 2000). Major developments of ICT have been applied for optimal portfolio selection where Bellman and Zadeh (1970) proposed fuzzy decision theory. Ostermark (1996) also proposed

a dynamic portfolio model based on fuzzy principle, i.e, fuzzy control model (FCM) where he used fuzzy numbers to recognize uncertainty of future prices and risk level. Lai *et. al.* (2006) suggested applications of genetic algorithm for selection of optimal portfolio involving two stages. In the first stage the best performing assets are selected on their return basis and in the second stage best distribution of wealth is used to select assets.

Lin and Liu (2008) provided application of genetic algorithms with minimum transaction lots. Based on Markowitz model their study presented three possible models for portfolio selection problems with minimum transaction lots and proposed genetic algorithm to obtain the solutions. Additional research by Casas (2001) and Chapados and Bengio (2001) found applications of neural network in portfolio optimization. Their study introduced an asset allocation framework based on active control of the value at risk of portfolio. Within this framework they proposed two paradigms for making the allocation using neural network, where the first one introduced networks to forecast the asset behavior and second paradigm used networks to make portfolio allocation decisions.

Table 2.3 A Summary of research studies on Mutual funds			
Broad Category	Study(Year)	Relevant issues	Conclusions
Performance Analysis			
Performance of UTI	P.K.Jain (1982)	Return on US-71 and US-76	UTI performed poorly in terms of ROI
Compared risk	J.A.Haslem (1988)	Risk level comparison	Conservative risk profile differentiates the performance of growth cluster
Performance measurement	M.Grinblatt and S.Titman (1993)	Smart money test	
	J. Sarkar and S.W. Majumdar (1995)	Alpha values of funds	Funds possess high risk
	O. P. Gupta and Sanjay Sehgal (1996)	Fund diversification and consistency	Funds perform well
	S. P. Kothari and Jerold B. Warner (2001)	Simulated fund portfolios	Standard mutual fund performance measures are unreliable and can result in false inferences.
	B. Mishra And M. Rehman(2002)	Lower partial moment	LPM provides less tracking errors if returns are not normally distributed
	W. J. Bertin et.al (2004)	Market capitalization	Fund performance is negatively related to size of fund
	S.Anand and V.Murugiah (2004)	Risk free return	Mutual funds do not compensate investors for additional risk
Performance Comparison	Z. Bello (2005)	Characteristics of portfolio and diversification	Performance of Socially responsible funds don't differ significantly from conventional funds
Performance determinants	M.Baer, A. Kempf and S. Ruenzi (2006)	Fund management structure	Negative relationship exists between team management and fund performance
Performance comparison	SharadPanwar and R. Madhumati (2006)	Characteristic of asset held	Mean return of private and public sector funds do not vary significantly
Performance of quarterly returns	M. Gupta and N.Aggarwal(2007)	Capital Asset Pricing Model (CAPM)	Both CAPM and Fama French model yield contrasting results
Fund performance	Rania Ahmed Azmi (2008)	Gender of fund managers, expense ratio and risk	Significant relation exist between manager's gender and fund performance,
Investment style and Strategies			
Investment styles	W.F.Sharpe (1992)	Category based and return based styles	Investors differ in choice of their investment style
Investment strategies	Jegadeesh, N. and S. Titman (1993)	Momentum strategies	Buying past winners and selling losers generate significant positive returns
	C.S. Asness et.al (1997)	Persistence in short run	Momentum strategy provides positive returns.
Investment style	Louis K. C. Chan et.al. (2002)	Size and book to market as descriptor of fund style	Most mutual fund adopt style that bunches around an overall market index
Investment strategies	Graciela Kaminsky et.al (2004)	Trading strategies during crises	Mutual funds systematically sell losers and buy past winners.

Performance and style	D.N.Rao (2006)	Difference in performance due to investment style	RoI of growth plans is higher than that of dividend plans
Knowledge and strategies	AronGottesman and M. Morey (2006)	Fund managers' knowledge	Fund managers with advance knowledge use different styles to outperform
Investment style	K.Brown, V.Harlow and H.Zhang (2008)	Style consistency and risk measure	Investment style of mutual funds influences the returns mutual fund produce
Style based Performance	Piet Eichholtz, Nils Kok and Milena Margaritova (2009)	Performance of real estate mutual funds	Performance of real estate mutual funds can be attributed to investment style but not explained by investment skills
Performance Measures			
Risk measure	J.L.Treynor (1965)	Risk adjusted performance	Return generated by fund over and above risk free return and systematic risk
	William F.Sharpe (1966)	Reward per unit of total risk	Return generated by fund over and above risk free return and total risk
	M.C.Jensen (1968)	Differential return	Compares the return fund has generated and return actually expected out of fund at a particular systematic risk
	E.Fama (1972)	Net selectivity	Compares return of a fund with required rate and total risk associated
	J.A.Haslem (1988)	Risk adjusted performance	Compared portfolio risk relative to market risk
Past performance	R. Ippolito (1992)	Fund selection criterion	Investors place their saving in funds with recentsuperior performance
	Werner, De Bondt (1993)	Stock market overreaction	Investors prefer past winning stock
	Martin J. Gruber (1996)	Correlation of new inflows and outperforming funds	Best performing funds attract more funds
Past informations	W.Goetzmann and NadavPeles (1997)	Cognitive dissonance	Investors do react to past performance
	E.R.Sirri and Peter Tufano (1998)	Past performance and net inflows	Major inflows are attracted by best performing funds
	L.Zheng (1999)	Smart money	Investors identify funds with better performance
	V. Nanda et. al (2000)	Risk determinants	Investors evaluate funds through their past performance
	Susan Christoffersen(2001)	Fee waivers	Fund managers willingly wave off fee in order to attract additional funds by luring with past performance
Past returns	Edward S. O'Neal (2001)	Window dressing	Equity funds exhibit atypical behavior during fiscal year ends
Performance measure	K.Bhattacharjee and Bijan Roy (2006)	Performance change measure	In short run Mutual funds are unable to yield above normal return
Portfolio management			
Portfolio	H.M. Markowitz (1952)	Risk and expected	Investors are risk averse and will

selection		return	take risk if it promise to compensate
	R.E.Bellman and L.A.Zadeh (1970)	Dynamic programming	Fuzzy decision theory
Portfolio strategies	Keith Ambachtsheer (1972)	Active and Passive portfolio	Investors play actively when they select undervalued securities or passive strategy when they select a stable portfolio
	John L. Maginn and L.Donald (1983)	Risk and return trade off	Selecting an appropriate strategy is most important decision
	R.G. Ibbotson and Gary.P.Brinson(1987)	Active management	Active investors gain above average return than ordinary investor
Return optimization	M.G.Speranza (1993)	Return based strategy	Return on portfolio can be optimized by linear programming approach
	Edwin J. Elton and M.J. Gruber (1995)	Efficient frontier	Optimality can be found by maximizing the slope of efficient frontier
	Eric Ordentlich and T. S. Cover (1996)	On line portfolio strategy	LPP provides optimal portfolio
Portfolio optimization	R.Ostermark (1996)	Dynamic portfolio management	Optimal portfolio can be obtained through fuzzy logic
	M.R.Young (1998)	Worst realization	LPP model maximize minimum return and minimize maximum return
	Y.F.Hung et al. (1999)	Optimization and feasible region	Best solution of portfolio optimization can be obtained through LP.
	B. Kovalerchun and E. Vityaev (2000)	Data mining and intelligent system	Data mining can be adopted for finance research
	C.A. Casas (2001) N. Chapados and Y. Bengio (2001)	Neural networks	Optimal portfolio can be selected using neural network
Optimal portfolio	Kin Keung Lai et. al. (2006)	Genetic algorithm	Two stage genetic algorithm for portfolio selection
	Chang Chun Lin and Yi-Ting Liu (2008)	Minimum transaction lot	Portfolio obtained using proposed algorithm are close to efficient frontier

2.5 Risk management

Risk is an inseparable outcome associated with the investment decisions. Risk is the trade-off that every investor has to make between the higher rewards that potentially come with the opportunity and the higher risk that has to be borne as a consequence of the danger (Elmiger and Kim, 2003). Mutual fund managers have to assume a certain level of risk while constructing diversified portfolio but the level of risk they can assume differ with their access to superior information, proficiency in estimating risk and even goodwill they have maintained over the years.

Study by Chevalier and Ellison (1997) analyzes the convex flow-performance relation and finds evidence that mutual funds that are well ahead of their peers also have an incentive to increase risk to make lists of top performers. They concluded that mutual funds who have already maintained their reputation have risk absorption capacity and can assume higher level of risk than their competitors who have yet to prove themselves. Even research findings by Goetzmann *et. al.* (2007) suggest that fund managers have incentive to change risk level to manipulate their performance. Thus, fund managers may decide to assume higher risk level in anticipation of superior performance.

Doogar *et. al.* (2004) investigated the financial riskiness of large US based firms during 1975-1999. They found that during the study period when their market share was growing steadily, the Big 6 shares of the financially riskiest clients dropped or remained relatively unchanged. Thus, it appears that over the time Big 6 firms had become increasingly averse to providing services to the most financially risky clients. Overall, they concluded that the increases in the riskiness of Big 6 portfolios in the post-1994 era do not appear to be driven by a systematic pursuit of particularly risky clients.

2.5.1 Risk estimation

For estimating presence of risk in any investment different models have been provided which attempt to cover varied parameters to measure volatility. Existing literature on risk management has deep roots in economics, statistics and mathematics which can be traced back on the foundation of probability Ramsey (1926), game theory (Von Neumann and Morgenstern 1944), statistical inference (Savage, 1954). Most commonly used risk measures are proposed by Treynor (1965); Sharpe (1966); Jensen (1968); Fama (1972).

Treynor (1965) expressed risk taking as additional return of portfolio over and above risk free return in relation to portfolio's systematic risk. Thus, accordingly reward to volatility ratio is a measurement of returns earned in excess of that which could have been earned on investment that has no diversifiable risk, per each unit of market risk assumed.

$$\text{Treynor's Index } (T_i) = (R_i - R_f)/B_i.$$

Here, R_i signify return on portfolio and R_f means risk free return. B_i signifies systematic risk of the portfolio.

Sharpe (1966) provided measure of excess return (risk premium) per unit of risk in an investment asset. Sharpe ratio helps to identify how well return of an asset compensates investor for the risk taken.

$$\text{Sharpe Index } (S_i) = (R_i - R_f) / \sigma$$

In this method, R_i refers to return of the portfolio, R_f is risk free return and σ is standard deviation measure.

Jensen (1968) explained measure to determine the abnormal return of a portfolio over the theoretical expected return. Accordingly, risk can be estimated as:

$$R_i = R_f + B_i (R_m - R_f)$$

Fama (1972) proposed additional model that compares the performance of a portfolio measured in terms of returns of a fund with the required return commensurate with the total risk associated with it. Here, required return can be calculated as:

$$R_i = R_f + S_i / S_m * (R_m - R_f)$$

Elton and Gruber (1981) gave equations to determine how risk affects the return on an investment.

$$R_i = a_i + \beta_i R_m$$

In this equation a_i is component of security's return which is independent of market performance and R_m indicates market related return.

Risk management practices mainly focus on statistical measures as Morgan (1995) explained that Value at Risk (VaR) is an estimate with predetermined confidence level of how much one can lose from holding a position over a set horizon. The method explained the use of historical returns to forecast future volatilities and correlation that are used to estimate market

risk. Value at Risk makes use of historical figures to derive the maximum possible loss on investment. Study by Linsmeier and Pearson (1996), Duffie and Pan (1997) and Engle and Mangganelli (1999) focused mainly on estimation of VaR. Study by Johansson *et. al.* (1999) also discussed the computational issues of VaR and admitted, it a true measure of risk estimation as it aggregates the several risks and quantifies them into a single number. Where Chow and Kritzman (2001) discussed the use of VaR in formulating risk budget, study by Basak and Shapiro (2001), Jorion (2001) and Gaivoronski and Pflug (2004) also suggested application of VaR for optimal portfolio decision.

Study by Fan *et. al.* (2004) concluded that VaR measure can be applied to risk management in China. Bodnar *et. al.* (1998) explained that wide usage of VaR based risk management by financial as well as non – financial firms stems from the fact that VaR is an easily interpretable summary measure of risk. Smith *et. al.* (1999) further propounded that in practice VaR estimates not only serve as summary statistics for decision makers but are also used as tool to manage and control risk where economic agents struggle to maintain the VaR of their market exposure at a pre specified level. Hence, VaR is very important and it has also been used in the present research work.

However, some deficiencies of VaR have been identified by Artzner *et. al.* (1999), Messina (2003) and Bredow (2004) where they highlighted some properties which a reasonable measure of risk should provide and concluded that VaR has got limited ability to represent risk preference of investors. A contradiction to VaR as a risk measure was also proposed by Lo (1999). He provided that existing risk management practices are based on probabilities of extreme losses e.g. value at risk which do not exhibit complete picture. He introduced this fact that any complete story of risk management must cover three P's to cover sensible risk profile of individual investors and accordingly proposed a systematic approach to rational decision making in uncertain world by focusing on Probability, Price and Preferences. He proposed that the three Ps interact to determine sensible risk for individuals and guide them on how much risk to bear and how much to hedge.

Investors prefer to invest in mutual funds because they have access to updated market information and applying their professional skills helps in reducing risk. Among researchers it

has been an issue of debate whether mutual funds are able to manage market risk which is not possible for an individual investor. Since Jensen (1968) there has been a constant debate on whether mutual funds exhibit risk management ability. Studies by Carhart (1997), Wermers (2000), Jiang (2003), Breon (2008) found no evidence of market timings and concluded that mutual funds do not get significant benefits by taking advantage of time varying investment opportunities. In this regard Oldfield and Santomero (1997) provided that any risk management system requires substantial firm level commitment, i.e., risk manager should have the ability to understand global commitment and exposures inherent in them. The researcher provided several guiding principles for successful implementation of firm level risk management practices that included defining risk management practices for each business activity to be pursued. Further, specific risks of each business activity must be defined, including means to measure the risk and procedures, so that risk management begins at the point nearest to assumption of risk.

Estimating market volatility can include simulation based methods and parametric methods. Akgiray (1989), Ballie and Bollerslev (1992), West and Cho (1995), Taylor (1999) attempted to apply time series analysis for forecasting volatility and predicted accuracy by mean absolute forecast. Standard deviation and variance analysis as a basic measure of volatility has still got a strong acceptance in the financial markets. Mutual funds in India still use standard deviation as a measure of risk but study by Jorion (2001) highlighted the importance of VaR as a measure of downside risk for Indian mutual funds. He explained that many of the reasons that made VaR successful for banking industry are also applicable to investment managers.

2.5.2 Diversification

Mutual funds are considered to be a preferred investment because of their ability to diversify fund and assure minimum possible risk using professional skills of fund managers. Study by Evans and Archer (1968) examined how the portfolio risk for randomly selected funds can be reduced as a function of number of securities in the portfolio. They concluded that a relatively stable and predictable relationship exists between the number of securities included and the level of portfolio dispersion. Different researchers have endeavored to estimate the impact of

diversification on reducing risk along with deciding the minimal optimum number of securities that should be included to make it a perfectly diversified portfolio.

Fisher and Lorie (1970) evaluated the return distributions for the year between 1926-1965 and evaluated the effect of extending diversification. They concluded that holding an eight stock portfolio can reduce the diversifiable risk by approximately 80% than holding a single stock. Elton and Gruber (1977) also admitted that there exist a significant relationship between portfolio size and risk. They provided the formulas for determining the effect of diversification on risk. Further, the study depicts that diversification of portfolio with 10-20 stock does not give desired results, but diversification with 15-100 stocks diversified portfolio variance reduces significantly. In contrast, Statman (1987) also endeavored to identify the optimal number of securities to be included in the portfolio and his findings concluded that a portfolio containing 30-40 stocks gives efficient results of diversification.

Recent empirical research has been conducted by Shawky and Smith (2005). They analyzed the US equity fund from 1992-2000 and explained that portfolio managers' decision to optimal diversification is the result of trade -off between the number of securities and monitoring costs. They opine that optimal portfolio size can be obtained by 481 stocks in the portfolio and any deviation from this optimal level will yield high risk. Related studies on international diversification have also revealed that investors get benefit by investing some part of their portfolio in foreign equities [Grubel (1968); Levy and Sarnat (1970); Lessard (1973); Cavaglia *et. al.* 2000). Although various research findings provided different number of securities to be included in the portfolio, yet the problem was to analyze if extending diversification with added securities would further reduce risk level. Study by De Wit (1998), Shergill and Raman (2003) also suggests that diversification can provide benefit of risk reduction even to portfolios already containing a large number of securities.

International portfolio diversification for monthly index data from 16 countries was studied for a period from 1970 to 1992 by Allen and Macdonald (1995) from Australian investors' perspective and concluded that there exist potential long run portfolio diversification gains. Solnik (2000) compared the performance of domestic and international diversified portfolio and concluded that international portfolio with the same risk level as of domestic portfolio

would earn nearly three percent more return than domestic portfolios. He also explained that risk reduction can be seen in domestic portfolios containing 40-50 stocks but adding international stocks to purely domestic portfolio reduces risk much more rapidly than adding domestic stocks.

Even the study by Li *et. al.* (2003) point out significant benefits for US equity investors if they invest in emerging markets. They concluded that with the integration of world equity market diversification benefits may reduce but will not completely eliminate, for investment in emerging markets subject to short sales constraint. Similarly, Schmukler (2004) highlighted the scope of getting additional benefits by diversifying portfolio in emerging markets. A recent study by Didier *et. al.* (2008) provided that mutual funds invest in a finite number of firms but this restricted investment practice has a cost and there are unexploited gains from international diversification. Thus, mutual funds can achieve better returns by broadening their investment scope.

According to Jacquillat and Solnik (1978) share price behavior of MNCs is indistinguishable from that of share price of purely domestic companies. Similarly, study by Kalra *et. al.* (2004) argued that benefits of international diversification are exaggerated. Although huge literature in the area of reducing portfolio risk suggests diversification, but the question of concern is optimal number of securities that should be added to the portfolio in order to diversify risk. Excess diversification may not only result in increasing the fund management cost (including transaction cost for switching), but will also misalign the investor's objectives and fund manager's working philosophy. Many researchers endeavored to identify the optimal number of securities that should be included in the securities so that the overall risk could be reduced [Statman, (1987), Shawky, (2005)].

Mutual funds offer a wide variety of choice even to small investors along with professional management. Edelen (1999) concluded that open end mutual funds investors receive the benefit of fund manager's specialized skills through diversification that eventually reduces risk. Further, study by Moultrup (1998) added that number of funds to be included in a hypothetical portfolio depends on risk profile of a typical subscriber and on the covariance between different sectors and geographical areas. The number of funds must be defined

considering the pay-off between risk diversification and trading costs, as more number of securities determinate high performance stability but it also encourages increased transaction costs that ultimately result in negligible net gains (Statman, 2004).

2.6 Forecasting stock market movements

Huge literature is available on forecasting of market behavior. Contradicting studies are available presenting non predictable patterns of stock market as portrayed by the evidence from efficient market hypothesis (EMH) which denies the scope of predictability in stock market. However, a few studies have documented the analysis where trend patterns are clearly visible which suggests the scope of short run predictability of market movements.

2.6.1 Efficient Market Hypothesis (EMH)

If the stock market behaved like a mechanically imperfect roulette wheel, people would notice the imperfections and, by acting on them, remove those (Roberts, 1959). He provided that stock market movements do not give any hints, working on which investor will be able to yield abnormal returns. For analyzing the patterns in stock market movement he took series of random number and plotted them (figure 2.2). Examination of this plot revealed the formation of head and shoulders which technical analysts believe as indicator of trend reversal but he further added that technical patterns are easy to see only when it is too late to act on them.

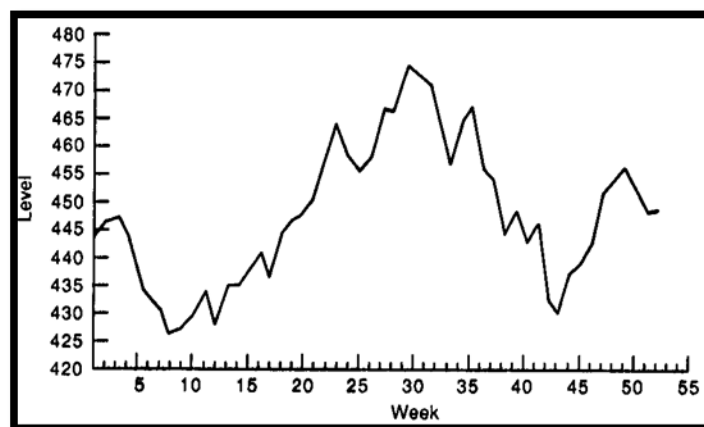


Figure 2.2 Patterns in stock market movements

Fama (1965) propounded the concept of “efficient market” by studying the serial correlations in daily price changes of 30 stocks from Dow Jones Industrial Average Index (DJIAI) and concluded that stock market seemed to work in a way that allow all information reflected in past prices to be incorporated in current prices. He explained efficient market as “a market where there are large numbers of rational profit maximizers actively competing with each other trying to predict future market values of individual securities, and where important current information is almost freely available to all participants”. The phenomenon of efficient market as proposed by Fama (1965) is quite similar to the idea of perfect competitive market where each seller earns a normal profit (Arrow, 1959). The idea similarly applies to stock market where any new available information is immediately reflected in prices and there is no scope to get abnormal returns.

Where the above studies supported the notion that stock market has no memory, Cootner (1964) had also claimed that past behavior of stock prices is not useful in deriving how it will behave in future. Similarly, study by Ball and Brown (1969) documented post earnings announcement drift which explained that information contained in earnings announcement takes several days to be fully reflected in market prices. Thus, even the individuals who have access to superior or insider information cannot yield any additional returns.

Fama (1970) made a distinction between three forms of EMH viz. weak form, semi strong form and strong form. The weak form of EMH suggests that past prices or returns reflect future prices or returns, the semi strong form provide that security prices reflect all publically available information and strong form provides that security prices reflect all available information including private information. Study by Gosnell *et. al.* (1996) provided that when new information is released it is fully incorporated into the stock prices and thus, trading rules are incapable of producing superior returns. Statman (1999) highlighted the dual meanings of market efficiency and explained that for some investors, market efficiency means that there is no systematic way to beat the market and for others it means that security prices are rational which reflect only fundamental characteristics such as risk but not psychological characteristics such as sentiments.

Malkiel (2003) also expressed that financial markets are efficient when markets do not allow investors to earn above average return without accepting above average risks. The findings suggest that whatever predictable patterns may exist and whatever inefficiency may occur, they do not give way to profitable investment strategies. He further added that there appear to be no recognizable anomalies or irrationalities to enable professionals to take advantage of exploitable arbitrage opportunities.

2.6.2 Contradictions

Contradiction to EMH has been presented by Granger (1986) who argued that if two prices are co-integrated, one price can be used to forecast the prices of another. Similarly, studies presenting violation of efficient market principle have been discussed by Hakkio and Rush (1989); Sephton and Larson (1991); Baffes (1994) and Engle (1996). Further, study by Fluck, Malkiel and Quandt (1997) also contradicted the unpredictable behavior of stock prices and suggested strategy of buying stock over a period of 13 years during 1980s and early 1990s that have poor return over past three to five years. They found that stocks with very low returns over the past three to five years had higher returns in the next period, and that stocks with very high returns over the past three to five years had lower returns in the next period.

Study by Lo and Mackinlay (1999) rejected the hypothesis of random walk behavior of stock prices and concluded that short run serial correlation are not zero and too many successive moves in the same direction provide short run predictability of market behavior. Lo *et. al.* (2000) also supported this concept by applying non parametric statistical techniques that explored and recognized patterns which can be used to predict market behavior. They applied this method to large number of US stocks from 1962-1996 to evaluate the effectiveness of technical analysis and found that over the 31 year sample period several technical indicators provide incremental information that has some predictable value.

Stock market movements are directly influenced by investors' sentiments and their behavior to react to market timings. Existing literature on investor's behavior by Fischhoff and Slovic (1980); Shefrin and Statman (1985); Huberman and Regev (2001) highlight that investors are irrational most of the time and this provides a predictable behavior of investors. Shleifer

and Summers (1990) suggested that movements in stock prices cannot be attributed merely to the rational expectations of investors but also involve an irrational component. Study by Porta *et. al.* (1997) admitted that the predictability of stock returns reflects the psychological factors, social movements, noise trading, and fashions or "fads" of irrational investors in a speculative market.

2.6.3 Pattern analysis

An extensive literature documents patterns in market returns. Initially, where Wachtel (1942) examined the seasonality of stock market from 1927 – 1942 and made reference to the January effect, Kelly (1930) described Monday effect by recommending Monday as worst day to buy stocks. Merrill (1966) reported that from period 1952 – 1965 Dow Jones Industrial Average (DJIA) rose only 43% on Monday trading days whereas rose over 50% on other trading days. Results of his sample study showed that DJIA increased 64.6% on the Friday trading days. Hirsch (1968) also identified negative average returns on Monday. A similar kind of study by Cross (1973) on price changes for the S&P 500 for the period 1953 – 1970 and reported that proportion of increase on Friday is considerably higher than the proportion of increase on Monday. Study by Gibbons and Hess (1981) reported “the Monday effect” (figure 2.3) where they analyzed the S&P 500 for a period from 1962-1978 and concluded that stock prices tend to go down on Monday but they further added that Monday effect seemed to decrease over time.

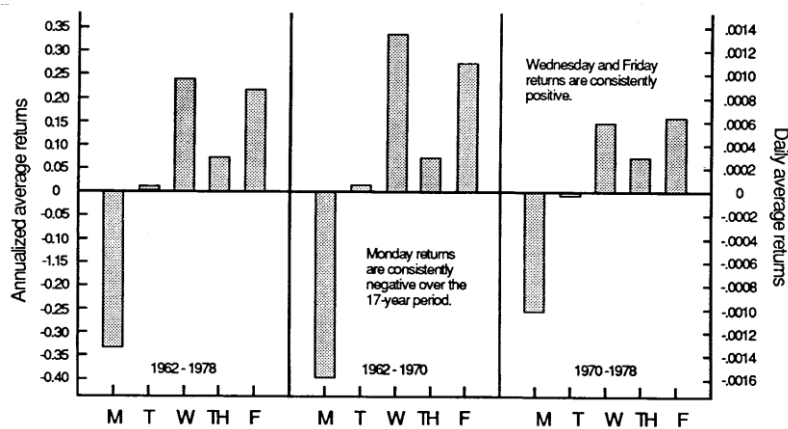


Figure 2.3: Monday Effect

Bondt and Thaler (1985) studied monthly returns of New York Stock Exchange (NYSE) from 1926 to 1982 and concluded that winners and losers in one 36 month period tend to reverse their performance over next 36 month period. They further added that many of these reversals occur in January. Similar kind of results were also provided by Liano and Lindley (1995) where they analyzed the weekend effect in the first half and the second half of the month and concluded that Friday's returns are significantly greater than Monday's returns but spread between Monday's returns and Friday's returns shift significantly in the first half and second half of the month.

Siegel (1998) examined the Monday effect over the period from 1985-1997 and concluded that, if Monday returns had been equal to the average return for other weekdays over this period, the Dow Jones Industrial Average would be almost twice its level at the end of 1997. Mehdiian and Perry (2001) re-examined the Monday effect in US stock market from 1964-1999 using daily returns from three large cap indices and two small cap indices and concluded that before 1987 Monday returns are significantly negative in all the five US indices whereas after 1987 a significant reversal of Monday effect is noticed where returns on Monday are reported to be positive.

Study by Moosa (2007) investigated DJIA over the period 1970-2005. Results of the study highlight that positive January effect has faded into insignificance while the negative July effect has become prominent. The vanishing January effect can be attributed to the change in tax treatment of the realized/unrealized gains/losses and change in the accounting standards.

2.7 Theoretical framework

The new marketing philosophy and strategies place special emphasis on recognition of customer needs to provide high level of quality services (Harrison, 2000). However, understanding what customers expect and restructure the organizational policies accordingly is a tough job. Study by Smith (2003) provides that major changes in the overall organization structure to meet customer expectations require huge investment of time and resources. Moreover, it is also evident that many change programs often fail to meet expectations. The

reason for this failure is presence of ambiguity among the investors. Thus, it becomes imperative to understand how investors perceive presence of risk in mutual funds.

Risk associated with any outcome is generally understood as the probability of negative outcome. Slovic (1967) explained risk as probability of loss in terms of measurement of risk. He propounded that an individual's decision on risk is determined by a person's belief about the relative importance of probabilities and limitations of his ability to act on the basis of these beliefs. Lopes (1987) explained risk as a situation in which a decision is made whose consequences depend upon the outcome of future events having known probabilities. Her explicative mechanism mainly reflects the psychology of personality, where he explored risk seeking and risk averse participants. The study concluded that risk is considered as product of consequences of an event and probability of its occurrence.

An individual's probability estimation about an outcome is a strong determinant of his action. When decision makers perceive lower probabilities and smaller levels of potential financial loss associated with a particular business situation, they are more likely to enter it (McNamara & Bromiley, 1997; Palich & Bagby, 1995; Simon *et al.*, 1999). Study by Simon *et al.* (1999) found that individuals given the exact same information could perceive different levels of risk. They further demonstrated that lower level of perceived risk was associated with a stronger likelihood of accepting new challenges. Thus, these theories portrays that an individual's probability estimation about loss in particular outcome will guide him towards the level of risk he assumes with an investment.

Risk perception of investors comprises a wide range of elements. Huge literature available on risk perception has identified varied factors affecting the risk perception of an individual. Few studies on age wise risk taking behavior support that as the age of investors increases they prefer to invest in safe securities. Research by Morin and Suarez (1983); Bodie *et al.* (1992); Riley and Chow (1992); Palsson (1996) and Steinberg (2005) concluded that people in old age prefer to invest in less risky securities so they rebalance their portfolios in favor of fixed income securities. Income level of any individual plays a significant role in determining his risk appetite. Existing research has also provided that income and preferred higher risk level are positively associated [Blume (1978), Riley and Chow (1992) cicchetti and Dubin (1994),

Shaw (1996) and Bernheim *et al.* (2001); Ajmi (2008)]. Research by Barber and Odean (2001); Olsen and Cox (2001); Bernasek and Shwiff (2001); Dwyer (2002) and Schubert (2006) reported that women show less confidence than men in the area of finance decision making. Further, investor's education level also guides him in selecting optimal risk option. Baker and Haslem (1974); Crimmon and Wehrung (1990); Mankiw and Zeldes(1991); Haliassos and Bertaut (1995); Grimes and Snively (1999) opine that well educated investors show higher degree of willingness to take risk. Schooley and Worden (1999) are of the opinion that investors with high school diplomas are more risk averse and prefer to invest in fixed income securities. Christiansen (2008) found that highly educated investors are less risk averse and prefer to invest in stock and bonds.

Different researchers have endeavored to estimate impact of diversification on reducing risk along with deciding the minimal optimum number of securities that should be included to make it a perfectly diversified portfolio Evans and Archer (1968); Fisher and Lorie (1970); Elton and Gruber (1977); Statman (1987); Shawky and Smith (2005). Related studies on international diversification have also revealed that investors get benefit by investing some part of their portfolio in foreign equities (Grubel, 1968) (Levy, 1970) (Lessard, 1973) (Cavaglia *et al.*, 2000). Recent study by Didier *et. al.* (2008) provided that mutual funds invest in a finite number of firms but this restricted investment practice has a cost and there are unexploited gains from international diversification. Thus, mutual funds can achieve better returns by broadening their investment scope.

Theory of bad apple lays down that one rotten apple in a basket spoils the whole set of apples lying in the same basket. Based on this theory, a careful selection of security is prerequisite for optimal portfolio composition. Mutual funds provide a weighted return to their investors. Thus, any negligence on the part of manager in stock selection will influence the composite returns on the portfolio. Managers should always be conscious of the probable existence of the toxic '*Bad Apples*', and anticipate their presence within any large group, in any location (Lupfer and Kambil, 2009).

Limited literature is available on the history of financial innovation but it clearly demonstrates that the creation of new financial products and processes has been an ongoing part of

economies for at least the past four centuries, if not longer (Tufano, 1995). Study by Suzuki, 1986) provided that financial innovation is fighter promoted when the financial authorities recognize the obsolescence of existing statutory framework and deregulate the essential part of it. Thus, the need to continuously revive the existing financial products becomes relevant. This theory is based on the premise that humans are fallible and errors are expected. The focus should be on the failure in the group, team or procedure. Emphasis is on feedback from processes, accurate information and possibly dialogue with user (Allsop and Mulcahy, 1996).

Thus, based on these earlier findings, an attempt has been made in the present study to understand investors' perception towards presence of risk in the mutual funds. A thorough understanding of investors' understanding towards disclosure practices of mutual funds, working of mutual fund AMCs and risk perception becomes a prerequisite for inducing innovation in mutual fund schemes. Moreover, on the other side AMCs practices to design well-structured fund schemes require that fund managers should align their investment style with investors' expectations. Thus, the present study endeavors to align AMCs working style with investors' expectations to induce innovation in the mutual funds. The designing of FININOV aims at synthesizing the working practices of AMCs by incorporating risk management practices along-with a due consideration to investors' expectations.

Conclusion

Although vast literature is available that attempts to examine the working and performance of mutual funds yet, there are still some areas uncovered. The foremost, important among them is the investors' risk perception as mutual funds comprise of large number of investors who pool their savings with varied investment objective. Thus, the significant differences in investors' risk perception and their expectation from mutual funds return may exist. Earlier studies have ignored this area which is the prerequisite for introducing any innovative fund scheme. Further, in the Indian context much of the work has been done in analyzing the comparative the performance of funds. Significance of investment style adopted by the fund managers has not been covered. Thus, previous studies have not endeavored to study mutual funds working style in accordance with investors' expectations which has fostered perception gap. Scanty literature is available on innovations in mutual funds that take place to align

investors' expectations and working style of mutual funds AMCs. Hence, in the present study, an attempt has been made to provide a unique blend of significant information on investors' risk perception and actual performance of mutual funds. Finally, the focus of this study is to imbibe investors' expectations in the designing of new fund scheme.

CHAPTER-III

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter introduces overall research design of study which includes the methodology adopted for carrying out the research study and also describes the various phases of this research. This study has been conducted with the prime objective of identifying the factors responsible for creating gap in investors' perception towards mutual funds and suggests a roadmap for portfolio management to mutual fund AMCs in order to align mutual funds' working style with investors' expectations. Although, a number of techniques are available to collect primary information from investors, a well-structured questionnaire has been designed and used as a prime survey instrument for data collection as it addresses the issue of reliability of information by reducing and eliminating differences in the way that the questions are asked, and how they are presented. Further, secondary data has also been used and analyzed using various research methods, the detail of which has been presented in the following sections.

3.2 Phases of research

The complete research process was carried out in the following four phases:

Phase I: Understanding the existing perspectives

Phase I of the study explored existing literature on current status of mutual funds which has been evaluated using various performance measures and simultaneously analyzing the factors that contribute towards risk perception of investors. In depth literature has also been studied on random movement of stock prices and possibility of forecasting future trends in financial markets. Literature review on financial innovation processes, innovations in mutual funds, market volatility and risk management has also been expounded.

Phase II: Assessment of investors' perception and expectations

Phase II of this research includes designing of a well-structured questionnaire to assess investors' responses on risk perceived by them in mutual fund investment. The complete emphasis of this questionnaire was to uncover the information related to investors' perception towards quality of mutual funds' services, disclosure practices of mutual funds, investors' trust in performance and professional competence of AMCs and above all the risk perception towards mutual funds. The questionnaire has been designed after extensive literature review and validated through discussions with academicians and financial intermediaries/practitioners.

Phase III: Assessment of working style of Mutual funds

The core objectives of study mooted the need to examine the working philosophy of mutual fund AMCs. Investors pool their savings with mutual funds and expect them to perform well as AMCs are expected to be updated with market movements every time. Thus, focus of this phase was to study the working style of selected mutual funds' AMCs on how they use their professional skills to decide portfolio mix and manage risk-return trade off.

Phase IV: Developing a strategic framework 'FININOV'

Finally, in the last stage of this study an endeavor has been made to synthesize the investors' perception and working style of mutual funds' AMCs. Presence of risk is a normal feature of stock market investment and mutual funds' AMCs keep on designing new funds to lure more investors without actually giving an insight into investors' expectations. Suggestive framework 'FININOV' proposes a strategic framework whereby AMCs are guided to assume calculated risk keeping in mind investors' risk appetite.

3.3 Research methodology

In this research multivariate factors have been considered for covering different aspects of this study. The study makes use of both primary and secondary data in order to derive necessary conclusions pertaining to research objectives. The study comprises of analysis on investors'

risk perception towards mutual funds and further examines the working style of mutual funds' AMCs to understand their capability to perform and reduce the impact of volatility. The learning of these two issues has been used to evolve a strategic framework 'FININOV'.

3.3.1 Research design

In order to satisfy the objectives of research, the study used both exploratory and descriptive research design. As the first objective of study was to conduct IRPA, exploratory research design has been used to generate basic knowledge on investors' risk perception and uncover variables that influence their perception. Further, for analyzing the flaws in the working of mutual funds, descriptive research design has been used that aims at defining and examining the associative relationships.

3.3.2 Participants

The study selected total 400 investors from various major cities of Punjab. The purpose of selecting Punjab as a sample is based on the assumption that with an average growth rate of more than 10% it truly represent the progressive economy of India. While conducting the survey an attempt has been made to give due representation to each region of Punjab viz. *Doaba, Majha and Malwa* by including investors from major cities of Punjab.

3.3.3 Objectives of the study

The study has been conducted with the following prime objectives:

- To identify and establish linkage between factors responsible for creating gap in investor's expectations from security returns and actual portfolio management by mutual funds through Investors' Risk Perception Analysis (IRPA).
- To identify current financial flaws in prevailing mutual funds and propose a roadmap for portfolio selection and critically analyze important parameters that will ensure better financial returns on portfolio selection and can eventually help in risk management.

- To evolve a multidimensional strategic framework “FININOV” which will allow existing financial products to be overhauled/ restructured.

3.3.4 Data collection

For the purpose of carrying out this study both primary as well as secondary data have been used. Primary data has been used for the purpose of Investors’ Risk Perception Analysis (IRPA), which is the main theme of this research. As 400 investors were taken under sample for the purpose of carrying out the survey, 100 investors from each of four mutual funds i.e State Bank of India (SBI) mutual funds, Unit Trust of India (UTI) mutual funds, Reliance mutual funds and ICICI prudential mutual funds have been selected.

Literature review provided an initial development of draft questionnaire that contained around 60 questions. However, certain revisions were made in the questionnaire based on suggestions from peers and professional practitioners. Thus, unnecessary questions that portrayed it as too lengthy and were not within the frame of research objectives were deleted. The final revised questionnaire contains 45 statements that aim to extract investors’ hidden expectations. Table 3.1 presents the detail purpose of each question. Moreover, finalized questionnaire is given in Annexure A.

The scoring of Information collected from respondents has been compiled in Excel format according to standardized manuals of statistical tests. Finally, data has been analyzed using SPSS (17.0 version). Further, for the purpose of analyzing the flaws in the working of mutual funds secondary data pertaining to risk and returns of concerned funds has also been collected from online sources viz. individual websites of mutual funds, AMFI, SEBI etc. Further, these data were being compared and analyzed to understand the different investment styles of fund managers.

Table 3.1 Detail of Questionnaire			
Sr. No.	Gist of Questions	Response method	Purpose
1	Name		Data Identification
2	Address		Data identification
3	Age	Please tick (✓) one option	Demographic details
4	Marital status	Please tick (✓) one option	
5	Area	Please tick (✓) one option	
6	Education	Please tick (✓) one option	
7	Profession	Please tick (✓) one option	
8	Income	Please tick (✓) one option	
9	Propensity to save	Please tick (✓) one option	
10	Stability of Income	Please tick (✓) one option	
11	Investors' Knowledge	Please tick (✓) one option	
12	What is your main objective behind investment?	Please tick (✓) one option	Purpose of investing money
13	Preference for various investment Avenues	Rank from 1-8	Choice of investment avenues
14	Which mutual fund you prefer to invest?	Please tick (✓) one option	Category formulation
15	Evaluation of Service quality parameters of mutual funds: a) Transparency b) Responsiveness c) Communication d) Commitment e) Assurance	Rate from 1-5	Analyze investors perception about service quality both before and after investment
16	Disclosure of risk in mutual funds	Please tick (✓) one option	Investors' perception towards disclosure practices of mutual funds. This was important to examine as investors are dissatisfied when mutual funds fail to deliver overwhelming returns
17	Disclosure of load	Please tick (✓) one option	
18	Disclosure of portfolio contents	Please tick (✓) one option	
19	Disclosure of guaranteed return	Please tick (✓) one option	
20	Disclosure of maturity/liquidity	Please tick (✓) one option	
21	Disclosure of % fund allocation	Please tick (✓) one option	
22	Actual returns do not match with expected returns	Please tick (✓) one option	Investors' perception towards working and professional

23	Mutual funds are poor to respond to market volatility	Please tick (✓) one option	competence of mutual funds.
24	High hidden costs	Please tick (✓) one option	
25	Funds not invested according to investors' objectives	Please tick (✓) one option	
26	Agents are not well informed	Please tick (✓) one option	
27	AMCs are not able to protect investors' interest	Please tick (✓) one option	
28	Mutual funds do not possess strong network	Please tick (✓) one option	
29	Investors' willingness to assume risk	Please tick (✓) one option	Understand Willingness of investors to assume risk, preference for level of risk they wish to assume and Investors' overall risk perception towards mutual funds.
30	Preference for Level of risk	Please tick (✓) one option	
31	Worried about risk in mutual funds	Rank 1-5 (1 being lowest and 5 highest)	
32	Perception on AMCs ability to estimate risk	Rank 1-5 (1 being lowest and 5 highest)	
33	Perception on AMCs ability to control risk	Rank 1-5 (1 being lowest and 5 highest)	
34	Probability of losing investment in mutual funds	Rank 1-5 (1 being lowest and 5 highest)	
35	Lose from mutual fund investment due to downtrend in stock market	Rank 1-5 (1 being lowest and 5 highest)	
36	Gain from mutual fund investment due to uptrend in stock market	Rank 1-5 (1 being lowest and 5 highest)	
37	Credibility of claims in advertisements	Rank 1-5 (1 being lowest and 5 highest)	
38	Confidence in AR from mutual funds	Rank 1-5 (1 being lowest and 5 highest)	
39	Confidence in TR from mutual funds	Rank 1-5 (1 being lowest and 5 highest)	
40	Perception about overall risk in mutual funds	Rank 1-5 (1 being lowest and 5 highest)	

3.4 Data analysis

Data collected from questionnaires has been analyzed by using SPSS 17.0. Statistical tools like Chi-square (χ^2) test, factor analysis, ANOVA, multiple regression and canonical correlation have been used to test the hypotheses. Chi-square test has been used to determine whether the two attributes are independent of each other. In chi square test results are interpreted after analysis of observed (O) and expected frequencies (E). Significance of χ^2 highlight that strong association exists between the variables under the study.

Analysis of Variance (ANOVA) is used to test for the significance of the differences among more than two sample means. Using ANOVA, inferences can be made about whether the different samples have been drawn from the populations having the same mean. ANOVA involves determining one estimate of the population variance from the variance among the sample means and second estimate of the population variance from the variance within the sample. Further, both the estimates are compared. If both the estimates are approximately equal in value, then the null hypothesis, i.e., sample means do not vary significantly, is accepted. These two estimates of the population variance are compared by computing their ratio, called F statistic.

Factor analysis has been carried out for the purpose of data reduction that aims at examining the patterns of correlations between the observed measures. Thus, factor analysis attempts to identify a set of dimensions that is not directly observable in a large set of variables. This analysis has been used to summarize a majority of the information in a data set in terms of relatively lesser new categories, called factors. Major use of factor analysis is to group redundant variables so that smaller number of variables can be selected for further analysis.

As the primary objective of this research work is to examine the relationship between independent factors that are responsible for creating gap in investors' perception canonical correlation has been used to analyze relationship between set of dependent and a set of independent variables. For the purpose of analyzing IRPA step wise multiple regression has also been carried out, which endeavors to examine the relationship between investors' risk perception as criterion variable and a set of independent variables.

Secondary data collected for relevant fund schemes has been analyzed using various risk measures viz. Standard deviation (σ), Beta (β), Sharpe ratio (S_i), Treynor (T_i), Fama etc. Standard deviation is a basic measure of volatility. Sharpe ratio helps to identify how well return of an asset compensates investor for the risk taken. Treynor index provides reward to volatility ratio as a measurement of returns earned in excess of that which could have been earned on investment that has no diversifiable risk, per each unit of market risk assumed. Fama compares the performance of a portfolio measured in terms of returns of a fund with the required return commensurate with the total risk associated with it. Further, to understand the market movement of fund NAVs run test has been carried out.

3.5 Data validation and reliability

The questionnaire developed has been pre-tested and validated through face validity as it was sent to a carefully selected sample of experts and it also has a sufficiently good reliability score. In this study the complete set of questions were divided into sections viz. services perception, disclosure practices, performance and investors' expectations, risk perception. The Question wise reliability index, which is given in Table 3.2, reveals that the internal consistency based on the inter item correlation is quite good in all the above questions.

Reliability of questionnaire can be estimated from Cronbach alpha presented for various statements in the questionnaire, which suggests higher degree of inter correlation among the test items (Cronbach, 1951). Generally, as a rule of thumb Cronbach alpha ≥ 0.70 is considered as an acceptable reliability coefficient (Nunnally, 1978) and Cronbach alpha calculated for various statements in the questionnaire show higher consistency. Moreover, a reduction in number of items reduces Cronbach alpha. So the questionnaire is considered reliable.

Table 3.2 Data reliability		
Variables	Items included in variable	Cronbach Alpha
Disclosure practices	i) Fundamental risk	0.821
	ii) Entry/Exit Load	
	iii) Portfolio contents	
	iv) Illustrated examples are not Guaranteed returns	
	v) Maturity and Liquidity	
	vi) % fund allocation	
Performance and investors' expectations	i) Actual return does not match with Expected returns	0.8153
	ii) Response to market volatility	
	iii) Hidden cost	
	iv) Investment objective	
	v) Agents are not well informed	
	vi) AMCs not able to protect investor's interest	
	vii) Mutual funds don't possess strong communication network	
Risk Perception and Confidence	i) Willingness to take risk	0.801
	ii) Level of Risk preference	
	iii) Worried about risk in MF	
	iv) AMCs ability to estimate risk	
	v) AMCs ability to control risk	
	vi) Probability of losing money	
	vii) MFs influenced by downtrend in Stock market	
	viii) MFs Influenced by uptrend in stock market	
	ix) Credibility of MF advertisement	
	x) Confident about annual return from MF	
	xi) Confident about Total return on maturity	
	xii) Overall risk in MF	
Services perception	i) Transparency	0.834
	ii) Responsiveness	
	iii) Communication	
	iv) Commitment	
	v) Assurance	

3.6 Concluding remarks

Choice of an appropriate research design and methodology is one of the most important aspects that pave the way for targeted outcomes in the research process. This chapter elaborates the detail of step by step approach employed for the research. The present study reveals the results based on primary and secondary data which has been analyzed using appropriate statistical and financial tools. Thorough methodology that has been applied at different phases of this study has also been explained. Finally, a brief overview of rationale of statistical methods used to test hypotheses like Chi square, ANOVA, factor analysis, multiple regressions and canonical regression is also outlined. Financial tools measure risk return trade off like average return on investment (RoI), Beta (β), Treynor index (T_i), Sharpe index (S_i), Fama etc. have been used. The conceptual framework of research has been presented in Figure 3.1.

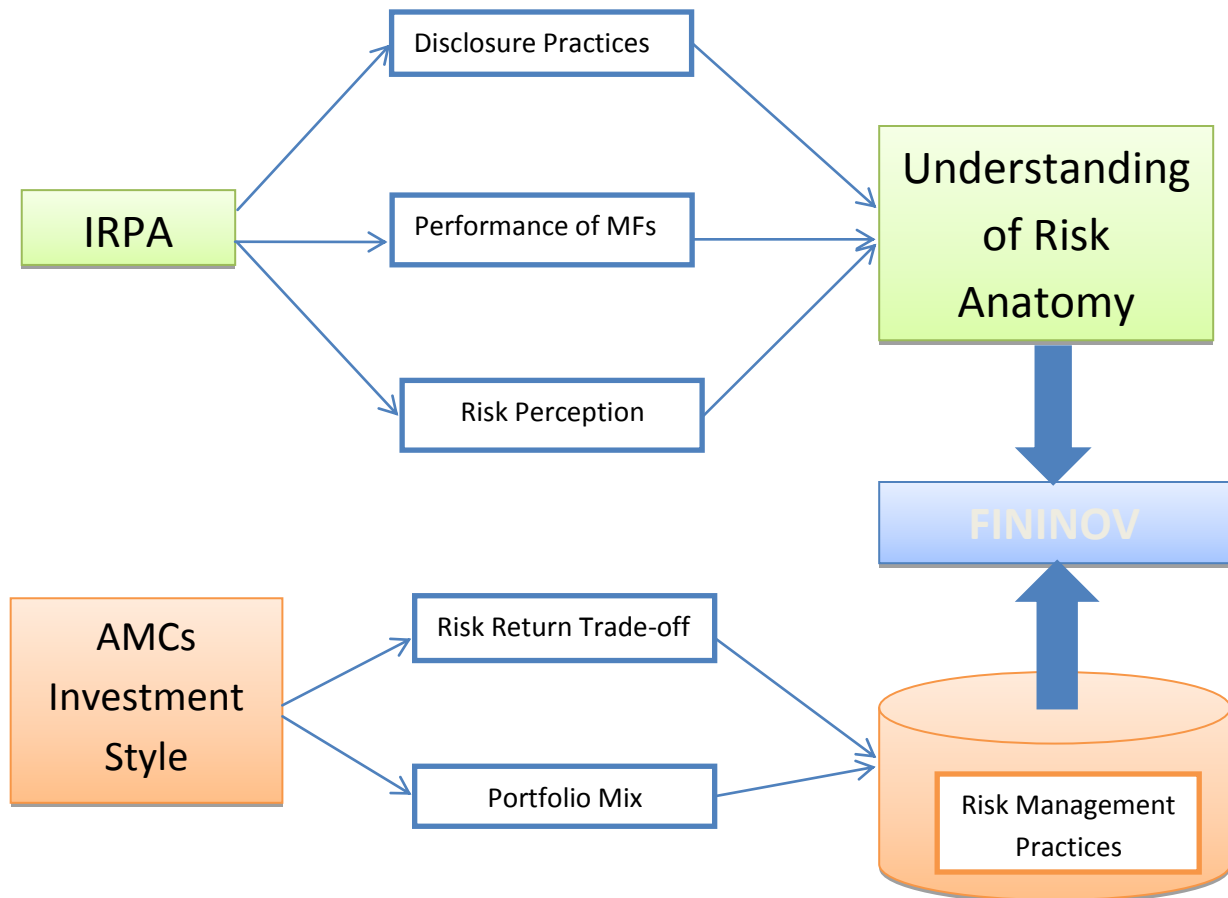


Figure 3.1 Conceptual Framework of Research

In order to achieve the research objectives the study initially conducts primary survey ‘IRPA’ through well- structured questionnaire on different issues pertaining to MFs’ disclosure practices, performance of MFs and risk perception of investors and then AMCs’ investment style are analyzed. Based on these investigations a strategic framework FININOV is proposed (Figure 3.1).

CHAPTER – IV

SURVEY BASED RESEARCH RESULTS

4.1 Introduction

In this chapter survey based research results conducted on mutual fund investors of Punjab have been discussed, analyzed and presented. The survey was conducted on existing investors of mutual funds who have experienced the working of mutual funds. The objective of the survey has been to assess and identify the factors responsible for creating gap in investors' expectations from security returns and actual portfolio management by mutual funds.

4.2 Questionnaire development and data collection

For conducting the survey, the first task was to design a questionnaire. A well-structured and comprehensive questionnaire containing 45 questions was designed, to seek information on investors' perception towards services of mutual funds, contribution of mutual funds' disclosure practices in creating perception gap, investor's acumen on mutual funds' ability to manage risk and overall risk perception. The questionnaire was developed after thorough literature review and validated after discussion with senior academicians and practitioners. A 1-5 likert scale was deployed for all the questions in order to measure the investors' responses. The questionnaire was divided into five sub headings viz. Section A, B, C, D and E.

Section A was designed to get basic information of investors that comprise of information on age, marital status, area, income, profession, education, stability of income, propensity to save. Section B seeks to obtain information on investors' knowledge, investment objective and their preference for various investment avenues. Section C has been designed to obtain detailed information on investors' opinion regarding mutual funds' service quality and their performance. A particular set of questions seek to obtain investors' views on mutual funds' practices before and after investing in the funds. Section D and E seek to determine the level of risk which investors are willing to assume and further extend it to obtain information on

investors' confidence in mutual funds working and their perception about overall risk (Details in Ch. 3).

Designed questionnaire was pre-tested on a sample of 50 investors to ensure its effectiveness. However, suggestions of financial intermediaries, peers and senior consultants were incorporated to retain the questions that satisfy the research objectives. Reliability of questionnaire was measured using the Cronbach alpha (Cronbach, 1951). The detail finalized questionnaire is given in Appendix A. The questionnaire served the purpose of uncovering the hidden perception of mutual funds' investors and helped identify the grey areas where mutual fund AMCs should focus. Finally, data was collected from the major cities of Punjab by sending 1780 questionnaires out of which 661 questionnaires were received. The response rate of questionnaire has been 37.13%. Final analysis is based on the 400 questionnaires, picking 100 questionnaires from UTI, SBI, ICICI and Reliance mutual funds. The findings of the data collected through questionnaire are described in the following sections.

4.3 Survey breakup

The basic objective of this research was to take initial steps in understanding the perceived expectation of investors and further obtain investors' opinion on how much they believe in the working style of mutual funds' AMCs. Following sub sections portray the detail of data collected and findings of this study.

4.3.1 Age wise breakup of investors

Study comprised of responses from all categories of investors and thus, randomly selected investors belong to all age group. For the purpose of study, age wise distribution of investors is categorized as aggressive investors, i.e., investors with age less than 30 years ($n_1=170$), moderate investors with age group ranging between 30-50 years ($n_2=165$), and conservative investors with age group above 50 years ($n_3=65$). Study by Bodie *et. al.* (1992); Strong and Taylor (2001) highlight that investors in the young age are less risk averse than investors in the age near to their retired. Their findings revealed that as the people get older they prefer to invest in less risky securities as with age their risk tolerance reduces. As people age they face a short investment span over which they have to receive return on investment and in young

age investors have sufficient time to recover loss, if any. According to Grable and Lytton (1998) age and investment risk tolerance are inversely related. They provided that as the individual investor's age increases he has less time to recover losses than investors in their young and mid age. Moreover, few questions framed in our questionnaire, i.e., willingness to assume risk, level of risk and worried about presence of risk also support these views as the results revealed that investors become risk averse with increase in age. Thus, these categories have been framed after considering the risk tolerance of investors.

The age wise breakup of investors is shown in figure 4.1. The purpose of categorizing investors into three groups is because it was assumed that investment preferences vary at different stages of life.

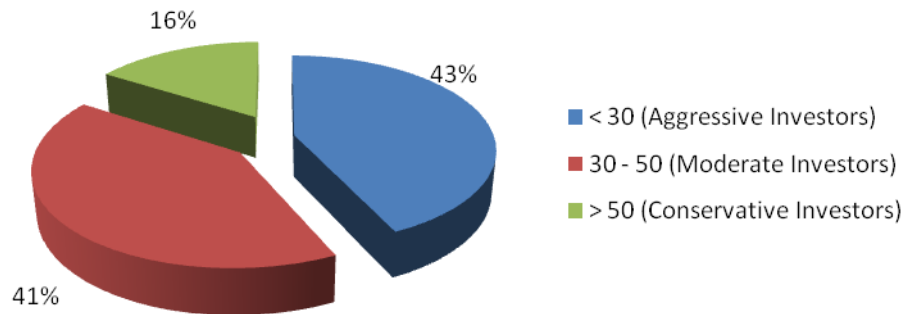


Figure 4.1: age wise distribution

4.3.2 Marital status

Breakup of total respondents in terms of marital status suggest that majority of mutual fund investors are married ($n_1=279$) whereas unmarried investors ($n_2=121$) comprise of only 30%. Married investors' preference for mutual fund may be because of their willingness to assume calculated risk, whereas at unmarried stage priorities are different and they may be willing to assume greater risk. Figure 4.2 provides a break up of total investors with reference to their marital status.

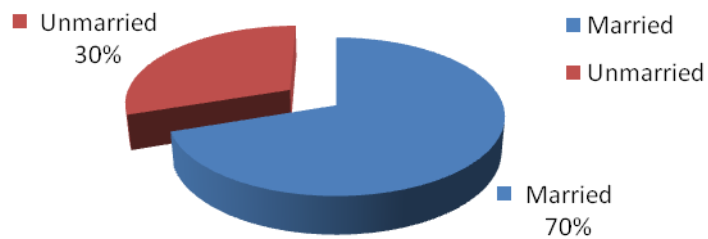


Figure 4.2 Marital status distribution

4.3.3 Area wise distribution

Total respondents under study were taken from all the regions of Punjab and hence respondents from urban ($n_1=313$), semi urban ($n_2=69$) and rural ($n_3=18$) were targeted. Figure 4.3 depicts the area wise distribution of investors which clearly shows that the majority of investors, i.e., 78% belong to urban area whereas only 5% respondents were from rural area.

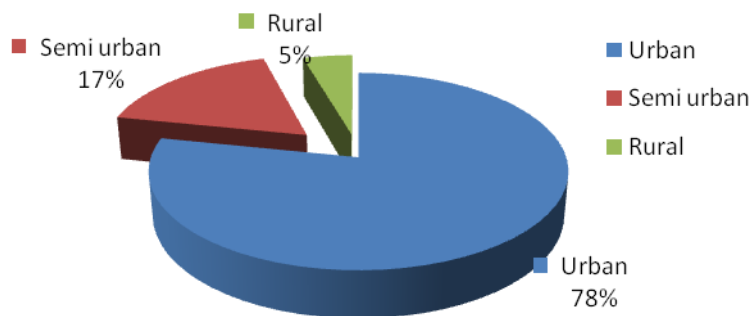


Figure 4.3 Area wise distribution

4.3.4 Education

Education plays a significant role in investment decisions of the investors. Generally, investors with poor educational background are less aware of the financial avenues available and prefer to invest in traditionally available investments. Figure 4.4 reveals that the sample under the study has approximately 50% post graduate investors ($n_1=201$), 40% graduate investors ($n_2=159$) and only 10% under graduate investors ($n_3=40$).

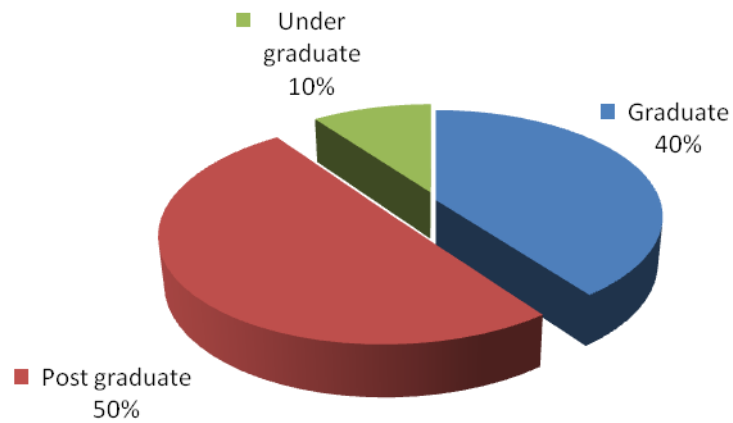


Figure 4.4 Education

4.3.5 Profession

Profession of any individual also plays an important role in determining his choice for various investment alternatives. The data of respondents in figure 4.5 reveals that 19% respondents who invested in mutual fund are businessmen ($n_1=75$), 66% respondents are salaried ($n_2=263$) and 15% comprise of professionals ($n_3=62$).

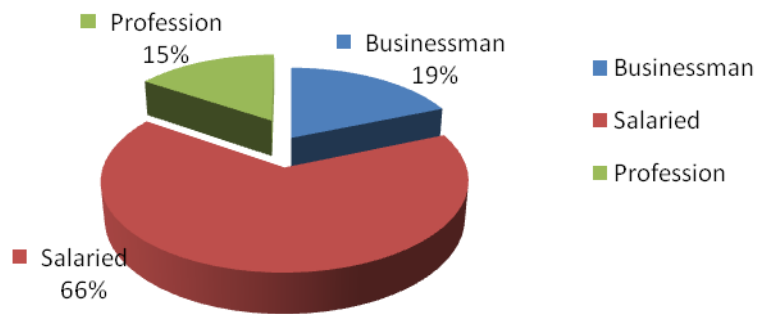


Figure 4.5 Profession

This analysis provides that mutual fund is a preferred choice for salaried investors. Salaried investors' preference for mutual funds may be because of its professional management that assures calculated risk.

4.3.6 Income

Income wise distribution of investors highlights that mutual fund investors comprise of mainly middle or upper middle income group. Among the total respondents proportion of investors on extreme lower income or higher side are found to be very few. For the purpose of convenience in data analysis these investors are classified into four categories viz. Basic investors with income less than 1.5 lakh, low tax payer with income in the range of 1.5-3 lakh, high tax payer with income in the range of 3-5 lakh and lastly the wealthy investors with income above 5 lakh. As presented in figure 4.6 basic investor ($n_1=69$) comprise of 18% and proportion of low tax payer ($n_2=133$) is 33%. Majority of investors in the sample are high tax payers ($n_3=161$) comprise of 40% of total respondents and rest 9% are wealthy investors ($n_4=37$).

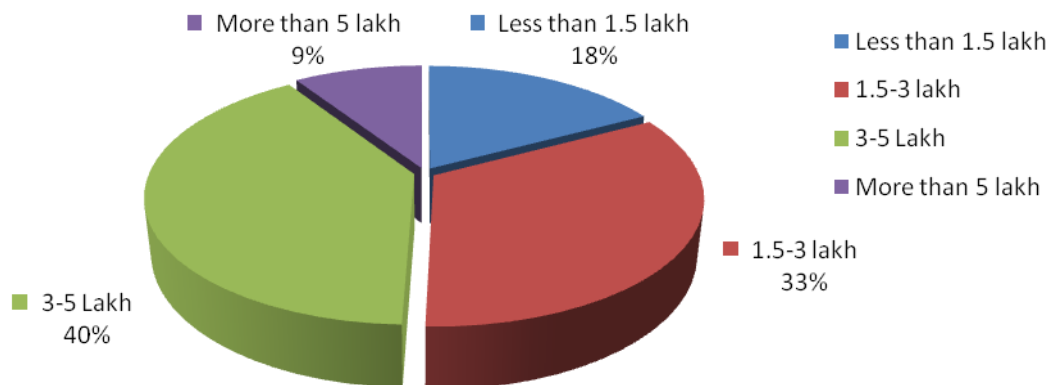


Figure 4.6 Income wise distribution

4.4 Investment objective

Investment objective of any investor depends upon his future obligations, thus, demographic features of any individual are mainly responsible for determining the investment objective of investors. Analysis of data shows that 34.3% of respondents ($n=137$) explained tax saving as their investment objective, whereas 11.8% investors ($n=47$) provided that they invest to earn retirement benefits. Further, 15% investors ($n=60$) revealed contingency and fear of future uncertainty is what lures them towards investment, 22% investors ($n=88$) explained capital appreciation and 17% investors ($n=68$) described that they save for education and marriage of

their children. These investment objectives can also be interpreted as among the total investors 66% investors were salaried class and their core preference to invest in mutual funds is because of the tax benefits offered by fund schemes.

Table 4.1 Choice of Investment Objective							
Group	Tax saving	Retire	Contingency	Capital Appreciation	Children education/ Marriage		Test Results
	N (%)	N %	N %	N %	N %	Total	
Age							
Aggressive investors	66 (16.5)	12 (3)	22 (5.5)	56 (14)	14 (3.5)	170 (42.5)	Chi^2=77.106* (df:8) Linear association=0.062 p=0.001
Moderate investors	53 (13.3)	13 (3.3)	25 (6.3)	26 (6.5)	48 (12)	165 (41.3)	
Conservative investors	18 (4.5)	22 (5.5)	13 (3.3)	6 (1.5)	6 (1.5)	65 (16.2)	
Total	137 (34.3)	47 (11.8)	60 (15)	88 (22)	68 (17)	400 (100)	
Marital status							
Married	89 (22.3)	45 (11.3)	35 (8.8)	46 (11.5)	64 (16)	279 (69.7)	Chi^2=52.123* (df:4) Linear Association=1.767 p=0.001
Unmarried	48 (12)	2 (0.5)	25 (6.3)	42 (10.5)	4 (1)	121 (30.3)	
Total	137 (34.3)	47 (11.8)	60 (15)	88 (22)	68 (17)	400 (100)	
Profession							
Business	7 (1.8)	7 (1.8)	19 (4.8)	24 (6)	18 (4.5)	75 (18.8)	Chi^2=44.078* (df:8) Linear Association=2.851 p=0.001
Salaried	115 (28.8)	35 (8.8)	32 (8)	45 (11.3)	36 (9)	263 (65.7)	
Professional	15 (3.8)	5 (1.3)	9 (2.3)	19 (4.8)	14 (3.5)	62 (15.5)	
Total	137 (34.3)	47 (11.8)	60 (15)	88 (22)	68 (17)	400 (100)	
Income							
Basic investors	18 (4.5)	4 (1)	18 (4.5)	15 (3.8)	14 (3.5)	69 (17.3)	Chi^2=21.135 (df:12) Linear Association=0.007 p=0.048**
Low tax payer	57 (14.3)	13 (3.3)	20 (5)	24 (6)	19 (4.8)	133 (33.3)	
High Tax payer	51 (12.8)	25 (6.3)	19 (4.8)	40 (10)	26 (6.5)	161 (40.3)	
Wealthy investors	11 (3.8)	5 (1.3)	3 (0.8)	9 (2.3)	9 (2.3)	37 (9.3)	
Total	137 (34.3)	47 (11.8)	60 (15)	88 (22)	68 (17)	400 (100)	

*P< 0.001 ** P < 0.05

Table 4.1 provides the category wise summary of investment objectives of investors. An analysis of this table reveals that majority of aggressive investors have tax reduction or capital appreciation as main investment objective. Although, majority of moderate investors (n=53) opined tax saving as their investment objective, significant number of investors (n=48) from this category also described children education and marriage as their investment objective. In contrast, the main investment objective of conservative investors (n=22) is to get retirement benefits in the future. Next choice of even conservative investors is tax reduction which is similar to aggressive and moderate investors. Thus, the detail of investment objectives compiled in this table provides a clear insight on differences in investment objectives which they set in accordance of their age group. $\chi^2 = 77.106$, ($p=0.001$) is significant which indicates a strong association between age and investment objective.

Investment objective as described by married investors (n=89) is similar with investment objective of unmarried investors (n=48) where they explained tax saving as their main objective but along with it investment preferences of married investors (n=64) for children education/marriage and unmarried investors (n=42) for capital appreciation as investment objective cannot be ignored. $\chi^2=52.123$, $p=0.001$ is significant which highlights a strong association between marital status and investment objective. Similarly, the vision of setting investment objective is also influenced by the nature of profession of investors. Majority of salaried investors (n=115) reveal tax saving as their investment objective whereas investors with business background (n=24) and professional investors (n=19) explained capital appreciation as their investment objective. $\chi^2=44.078$, $p=0.001$ is significant which highlights an association between profession and investment objective. Summary results of income wise investment objective have also revealed that strong association exists between income of investors and investment objective decided by them with $\chi^2=21.135$, $p<0.05$.

4.5 Overall investment preferences

The mean and SD of investment preferences for various investment avenues has been computed for the entire sample, dividing it in different categories. Overall average preference score (PS) for different investment avenues as presented in Table 4.2 reveal that investors consider insurance as most preferred investment avenue, followed by banking securities and

mutual funds respectively. However, results of mean preference of overall sample study also reveal that investors have last preference for gold as an investment.

Age wise investment preferences of investors reveal that where aggressive investors prefer mutual funds (PS=3.65) over insurance (PS=3.86), moderate investors reveal banking securities as a preferred investment (PS= 3.69) over insurance (PS=3.86) and mutual funds (PS=3.94). Similarly, conservative investors also describe banking securities (PS=2.78) as most preferred investment avenue than insurance (PS= 3.26). The Analysis of Variance (ANOVA) for age and investment preferences for different investment avenues is presented in Table 4.3. Results of ANOVA highlight that there is a significant difference amongst age groups and investment preference for insurance ($F(2,397) = 3.082, p < 0.05$), shares ($F(2,397) = 11.395, p < 0.001$), mutual funds ($F(2,397) = 6.312, p < 0.01$) and bank ($F(2,397) = 9.115, p < 0.001$).

Analysis of investment preferences of married investors also reveals that married investors prefer to invest in risk free securities which are exposed by their preference order. Responses of married investors provided that their most preferred investment choice is bank (PS=3.70) followed by insurance (PS=3.74) and PPF (PS= 3.95) whereas unmarried investors revealed that they prefer to invest in mutual funds (PS= 3.74) than insurance (PS=3.84). However, both married investors (PS= 5.63) and unmarried investors (PS= 5.61) opted gold as a least preferred investment. Profession wise investment preferences revealed their bank investment as foremost preferred avenue (PS= 3.49), followed by mutual funds (PS= 3.84) and real estate (PS=3.86), whereas salaried investors have shown their inclination towards risk free and tax saving investment avenues with foremost preference to insurance (PS= 3.54) and PPF (PS= 3.57). However, the investment tastes of professional investors are somewhat different with preferred choice towards mutual funds (PS= 3.35) and insurance (PS=4.17).

Income wise investment preferences for different category of investors reveal that basic investors prefer insurance (PS= 2.72) as their foremost choice with banking securities (PS=2.82) as next preference. Wealthy investors also reveal banking securities (PS=3.40) as their most preferred choice, but opined mutual funds (PS= 3.78) as their next choice before insurance (PS=4.08). ANOVA results for income and investment preferences of investors are

presented in Table 4.4. Income wise ANOVA results are found to be significant for insurance ($F=10.49$, $p< 0.001$), mutual fund ($F (3,396) =3.631$, $p< 0.05$), post office ($F (3,396) = 3.453$, $p< 0.05$), bank ($F (3,396) =7.132$, $p<0.001$), real estate ($F (3,396) =10.126$, $p<0.001$)

Table 4.2 Overall investment Preference score and Standard deviation coefficient																
	Insurance		PPF		Share		MF		PO		Bank		Real Estate		Gold	
	PS	σ	PS	σ	PS	σ	PS	σ	PS	σ	PS	σ	PS	σ	PS	σ
Age																
Aggressive investors	3.86	1.86	4.17	2.09	4.71	2.39	3.65	2.03	4.68	2.05	4.32	2.59	5	2.5	5.51	2.18
Moderate investors	3.86	1.85	4.06	2.11	5.24	2.47	3.94	1.81	4.6	2.029	3.69	2.51	4.85	2.45	5.67	2.19
Conservative investors	3.26	1.41	3.95	2.16	6.35	1.87	4.63	1.55	4.4	1.8	2.78	2.3	4.83	2.39	5.78	2.34
Total	3.76	1.8	4.09	2.1	5.2	2.41	3.93	1.9	4.6	2	3.81	2.56	4.91	2.45	5.62	2.21
Marital status																
Married	3.74	1.76	3.95	2.17	5.41	2.39	4.01	1.8	4.64	1.96	3.7	2.53	4.87	2.48	5.63	2.19
Unmarried	3.83	1.89	4.41	1.93	4.7	2.4	3.74	2.09	4.52	2.09	4.06	2.62	5	2.41	5.61	2.27
Total	3.76	1.8	4.09	2.1	5.2	2.41	3.93	1.9	4.6	2	3.81	2.56	4.91	2.45	5.62	2.21
Professional																
Business	4.2	1.72	5.69	1.85	5.02	2.61	3.84	1.74	5.36	1.96	3.49	2.61	3.86	2.41	4.5	2.3
Salaried	3.54	1.78	3.57	1.97	5.45	2.3	4.09	1.91	4.29	1.91	3.82	2.53	5.3	2.38	5.85	2.14
Professional	4.17	1.86	4.37	1.94	4.33	2.46	3.35	1.95	5.03	2.12	4.14	2.66	4.51	2.43	5.96	2.01
Total	3.76	1.8	4.09	2.1	5.2	2.41	3.93	1.9	4.6	2	3.81	2.56	4.91	2.45	5.62	2.21
Income																
Basic investors	2.72	1.49	4.4	1.71	5.84	2.12	4.34	1.71	4.4	2	2.82	2.3	5.97	1.9	5.46	2.43
Low tax payer	3.83	1.79	3.98	2.25	5.13	2.29	4.17	2.01	4.26	1.87	3.69	2.55	5.27	2.53	5.54	2.16
High Tax payer	4.08	1.74	3.96	2.13	5.01	2.54	3.59	1.83	4.83	2.04	4.42	2.52	4.24	2.45	5.81	2.18
Wealthy investors	4.08	1.97	4.45	2.11	5.02	2.66	3.78	1.9	5.21	2.07	3.4	2.62	4.51	2.26	5.37	2.11
Total	3.76	1.8	4.09	2.1	5.2	2.41	3.93	1.9	4.6	2	3.81	2.56	4.91	2.45	5.62	2.21
Rank	1		4		7		3		5		2		6		8	

Table 4.3 Age and Investment preferences for various investment avenues						
		Sum of Squares	df	Mean Square	F	Sig.
Insurance	Between Groups	19.869	2	9.934	3.082	.047***
	Within Groups	1279.509	397	3.223		
	Total	1299.378	399			
PPF	Between Groups	2.616	2	1.308	.293	.746
	Within Groups	1772.961	397	4.466		
	Total	1775.577	399			
Share	Between Groups	126.388	2	63.194	11.395	.001*
	Within Groups	2201.612	397	5.546		
	Total	2328.000	399			
MF	Between Groups	44.451	2	22.225	6.312	.002**
	Within Groups	1397.859	397	3.521		
	Total	1442.310	399			
PO	Between Groups	3.907	2	1.954	.485	.616
	Within Groups	1599.470	397	4.029		
	Total	1603.377	399			
Bank	Between Groups	115.511	2	57.755	9.115	.001*
	Within Groups	2515.427	397	6.336		
	Total	2630.938	399			
real estate	Between Groups	2.290	2	1.145	.188	.828
	Within Groups	2411.648	397	6.075		
	Total	2413.938	399			
Gold	Between Groups	4.313	2	2.157	.438	.646
	Within Groups	1955.437	397	4.926		
	Total	1959.750	399			

* $P < 0.001$ * $P < 0.01$ *** $P < 0.05$

Table 4.4 Income and Investment preferences for various investment avenues						
Variable		Sum of square	df	Mean square	F	Sig.
Insurance	Between the groups	95.709	3	31.903	10.496	.001*
	Within the group	1203.668	396	3.040		
	Total	1299.378	399			
PPF	Between the groups	16.004	3	5.335	1.201	.309
	Within the group	1759.573	396	4.443		
	Total	1775.578	399			
Shares	Between the groups	35.273	3	11.758	2.031	.109
	Within the group	2292.727	396	5.790		
	Total	2328.000	399			
Mutual Fund	Between the groups	38.607	3	12.869	3.631	.013**
	Within the group	1403.703	396	3.545		
	Total	1442.310	399			
PO Schemes	Between the groups	40.879	3	13.626	3.453	.017**
	Within the group	1562.499	396	3.946		
	Total	1603.377	399			
Bank	Between the groups	134.856	3	44.952	7.132	.001*
	Within the group	2496.081	396	6.303		
	Total	2630.938	399			
Real estate	Between the groups	171.983	3	57.328	10.126	.001*
	Within the group	2241.954	396	5.662		
	Total	2413.937	399			
Gold	Between the groups	10.546	3	3.515	.714	.544
	Within the group	1949.204	396	4.922		
	Total	1959.750	399			

* $P < 0.001$

** $P < 0.05$

4.6 Perceptual Gap

Perception of mutual fund investors has been judged for quality of services provided by mutual fund AMCs. Responses of investors were obtained on 5 point likert scale about their experience with mutual fund service providers both before investment and after investment. Average Perceived Score (APS) of investors and Average Experienced score (AES) are

calculated to find out perception gap. Table 4.5 depicts the perceptual gap which investors actually experience once they invest in mutual funds. Actual experience of investors which they realized through difference in mutual fund services through their post-sale behavior has been measured using five parameters viz. transparency, responsiveness, communication, commitment and assurance. Negative results of perception gap on all these parameters highlight the level of dissatisfaction among investors which signify that investors believe mutual funds have different orientation towards customer services once the investment deal is finalized.

Table 4.5 Analysis of Perceptual gap					
Variable	Average Perceived score(APS)	Standard deviation	Average Experienced score(AES)	Standard deviation	Perceptual Gap
Transparency	4.03	0.97	3.34	1.08	-0.69
Responsiveness	4.20	0.88	3.15	1.02	-1.05
Communication	4.3	0.834	2.99	1.02	-1.31
Commitment	4.24	0.85	2.65	1.07	-1.59
Assurance	4.24	0.83	2.42	1.04	-1.82

Figure 4.7 presents the APS and AES for service quality of mutual funds. Analysis of these score clearly show that for all the parameters of service quality of mutual funds $AES < APS$ which highlights that investors are lured by highly promising results with extreme service quality offered by mutual fund AMCs, while their actual experience does not provide satisfactory results. These results explain that although with regard to transparency significant gap is not reflected with $AES = 3.34$, but significant gap which investors encounter are in term of assurance ($AES = 2.42$), and commitment ($AES = 2.65$).

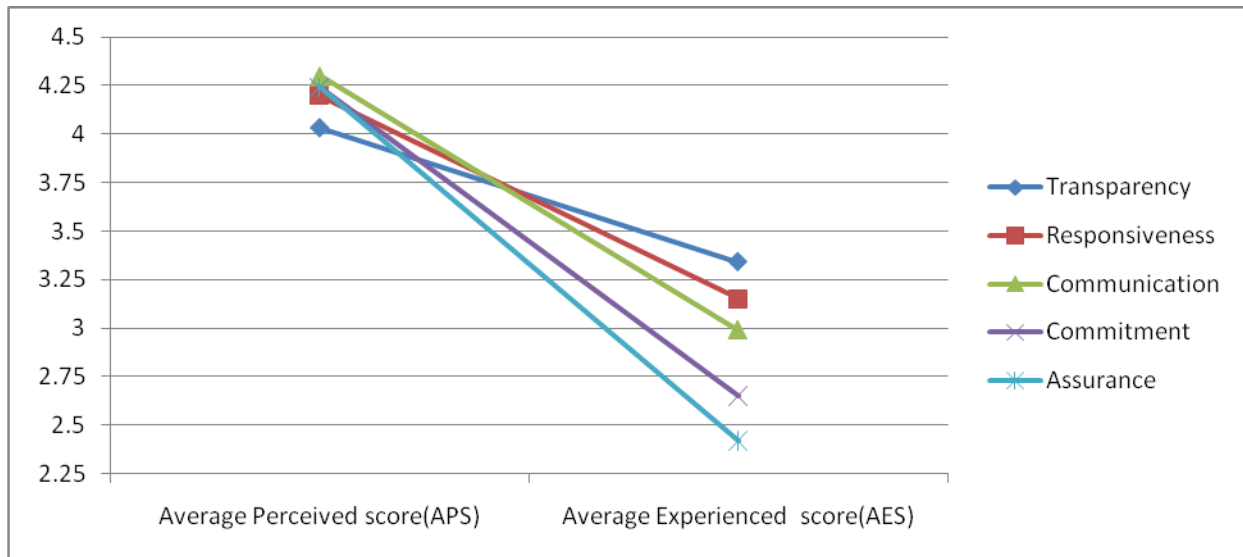


Figure 4.7 Perceptual Gap

4.7 Mutual funds' disclosure practices

The factors that contribute towards widening these service quality gaps may be either due to demographic profile of investors, which is regarded as uncontrollable factors or on the part of mutual funds where they are required to disclose every minute detail to the investors so that they may finalize their rational decision after prioritizing their needs. Thus, in an attempt to understand the disclosure practices of mutual funds, few questions pertaining to mutual funds disclosure practices were asked and analysis of data is provided in Table 4.6. The results reveal that aggressive investors (n=57) do not agree with the statement that mutual funds disclose all fundamental risk. Similarly, moderate investors (n=74), and conservative investors (n=29) also disagree with disclosure of risk involved in mutual funds. Overall, mean scores of different category of investors also provide significant difference in responses of investors. Chi square is 16.27 and significant ($p < 0.05$), which indicates an association between age and disclosure practices with reference to fundamental risk contained in mutual funds. Responses on investors' perception about disclosure of entry and exit load reveals that majority of investors (n=104) are not on extreme verge of negative opinion with overall $M = 3.11$. However, Chi square is not significant for age wise responses on disclosure of entry/exit load by mutual funds.

Although mixed responses have been received for opinion on mutual funds disclosure of portfolio content but mean score of aggressive investors (M= 3.25) is fairly less than mean responses of conservative investors (M=3.46). Analysis of investors responses on mutual funds practice to disclose that whatever illustrative examples are given they are not assured return provide that aggressive investors (M= 3.61) are not showing their consensus on this issue. However, mean scores of moderate investors (M=3.78) and conservative investors (M= 4.15) provide extreme discontentment of investors.

Chi²=19.014 is significant (p<0.05), depicting a positive association between investors' age and their understanding about mutual funds' disclosure of guaranteed returns. Further, analysis of investors' responses on mutual funds disclosure of maturity and liquidity also provide that majority of aggressive investors (n=66), moderate investors (n=73) and conservative investors (n=28) strongly disagree on the disclosure practice of mutual funds. Overall, mean score (M= 3.92) also reveals that investors are of negative opinion on mutual funds disclosure of maturity/liquidity. Significance of Chi²=21.226 (p<0.01) at 1 percent level highlight an association between investors' age and understanding the disclosure of maturity/liquidity by mutual funds. Finally, analysis of investors' responses on % fund allocation by mutual funds also shows that investors do not agree that mutual funds actually disclosed % of fund that will finally be allocated to them after deducting necessary charges. Where aggressive investors mean score (M=3.14) is quite similar to the mean score of moderate investors (M=3.06), conservative investors provide high degree of disagreement (M= 3.36). Chi²=18.388 (p<0.05) is significant at 5 percent level, which provides strong association between age wise investors' understanding about mutual funds' disclosure practice of % fund allocation.

Table 4.6 Age wise responses on Mutual funds disclosure practices								
Group	SA	A	MA	D	SD	Total	Mean	
Age	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Aggressive	8 (2)	34 (8.5)	33 (8.3)	57 (14.3)	38 (9.5)	170 (42.5)	3.49	Chi ² =16.27** (df:8) Linear association=10.938
Moderate	4 (1)	19 (4.8)	22 (5.5)	74 (18.5)	46 (11.5)	165 (41.3)	3.85	
Conservative	1 (0.3)	4 (1)	12 (3)	29 (7.3)	19 (4.8)	65 (16.3)	3.93	
Total	13 (3.3)	57 (14.3)	67 (16.8)	160 (40)	103 (25.8)	400 (100)	3.70	

Investors' perception about entry/exit load disclosure by Mutual funds								
Aggressive	17(4.3)	44 (11)	50(12.5)	36 (9)	23 (5.8)	170 (42.5)	3.02	Chi^2=5.724 (df:8) Linear association= 1.162
Moderate	14(3.5)	41(10.3)	37 (9.3)	47 (11.8)	26 (6.5)	165 (41.3)	3.18	
Conservative	5 (1.3)	19 (4.8)	13 (3.3)	16 (4)	12 (3)	65 (16.3)	3.16	
Total	36 (9)	104 (26)	100 (25)	99 (24.8)	61 (15.3)	400 (100)	3.11	
Investors' perception about portfolio content disclosure by Mutual funds								
Aggressive	14(3.5)	38 (9.5)	39 (9.8)	49 (12.3)	30 (7.5)	170 (42.5)	3.25	Chi^2=8.549 (df:8) Linear association= 0.997
Moderate	17(4.3)	35 (8.8)	26 (6.5)	60 (15)	27 (6.8)	165 (41.3)	3.27	
Conservative	6 (1.5)	13 (3.3)	7 (1.8)	23 (5.8)	16 (4)	65 (16.3)	3.46	
Total	37 (9.3)	86 (21.5)	72 (18)	132 (33)	73 (18.3)	400 (100)	3.29	
Investors' perception about disclosure of guaranteed return by Mutual funds								
Aggressive	8 (2)	29 (7.3)	32 (8)	53 (13.3)	48 (12)	170 (42.5)	3.61	Chi^2=19.014** (df:8) Linear association= 10.876
Moderate	2 (0.5)	24 (6)	25 (6.3)	70 (17.5)	44 (11)	165 (41.3)	3.78	
Conservative	0	5 (1.3)	5 (1.3)	30 (7.5)	25 (6.3)	65 (16.3)	4.15	
Total	10 (2.5)	58 (14.5)	62 (15.5)	153 (38.3)	117 (29.3)	400 (100)	3.77	
Investors' perception about disclosure of Maturity/Liquidity by Mutual funds								
Aggressive	12 (3)	31 (7.8)	20 (5)	41 (10.3)	66 (16.5)	170 (42.5)	3.69	Chi^2=21.226* (df:8) Linear association= 9.664
Moderate	1 (0.3)	21 (5.3)	15 (3.8)	55 (13.8)	73 (18.3)	165 (41.3)	4.07	
Conservative	2 (0.5)	3 (0.8)	7 (1.8)	25 (6.3)	28 (7)	65 (16.3)	4.13	
Total	15 (3.8)	55 (13.8)	42 (10.5)	121 (30.3)	167 (41.8)	400 (100)	3.92	
Investors' perception about disclosure of % Fund Allocation by Mutual funds								
Aggressive	14(3.5)	48 (12)	42(10.5)	32 (8)	34(8.5)	170 (42.5)	3.14	Chi^2=18.388** (df:8) Linear association= 0.668
Moderate	18(4.5)	55(13.8)	20(5)	42 (10.5)	30 (7.5)	165 (41.3)	3.06	
Conservative	9 (2.3)	12(3)	8 (2)	18 (4.5)	18 (4.5)	65 (16.3)	3.36	
Total	41 (10.3)	115 (28.8)	70 (17.5)	92 (23)	82 (20.5)	400 (100)	3.14	

* p<0.01 **p<0.05

One way ANOVA has been used for analyzing if age wise responses of investors significantly differ for disclosure practices of mutual funds. The ANOVA results for age and

disclosure practices are presented in Table 4.7, which highlights that age wise responses are significantly different for risk disclosure by mutual funds ($F(2, 397) = 6.236, p < 0.01$), disclosure of guaranteed returns ($F(2, 397) = 5.909, p < 0.01$), disclosure of maturity/liquidity ($F(2, 397) = 5.792, P < 0.01$). However, ANOVA results are not found significant for disclosure of load, disclosure of portfolio content and disclosure of % fund allocation.

Table 4.7 Age and Investors' Perception about disclosure Practices of Mutual funds						
Variable		Sum of square	df	Mean square	F	Sig.
Risk disclosure	Between the groups	14.64	2	7.322	6.236	0.002*
	Within the group	466.13	397	1.17		
	Total	480.77	399			
Disclosure of Entry/Exit load	Between the groups	2.348	2	1.17	0.799	0.451
	Within the group	583.59	397	1.47		
	Total	585.93	399			
Disclosure of portfolio content	Between the groups	2.185	2	1.093	0.699	0.498
	Within the group	621.005	397	1.564		
	Total	623.19	399			
Disclosure of guaranteed returns	Between the groups	13.884	2	6.94	5.909	0.003*
	Within the group	466.41	397	1.17		
	Total	480.25	399			
Maturity/ Liquidity	Between the groups	15.92	2	7.96	5.792	0.003*
	Within the group	545.82	397	1.37		
	Total	561.75	399			
Disclosure of % fund allocated	Between the groups	4.28	2	2.14	1.239	0.291
	Within the group	686.01	397	1.72		
	Total	690.29	399			

* $P < 0.01$

4.8 Perception towards mutual fund working

Perception of investors towards working style of mutual fund AMCs is a strong determinant of investors' risk perception. Responses of investors' on their experience with mutual funds' ability to yield expected return, hidden costs, AMCs ability to respond to volatility, investment style picked by AMCs to suit investors' objective, AMCs ability to protect investors' interest are important to study in order to extract exact information on how investors perceive the working of mutual funds.

Responses of investors pertaining to mutual funds' working ability are presented in Table 4.8. Firstly, overall mean score of respondents ($M=1.87$) for their opinion on actual returns delivered by mutual funds do not match with expected returns reveals that investors agree on this statement. Majority of investors ($n=183$) agree on poor working style of mutual funds, whereby they are not able to deliver expected returns. $\chi^2=35.722$ is significant ($p=0.003$) at 1 percent level which highlights that investors' knowledge and their perception towards mutual funds ability to yield expected returns are related. Among the various responses on mutual funds ability to respond to market volatility, it has been observed that although overall investors agree that mutual funds do not perform efficiently to tackle market volatility with ($M=2.05$, $n=180$) showing their consent. Responses of investors with very less knowledge ($M=2.05$) significantly differ from investors with extensive knowledge ($M= 1.1$). The result of Chi-square reveal that an association exists between investors' knowledge and their perception towards mutual funds' ability to respond to market volatility ($\chi^2=42.083$, $p=0.003$).

Analyses of Table 4.8 on hidden costs charged by mutual funds reveal that overall investors agree that mutual funds charge hidden costs on their investments and these are not earlier disclosed at the time of investment ($M=1.92$). Majority of investors ($n=153$) strongly agree that mutual funds charge hidden costs. Significance of Chi square is significant and it depicts a relation between investors' knowledge and their opinion about hidden costs charged by mutual funds ($\chi^2=30.158$, $p= 0.017$). Further, overall mean score of investors on their response to whether mutual funds invest funds in accordance to investors' objectives reveals that investors ($n=162$) agree ($M=2.16$) that MF do not invest funds according to investors' investment objectives. The results have $\chi^2=29.042$, is significant at 5 percent level ($p=0.024$). Investors also show their consent on the issue that agents of mutual funds are not well informed ($M= 2.10$, $n=177$). This indicates that investors realized mutual fund agents are not informed enough to bestow thorough information to investors. However, Chi square is not found to be significant in this case. Analysis of investors' responses on their perception towards mutual funds' ability to protect investors' interest also indicates that investors agree ($M=2.19$, $n=189$) that mutual fund AMCs do not take some special steps in order to protect investors' interest. The result of Chi square reveals that there is a strong association between

investors' knowledge and their perception towards mutual funds' working style ($\chi^2=28.846$, $p=0.025$). Finally, investors also positively affirm that mutual funds do not possess strong network ($M=2.24$, $n=146$). $\chi^2=15.382$ is not significant for investors' knowledge and investors' perception on mutual funds possess strong network.

One way ANOVA has been performed to analyze if investors' perception differ significantly for mutual funds working with their knowledge on finance. Results of ANOVA for investors' knowledge and their opinion for mutual funds' ability are shown in Table 4.9. The analysis of ANOVA reveals that there is a significant difference in responses of investors for their perception that mutual funds are not able to deliver expected returns, which yield $F(4, 395) = 3.082$, $p=0.016$. Further, ANOVA results are also found significant for investors' knowledge and their perception towards mutual funds' ability to respond to volatility, which yield F ratio of $F(4,395) = 2.623$, $p=0.034$. However, in rest of the cases ANOVA is not found significant that indicating that there is no significant difference in term of less knowledgeable or extensive knowledge able investors.

Table 4.8: Investor's Knowledge and Perception towards Mutual Funds ability								
Variable	SA (%)	A (%)	MA (%)	D (%)	SD (%)	Total (%)	Mean score	Test results
Actual return does not match with Expected returns								
Very less knowledge	7.3	5.3	0.5	0.3	0.3	13.5	1.59	Chi^2=35.722* (df:16) Linear association=2.52
Some knowledge	8.3	16	3	0.5	0.2	28	1.87	
Moderate Knowledge	11.8	17.3	4.3	2.3	0.3	35.7	1.937	
Good knowledge	8.3	6.5	3.8	0.7	1	20.3	2.0	
Extensive knowledge	1.8	0.8	0	0	0	2.5	2.30	
Total	37.3	45.8	11.5	3.8	1.8	100	1.87	
Mutual funds are poor to respond to market volatility								
Very less knowledge	2.8	8	2.3	0.3	0.3	13.5	2.05	Chi^2=42.083* (df:16) Linear association=0.354
Some knowledge	8.8	11.3	6	2	0	28	2.04	
Moderate Knowledge	11.5	15.3	4.8	4	0	35.7	2.07	
Good knowledge	5	10.3	3	1.3	0.8	20.3	2.16	
Extensive knowledge	2.3	0.3	0	0	0	2.5	1.1	
Total	30.3	45	16	7.5	1	100	2.05	
High hidden cost								
Very less knowledge	6	4	2.3	1	0.3	13.5	1.96	Chi^2=30.158** (df:16) Linear association=0.001
Some knowledge	12.3	8.5	5	2.3	0	28	1.98	
Moderate Knowledge	11.3	18.3	3.5	2.8	0	35.7	1.89	
Good knowledge	9.5	7	2	1.5	0.3	20.3	1.85	
Extensive knowledge	0.3	1.3	1	0	0	2.5	2.1	
Total	39.3	39	13.8	7.5	0.5	100	1.92	

Funds not invested according to investor's objective								
Very less knowledge	3	7	2	1.3	0.2	13.5	2.15	Chi^2=29.042** (df:16) Linear association=0.013
Some knowledge	6.5	14	5	2.5	0	28	2.14	
Moderate Knowledge	12.8	10.3	8.8	4	0	35.7	2.22	
Good knowledge	6.5	7.5	2.8	3.3	0.3	20.3	2.09	
Extensive knowledge	0.5	1.8	0	0.3	0	2.5	2.10	
Total	29.3	40.5	18.5	11.3	0.5	100	2.16	
Agents are not well informed								
Very less knowledge	4	5.8	2.3	1.3	0.3	13.5	2.11	Chi^2=16.772 (df:16) Linear association=0.263
Some knowledge	6.8	13	6.3	2	0	28	2.12	
Moderate Knowledge	11.5	13.3	7	3.8	0.3	35.7	2.10	
Good knowledge	5.3	10.3	2.8	1.5	0.5	20.3	2.09	
Extensive knowledge	0.5	2	0	0	0	2.5	1.80	
Total	28	44.3	18.3	8.5	1	100	2.10	
AMCs are not able to protect investors interest								
Very less knowledge	4.3	5	2.5	1.8	0	13.5	2.15	Chi^2=28.846** (df:16) Linear association=2.192
Some knowledge	7	15.3	3.3	2.5	0	28	2.06	
Moderate Knowledge	7	18	5.8	4.8	0.3	35.7	2.27	
Good knowledge	6	7.8	3.5	2.3	0.8	20.3	2.19	
Extensive knowledge	0	1.3	1.3	0	0	2.5	2.60	
Total	24.3	47.3	16.3	11.3	1	100	2.19	
Mutual funds don't possess strong network								
Very less knowledge	4.3	4.8	3.3	1	0.3	13.5	2.20	Chi^2=15.382 (df:16) Linear association=0.88
Some knowledge	8	10.8	5.8	3.3	0.3	28	2.20	
Moderate Knowledge	9.3	14	8	4.3	0.3	35.7	2.30	
Good knowledge	7	6.3	2.5	3.8	0.8	20.3	2.19	
Extensive knowledge	0.5	0.8	1	0.3	0	2.5	2.40	
Total	29	36.5	20.5	12.5	1.5	100	2.24	

*P< 0.01

Table 4.9 ANOVA For investor's knowledge and Perception towards Mutual fund ability						
		Sum of Squares	Df	Mean Square	F	Sig.
Actual return V/s Expected return	Between Groups	9.419	4	2.355	3.082	.016*
	Within Groups	301.82	395	.764		
	Total	311.24	399			
Poor response to volatility	Between Groups	9.727	4	2.432	2.623	.034*
	Within Groups	366.17	395	.927		
	Total	375.89	399			
Hidden cost	Between Groups	2.381	4	.595	.683	.604
	Within Groups	344.37	395	.872		
	Total	346.76	399			
Investor's Objective	Between Groups	.437	4	.109	.113	.978
	Within Groups	381.54	395	.966		
	Total	381.97	399			
Agents not informed	Between Groups	.978	4	.244	.274	.894

	Within Groups	351.82	395	.891		
	Total	352.79	399			
AMC does not protect investor's interest	Between Groups	4.011	4	1.003	1.095	.359
	Within Groups	361.73	395	.916		
	Total	365.75	399			
MF donot have strong network	Between Groups	1.044	4	.261	.238	.917
	Within Groups	433.31	395	1.097		
	Total	434.36	399			

*P<0.05

4.9 Investors' Risk Perception Analysis (IRPA)

The analysis carried out in previous sections explored the various factors that contribute towards the basic foundation of risk perception. This section provides the analysis of investors' risk perception towards mutual funds. Percentage responses and mean responses of different category of investors (age wise) have been computed and presented in Table 4.10. Analysis of result reveal that overall investors are willing to assume disclosed risk ($M=2.13$) with majority of aggressive investors ($n_1=60$), moderate investors ($n_2=60$) and conservative investors ($n_3=60$) showing positive assertion on their willingness to assume disclosed risk. The results of Chi square provide an association between age and willingness to assume risk as $\chi^2=20.625$ is significant at 1 percent level ($p=0.008$).

For understanding how investors evaluate various risk return pay-offs, a graphic illustration was presented to them where various options reflect the different combination of risk/return trade-off. Analysis of responses on investor's choice of assuming different risk level provides that aggressive investors ($M=3.46$) are more willing to assume higher risk than conservative investors ($M=1.92$). These results have revealed that given the choices with different level of risk involved, investors avoid extreme alternatives. These findings support the earlier findings of Simonson and Tversky (1992); Benartzi and Thaler (2002). Chi square is significant for age and level of risk assumed ($\chi^2=152.377$, $p<0.001$).

Further, for understanding the risk anatomy of investors 1-5 rating scale was designed where 1 means lowest scale and 5 means highest opinion. Investors' responses on how much they are worried about risk in mutual funds provide an insight that aggressive investors are less

worried ($M=2.711$) than moderate investors ($M=3.00$). Conservative investors are found to be most worried about risk in mutual funds ($M=3.13$). Result of Chi-square indicates that there is strong association between age and worried for risk ($\chi^2=24.85$, $p=0.002$). AMC's of mutual fund are responsible for overall working of mutual funds and have to make final choice of securities to be included in fund. Further, selection of timings when to buy and sell, estimating market trends, forecasting stock prices etc. are few responsibilities which AMC's are expected to perform with their professional skills. Performance of mutual fund AMC's at appropriate time may reduce investment risk significantly. It has been observed that aggressive investors are more optimistic about AMC's ability to estimate risk ($M=3.43$), whereas moderate investors are comparatively less confident ($M=3.16$) than aggressive investors. Conservative investors are found to be more pessimistic ($M=2.58$), with less confidence about AMC's ability to estimate risk. The results of Chi-square reveal an association between age and investors' perception about AMC's ability to estimate risk ($\chi^2=45.136$, $p<0.001$). Similarly, responses of investors on AMC's ability to control risk also reveal that aggressive investors are more confident ($M=3.40$) than moderate investors ($M=3.13$) and conservative investors have lowest mean score ($M=2.46$). Chi-square is significant, depicting an association between age and investors' perception towards AMC's ability to control risk ($\chi^2=53.108$, $p<0.001$). Analysis of investors' responses on probability to lose money in mutual fund provides that investors do not consider mutual funds as extremely volatile investment avenue ($M=2.90$). However, Chi-square is not found significant in this case.

The analysis of investors' responses on their perception towards loss in mutual funds, when there is downtrend in the market reveals that aggressive investors are less pessimistic ($M=3.63$) than moderate investors ($M=3.86$). However, conservative investors rate it highest ($M=4.16$) which is indicative of the fact that these investors expect maximum loss in mutual funds, whenever markets follow negative trend. $\chi^2=19.059$ is significant ($p<0.05$) at 5 percent level, which highlights significant association between age and investors' perception towards loss in mutual funds due to downtrend in markets. It has been observed that where aggressive investors are less pessimistic about negative trend similarly, these investors are somewhat optimistic ($M=3.86$) about mutual fund returns when followed with uptrend in the

stock market. Mean responses of moderate investors ($M= 4.07$) and conservative investors ($M= 4.30$) provides an insight that investors are highly optimistic that mutual funds will gain with uptrend in stock market. As seen from results of Chi square ($\chi^2=15.422$, $p\leq 0.05$), a strong association exists between age and investors' optimistic perception from mutual fund returns when markets follow uptrend.

Mutual fund advertisements play a significant role in investors' final investment decision. Thus, data has been collected and analyzed regarding investors' perception on how much claim they have on credibility of mutual funds' advertisement. Results as presented in Table 4.10 provide that aggressive investors ($M= 3.06$) are moderately satisfied with commitments mutual funds made through their advertisements, whereas mean scores of moderate investors ($M=2.72$), and conservative investors ($M= 2.55$) reveal that these investors have negative opinion about claims made by mutual funds in their advertisements. $\chi^2=35.667$ is significant at 0.1 percent level ($p\leq 0.001$) which portrays an association between age and investors' perception towards credibility of claims by mutual funds.

Further, it has been observed that aggressive investors are found to be more confident ($M= 3.54$), than moderate investors ($M=3.16$) and conservative investors ($M= 2.47$) in term of their expected annual returns (AR) from mutual fund investment. Even, results of Chi square are also significant at 0.001 percent level ($\chi^2=90.919$, $p<0.001$). Similarly, aggressive investors are found to be more confident ($M= 3.58$) than moderate investors ($M=3.29$) for total returns (TR) from mutual funds. Conservative investors have been observed as least confident ($M= 2.56$) regarding expected total returns from mutual funds. Results of chi square reveal that a strong association exists between age and confidence in expected TR from mutual funds ($\chi^2= 76.811$, $p= 0.001$).

Table 4.10 Investor's Risk Perception Analysis								
Willingness to take risk								
Age	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Total (%)	Mean Score	Test Results
Aggressive investors	12.8	15	11.3	3	0.5	42.5	2.14	Chi^2=20.625* (df:8) Linear Association=0.251
Moderate investors	7.5	21.5	11	1	0.3	41.3	2.15	
Conservative investors	3	9.5	3.5	0.3	0	16.3	2.06	
Total	23.3	46	25.8	4.3	0.8	100	2.13	
Level of Risk								
Aggressive investors	1.5	5.5	13.3	16.5	5.8	42.5	3.46	Chi^2=152.377* (df:8) Linear Association=96.30
Moderate investors	1.8	11.8	20.3	6	1.5	41.3	3.84	
Conservative investors	7	4.8	3.5	0.8	0.3	16.3	1.92	
Total	10.3	22	37	23.3	7.5	100	2.95	
Worried About risk in Mutual Funds								
Aggressive investors	5.8	12	15	8.3	1.5	42.5	2.711	Chi^2=24.85* (df:8) Linear Association=9.901
Moderate investors	3.3	7.8	17.5	11	1.8	41.3	3.00	
Conservative investors	2	3.3	3	6.5	1.5	16.3	3.13	
Total	11	23	35.5	25.8	4.8	100	2.90	
AMCs ability to Estimate Risk								
Aggressive investors	1.5	8.3	10.5	14.8	7.5	42.5	3.43	Chi^2=45.136* (df:8) Linear Association=24.79
Moderate investors	2.5	7.8	14.8	12.8	3.5	41.3	3.16	
Conservative investors	4	4	4.5	2.3	1.5	16.3	2.58	
Total	8	20	29.8	29.8	12.5	100	3.18	
AMCs ability to control risk								
Aggressive investors	1.8	7.5	12.8	12.8	7.8	42.5	3.40	Chi^2=53.108* (df:8) Linear Association=27.19
Moderate investors	3.3	9	11.8	13.5	3.8	41.3	3.13	
Conservative investors	5	4.5	3	1.8	2	16.3	2.46	
Total	10	21	27.5	28	13.5	100	3.14	
Probability of lose in MF								
Aggressive investors	4.3	9	18.5	8	2.8	42.5	2.90	Chi^2=12.052 (df:8) Linear Association=0.001
Moderate investors	2.8	11.3	16.3	10	1	41.3	2.88	
Conservative investors	1.3	3.5	6.8	4.8	0	16.3	2.92	
Total	8.3	23.8	41.5	22.8	3.8	100	2.90	
Lose due to downtrend in stock market								
Aggressive investors	2.3	4	10	17	9.3	42.5	3.63	Chi^2=19.059** (df:8) Linear Association=11.623
Moderate investors	1.8	4.5	6.3	13.8	15	41.3	3.86	
Conservative investors	0.3	0.5	2	7	6.5	16.3	4.16	
Total	4.3	9	18.3	37.8	30.8	100	3.81	
Gain due to Uptrend in stock market								
Aggressive investors	0.3	3.3	9	19.3	10.8	42.5	3.87	Chi^2=15.422** (df:8) Linear Association=11.83
Moderate investors	0.5	1.8	7.5	16	15.5	41.3	4.07	
Conservative investors	0	0.5	1.8	6.3	7.8	16.3	4.30	
Total	0.8	5.5	18.3	41.5	34	100	4.02	
Credibility of claims in Mutual fund Advertisement								
Aggressive investors	1.3	10	18.5	10.5	2.3	42.5	3.06	Chi^2=35.667* (df:8) Linear
Moderate investors	4.8	11.3	17.3	6.8	1.3	41.3	2.72	
Conservative investors	0.3	8	6.8	1.3	0	16.3	2.55	

Total	6.3	29.3	42.5	18.5	3.5	100	2.83	Association=17.96
Confidence of Annual Returns								
Aggressive investors	0.3	5.5	13.5	17.3	6	42.5	3.54	Chi^2=90.919* (df:8) Linear Association=50.64
Moderate investors	0.5	9.3	17.3	11.3	3	41.3	3.16	
Conservative investors	3.8	5.3	3.5	3.3	0.5	16.3	2.47	
Total	4.5	20	34.3	31.8	9.5	100	3.21	
Confidence of expected total returns								
Aggressive investors	0	6	14.3	13.8	8.5	42.5	3.58	Chi^2=76.811* (df:8) Linear Association=40.23
Moderate investors	0.8	7.8	15	14	3.8	41.3	3.29	
Conservative investors	3.5	4.5	4.5	3	0.8	16.3	2.56	
Total	4.3	18.3	33.8	30.8	13	100	3.30	
Overall risk in Mutual Funds								
Aggressive investors	1	8.8	18.5	10.3	4	42.5	3.17	Chi^2=56.361* (df:8) Linear Association=28.27
Moderate investors	1.3	4	17.3	14	4.8	41.3	3.41	
Conservative investors	0.3	1.8	3	4.3	7	16.3	3.98	
Total	2.5	14.5	38.8	28.5	15.8	100	3.40	

* P<0.001 ** P<0.05

Risk perception of any investor is mainly defined by his demographic composition. Age wise risk perception of investors towards risk involved in mutual funds has been presented in table 4.10. Analysis of investors' perception towards overall risk in mutual fund reveals that aggressive investor rate mutual funds less risky (M= 3.17) than moderate investors (M= 3.41). However, conservative investors are found to be most risk averse and rank mutual funds very risky (M=3.98). Results of Chi square highlight strong association between age and investors' risk perception towards overall risk involved in mutual funds (Chi²=56.361, $p \leq 0.001$).

Based on findings of this analysis, the first hypothesis H_1 has been accepted and confirmed. The results highlight that despite mutual funds' effort to design new fund schemes to suit investors' requirements investors consider mutual fund a risky investment. The findings of questionnaire have also revealed that investors have somewhat optimistic opinion about the working of AMCs and they are found to be confident about the returns that they will get on their investment. These findings confirm the second hypothesis of this study (H_2).

Age wise ANOVA results for investors' risk perception towards mutual funds is presented in Table 4.11. The analysis of ANOVA reveals that mean responses are significantly different

for investors of different age group and level of risk assumed by mutual funds with F ratio of $F(2, 397) = 64.782$, $p = 0.001$. These results highlight that investors' decision on level of risk they wish to assume is influenced by age group of investors. ANOVA results are also found significant for worried about risk in mutual funds with F ratio of $F(2, 397) = 5.322$, $p = 0.01$, risk estimated by mutual funds with F ratio of $F(2, 397) = 14.143$, $p \leq 0.001$ and risk control by mutual funds with F ratio of $F(2, 397) = 15.944$, $p = 0.001$.

Mutual funds invest their fund corpus in diversified securities of stock market. Thus, uptrends or downtrends in stock market certainly influence the returns that will accrue on mutual funds during different market trends. ANOVA results for age wise investors' perception towards loss from mutual funds due to downtrend in mutual funds indicates that responses of investors differ significantly ($F(2, 397) = 6.005$, $p = 0.003$). Similarly, ANOVA results are also significant for age wise investors' responses towards gain from mutual funds due to uptrend in market with F ratio of $F(2, 397) = 6.081$, $p = 0.003$.

Analysis of ANOVA results also reveal that age wise responses of investors significantly differ for credibility of claims by mutual funds with F ratio of $F(2, 397) = 9.774$, $p = 0.001$, investors' confidence in AR from mutual funds $F(2, 397) = 30.248$, $p < 0.001$, investors' confidence in TR from mutual funds $F(2, 397) = 24.710$, $p < 0.001$. Age plays an important role in determining the risk perception of investors. Results of one way ANOVA which yield F ratio of $F(2, 397) = 16.587$, $p = 0.001$ for age wise investors' risk perception towards overall risk in mutual funds reveals that investors' responses differ significantly. Based on results it can be inferred that age is a strong determinant for investors' risk perception.

One way ANOVA has also been carried out to determine if investors' risk perception is influenced by investors' knowledge. Results provided by ANOVA have been summarized in Table 4.12. Analysis of these results provides that responses of investors' risk perception differ significantly for investors' knowledge. ANOVA results for level of risk yield F ratio of $F(4, 395) = 33.963$, $p = 0.001$ reveals that level of risk to be assumed by investors vary significantly with investors' knowledge. ANOVA results are also significant for willingness to assume disclosed risk ($F(4, 395) = 4.070$, $p = 0.003$), worried about risk ($F(4, 395) =$

5.370, $p=0.001$), risk estimated by AMCs ($F(4,395) = 11.234$, $p=0.001$) and for AMCs ability to control risk ($F(4,395) = 8.722$, $p=0.001$).

Knowledge wise investors' responses differ significantly for their opinion on probability to lose money in mutual funds which is provided by F ratio of $F(4, 395) = 4.255$, $p=0.002$. Investors' knowledge also influences investors' perception towards credibility of claims in mutual fund advertisements which yields F ratio of $F(4, 395) = 5.805$, $p= 0.001$, confident about AR from mutual funds $F(4, 395) = 12.033$, $p= 0.001$, confident about TR from mutual funds $F(4, 395) = 10.278$, $p=0.001$. Finally, analysis of ANOVA results reveal that investors' perception towards overall risk in mutual funds also differ significantly for different categories of investors' knowledge, which yield F ratio of $F(4, 395) = 12.234$, $p=0.001$.

Table 4.11 ANOVA results for Age and Risk Perception Towards Mutual Funds						
		Sum of Squares	df	Mean Square	F	Sig.
Level of risk	Between Groups	114.238	2	57.119	64.782	.001*
	Within Groups	350.039	397	0.882		
	Total	464.278	399			
Willingness to take risk	Between groups	0.4	2	0.2	0.28	0.756
	Within groups	283.578	397	0.714		
	Total	283.977	399			
worried about risk	Between Groups	11.573	2	5.787	5.322	.005**
	Within Groups	431.624	397	1.087		
	Total	443.198	399			
Risk estimation by AMC	Between Groups	34.116	2	17.058	14.143	.001*
	Within Groups	478.821	397	1.206		
	Total	512.938	399			
Risk control by AMC	Between Groups	41.945	2	20.973	15.944	.001*
	Within Groups	522.215	397	1.315		
	Total	564.16	399			

Probability to lose	Between Groups	0.078	2	0.039	0.042	0.959
	Within Groups	373.922	397	0.942		
	Total	374	399			
Downtrend in stock market	Between Groups	14.084	2	7.042	6.005	.003**
	Within Groups	465.593	397	1.173		
	Total	479.678	399			
uptrend in stock market	Between Groups	9.624	2	4.812	6.081	.003**
	Within Groups	314.126	397	0.791		
	Total	323.75	399			
Credibility of Advertisement	Between Groups	15.788	2	7.894	9.774	.001*
	Within Groups	320.649	397	0.808		
	Total	336.437	399			
Confident of AR	Between Groups	54.49	2	27.245	30.248	.001*
	Within Groups	357.587	397	0.901		
	Total	412.078	399			
Confident of TR	Between Groups	48.266	2	24.133	24.71	.001*
	Within Groups	387.734	397	0.977		
	Total	436	399			
Overall risk in MF	Between Groups	30.724	2	15.362	16.587	.001*
	Within Groups	367.666	397	0.926		
	Total	398.39	399			

*P<0.001, ** P<0.01

Table 4.12 ANOVA results for Investors' Knowledge and Risk perception						
		Sum of Squares	df	Mean Square	F	Sig.
Level of risk	Between Groups	118.815	4	29.704	33.963	.001*
	Within Groups	345.462	395	.875		
	Total	464.278	399			
willingness to take risk	Between Groups	11.241	4	2.810	4.070	.003**
	Within Groups	272.737	395	.690		
	Total	283.978	399			
worried about risk	Between Groups	22.858	4	5.714	5.370	.001*
	Within Groups	420.340	395	1.064		

	Total	443.198	399			
Risk estimation by AMC	Between Groups	52.393	4	13.098	11.234	.001*
	Within Groups	460.545	395	1.166		
	Total	512.938	399			
Risk control by AMC	Between Groups	45.785	4	11.446	8.722	.001*
	Within Groups	518.375	395	1.312		
	Total	564.160	399			
Probability to lose	Between Groups	15.450	4	3.862	4.255	.002**
	Within Groups	358.550	395	.908		
	Total	374.000	399			
Downtrend in stock market	Between Groups	7.731	4	1.933	1.618	.169
	Within Groups	471.947	395	1.195		
	Total	479.678	399			
uptrend in stock market	Between Groups	10.981	4	2.745	3.467	.008**
	Within Groups	312.769	395	.792		
	Total	323.750	399			
Credibility of Advertisement	Between Groups	18.678	4	4.670	5.805	.001*
	Within Groups	317.759	395	.804		
	Total	336.438	399			
Confident of AR	Between Groups	44.758	4	11.189	12.033	.001*
	Within Groups	367.320	395	.930		
	Total	412.078	399			
Confident of TR	Between Groups	41.101	4	10.275	10.278	.001*
	Within Groups	394.899	395	1.000		
	Total	436.000	399			
Overall risk in MF	Between Groups	43.916	4	10.979	12.234	.001*
	Within Groups	354.474	395	.897		
	Total	398.390	399			

*P<0.001, ** P< 0.01

Income of investors has significant role to play in determining his perception towards risk involved in various investment avenues as an investor with strong financial background may be more opportunistic and willing to assume higher risk in anticipation of higher return. The motivation of their willingness to assume higher risk is the strong financial backup which they may use in order to offset their losses.

Income wise risk perception of investors has been summarized in Table 4.13. Results of this analysis highlight that basic investors are willing to assume lowest risk (M= 2.52) and Low tax payer somewhat higher risk than basic investors (M=2.63). However, results of high tax payers reveal that they are willing to assume higher risk (M= 3.27). Wealthy investors are will to assume the highest risk (M= 3.54). Chi square is significant at 0.1 percent level ($\chi^2=71.434$, $p<0.001$), which highlights a strong association between income and risk perception. Further, one way ANOVA has been applied to examine whether investors

perception towards assuming risk level vary significantly with income. Results of ANOVA highlight that income wise risk perception vary significantly for level of risk with F ratio of $F(3, 396) = 6.136$, $p < 0.001$.

Results of income wise perception towards AMC's ability to estimate risk also show that investors with lower income level are more pessimistic which is highlighted by the mean score of basic investors ($M = 2.82$), low tax payers ($M = 3.00$) whereas as higher mean score of tax payers ($M = 3.36$) and wealthy investors ($M = 3.75$) reveal their optimistic perception. Chi square is significant at 0.1 percent level which suggests an association between income and perception towards AMC's ability to estimate risk ($\chi^2 = 31.252$, $p < 0.001$). F ratio of $F(3, 396) = 8.443$ ($p < 0.001$) highlight that responses of investors vary significantly for their perception towards AMC's ability to estimate risk. Similarly, results of investors' responses for AMC's ability to control risk also reveal that basic investors ($M = 2.62$) and low tax payer ($M = 2.88$) have less trust in the working of AMC's whereas high tax payers ($M = 3.46$) and wealthy investors ($M = 3.59$) have more trust in working of AMC's. $\chi^2 = 45.121$ ($p < 0.001$) is significant depicting an association between income and perception towards AMC's ability to control risk. Results of ANOVA provide F ratio of $F(3, 396) = 13.308$ which is significant at 0.1 percent level ($p < 0.001$).

Table 4.13 Investor's Risk Perception Analysis								
Willingness to take risk								
Income	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Total (%)	Mean Score	Test Results
Basic investors	3.8	5.8	6.3	1	0.5	17.3	2.35	Chi^2=25.741** (df:12) Linear association=11.82
Low tax payer	5	16.3	10	1.8	0.3	33.3	2.27	
High Tax payer	12	20	7.3	1	0	40.3	1.93	
Wealthy investors	2.5	4	2.3	0.5	0	9.3	2.08	
Total	23.3	46	25.8	4.3	0.8	100	2.13	
Level of Risk								
Basic investors	4.3	5.3	3.5	3	1.3	17.3	2.52	Chi^2=71.434* (df:12) Linear association=42.787
Low tax payer	4.3	10.3	13.8	3.3	1.8	33.3	2.63	
High Tax payer	1.5	5.5	17	13	3.3	40.3	3.27	
Wealthy investors	0.3	1	2.8	4	1.3	9.3	3.54	
Total	10.3	22	37	23.3	7.5	100	2.95	
Worried About risk in Mutual Funds								
Basic investors	1.8	4.8	3.3	5.3	2.3	17.3	3.08	Chi^2=29.119* (df:12) Linear association=4.388
Low tax payer	2.3	6.5	14.5	8.8	1.3	33.3	3.00	
High Tax payer	6.3	9.5	14	9.8	0.8	40.3	2.73	
Wealthy investors	0.8	2.3	3.8	2	0.5	9.3	2.91	
Total	11	23	35.5	25.8	4.8	100	2.90	
AMCs ability to Estimate Risk								

Basic investors	2	4	7.3	3	1	17.3	2.82	Chi ² =31.252* (df:12) Linear association=23.132
Low tax payer	3.8	8.5	8.5	9	3.5	33.3	3.00	
High Tax payer	2	7	11.3	14.3	5.8	40.3	3.36	
Wealthy investors	0.3	0.5	2.8	3.5	2.3	9.3	3.75	
Total	8	20	29.8	29.8	12.5	100	3.18	
AMCs ability to control risk								
Basic investors	3.3	5	5.5	2	1.5	17.3	2.62	Chi ² =45.121* (df:12) Linear association=33.921
Low tax payer	5	7.5	10	7.8	3	33.3	2.88	
High Tax payer	1.5	7.8	9	14.5	7.5	40.3	3.46	
Wealthy investors	0.3	0.8	3	3.8	1.5	9.3	3.59	
Total	10	21	27.5	28	13.5	100	3.14	
Probability of lose in MF								
Basic investors	0.3	2.8	8.5	4.8	1	17.3	3.20	Chi ² =19.260 (df:12) Linear association=7.754
Low tax payer	3	7	13	8.5	1.8	33.3	2.96	
High Tax payer	4.5	12	15.8	7.5	0.5	40.3	2.68	
Wealthy investors	0.5	2	4.3	2	0.5	9.3	3.00	
Total	8.3	23.8	41.5	22.8	3.8	100	2.90	
Lose due to downtrend in stock market								
Basic investors	0.8	2.3	3.8	6.8	3.8	17.3	3.60	Chi ² =13.219 (df:12) Linear association=3.545
Low tax payer	1.3	3	5.3	12.5	11.3	33.3	3.88	
High Tax payer	2.3	3.8	7.5	15.3	11.5	40.3	3.74	
Wealthy investors	0	0	1.8	3.3	4.3	9.3	4.27	
Total	4.3	9	18.3	37.8	30.8	100	3.81	
Gain due to Uptrend in stock market								
Basic investors	0.3	2.5	2.3	5.8	6.5	17.3	3.91	Chi ² =29.39* (df:12) Linear association=0.136
Low tax payer	0	1.3	6.5	14.8	10.8	33.3	4.05	
High Tax payer	0	1.3	8	17	14	40.3	4.08	
Wealthy investors	0.5	0.5	1.5	4	2.8	9.3	3.86	
Total	0.8	5.5	18.3	41.5	34	100	4.02	
Credibility of Mutual fund advertisement								
Basic investors	1.5	5.8	6	3	1	17.3	2.78	Chi ² =16.627 (df:12) Linear association=0.979
Low tax payer	2.8	8.8	15	5	1.8	33.3	2.82	
High Tax payer	1.5	13.3	17	7.8	0.8	40.3	2.82	
Wealthy investors	0.5	1.5	4.5	2.8	0	9.3	3.02	
Total	6.3	29.3	42.5	18.5	3.5	100	2.83	
Confidence of expected AR								
Basic investors	1.8	5	5.3	4	1.3	17.3	2.88	Chi ² =33.969* (df:12) Linear association=22.047
Low tax payer	2.3	7.5	13	7.8	2.8	33.3	3.03	
High Tax payer	0.5	5.8	14	16.3	3.8	40.3	3.42	
Wealthy investors	0	1.8	2	3.8	1.8	9.3	3.59	
Total	4.5	20	34.3	31.8	9.5	100	3.21	
Confidence of expected TR								
Basic investors	1.3	5.8	4.3	4	2	17.3	2.98	Chi ² =31.886* (df:12) Linear association=15.008
Low tax payer	2	6.8	11.3	9.3	4	33.3	3.19	
High Tax payer	1	4.3	16.5	13.3	5.3	40.3	3.43	
Wealthy investors	0	1.5	1.8	4.3	1.8	9.3	3.67	
Total	4.3	18.3	33.8	30.8	13	100	3.30	
Overall risk in Mutual Funds								
Basic investors	0	1.8	5	5	5.5	17.3	3.82	Chi ² =34.660* (df:12) Linear association=20.856
Low tax payer	1.3	3.3	11.5	11.3	6	33.3	3.52	
High Tax payer	1.3	7.8	18	9.8	3.5	40.3	3.16	
Wealthy investors	0	1.8	4.3	2.5	0.3	9.3	3.24	
Total	2.5	14.5	38.8	28.5	15.8	100	3.40	

Further, analysis of Table 4.13 reveals that income level of investors does not influence their perception towards credibility of claim by mutual funds in their advertisement. Basic investors ($M=2.78$) and low tax payers ($M=2.82$) have low mean score, thus the investors in lower income bracket have negative assertion towards mutual funds' claim whereas in case of wealthy investors ($M= 3.02$) the same is not reported. Chi square ($\chi^2=16.627$, $p= 0.164$) is not significant which reveals that no association exists between income and perception towards claims by mutual fund advertisement. Moreover, results of ANOVA (Table 4.14) with F ratio of $F(3, 396)=0.620$, $p= 0.603$ also reveal that investors' responses does not vary significantly for different income level. Summary results of investors' confidence in AR from mutual funds indicates that investors in low income group have less confidence in returns from mutual funds as provided by mean scores of basic investors ($M= 2.88$) and low tax payer ($M=3.03$).

Investors gain confidence in AR from mutual funds when they are in upper income group, i.e., high tax payers ($M= 3.42$) and wealthy investors ($M= 3.59$). Result of Chi square is significant at 1 percent, which reveals an association between income and investors' confidence in AR from mutual funds ($\chi^2=33.969$, $p=0.001$). Further, F ratio of $F(3, 396) = 8.161$, $p< 0.001$ also reveal that investors' perception towards AR from mutual funds vary significantly with income level. Summarized results of investors' perception towards TR from mutual funds reveal similar results that income group significantly affect investors' confidence level. Investors in low income group, i.e., basic investors ($M= 2.98$) and low tax payers ($M= 3.19$) reveal less confidence in TR from mutual funds whereas high tax payers ($M= 3.43$) and wealthy investors ($M= 3.67$) show high confidence in TR from mutual funds. Significance of Chi square at 1 percent level ($\chi^2=31.886$, $p= 0.001$) highlights a relation between income and investors' confidence in TR from mutual funds. F ratio of $F(3, 396) =5.167$, $p= 0.002$ also highlight that investors' confidence in TR from mutual funds vary significantly for varied income level.

Finally, it has been observed that investors with low income level rate mutual funds high in terms of presence of risk, i.e., basic investors ($M= 3.82$), low tax payers ($M=3.52$) but in contrast investors with high income do not consider mutual funds as extreme risky, as their mean scores are higher, viz. high tax payer ($M= 3.16$) and wealthy investors ($M=3.24$). The results

of Chi square at 1 percent level reveals that an association exists between income and investors' risk perception ($\chi^2=34.660$, $p= 0.001$). ANOVA results of $F(3, 396) = 8.728$, $p<0.001$ also highlight that investors' responses vary significantly for different income level.

Risk perception of investors has been admitted to be a fundamental issue underlying a number of financial decisions. Previous studies on risk perception and tolerance have endeavored to identify number of socio – economic factors that determine the risk taking decisions of investors. Age (Morin and Suarez, 1983; Bodie *et al.* 1992; Riley and Chow, 1992; Palsson, 1996; Heaton and Lucas, 2000; Steinberg, 2005), income (Riley and Chow, 1992; Cicchetti and Dubin, 1994; Shaw, 1996; Bernheim *et. al.*, 2001; Ajmi, 2008) and education/ knowledge (Crimmon and Wehrung, 1990; Mankiw and Zeldes, 1991; Haliassos and Bertaut, 1995; Grimes and Snively, 1999) have been identified as the key factors that determine investors' risk taking behavior. Based on these findings an attempt has been made to understand investors' risk perception about MF along- with important socio- economic factors. The overall analysis provides that although investors admit that mutual fund investment is risky but their responses vary significantly with different levels of socio-economic status.

The findings of this analysis help in accepting and confirming the first hypothesis (H_1) and provide that despite mutual funds' effort to design new fund schemes to suit investors' requirements investors consider mutual fund a risky investment. The findings of questionnaire have also revealed that investors have an optimistic opinion about the working of AMCs and they are found to be confident about the returns that they will get. These results expose that investors admit mutual funds are vulnerable to market fluctuations but they are confident to get returns in the long run Based on these findings the second hypothesis of this study (H_2) that experienced investors may have more confidence regarding expected return from mutual funds.

Table 4.14 ANOVA results for income and investors' Risk Perception						
		Sum of Squares	df	Mean Square	F	Sig.
Level of risk	Between Groups	55.21	3	18.406	17.819	.000*
	Within Groups	409.05	396	1.033		
	Total	464.27	399			
willingness to take risk	Between Groups	12.61	3	4.204	6.136	.000*
	Within Groups	271.36	396	.685		
	Total	443.19	399			
worried about risk	Between Groups	8.45	3	2.818	2.567	.054
	Within Groups	434.74	396	1.098		
	Total	443.19	399			
Risk estimation by AMC	Between Groups	30.83	3	10.278	8.443	.000*
	Within Groups	482.10	396	1.217		
	Total	512.93	399			
Risk control by AMC	Between Groups	51.66	3	17.223	13.308	.000*
	Within Groups	512.49	396	1.294		
	Total	564.16	399			
Probability to lose	Between Groups	14.48	3	4.830	5.320	.001*
	Within Groups	359.51	396	.908		
	Total	374.00	399			
Downtrend in stock market	Between Groups	12.07	3	4.026	3.410	.018**
	Within Groups	467.59	396	1.181		
	Total	479.67	399			
uptrend in stock market	Between Groups	2.53	3	.844	1.041	.374
	Within Groups	321.21	396	.811		
	Total	323.75	399			
Credibility of Advertisement	Between Groups	1.57	3	.524	.620	.603
	Within Groups	334.86	396	.846		
	Total	336.43	399			
Confident of AR	Between Groups	23.99	3	7.998	8.161	.000*
	Within Groups	388.08	396	.980		
	Total	412.07	399			
Confident of TR	Between Groups	16.42	3	5.475	5.167	.002*
	Within Groups	419.57	396	1.060		
	Total	436.00	399			
Overall risk in MF	Between Groups	24.70	3	8.236	8.728	.000*
	Within Groups	373.68	396	.944		
	Total	398.39	399			

* P<0.01 ** P<0.05

4.10 Factor analysis

To understand the interrelationship among a large number of variables and to explain these variables in terms of their common underlying dimensions factor analysis has been applied. Factor analysis technique of data reduction has been applied on section C, D and E with principal component analysis (Varimax rotation) and Kaiser normalization. Factor analysis

has resulted in six factors as presented in Table 4.15. Detail of rotated component matrix is provided in annexure B.

Factor analysis on investors' perception identifies six factors viz.

- 1 Risk management and confidence
- 2 Disclosure practices
- 3 Capability and Investor's expectations
- 4 Performance
- 5 Risk Perception
- 6 Market Volatility

These six factors account for total variance of 59.64%. Risk management and Confidence factor that includes willingness to assume risk (0.553), AMC's ability to estimate risk (0.791), AMC's ability to control risk (0.740), credibility of mutual fund advertisements (0.573), investors' confidence in AR (0.821) and TR (0.833) from mutual funds emerges as an important factor and explains 20.876% variance. The results highlight that investors have trust in the working of AMC's for risk estimation (M= 3.18) and risk control (M=3.14). Investors' also reveal their moderate degree of confidence in AR (M= 3.21) and TR (M= 3.30).

Disclosure practice has emerged as the second most important factor which accounts for total variance of 14.895%. The major elements of this factor are disclosure of fundamental risk in mutual funds (0.644), disclosure of entry/exit load (0.768), disclosure of portfolio content (0.739), disclosure of guaranteed returns (0.526), disclosure about maturity/liquidity (0.504), and disclosure about % portfolio allocation (0.702). Mean score ranging from 3.11 to 3.92 for all the disclosure practices reveals that investors do not agree that mutual funds disclose complete information to them.

Table 4.15 Factor Analysis						
Factor Name	Eigen Value	%of variance	Item Name	Item Loading	Mean	S.D
Risk management and Confidence	5.219	20.876	Level of risk	0.553	2.95	1.07
			Risk estimation by AMC	0.791	3.18	1.13
			Risk control by AMC	0.740	3.14	1.18
			Credibility of MF Claims	.573	2.83	0.92
			Confident about AR	.821	3.21	1.01
			Confident about TR	.833	3.30	1.04
Disclosure practices	3.724	14.895	Disclosure or risk	0.644	3.70	1.09
			Disclosure of load	0.768	3.11	1.21
			Disclosure of portfolio content	0.739	3.29	1.25
			Disclosure of guaranteed return	0.526	3.77	1.09
			Disclosure of maturity/liquidity	0.504	3.92	1.18
			Disclosure of % fund allocated	0.702	3.14	1.31
Capability & investor's expectations	1.882	7.527	ignore investor's objective	0.603	2.16	0.95
			Agents are not informed	0.773	2.10	0.94
			AMCs protect investor's interest	0.755	2.19	0.96
			MF do not possess strong network	0.659	2.24	1.04
Performance	1.568	6.273	Actual v/s expected return	0.785	1.87	0.88
			poor response to volatility	0.607	2.05	0.97
			High hidden cost	0.505	1.92	0.93
Risk Perception	1.423	5.691	Willingness to take risk	0.640	2.13	0.84
			Worried about risk	0.661	2.90	1.05
			Probability of lose in MF	0.758	2.90	0.968
			Overall risk in MF	0.563	3.40	0.99
Market volatility	1.099	4.395	Uptrend in stock market	0.714	4.02	0.90
			Downtrend in stock market	0.642	3.81	1.09

Capability of mutual funds and investors' expectation has been recognized as third important factor that accounts for 7.527% variance. The major variables comprising this factor include mutual funds ignore investors' objective (0.603), agents are not informed (0.553), AMCs inability to protect investors' interest (0.755), mutual funds do not possess strong network (0.659). The mean scores of these variables ranging between 2.10 to 2.24 highlight that investors' agree with incompetence possessed by mutual funds.

Next factor that emerges from factor analysis is performance of mutual funds that account for 6.273% variance. The major elements of this factor are mutual funds do not deliver expected returns (0.659), mutual funds are poor to respond to market volatility (0.785), high hidden cost (0.505). Actual returns from mutual funds do not match with expected returns with $M=1.87$ reveals that investors agree that mutual funds do not perform professionally in order to deliver expected returns. Similarly, $M=2.05$ for mutual funds poor response to volatility expose the fact that investors believe in professional incompetence on the part of mutual funds. Last component of this factor has $M=1.92$, which indicates that investors believe mutual funds have high hidden costs.

Risk perception has emerged as another component of factor analysis accounting for 5.691% variance. Major elements of this factor include willingness to take risk (0.640), worried about risk (0.661), probability of lose in mutual fund (0.758), overall risk in mutual fund (0.563). Mean scores of investors' responses on how much worried they are about risk in mutual funds ($M=2.90$) and probability of lose in mutual funds ($M=2.90$) reveal moderate degree of apprehensions but $M= 3.40$ for overall risk in mutual funds highlights that investors rate mutual funds as somewhat risky investment.

Last factor has been identified as market volatility which account for 4.395% of variance. This factor comprises of two components, i.e., gain in mutual funds due to uptrend in stock market (0.714) and loss in mutual funds due to downtrend in mutual funds (0.642). Mean score of these results reveal that investors are more optimistic about high returns from mutual funds due to uptrend in stock market ($M= 4.02$) whereas they also anticipate high risk from mutual funds due to downtrend in stock market ($M=3.81$).

4.11 Canonical Correlation and Regression Analysis

The main objective of this research was to identify factors responsible for creating gap in investor's expectations from security returns and actual portfolio management by mutual funds, for which multivariate statistical technique canonical correlation has been used. Canonical correlation has been applied to examine relationship between a set of dependent and independent variables with little prior knowledge of such relationships. For the purpose

of examining the core objective of research a set of dependent variables that included investors' confidence in returns from mutual funds, level of risk they wish to assume and their perception towards overall risk in mutual funds and the independent variables that included Age, income, investors' knowledge, worried, probability of lose, credibility of advertisement have been considered. Results provided by canonical correlation have been summarized in Table 4.16. Detail outcome of SPSS results are provided in Annexure C. The results presented in table 4.16 highlight a significant canonical correlation ($r= 0.788$, $p \leq 0.001$) between a set of variables representing investors' risk perception and set of independent variables. Canonical loadings provide the correlation between each item and linear combinations of variable for the same set whereas cross loadings provide correlation between each item in one variable set and canonical variate for other variable set (Leech *et. al.*, 2005).

These canonical loadings provide that highest loading is for risk level -0.824 which highlight influenced relation between risk level and variables in the dependent set. Similarly among the dependent set of variables highest loading for is for age (0.646). The redundancy index presented in table is 0.325 and 0.190 for the dependent and independent canonical variates respectively, which indicates the amount of mean variance of the variable of one set that is explained by a canonical variate of the other set. Canonical correlation measures the correlation between individual independent and dependent variables and their respective canonical variates. Further, for assessing the stability of canonical loadings, stability runs have been performed by step down deletion of each independent variable. Although, results of canonical correlation vary significantly with deletion of age as an independent variable but still positive and high relationship is revealed ($r= 0.713$, $p \leq 0.001$), but results do not vary extremely in rest of the dropped cases. Results of canonical correlation even vary somewhat when credibility as independent variable is deleted, which produces $r= 0.755$ but even it is found significant $p \leq 0.001$. The cross loadings of independent variable from this analysis indicate that age and worries have largest cross loadings on dependent set with cross loading of 0.509 and 0.429. Finally, to assess the validity of canonical loadings, stability runs have been made by dropping one variable at a time and canonical correlation was re-executed. Columns 3, 4, 5, 6, 7 and 8 respectively highlight stability of canonical loadings.

Table 4.16 Analysis of Canonical Correlation Results								
	Results with all variables		Result after deletion of					
			Age	Income	Knowledge	Worried	Probability	Credibility
Canonical correlation	0.788		0.713	0.766	0.773	0.770	0.764	0.755
F statistic	0.001		0.001	0.001	0.001	0.001	0.000	0.000
Dependent variable	Canonical cross loading	Canonical loadings	Canonical loadings					
Confident AR	-0.576	-0.731	-0.737	-0.730	-0.748	-0.739	-0.719	-0.677
Confident TR	-0.512	-0.650	-0.664	-0.655	-0.662	-0.641	-0.656	-0.604
Risk level	-0.649	-0.824	-0.773	-0.815	-0.806	-0.837	-0.861	-0.827
Overall risk	0.536	0.681	0.727	0.690	0.686	0.659	0.627	0.722
Shared Variance	0.524		0.528	0.526	0.529	0.523	0.520	0.507
Redundancy index	0.325		0.268	0.309	0.316	0.311	0.304	0.289
Independent variables	Canonical cross loading	Canonical loadings	Canonical loadings					
Age	0.509	0.646	NA	0.661	0.654	0.665	0.677	0.669
Income	-0.356	-0.451	-0.490	NA	-0.457	-0.463	-0.468	-0.473
Knowledge	-0.512	-0.650	-0.705	-0.666	NA	-0.666	-0.676	-0.681
Worried	0.429	0.544	0.619	0.563	0.557	NA	0.543	0.576
Probability	0.399	0.506	0.588	0.526	0.523	0.508	NA	0.537
Credibility	-0.389	-0.494	-0.538	-0.507	-0.507	-0.510	-0.516	NA
Shared variance	0.307		0.351	0.346	0.295	0.324	0.339	0.351
Redundancy index	0.190		0.178	0.203	0.176	0.192	0.198	0.20

Second stage canonical correlation has been examined after deleting risk level from dependent set of variables. Results of second stage canonical correlation are presented in Table 4.17. These results highlight significant canonical correlation ($r= 0.712$, $p\leq 0.001$) between investors' confidence from mutual fund returns and risk perception towards mutual funds and a set of independent variables. Results of canonical correlation vary from $r= 0.664$ to $r= 0.707$ with deletion of independent variables individually. The redundancy index is 0.301 and 0.154 for dependent and independent variables respectively. The redundancy index

is a measure of the variance of one set of variables predicted from the linear combination of the other set of variables. The cross loadings of independent variable from this analysis indicate that probability and worries have largest cross loadings on dependent set with cross loading of 0.438 and 0.453. Finally, to assess the validity of canonical loadings, stability runs have been made by dropping one variable at a time and canonical correlation was re-executed.

Table 4.17 Analysis of Canonical Correlation Results with stability analysis								
	Results with all variables		Result after deletion of					
			Age	Income	Knowledge	Worried	Probabilit	Credible
Canonical correlation	0.712		0.665	0.697	0.707	0.690	0.664	0.677
F statistic	0.001		0.001	0.001	0.001	0.001	0.001	0.001
Dependent variable	Canonical cross loading	Canonical loadings	Canonical loadings					
Confident AR	-0.574	-0.807	-0.78	-0.80	-0.811	-0.828	-0.830	-0.745
Confident TR	-0.509	-0.715	-0.70	-0.71	-0.717	-0.711	-0.765	-0.661
Overall risk	0.560	0.787	0.806	0.791	0.783	0.771	0.741	0.849
Shared Variance	0.594		0.588	0.593	0.595	0.595	0.608	0.571
Redundancy index	0.301		0.260	0.288	0.297	0.283	0.268	0.262
Independent variables	Canonical cross loading	Canonical loadings	Canonical loadings					
Age	0.395	0.555	NA	0.566	0.559	0.575	0.600	0.568
Income	-0.287	-0.403	-0.287	NA	-0.406	-0.417	-0.429	-0.422
Knowledge	-0.404	-0.568	-0.404	-0.580	NA	-0.585	-0.607	-0.595
Worried	0.438	0.615	0.442	0.630	0.618	NA	0.648	0.662
Probability	0.453	0.637	0.457	0.651	0.640	0.652	NA	0.688
Credibility	-0.352	-0.495	-0.346	-0.503	-0.500	-0.518	-0.550	NA
Shared variance	0.303		0.348	0.346	0.304	0.308	0.327	0.353
Redundancy index	0.154		0.154	0.168	0.152	0.147	0.144	0.162

Columns 3, 4, 5, 6, 7, and 8 respectively highlight stability of canonical loadings which provide an insight that canonical correlation vary significantly when one by one independent variables are deleted from set of variables. Detail SPSS outcome of second stage canonical results are provided in Annexure D.

For a closer examination of relationship between investors' risk perception towards mutual funds and its determinants, multiple regression has also been used taking investors' confidence in mutual fund returns as dependent variable and investors' believe in Mutual funds' ability as independent variables. The general purpose of multiple regression is to learn more about relationship between several predictor variables and a criterion variable. The results of multiple regression have been summarized in Table 4.18. The Durbin Watson statistic= 1.79 (which tests whether adjacent residuals are correlated) is found satisfactory. The multivariate test statistic reveals multiple correlation coefficient (R) is 0.705 ($R^2=0.497$) and $\bar{R}^2 = 0.491$.

The value of $\bar{R}^2$ measures variability in the outcome by predictor variable which leads to the connotation that 49.1% of the variance in confident about TR can be predicted from investors' belief in AMCs ability, Age, credibility and worries. The results indicate that all the predictor variable, i.e., risk estimation by AMCs ($p < 0.001$), risk control by AMCs ($P < 0.001$), credibility ($p < 0.001$), worried ($p < 0.001$) and age ($p < 0.01$) yield significant results. The standardized $\beta=0.38$ reveals that risk estimation by AMCs contribute maximum to the model which indicates that a unit change in this predictor variable has a large effect on criterion variable. Similarly, high $t = 8.378$ indicate that predictor variable has large impact on criterion variable. The tolerance values highlight the correlation between the predictor variables whereas VIF is an alternative measure of collinearity in which high values reveal strong relationship between predictor variables. The tolerance for each variable is > 0.616 (1.623) which indicate that there is no problem of multi collinearity (overlap between dependent variables). It is important to mention here that step wise multiple regression has been applied and all the variables are considered together when these values are computed and deleting any one variable from the independent variable can affect the level of significance for other dependent variable. Detail SPSS results of multiple regression for investors' confidence in TR is provided in Annexure E.

Table 4.18 Results of Multiple Regression Analysis for Confidence in MF returns [DV]						
Dependent Variable Confident about TR	Multiple R	R ²	Adjusted R ²	F Probability	Durban Watson Statistics	
	0.705	0.497	0.491	0.005	1.79	
Independent Variable	B	β	Standard Error	t-Value	Significance of t	Tolerance/VIF
Risk Estimation By AMC	0.35	0.38	0.042	8.378	0.000	0.616/1.623
Risk control by AMC	0.218	0.247	0.039	5.565	0.000	0.640/1.562
Credibility of advertisement	0.161	0.142	0.043	3.722	0.000	0.875/1.143
Worried about risk	-0.138	-1.40	0.039	-3.567	0.000	0.826/1.21
Age	-0.174	-1.20	0.055	-3.141	0.002	0.869/1.174
Dependent Variable Confident about AR	Multiple R	R ²	Adjusted R ²	F Probability	Durban Watson Statistics	
	0.704	0.497	0.490	0.000	2.002	
Independent Variable	B	β	Standard Error	t-Value	Significance of t	Tolerance/VIF
Risk Estimation By AMC	0.267	0.297	0.04	6.636	0.000	0.636/1.571
Risk control by AMC	0.210	0.246	0.039	5.375	0.000	0.613/1.632
Credibility	0.225	0.203	0.042	5.375	0.000	0.893/1.120
Age	-0.246	-0.175	0.053	-4.611	0.000	0.893/1.120
Probability	-0.165	-0.157	0.039	-4.189	0.000	0.907/1.103

Analysis of multivariate statistic for investors' confidence in AR from mutual funds reveal that $R=0.704$ ($R^2=0.496$) and $\bar{R}^2=0.490$ provide that 49% variance in investors' confidence can be predicted from Investors' trust in AMCs working, credibility, age and probability. These results are found significant at 0.1 percent level ($p < 0.001$). For multiple regression between investor' confidence in annual returns from mutual funds as criterion variable and predictor variable provide Durbin Watson statistic of 2.002 which is quite satisfactory. The standardized $\beta=0.297$ reveals that risk estimation by AMCs contribute maximum to the model which indicates that a unit change in this predictor variable has a large effect on

criterion variable. Similarly, high $t = 6.636$ for risk estimation by AMCs indicate that predictor variable has large impact on criterion variable. As step wise regression has been used, t value is found significant for all the predictor variables and variables with not significant t value were automatically deleted. The tolerance for each variable is > 0.636 (1.571) which indicate that there is no problem of multi collinearity (overlap between dependent variables). The details of step wise regression have been presented in Annexure F.

Multiple regression has also been carried for examining the relationship between investors' risk preference as criterion variable and a set of independent variables. The results of multiple regression for investors' risk preference as criterion variable are summarized in table 4.19. Analysis of these results provides $R = 0.668$ ($R^2 = 0.446$) and $adjusted R^2 = 0.439$ which is significant ($p < 0.001$). Durbin Watson statistic of 1.65 tests whether adjacent residuals are correlated is found satisfactory. $\beta = -0.378$ highlight that age is a strong predictor in investors' decision on level of risk they wish to assume, whereas $\beta = 0.223$ also highlight a significant impact of investors' knowledge on their willingness to assume a specified risk level.

Table 4.19 Results of Multiple Regression Analysis for Risk Perception [DV]						
Dependent Variable Risk Level	Multiple R	R^2	Adjusted R^2	F Probability	Durban Watson Statistics	
	0.668	0.446	0.439	0.000	1.65	
Independent Variable	B	β	Standard Error	t-Value	Significance of t	Tolerance/VIF
Age	-0.567	-0.378	0.06	-9.45	0.000	0.878/1.138
Knowledge	0.237	0.223	0.047	5.03	0.000	0.718/1.392
Income	0.229	0.187	0.051	4.525	0.000	0.827/1.209
Credibility	0.207	0.176	0.046	4.510	0.000	0.925/1.082
Worried about risk	-0.131	-0.127	0.04	-3.286	0.001	0.938/1.066
Dependent Variable Overall Risk in MF	Multiple R	R^2	Adjusted R^2	F Probability	Durban Watson Statistics	
	0.598	0.358	0.348	0.000	1.814	
Independent Variable	B	β	Standard Error	t-Value	Significance of t	Tolerance/VIF
Probability of lose	0.304	0.295	0.048	6.310	0.000	0.748/1.337
Age	0.239	0.172	0.06	3.971	0.000	0.868/1.152
Worried	0.149	0.157	0.046	3.257	0.000	0.699/1.43
Income	-0.144	-0.126	0.051	-2.825	0.005	0.815/1.227
Downtrend in market	0.142	0.155	0.040	3.534	0.000	0.845/1.183
knowledge	-0.126	-0.128	0.046	-2.708	0.007	0.729/1.372

High t values for all the predictor variables highlight their significant impact on criterion variable. The tolerance for each variable is > 0.878 (1.138) which indicate that there is no problem of multi collinearity (overlap between dependent variables).

Finally, the prime objective of research has also been examined through multiple regression for examining the relationship between how investors perceive overall risk in mutual funds and a set of predictor variables that included probability, age, worries, income, downtrend in stock market and investors' knowledge. Results summarized in Table 4.19 provide that $R = 0.598$ ($R^2 = 0.358$) and *adjusted* $R^2 = 0.348$ which is significant at 0.1 percent level ($p < 0.001$). Durbin Watson statistic (1.814) has also been examined to test whether adjacent residuals are correlated is also found to be satisfactory. Further, standardized $\beta = 0.295$ for probability to lose and $\beta = 0.172$ for age also provide that these predictor variables have most significant impact on investors' risk perception towards mutual funds risk. Similarly, high t value for probability ($t = 6.310$) and age ($t = 3.971$) provide that predictor variables have significant impact on criterion variables. The tolerance values highlight the correlation between the predictor variables whereas VIF is an alternative measure of collinearity in which high values reveal strong relationship between predictor variables. The tolerance for each variable is > 0.748 (1.337) which indicate that there is no problem of multi collinearity (overlap between dependent variables). It is important to note that all the variables are considered together when these results are computed. Therefore, deleting any one of the independent variable can affect the level of significance for dependent variable. As, step wise multiple regression has been used for risk perception, any independent variable that does not yield significant results is automatically deleted. The details of step wise regression have been presented in Annexure H.

4.12 Concluding Remarks

The thorough examination of empirical results has unleashed a fresh understanding of investors' perception for risk in mutual funds. Generally, mutual funds AMCs consider a few parameters in determining the risk appetite of investors, but these results provide a deep

insight on how much confidence investors have in the professional competence of mutual fund AMCs and the overall rating they perceive for presence of risk in mutual funds. Standardized statistical techniques like Chi square, ANOVA, Factor analysis has been used to examine and uncover the hidden expectation of investors. The Canonical correlations have been used to investigate the relationship between a set of multiple dependent and set of multiple independent variables. Further, for closer examination of relationship between dependent and set of independent variable multiple regression analysis has been carried out. In the next chapter analysis of risk assumed by mutual funds due to different investment styles along with a few strategies of proactive risk management have been presented with the objective to align mutual funds working with investors' expectations.

CHAPTER – V

ANALYSIS OF FINANCIAL PERFORMANCE OF MUTUAL FUNDS

5.1 Introduction

Mutual fund investment is generally preferred by investors because of their professional management and ability to diversify funds in various sectors and thus, reducing the possibility of unsystematic risk. Based on different investment objectives fund managers have to use their specialized skills and adopt varied investment styles. Although, Mutual fund industry in India has been in presence for more than half a century but the accelerated growth has been recorded after the participation of private players in this industry and liberalization policy adopted by government in 1990s. Thus, for analyzing the financial performance the study focused on the post liberalization era and analysis has been done for the period 1999 – 2009.

For the purpose of this study four mutual funds, i.e., UTI Mutual Fund, SBI Mutual Fund, Reliance Mutual Fund, ICICI Prudential Mutual Fund were taken as these are the most common options among mutual fund that are preferred by individual investors based on their reliability. A large number of schemes are available under these AMCs, but for analysis few important one have been included viz. Equity-growth funds, Balanced- growth funds and Income-growth funds. Among the equity funds SBI Magnum Equity Fund (SBIMEF), UTI Equity Fund (UTIEF), ICICI Prudential Aggressive fund (ICICIPAF) and Reliance Equity Fund (RELEF) have been examined. Balanced funds include UTI Balanced Fund (UTIBF), SBI Magnum Balanced Fund (SBIMBF), ICICI Prudential Balanced Fund (ICICIPBF) and Reliance Balanced Fund (RELBF). Finally, income funds include UTI Income Fund (UTIIF), SBI Magnum Income Fund (SBIMIF), ICICI Prudential Income Fund (ICICIPIF) and Reliance Income Fund (RELIF). This chapter presents the detailed analysis of secondary data, which reveals the working style and performance of different mutual funds. Further, for the purpose of analyzing the performance of these funds, secondary data has been collected and studied for the past 36 months, i.e., January 2007- December 2009 due to data availability constraint, as private sector funds under the study were not in existence during

1990s. Moreover, during this 36 months period markets faced both extreme bearish and bullish trend.

5.2 Indian mutual fund industry during 1999 – 2009

With financial innovations taking lead in the Indian capital markets AMC's were encouraged to come up with added schemes to suit investor's requirement. During the last decade mutual fund industry in India has widened its dimensions from providing only debt and equity funds to gilt edged funds, index funds, sector funds etc. and as a result the number of schemes operating increased from 284 to 451 from 1999 to 2005 and visible growth can be traced from 933 schemes currently operating in India in 2009 (Figure 5.1). Open ended schemes have also reported a spurt in growth with only 155 open end schemes in 1999 and now there are 589 open end schemes operating in 2009.

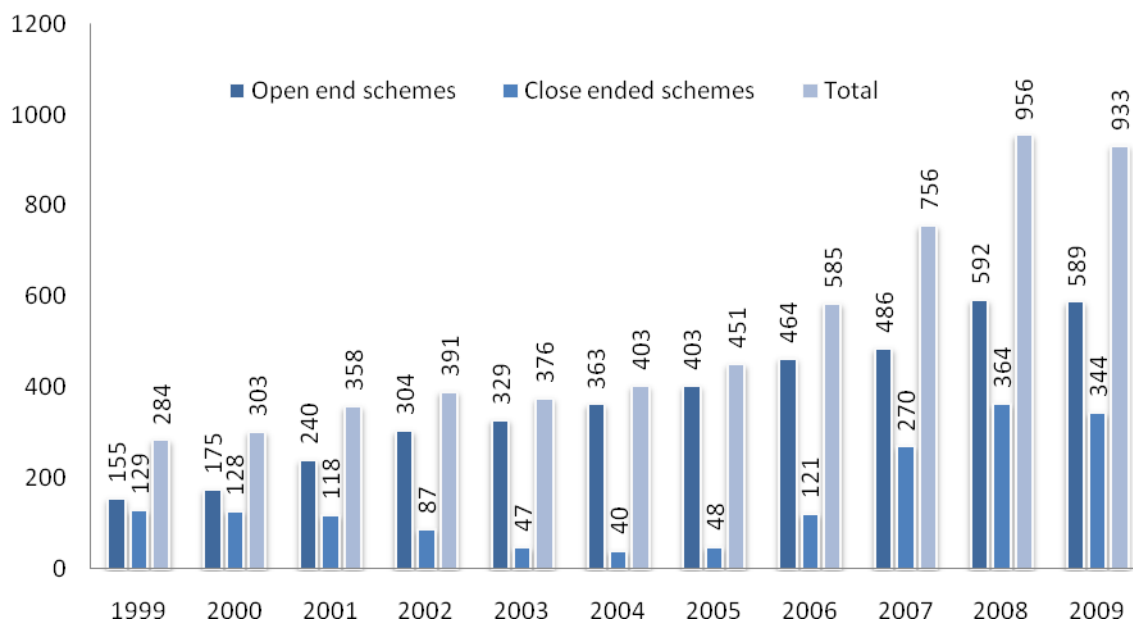


Figure 5.1 Growth of Mutual fund Schemes

On the other hand there is a reverse trend in case of close ended schemes which reduced to 40 schemes in 2004 from 129 in 1999. But the trend reversal during 2005 encouraged mutual funds to design more close ended schemes and presently 344 close ended schemes are operating in India. The key to this speedy growth can be attributed to the higher saving

pattern in India, as Indian investors are admitted to be highly future conscious. In addition to this, improved lucidity in regulatory framework has fetched the trust of Indian investors.

Financial liberalization era in the last decade has put its everlasting impact on Indian financial markets, especially the mutual funds which has resulted in the rolling over size of Assets Under Management (AUM). During the last ten years, industry has grown at nearly 22.29% compounded annual growth rate (CAGR). Although there was hardly any increase in number of AMC's operating during last ten years, as it rose from 31 in 1999 to 33 in 2009 but these AMC's adopted innovative ideas to lure more number of investors and net AUM increased from \$16111 million in march 1999 to \$ 126225 million in march 2008 (see figure 5.2), however, the impact of worldwide global crises is witnessed by decline in AUM of mutual funds during 2009.

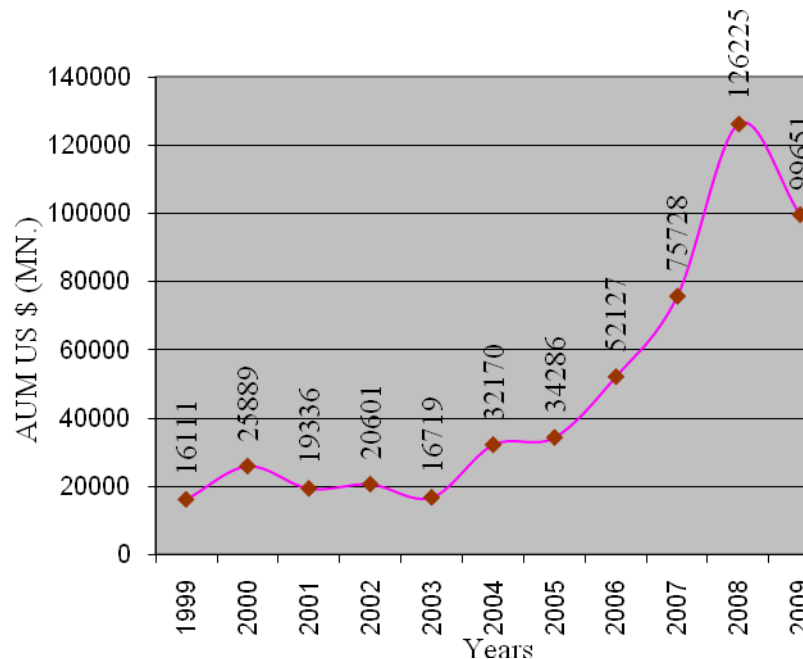


Figure 5.2 Assets under management (AUM)

Spontaneous growth of AUM in Indian mutual fund industry can be clearly seen with AUM of \$16719 million in 2003 increasing to \$ 126225 million in 2008. Despite the world – wide financial crisis in early 2008, the impact was not visible in case of mutual funds. During

April 2008, AUM witnessed an impressive growth of 7.32% within one month. Out of 33 AMCs operating in India 26 reported a rise in AUM during April 2008 over March 2008. Where ICICI Prudential has shown a growth rate of 2.55% over March 2008, Reliance mutual fund reported a growth of 5.99% with AUM Rs 9638.64 millions in April 2008. AUM of UTI increased by 7.28% during this period with highest inflow of Rs 356.659 million.

With increased risk appetite, high income and improved awareness, Indian investors have preferred mutual fund as an investment than traditional investments in government securities. This fact is quite apparent from data presented in Table 5.1 which shows that total net assets of mutual fund industry in India grew by 22.29% (CAGR) during 1999 – 2009. An appreciable increase in net assets can be seen in the year 2008 where growth rate has been reported as 54.81% from previous year. However, data of 2009 is quite disappointing as even mutual fund industry was not left untouched from the global financial crisis which resulted in negative trend in net assets of mutual funds. Thus, as a result of global crisis during 2009 mutual fund industry witnessed a negative growth rate of -17.39%.

Mutual fund in India has a great potential but despite the high growth rate of mutual fund industry it has been ranked at 19th position among worldwide nations because Indian markets have yet to tap their complete potential. Most neglected area where mutual fund industry is lacking its concentration is rural market where lack of awareness, limited banking services, poor networking is putting hurdles in the involvement of rural investors. Although UTI has tried to maintain its monopoly in mutual fund industry since its inception, data in Table 5.1 reveals that despite the deregulation in financial policies by regulatory authorities, it took private players a long time to embed their position in Indian mutual fund industry. Private players entered into mutual fund industry with a wide range of fund choices in 1993 that not only intensified competition but also helped mutual fund industry touch new heights. Data shows that in 1999 private funds had a contribution of merely 9.97% in total net assets, which increased to 51.77% in 2003, and currently during year ending March 2009 contribution of private players in net assets has been 80.4% (Table 5.1).

Indian mutual fund industry has witnessed a robust growth since its regulatory framework was strengthened in 1993. But the fact cannot be ignored that despite allowing the public sector mutual funds to enter in this industry in 1987, UTI has still remained a dominating player. Among Indian mutual fund players, UTI is still known to be a strong player among public sector with corpus of over Rs 54490 crore as on 31st March 2009 and it has been successful in managing wide variety of schemes with its Unique selling proposition (USP) of transparency and accountability towards unit holders.

Table 5.1 Net Assets of Mutual funds (Rs in Crores)				
Year	Private sector	UTI	Public Sector	Total
1999	6797.16 (9.97%)	53145.27 (77.94%)	8250.65 (12.09%)	68193.08
2000	25167.89 (23.32%)	72333.43 (67.00%)	10444.78 (9.68%)	107946.10
2001	25942.14 (28.64%)	58016.72 (64.04%)	6628.01 (7.32%)	90586.87
2002	41458.98 (41.21%)	51433.61 (51.13%)	7701.6 (7.66%)	100594.19
2003	56580.56 (51.77%)	43350.84 (39.66%)	9367.96 (8.57%)	109299.36
2004	107087.44 (76.70%)	20616.96 (14.77%)	11911.89 (8.53%)	139616.29
2005	117487.31 (78.53%)	20739.57 (13.87%)	11373.53 (7.6%)	149600.41
2006	181514.61 (78.29%)	29519.09 (12.73%)	20828.77 (8.98%)	2,31,862.47
2007	262078.64 (80.32%)	35488.26 (10.88%)	28725.23 (8.80%)	3,26,292.13
2008	415621.34 (82.28%)	48407.86 (9.58%)	41123.24 (8.14%)	5,05,152.44
2009	335,527.22 (80.4%)	37,801.01 (9.06%)	43,971.46 (10.54%)	417,299.68

Source: SEBI

Analysis of data reveals that even after more than a decade since their inception total cumulative contribution of all public sector mutual funds was hardly 12.09% in 1999 where as UTI alone held 77.94% of total net assets. This margin further decreased as investors developed their trust in private mutual funds and as a result total net assets held by UTI in 2008 was 9.58% whereas rest of public sector held 8.14% net assets. A sudden change in global financial policies forced financial markets to face acute downtrend and as a result once again investors reverted back to public sector from private sector. As shown in data results in year ending 2009, there is a negative trend in net assets held by private sector mutual funds which decreased from 82.28% in 2008 to 80.4% in 2009. Cumulative net assets held by public sector mutual funds (except UTI) increased to 10.54% in 2009 from 8.14% in 2008.

Analysis of mobilization of funds as shown in Table 5.2 reveals that private sector mutual funds tapped investors from various sectors with their swift and smart plans and as a result within very short period of time they were able to mobilize 34.55% of total funds mobilized

by mutual fund industry. But the major share was with UTI holding 58.09% of total funds mobilized. With innovative and well-structured planning the private sector funds edged themselves ahead of UTI and their fund mobilized increased to 71.39% in 2000 and share of UTI was reduced to 22.36%. During the year ending March 2008 out of total funds mobilized by mutual fund industry 84.68% were mobilized by private sector funds as against 7.55% by all public sector mutual funds (except UTI).

But again due to negative waves during financial year 2008-09 share of private sector started shifting towards public sector mutual funds as share of funds mobilized by private sector mutual funds came down to 79.10% in 2009 and share of public sector funds (except UTI) increased to 13.09% in the same year. Although due to global financial crisis downfall was seen in every financial sector but mutual fund industry in India has shown a positive wave in funds mobilized by various sector mutual funds that increased from Rs 4464376.32 crores in 2008 to Rs 5,426,353.26 crores in year ending March 2009.

Table 5.2 Mobilization of Funds (Rs in Crores)				
Year	Private sector	UTI	Public Sector	Total
1999	7846.50 (34.55%)	13192.89 (58.09%)	1671.34 (7.35%)	22710.73
2000	43725.66 (71.39%)	13698.44 (22.36%)	3817.13 (6.23%)	61241.23
2001	75009.11 (80.69%)	12413.00 (13.35%)	5535.28 (5.95%)	92957.39
2002	147798.26 (89.83%)	4643 (2.82%)	12081.91 (7.34%)	164523.17
2003	284095.49 (90.27%)	7095.82 (2.25%)	23514.88 (7.47%)	314706.19
2004	534649.28 (90.59%)	23992.4 (4.06%)	31548.19 (5.34%)	590189.87
2005	736364.30 (87.69%)	46656.08 (5.55%)	56588.99 (6.73%)	839708.37
2006	914703.26 (83.23%)	73127.42 (6.65%)	110318.63 (10.04%)	1098149.31
2007	1599873.44 (82.53%)	142279.68 (7.33%)	196339.85 (10.12%)	1938492.97
2008	3780752.63 (84.68%)	346125.75 (7.75%)	337497.94 (7.55%)	4464376.32
2009	4,292,750.31 (79.10%)	423,131.13 (7.79%)	710,471.82 (13.09%)	5,426,353.26

5.3 Analysis of Financial performance of Mutual Funds

For assessing the performance of mutual funds in terms of risk and return on investment (RoI) offered by AMCs, secondary data has been collected and interpreted in the following sub sections. It is worth mentioning here that study was restricted due to availability of data as comparative performance was not be available for funds taken in sample for all 10 years because some of the schemes for ICICI Mutual funds and Reliance mutual funds were not operative in last ten years period. Thus, comparative performance has been presented with the limitation of time period.

Table 5.3 provides a comparison of the basic parameters of four mutual funds under the study. Expense ratio of all the four funds when compared shows that SBIMEF - Growth has highest expense ratio $E_p=2.50\%$ and UTIEF takes the next lead with $E_p=1.94\%$. With regard to volatility in Net Asset Value (NAV), UTI seems to be performing well with 52 week highest on 37.88 whereas RELEF has a slow move with NAV 13.46. UTI seems to be playing well with healthy strategies of investment as the 52 week low NAV in this fund was 23.63 in comparison to RELEF with NAV 8.21. Portfolio turnover is a measure used to access how frequently assets within fund are bought and sold during last 12 months period. As a general practice a fund with higher portfolio turnover rate is not accepted to be excellent, as a fund with higher portfolio turnover will incur some additional transaction costs. But in case of RELEF-Growth highest level of portfolio turnover rate, i.e., 114% should not be taken as a negative outcome as it is providing higher rate of return than all other funds under the study which reveals that these fund managers have got ability of selecting superior funds that offset the added transaction costs.

The basic rejection of fund on the ground of higher portfolio turnover rate is that it adds to transaction cost but if this increased return is offset by the corresponding increase in transaction cost, it cannot be considered negative. SBIMEF has got the lowest portfolio turnover rate and along with it is also providing the highest rate of return, which reveals that with minimum shifting of funds SBIMEF is performing with excellent strategies to suit investors' objectives. Analysis of four income funds under the study shows that ICICIPIF-Growth provides highest variation in NAV during preceding 52 weeks with range (R) band

6.67. UTIIF are also showing higher level of variation R= 4.90 (Table 5.3). Comparison of Expense ratio, which highlights the operational efficiency of fund, also shows that SBIMIF-Growth bears the highest expense ratio of 1.85% whereas UTIIF-Growth bears the lowest expense ratio of 1.40% among the four funds under the study.

Data in Table 5.3 highlights the most important parameters that are evaluated before selecting a particular fund. Among the four funds under the study UTIBF is considered to be performing well with highest NAV but it also shows higher volatility with Range= 22.52. RELBF seem to move slowly with highest NAV 16.30 during last 52 weeks, whereas it also shows less volatility as compared to other funds with range of variation being 6.99. SBIBF-Growth bears maximum expense ratio of 2.50% whereas RELBF has the expense ratio of 2.25% that makes it clear that all funds do not show any meaningful variation with respect to expense ratio. A comparison of portfolio turnover ratio of these funds reveals that RELBF has the highest portfolio turnover ratio of 157% which at some time restricts investors' willingness to invest in this fund. A comparison of returns provided by this fund highlights that this fund is providing the highest returns to investors as compared to other funds under the study and this will sub set the extra cost borne by the fund.

Table 5.3 Fund Facts					
	Fund	NAV 52-week High	NAV 52-week low	Expense Ratio (Ep) (%)	Portfolio Turnover ratio(%)
Equity – Growth	UTIEF	37.88	23.63	1.94	58.65
	SBIMEF	32.84	17.51	2.50	48
	RELEF	13.46	8.21	1.89	114
	ICICIPAF	23.1	15.72	0.64	NA
Balanced – Growth	UTIBF	62.8	40.28	2.07	43.14
	SBIMBF	42.05	25.55	2.50	70
	RELBF	16.30	9.31	2.25	157

	ICICIPBF	36.38	23.17	2.29	1.48
Income - Growth	UTIIF	28.12	23.22	1.4	NA
	SBIMIF	22.9	20.35	1.85	NA
	RELIF	14.65	11.88	1.48	NA
	ICICIPIF	30.02	23.35	1.7	NA

Source: AMFI

5.3.1 Analysis of Equity Funds

The differences in working of mutual fund AMCs generate different returns on the investment. To understand if mutual funds can generate superior returns using their superior and unique strategies, return wise performance of mutual funds operating in the same broad category has been examined. Analysis of this data provides the comparative returns of four Mutual funds that have been selected for this study. SBIMEF-Growth has been proved to be highly volatile because of higher level of risk assumed by it, thus, as expected it has been providing high rate of return in comparison to other three funds under the study.

As this secondary data was collected during financial year ending 2009 results of return on investment (RoI) during last one year are negative for all mutual fund plans under the study and the condition was quite obvious, escapeless and threatening. This particular negative trend during last one year's result shows that financial crisis has also put its shadow on mutual fund industry in India and as a result all top class mutual funds had to suffer despite the best strategies adopted by them. Data of last three years performance again declare SBIMEF as a champion among other three funds under the study as it reports the highest return of 19.59% . This is followed by RELEF with return of 15.06%. This analysis has revealed that SBI mutual funds adopt some superior investment strategies with which they are able to generate significantly higher returns than other competitors in the same race.

Data relating to absolute returns provided by Equity funds has been examined during the 36 months study period and has been presented in Figure 5.3. This analysis reveals that UTIEF has been providing the highest return (10.72%) during the 2007 bullish trend in Indian stock

markets. However, the fund resulted in highly negative returns during 2008 bearish trend that caught worldwide financial markets. In comparison to it SBIMEF proves to be a less volatile security. Although this fund invested maximum proportion of funds (88%) in risky stocks, but it was able to yield 7.86% during 2007 bullish trend, yet the fund seems to be less volatile as the RoI of fund during bearish trend in 2008 has been -9.40%. This comparison also reveals that UTIEF invests less proportion of funds (86%) in risky stocks. During the trend reversal in the second quarter of 2009 this fund provides highest RoI of 10.61% whereas SBIMEF yields 9.30% RoI during the same period. These results violate the fund managers' philosophy of assuming high risk to yield high return. The findings of these results support the earlier research findings [Sinha (1994); Lo (2000); Omrane and Guedhami (2005)]. However, the analysis of RoI data on absolute returns by RELEF provides that as the fund comprise of less proportion of funds in equity stocks, the fund yields less RoI (3.45%) during 2007 bullish trend and similarly during bearish trend in 2008 the fund provided comparatively less risk (-4.71%). Again during the trend reversals in 2009 fund was not able to yield high RoI. Among all the fund compositions under the study ICICIPAF invests less proportion of funds in equity stocks (71%). As a result during the peak period in 2007, fund was not able to yield required RoI (3.03%). But this philosophy of fund managers has worked well for investors who did not want to lose heavily during negative trends as the fund resulted in RoI of -4.27% during the wave of bearish trend.

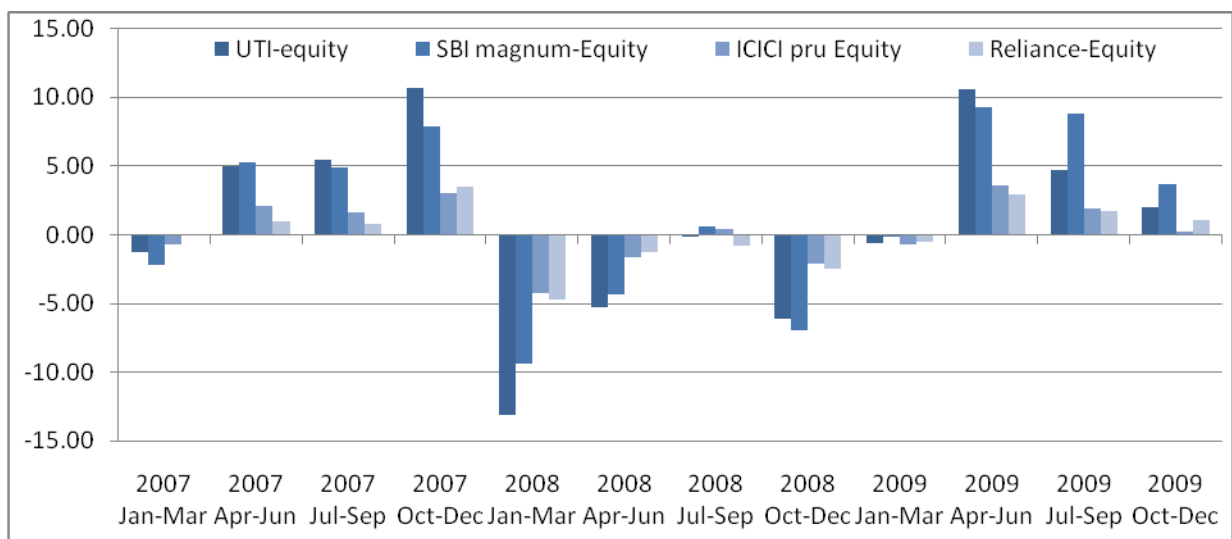


Figure 5.3 Absolute returns of Equity Mutual funds

Table 5.4 presents the various risk estimations that depict the variability or fluctuations in the return generated by various funds. Data estimates suggest that among four Mutual funds selected for this study, highest variation is shown by SBIMEF with $\sigma=5.48$ whereas least fluctuations are shown by ICICIPAF with $\sigma= 3.6$. As standard deviation is a measure of total risk assumed by securities, i.e., both systematic and unsystematic risk, it means there must be some specific securities present in SBIMEF and RELEF that are causing more variability in the returns. Beta is used as a measure of systematic risk only and as shown in the Table 5.4, again SBIMEF is showing higher level of $\beta=0.92$ whereas ICICIPAF has been at lowest level with $\beta= 0.59$. From data results, it cannot be inferred that SBI mutual fund are the most risky funds, however it can be interpreted that this plan is suitable particularly for those investors who want to avail the superlative advantage of market movements as beta signifies fluctuation in NAV of a fund vis-à-vis market volatility. Higher level of Beta in case of SBIMEF and RELEF signify that their NAVs are more responsive to market. Treynor index of all the four equity fund schemes is showing unfavorable performance as this particular measure signifies the ratio of return generated by fund over and above risk free return. With regard to this parameter all the four funds are showing negative performance with a negligible difference. RELEF and ICICIPAF are showing their equating underperformance with negative $T_i = -0.69$.

Table 5.4 Analysis of Systematic & Unsystematic risk-Equity Funds						
Fund	Mean	SD	S_i	β	T_i	Fama
UTIEF	-0.39	4.07	-0.12	0.68	-0.73	0.02
SBIMEF	-0.46	5.48	-0.1	0.92	-0.61	0.13
RELEF	-0.4	4.33	-0.12	0.73	-0.69	0.05
ICICIPAF	-0.3	3.6	-0.11	0.59	-0.69	0.04

Similarly, results of Sharpe ratio as presented in Table 5.4 also highlight the underperformance of all mutual funds taken under the study. Sharpe ratio depicts reward per unit of total risk and in these results all the four funds are showing underperformance with a very thin ignorable difference as RELEF has an $S_i=-0.12$ and SBIEF has $S_i=-0.10$. Fama as a

quantitative measure of risk is here depicting the compared performance of return with required return corresponding to total risk associated with it. SBIMEF with highest level of Fama indicates that fund manager has earned returns well above the return corresponding to the level of risk taken by him. Whereas UTIEF with the lowest level of Fama = 0.02 suggests the poor stock selection skills of fund managers in comparison to other funds included in the sample. This particular comparison reveals the fact that out of these four Equity funds, SBIMEF is performing reasonably well by providing excess return over and above the required rate of return to compensate the total risk assumed. However, lower level of Fama in case of UTIEF signify that lower level of risk is assumed by fund manager and thus, it is more suitable for risk averse investors.

5.3.2 Analysis of income funds

Income funds are especially designed for conservative investors who want to get regular periodic income from their investment instead of capital appreciation with least risk bearing securities in their portfolio. Majority of investments that comprise of the portfolio of income fund include preferred stock, money market instruments, bonds and government securities. Investment of these funds in low risk bearing securities does not assure higher average return than risk free return. Figure 5.4 provides the detailed comparison of absolute returns provided by selected funds under the 36 months study period. An analysis of MF returns clearly depicts that financial crisis has put its impact on all and has resulted into reduced returns for all the funds during the last one year. However in case of income funds private sector funds, i.e., RELIF and ICICIPIF are providing pretty good returns than public sector funds with ICICIPIF providing the highest return of 22.68% during last one year and SBIMIF providing the lowest return of 3.64%. Analysis of the average returns during last three years and five years also reveals ICICIPIF and RELIF are providing higher returns than public sector funds.

Among the income funds selected under the study ICICIPIF invests heavily in debt securities (97.15%) and as a result they were able to generate the highest return (1.1%) during 2007 bullish trend. Moreover when the liquidity financial crunch caught the Indian stock market their absolute returns reduced to 0.08%. RELIF has invested 72.46% in debt securities and

the remaining 27.54% were invested in securities other than equity stock and debt securities. With a philosophy of assuming calculated risk, they were able to generate highest return (0.81%) during the September 2007. However, their philosophy of assuming low risk did not work well during the bearish trend in 2008 and the fund yield were negative (-0.08%) in the first quarterly returns. Even the portfolio composition of SBIMIF included debt securities (75.05%) in their portfolio but despite the fact that they were investing more funds in fixed return bearing securities their absolute returns were less than RELIF. SBIMIF yield RoI of 0.68% during the third quarterly returns of 2007 bullish trend but their returns fell sharply during 2008 recession with negative returns of -0.17% in the second quarterly returns.

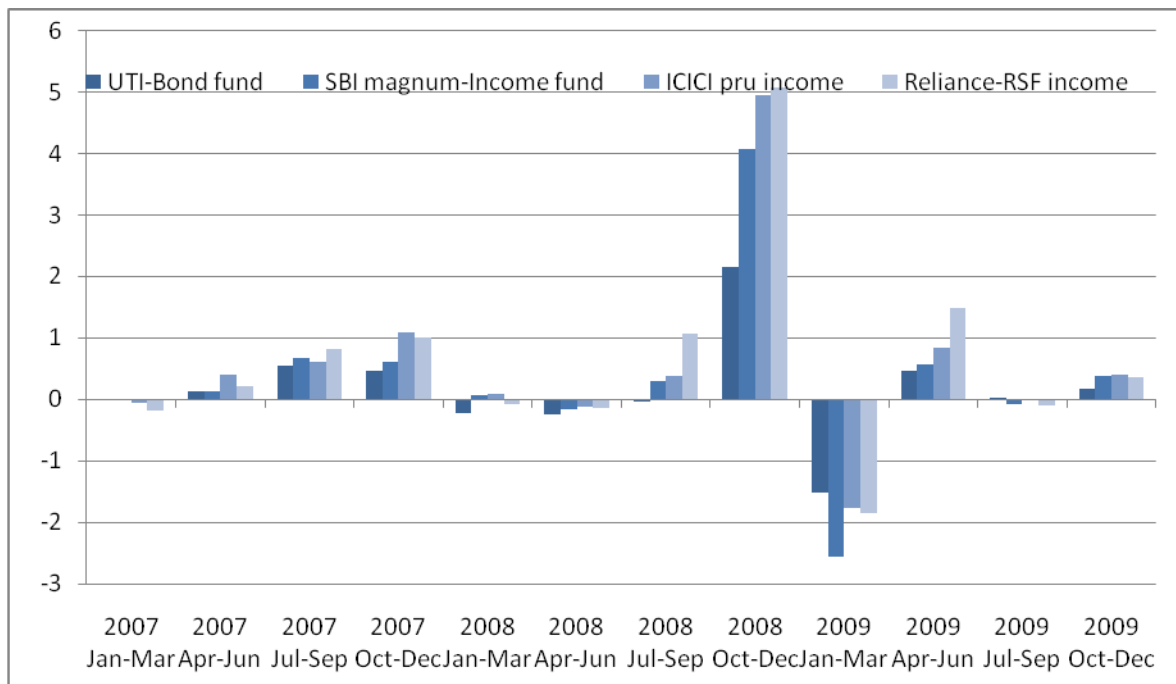


Figure 5.4: Absolute returns of Income Funds

UTIIF is comparatively conservative in designing its fund. The fund AMC's have invested 63.18% fund corpus in debt securities and the balance 36.82% is invested in securities other than equity stock and debt. But despite their strategy to accept low risk in investment, the fund earned the highest negative returns of -0.23% and -0.25% during the first and second quarters of 2008 bearish period. Analysis of returns generated by funds under the study have revealed that AMC's philosophy of selecting a portfolio mix with high risk securities to generate high return did not work well even for the income funds. The analysis of

relationship between portfolio mix and RoI by varied funds has revealed that where the fund managers with conservative style generate low returns during bullish trend, they even generate highest negative returns during bearish period. Similarly, fund managers with aggressive investment style have been found to generate better returns, and have also performed well during the 2008 bearish trend. The findings have revealed that AMC's stock selection ability decides the return that they will generate on fund corpus.

Table 5.5 highlights the comparative risks assumed by income fund schemes during the period of study. Analysis of standard deviation of the four funds reveals a significant difference. ICICIPIF shows highest fluctuations in returns provided to investors with $\sigma = 1.47$ whereas SBIMIF shows the lowest fluctuations with $\sigma = 1.03$. Sharpe ratio does not show negative results. Highest $S_i = 0.25$ as shown by ICICIPIF highlights the superior performance of fund in comparison to other four funds whereas SBIMIF with $S_i = 0.02$ shows the underperformance of the fund. ICICIPIF with $\beta = 11.85$ and RELIF with $\beta = 10.57$ explains the intense ability of fund's responsiveness to market changes, whereas SBIMIF with $\beta = 6.73$ explains that this fund is comparatively less responsive to market fluctuations. Comparative analysis of Treynor (T_i) shows that any fund is not able to provide extreme superior returns over and above risk free return and all the funds are ranging in the domain of little significant difference. Risk measure in terms of Fama provides negative results for all the four funds highlighting that any fund is not able to provide return above the required rate of return.

Table 5.5 Analysis of Systematic & Unsystematic risk-income Fund							
Income - Growth	Fund	Mean	SD	S_i	β	T_i	Fama
	UTIIF	0.23	1.36	0.09	8.48	0.02	-1.65
	SBIMIF	0.13	1.03	0.02	6.73	0	-1.32
	RELIF	-0.36	1.32	0.19	10.57	0.02	-1.47
	ICICIPIF	0.48	1.47	0.25	11.85	0.03	-1.55

5.3.3 Analysis of Balanced Funds

Balanced fund is a perfect choice for the investors wishing to invest in schemes that can provide them a blend of capital appreciation along with income. Funds collected from unit holders in this case are invested in stock, money market instruments and bonds. Although balanced funds are assumed to be less risky than equity funds, as less proportion of funds of these funds invested in equity shares, yet they are subject to market fluctuations. Balanced funds select some stocks of well performing sectors and some designated proportion is invested in government securities and bonds making it a well-diversified portfolio. Secondary data presented in Figure 5.5 provides a detailed comparison of absolute returns provided by selective funds under the study. Analysis of return generated by the funds reveals that SBIMBF outperforms all other funds with the highest return. If results of last one month are considered then RELBF provides the highest returns of 22.30%. Performance of ICICIPBF with RoI= 15.69 has been found to be poor in comparison to others. ICICIPBF is not showing a positive working style with – 4.51% RoI during last one year which is significantly less than other funds. Comparative analysis of all the funds provides that RELBF adopted the best investment strategies that has yielded maximum RoI.

Absolute returns for all the four balanced funds have been analyzed for 36 months duration (Figure 5.5). Among these four funds UTIBF invests heavily in equity stock (80%) followed by SBIMBF investing 72% of their fund corpus in equity shares. But the analysis of funds' RoI reveals that absolute returns of the SBIMBF is 9.80% and is higher than RoI on UTIBF, i.e., 9.08% during 2007 bullish trend. This fact indicates that in case of fund composition merely selecting equity stocks to magnify fund returns is a futile exercise, i.e., fund managers' differ in their stock selection ability and accordingly generate different risk return trade-off. The possibility is that carefully selecting safe securities with less risk may yield better results than creating heavy weight on equity composition. However, in case of RELBF funds' return of 6.95% during the same period justifies their strategy to assume calculated risk by including 67% equity stock in the portfolio. Similarly, the analysis of fund returns during trend reversal period in April 2009 reveals that RoI on SBIMBF (15.1%) is fairly higher than return generated by UTIBF (11.38%) with highest proportion of fund investment in equity shares. Critical analysis of these absolute returns highlights that fund managers who

prefer to invest in risky equity securities may not yield better returns than those who invest less proportion of funds in equity stock.

Fund managers of ICICIPBF are found to be more conservative as they selected to invest only 57% of total fund corpus in equity stock and as a result their absolute returns (3.02%) are very less even during the bullish trend in 2007. Moreover, this fund has proved to be successful for investors with their preference of calculated risk as even during the period of 2008 bearish period the fund yield absolute return of -3.38%. This fund resulted in assuring least possible negative returns during this period whereby RELBF and SBIMBF recorded a sharper decline of -9.12% and -14.74% respectively. On the basis, analysis of pattern generated over the study period it can be inferred that funds which assure higher return during bullish trend also yield highest negative returns during the market downfall. Mutual funds AMCs could not use their superior strategy to forecast the market volatility in order to reduce risk during the bearish trend in stock markets.

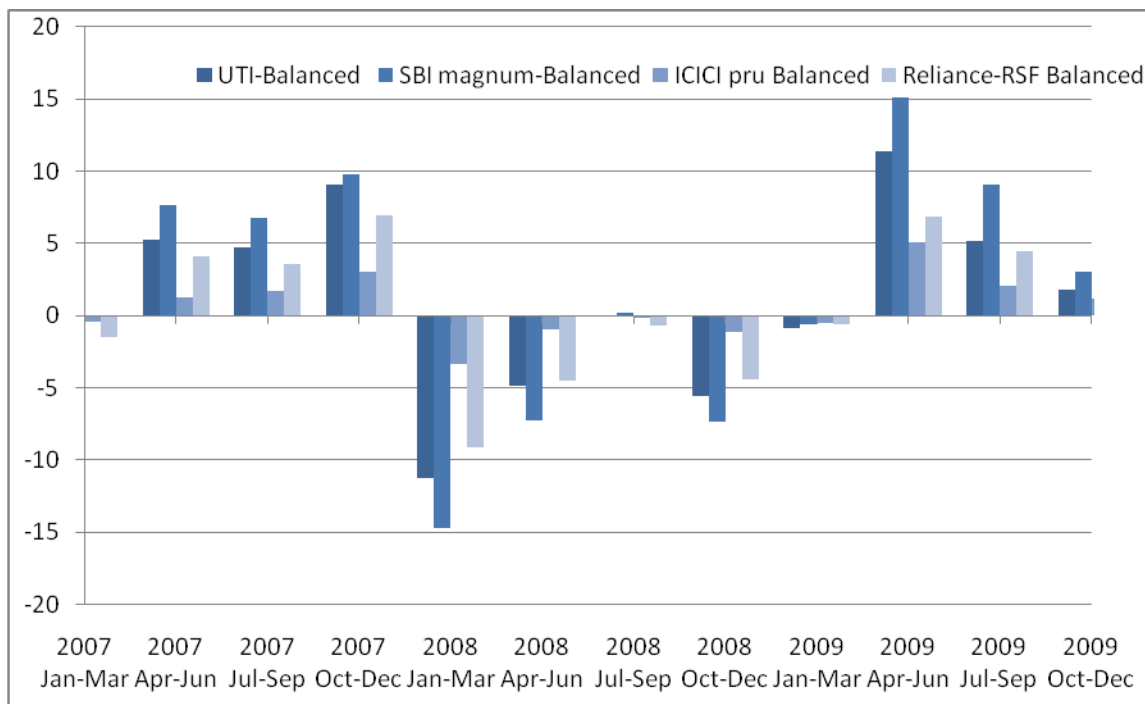


Figure 5.5 Absolute Returns of Balanced Funds

Data in Table 5.6 reveals the risk estimations of four balanced funds under the period of study. The results highlight the variation in returns generated by these funds. Most widely

accepted measure of variation in data is σ and a comparative estimations of selected funds show that UTIBF has the least fluctuations in returns provided by them to the investors with $\sigma = 3.61$ whereas RELBF shows the highest variation in returns with $\sigma = 4.35$. Beta (β) as a risk measure estimates only systematic risk present in securities held by individual fund scheme. Analysis of β of these four funds does not show a significant difference except in case of RELBF which is more risky among four funds with $\beta = 1.08$. Global crisis putting its impact on mutual fund industry in India is clearly reflected from negative Treynor (T_i) in all the four funds. This particular measure signifies the ratio of return generated by fund over and above risk free return. UTIBF and ICICIPBF are showing similar $T_i = -0.48$ whereas RELBF shows $T_i = -0.16$. Sharpe ratio depicts reward per unit of total risk. From the results it can be inferred that all the four funds are showing underperformance with a very thin ignorable difference. Fama as a quantitative measure of risk is here depicting the compared performance of return with required return corresponding to total risk associated with it. RELBF with high Fama implies that fund managers are able to prove their managerial skills in order to tap the market returns whereas UTIBF with negative Fama signifies that fund managers did not perform well to avail the recent up trends in market.

	Fund	Mean	SD	S_i	β	T_i	Fama
Balanced Growth	UTIBF	-0.34	3.61	-0.12	0.91	-0.48	-0.05
	SBIMBF	-0.34	4.08	-0.11	1.05	-0.42	0.01
	RELBF	-0.07	4.35	-0.04	1.08	-0.16	0.30
	ICICIPBF	-0.35	4.01	-0.11	0.96	-0.48	0.02

The overall analysis of the equity, income and balanced funds reveals that the four funds under the study differ significantly in their approach to manage market volatility and generate different RoI. Mutual fund AMCs have to adopt sophisticated strategies to distinguish their performance.

The findings of this study have revealed that fund managers differ in applying their professional diligence in selecting stock for the portfolio. Well planned investment strategies adopted by fund managers to manage risk return trade off enable them to get superior returns. Thus, the findings confirm the proposed hypothesis (H₃) that

comparative performance of Mutual funds to manage risk return trade off may vary significantly.

5.4 Investment Style of Mutual funds

Different investment styles of fund manager are reflected from the diversified portfolio designed by them. These sophisticated strategies adopted by fund managers help them in outperforming their performance in comparison to their competitors. Aggressive style of fund managers force them to design portfolio with highly risky securities that have the tendency to provide high returns whereas conservative fund managers select securities for their portfolios with minimum expected risk and expected calculated returns. However fund managers have to match their knowledge and investment skills in accordance of investment objectives explained by investors. A comparative analysis of portfolio designed by fund managers reveals that among equity-growth fund scheme as per the investors' expectations a majority portion is invested in equity stock that is risky, but has a high growth potential in terms of regular return and capital appreciation (Figure 5.6). Among the four funds under study SBIMEF invests majority of funds in equity stock, i.e., 88.34% whereas ICICIPEF seems to be taking a calculated risk by investing only 70.86% funds in equity stock. High level risk taken by SBIMEF seems to be paying it highest return 27.31% during last one month (June 2009), whereas ICICIPEF gets only 15.03% during the same period.

In addition to the analyses also indicates that additional risk borne by SBIMEF has resulted in the highest negative return of -1.85% during last one year when bearish trend was prevailing in Indian stock market. In case of ICICIPEF with its strategy of assuming calculated risk resulted in less negative return of -1.03% returns in the same period. RELEF seems to be adopting a different investment style by assuming a high risk for 76.44% investment, whereby 23.56% investment is held completely risk free as liquid asset. Ability of fund managers to maintain equilibrium in risk return trade off under this fund resulted in comparatively high return of 22.54% during last one month and during negative trends following global financial markets RELEF proved to be least risky with -0.52% returns. UTIEF also seems to follow the pattern of SBIMEF investing more in equity stock (86.36%) but stock selection abilities of fund manager are doubtful in this case. This fund provided

19.04% return during last one month which was pretty less than 27.31% provided by SBIMEF for same proportion of equity stock held in their portfolio. Moreover, comparison of returns during last one year also shows that this fund provided the highest negative return (-4.73%) among the funds considered for analysis.

Analyses of portfolios of Balanced- Growth scheme (Figure 5.6) reveals that UTIBF held the maximum proportion of their stock in equity shares (79.50%) and ICICIPBF held less proportion of their stock in equity stock (57.28%). A significant gap of returns earned by two funds 20.93% and 15.69% respectively during last one month has emerged due to high risk assumed by UTIBF. RELBF again adopts a completely different investment style with 67.21% investment in highly risky equity stock and holding the remaining funds as a complete risk free investment. This investment style adopted by Reliance fund managers has resulted in yielding the highest return of 19.39% during last one year. SBIMBF invested 71.69% of total portfolio funds in highly risky equity stock but yielded only 6.7% return during same period. These results reveal that stock selection capability of fund managers and their investment style decides the extent up to which a particular fund can satisfy investor's investment objectives. Comparison of SBIMBF and UTIBF also reveal that although in both the fund managers believed in putting more proportion of fund in equity securities, yet fund managers of UTIBF seemed to be less sharp and analytical as compared to SBIMBF. The difference in stock selection philosophy of fund managers resulted in significant gap between the returns provided by these funds with respective risks.

Comparison of income funds of these four AMCs reveals that as per the fund schemes, these funds are designed for risk averse investors so no proportion of fund is held in equity stock. Fund portfolio is invested in either debt or liquid current assets that are known to be completely risk free. Among these funds ICICIPIF invest a huge proportion of funds in debt securities (97.15%), whereas UTIIF with similar vision invest only 63.18% in debt securities. A Comparison of returns during last one month shows negative returns for all the funds. If returns calculated are considered during last one year ICICIPIF was able to gain pretty well (22.68%) for the level of risk assumed and UTIIF yielded 8.83% return during the same period. SBIMIF has been showing underperformance as compared to other funds considered in this study. With 75.04% investment in debt it yields lowest return of 3.64% during the last

one year. Again this poor performance of SBIMIF can be attributed to the incompetence of fund managers' stock selection capabilities. RELIF with 72.46% investment in debt securities performs well with its well-designed strategies and yields 15.38% return during the last year.

Thus, overall investment styles of these selected funds reveals that fund managers' vision, investment style and stock selection capabilities make a significant difference in returns they offer at a calculated risk.

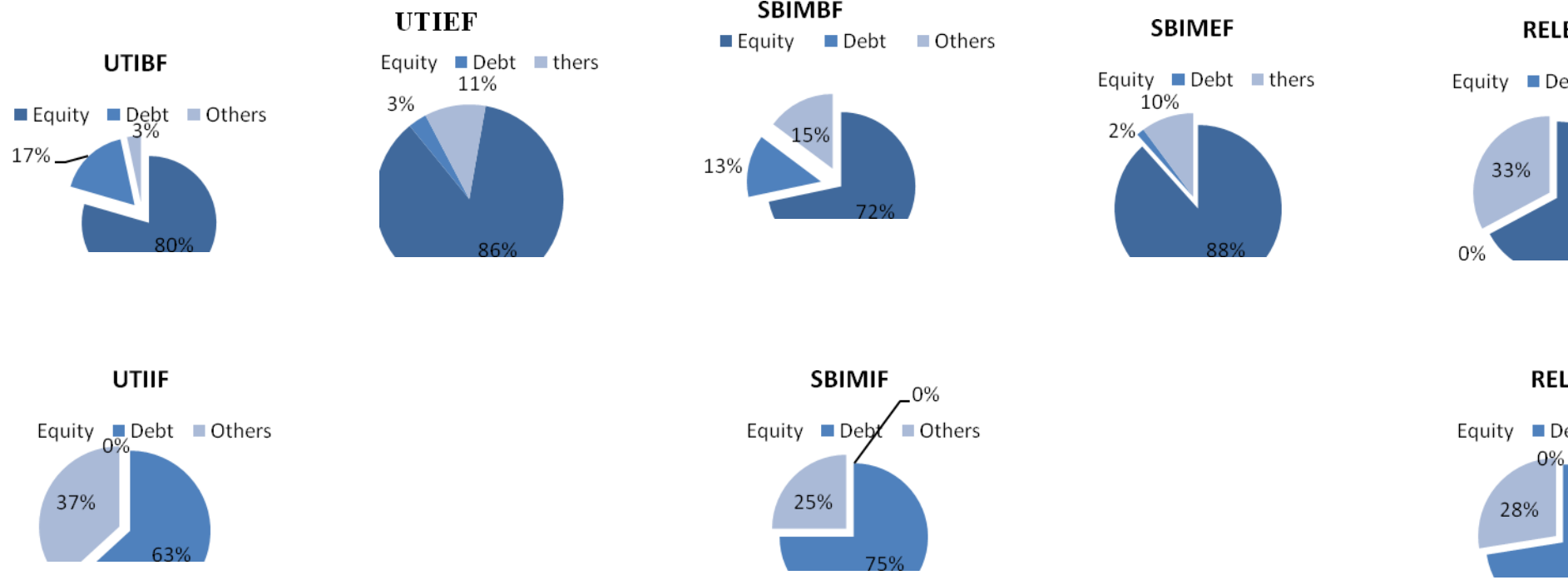


Figure 5.6 Portfolio Mix

5.5 Efficient Market Hypothesis

For accessing whether mutual fund managers analyze stock market movements and use their specialized skills to calculate and forecast future prices Sensex data and NAVs of four Mutual funds was analyzed and compared. In Indian context mutual fund investors are found to be more conservative and they generally rely on past performance to select any mutual fund. On the other side fund managers have varied obligations with regulatory constraints of taxes, transaction cost, and fees etc. that restricts their performance. Finally the question that arises is whether mutual funds can outperform the rest of unprofessional investors struggling to get excess returns? To examine performance of fund managers, the study includes four funds as have been taken for analysis earlier and these are: SBI Mutual fund, UTI Mutual fund, Reliance Mutual fund and ICICI Mutual fund.

To understand randomness in the movement of mutual fund prices, presence of anomalies have been observed. An anomaly is where empirical evidence contradicts the EMH and provides that if a share price rises one day, it is expected to rise the next day and if it falls one day it is expected to fall the next day. Presence of anomalies in any series enables prediction of future price movements with some accuracy. In our study to validate EMH and to conclude whether there exists any pattern in stock market movement an attempt has been made to examine randomness in the movement of Sensex and NAVs of mutual fund by using Run test. Results provided by this test (Table 5.7) validate that high degree of randomness exist among almost all the mutual fund schemes except, for RELIF ($R=2$) and SBIMBF ($R=3$). For the rest of the fund scheme $R=6$ or $R=4$ has been validated by run test for randomness, which is significant at 1% level. Z score < 1.96 of the entire fund scheme indicates that high degree of randomness prevails in the movement of NAVs and Sensex during 36 months study period. Further, in case of 12 Mutual fund schemes considered for analysis, random behavior of NAVs guide investors not to rely on mutual fund performance based on their past trend as generally mutual fund investors react to past performance (Ippolito, 1992).

Table 5.7 Runs Test													
	ICICIPEF	SBIMEF	RELEF	UTIEF	SENSEX	ICICIPBF	SBIMBF	RELBF	UTIBF	ICICIPIF	SBIMIF	RELIF	UTIIF
Test Value^a	22.63	30.64	12.81	35.81	155.89	35.33	10.67	13.15	58.82	23.91	20.76	11.25	23.55
Total Cases	36	36	36	36	36	36	36	36	36	36	36	36	36
Number of Runs	4	4	4	6	6	4	3	6	4	4	6	2	4
Z	-4.904	-4.904	-4.904	-4.227	-4.227	-4.904	-5.242	-4.227	-4.904	-4.904	-4.227	-5.580	-4.904
Ho	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Rejected	Accepted	Accepted	Accepted	Accepted	Rejected	Accepted

a. Median

Figure 5.7 shows comparative analysis of volatility existing in Sensex and performance of equity based four fund schemes under study. Examining these movements it is revealed that these equity based funds perform almost in the same direction with high r coefficient. As observed from analysis of correlation $r=0.948$ for ICICIPEF and $r=0.952$ with SBIMEF there has been a very high degree of relationship among Sensex volatility and equity based mutual fund schemes. Results of correlation have revealed that there exists a very high degree of correlation between all the fund schemes and Sensex volatility. Presence of high degree of correlation among equity based mutual fund and Sensex supports the semi strong form of EMH which proposes that share prices adjust to publically available information very fast and it can be concluded that no one can earn excess returns using some information.

Analysis of figure 5.7 clearly depicts that till January 2008 when Indian stock market was following the bullish trend, all equity based funds were at their peak NAV and they immediately reacted to downtrend experienced by world-wide financial markets. Thus, it has been found that mutual funds follow the random walk as followed by stock market. Same way during February 2009 when Indian stock market was facing bearish trend, equity based mutual funds didn't remain unaffected. During this period all the equity funds had their lowest NAV, however, they followed a trend reversal after this period. The analysis of plotted NAVs is showing technical indicators but also support the unpredictability (Roberts, 1959).

These results similarly provide that technical indicators may be identified but too late to react in order to get above average returns. The analysis revealed that all the equity funds were following the same direction as Sensex was moving. Any individual unprofessional investor would have got the similar returns if he would have invested in the similar period. However, expertise of mutual fund AMCs which was desirable during downtrend in stock market has not shown any different results that could highlight the distinguished performance of mutual fund AMCs. Results as shown in Figure 5.7 clearly reveal that mutual fund AMCs proved to be ineffective in their attempt to manage market volatility during bearish trend of the stock market.

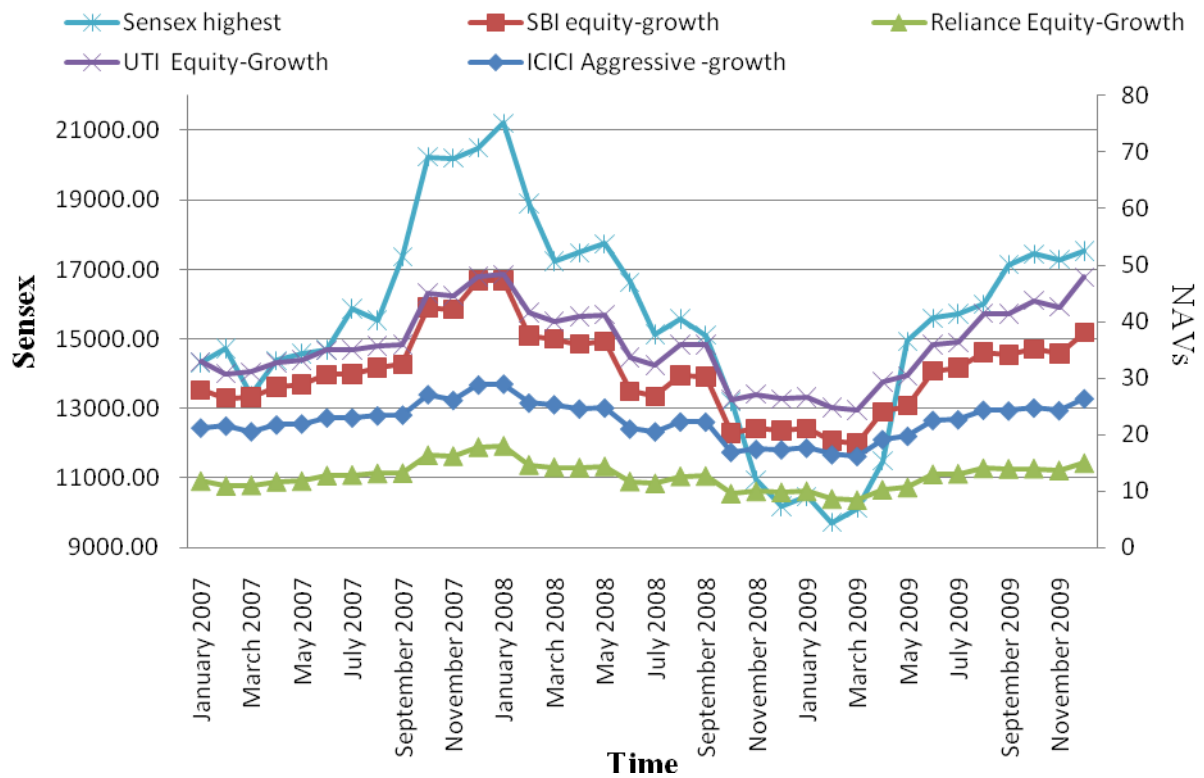


Figure 5.7: Comparative Analysis of NAVs of Equity funds

Figure 5.8 provides a comparative analysis of Balanced Funds and Sensex. Results of the study reveal that even these funds are also responding to market volatility. Existence of moderate and even high degree of relationship is revealed whereby ICICIPBF shows very high degree of correlation with $r=0.958$ and UTIBF provides $r=0.939$. These results are indicative of the fact that these funds respond immediately to market movements.

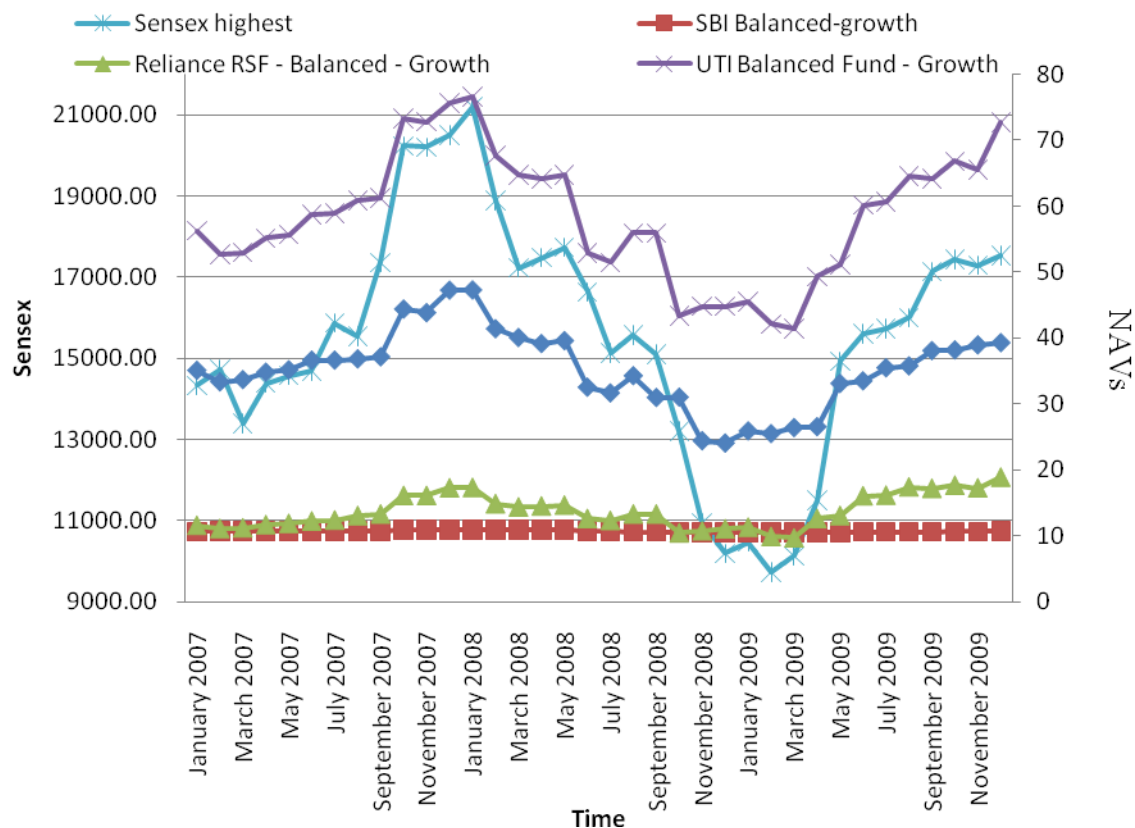


Figure5.8: Comparative Analysis of NAVs of Balanced funds

As observed from graphical trends of SENSEX and balanced funds, UTIBF and ICICIPBF are responding immediately to Stock market movements. As major holdings of even these funds are invested in equity securities so all the balanced funds followed a positive peak during early 2008 and also followed the downtrend afterwards. Thus, pattern analysis of this graph reveals that even balanced funds had random movement as SENSEX has, which provides that past performance of any fund is not a true base of fund selection. Moreover, the analysis of these NAVs also reveal that both UTIBF and ICICBF are showing their downtrend during bearish period in stock market, i.e., 12 months period from January 2008 to January 2009 and thus, are not able to tackle market volatility. However, both SBI and Reliance funds are providing that these funds do not provide high degree of volatility in their NAVs.

Further, analysis of (Figure 5.9) the movement of NAVs of Income Fund for 36 months study period along with Sensex depicts that despite the downtrend in the stock market during

February 2008 to December 2008, NAVs of income funds have been continuously increasing. Analysis of these NAVs reveals that income funds are not affected by volatility of stock market. Thus, these four income funds under the study have proved that during past 36 months all income funds have shown uptrend and even they are least affected by global financial crisis that captured world-wide financial markets. As these funds do not invest in equity securities, the performance of income fund NAVs may not have been affected by the market volatility.

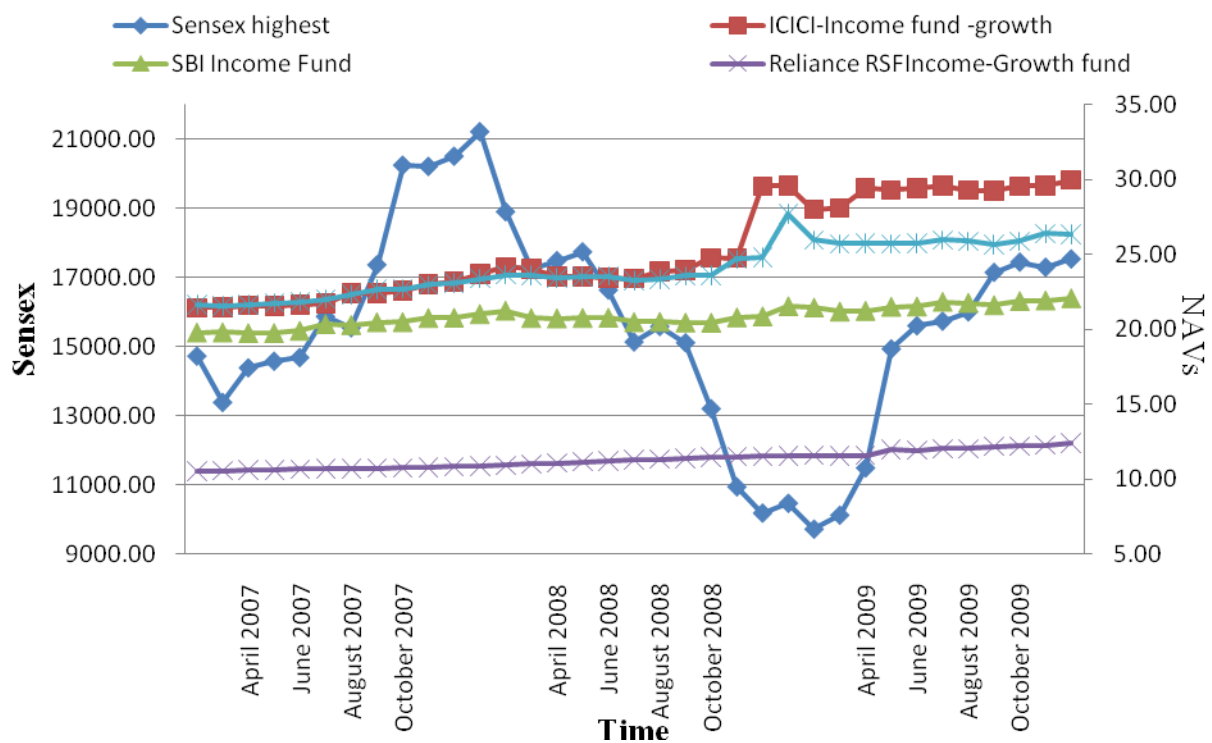


Figure 5.9: Comparative Analysis of NAVs of Income funds

Income Fund under the study have clearly shown that NAVs of these funds are not related to stock market volatility in any way. Negative relationship of $r=-0.277$ as shown by ICICIPIF and $r=-0.26$ given by UTIIF shows that performance of these funds is independent of Sensex volatility.

Generally a debate of getting extra return by investing heavily in equity shares is supported based on the assertion that higher the risk higher the returns. Analysis of adjusted $\bar{R}^2$ for

variability in data set as summarized in Table 5.8 provides that high degree of influence exists between Sensex and mutual fund schemes particularly where fund portfolios contain Equity stock. Highest fine tuning exists between SBIMEF fund $\bar{R}^2 = 0.903$ and ICICIPEF with $\bar{R}^2 = 0.896$. Additional results of adjusted $\bar{R}^2$ reveals ICICIPBF is highly influenced by Sensex with $\bar{R}^2 = 0.915$ and UTIBF is next to follow with $\bar{R}^2 = 0.878$.

Table 5.8 Analysis of Growth rate and Regression				
Mutual Funds	G	$\bar{R}^2$	t value	b
ICICIPEF	14.66	0.896	6.349	17.437
SBIMEF	14.46	0.903	-2.748	18.067
RELEF	14.34	0.890	1.770	16.932
UTIEF	13.81	0.856	1.246	14.537
ICICIPBF	14.33	0.915	3.457	19.499
SBIMBF	15.59	0.607	133.670	7.427
RELBF	10.96	0.609	2.249	7.465
UTIBF	14.35	0.878	3.657	15.943
ICICIPIF	6.58	0.049	10.629	-1.679
SBIMIF	4.36	-0.020	33.348	0.379
RELIF	5.19	-0.066	22.810	-0.870
UTIIF	5.060	0.039	17.510	-1.568

Results provided in the study (Table 5.8) show that although equity based mutual fund schemes have been performing well with UTIBF $g = 14.35$ and SBIEF growing at $g = 14.46$, yet evidence provides that selective and smart fund managers can outperform than those who prefer to assume high risk. NAV of SBIBF is $g = 15.59$ as they take calculated risk and similarly ICICIPEF NAV is growing as $g = 14.66$ during the 36 months study period. Results of NAV growth rates of Income Mutual fund show that they have comparatively slower growth with ICICIPIF $g = 6.58$ and Reliance RELIF $g = 5.19$. Outcome of this study proves that although picking up equity fund schemes in your portfolio accelerates the return on portfolio but fund managers can also get benefit of rapidly increasing growth rate by picking up selective stocks and blending equity with debt. Moreover Sensex $g = 14.57$ is not found to

be abnormally different as almost all equity based mutual funds were following nearly the same growth rate. Out of all the four equity based funds ICICIPEF yield $g=14.66$ which is not abnormally higher than what an individual investor would have got investing in stocks. Empirical evidence given by the study supports EMH that all funds investing in equity stock or blend of equity and bonds perform almost at the same rate and no single fund manager can outperform using unique information available to him. These findings further support the hypothesis (H_4) that although mutual fund managers possess professional skills but still they are not able to reduce and manage market volatility. These findings highlight that mutual fund schemes perform according to market trends only and thus, do not help investors in reducing the overall risk by applying their forecasting abilities.

Analysis of mutual funds' NAV performance reveals that mutual fund AMCs are not able to escape from the impact of market volatility on their invested funds. Thus, as most of the funds have shown their underperformance especially during the bearish trend the hypothesis (H_4) is confirmed. Hence, despite the professional skills fund managers possess, mutual funds may not be able to reduce risk from market volatility.

The above findings have portrayed a clear picture of mutual funds' working that highlights that performance of mutual funds do not vary significantly from stock market performance. The performance of majority of funds have revealed that fund AMCs do not use their specialized skills to reduce the effect of market volatility which lays down a platform for designing some risk management strategies eventually resulting in minimizing the risk.

The final objective of the study is to evolve a multidimensional strategic framework FININOV that will guide fund managers to systematically follow the roadmap in order to make innovations successful. The findings of the present research have revealed the factors influencing risk perception of investors and the different investment styles followed by fund managers. FININOV aims at synergizing these twin objectives in order to develop a systematic process for designing new fund schemes or restructuring the existing funds. In the next section few planning strategies have been proposed that mutual fund AMCs can adopt to manage portfolio risk and will pave the way to FININOV.

5.6 Proactive Risk Management Strategies

Presence of risk in the stock market trading is a normal feature. Financial theories portray number of models that attempts to guide and construct strategies for investment decisions that ultimately aim to reduce risk. Concern for managing risk in the financial markets has become a prime issue to be resolved especially when investors hand over their savings in the trusted hands. Crucial decision for Mutual fund AMC's is how to use available information and translate that information using their skills so that investors' trust can be maintained. Analysis of empirical results as portrayed by EMH shows that financial markets are efficient enough to absorb all the information and hence price movement cannot be forecasted. Thus, risk management being the most significant pre-requisite of investment decision should not be limited to the fact reporting but also requires the fund managers to be highly proactive in complete investment management process. The second objective of this study has been to analyze the current flaws in the existing working of mutual funds and propose a roadmap which investment managers should consider for portfolio management. This section presents a few systematic steps of proactive risk management, which mutual fund managers may adopt for defining their boundaries of assuming calculated risk.

5.6.1 Risk Estimation through Value at Risk (VaR)

Uncertainty in investment decision prevails when Mutual fund AMC's skills and knowledge fail to have proper access of decision relevant information due to complexity of financial markets. The best practice to assume calculated risk requires understanding the complexities of financial markets not only with risk estimation but also involves continuous monitoring. Doubt concerning the outcome in a given situation before the event occurs, implying that there is something about the present situation that will be different in the future. Thus, a risk management system must ensure applications of methodology that can guide them about the future course of action.

Tolerance Zone (figure 5.10) depicts the minimum and maximum specifications as described by investor for his willingness to assume risk represented by the Upper Specification Limit (USL) and the Lower Specification Limit (LSL). Investors based on their knowledge about

the market volatility, accepts the minimum risk which they will have to bear on their investment. AMC's design these specification limits and maximum level of risk is assumed to be dependent upon his risk appetite and his willingness to maximize his RoI. However, Lack of management's commitment for services performance may deviate AMC's to come up with different performance standards.

This deviation if less than the expected specification as proposed by investor will result in indifferent attitude of investors. In case the controllable limit as performed and delivered exceeds the upper specification limit of investors, it will certainly result in great dissatisfaction among the investors as AMC's will be held liable for the loss that will accrue to investors. This will lead to investors think over the incompetent professional management of mutual funds.

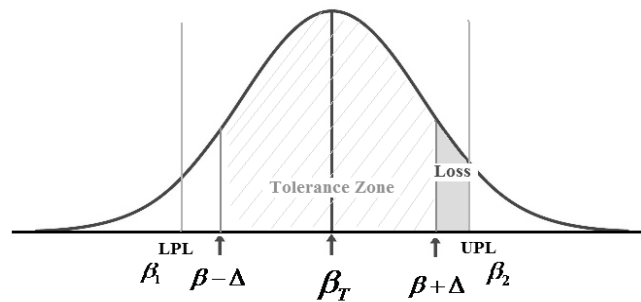


Figure 5.10: Risk Tolerance Zone

Analysis of mutual fund schemes under study have revealed the fact that adopting Value at Risk (VaR) may be used by mutual fund AMC's to estimate and compare their performance with defined risk that investors are willing to assume [Jorion, 2001 and Gaivoronski and Pflug, 2004]. Whereby risk tolerance zone define and direct that in any case fund performance in terms of assuming risk should not go beyond that specified limit. VaR will indicate the maximum possibility of risk in extreme worst situation [Johansson *et al.* (1999), Fan *et. al.* (2004)].

Calculated VaR (Table 5.9) for equity based schemes of four mutual funds show that most risky growth oriented mutual fund is not expected to decrease beyond 23%-35% (99% confidence) and almost 13%-20% (95% confidence). Further comparison of four mutual

funds covered in the study reveals that almost VaR of all the funds is in the same range except RELEF with extreme risk of -35.93% (99% confidence) and -24.18% (95% confidence).

Table 5.9 Analysis of Value at Risk (VaR)			
		VaR (Historic Simulation)	
Mutual Fund Schemes		99% Confidence	95% Confidence
ICICIPEF	Growth	-23.44%	-13.41%
SBIMEF	Growth	-35.93%	-24.18%
RELEF	Growth	-25.54%	-20.53%
UTIEF	Growth	-27.52%	-16.32%
ICICIPBF	Growth	-22.53%	-14.91%
SBIMBF	Growth	-11.62%	-5.6%
RELBF	Growth	-21.04%	-15.15%
UTIBF	Growth	-23.69%	-15.56%
ICICIPIF	Growth	-4.34%	-1.35%
SBIMIF	Growth	-0.02%	-0.013%
RELIF	Growth	0.002%	-0.001%
UTIIF	Growth	-0.046%	-0.01%

Analysis of VaR of Balanced schemes reveal the fact that estimated risk lies in the range of 22-24% (99% confidence) and 14-15% (95% confidence) except SBIMBF assuming very peculiar investment style with VaR -11.62% (99% confidence) and -5.6% (95% confidence). Finally the estimated VaR of income funds reveal the least extreme of losing investment with a range of 0.02%- 0.05% (99% confidence) and around 0.01% (95% confidence). VaR supports AMC's investment decision process whereby they will be able to define the boundaries of portfolio for different category of investors. Thus, as shown above calculation of VaR gives a signal that possibility of high loss is present in equity based funds whereas the least probability of loss is revealed by income funds. This particular methodology will guide and direct fund managers to select stocks that can match the risk appetite level of investors as well as possibility of loss in the selected stock.

5.6.2 Market volatility Risk Analysis (MvRA)

AMCs most crucial decision to invest in a particular security is intended towards alignment of investors' investment objective and constraints in front of market intermediaries. However, no unique strategy has been identified till yet that can be adopted to consistently beat the stock market. The challenge in front of mutual fund managers is to make it a win - win game so that the twin objective of both participants and regulatory environment can be satisfied. Lo (1999) introduced this fact that any complete story of risk management must cover three P's to cover sensible risk profile of individual investors and accordingly proposed a systematic approach to rational decision making in uncertain world by focusing on Probability, Price and Preferences.

In this section, the study introduces a new philosophy of understanding the market tactics that will demand highly professional skills and proficiency on the part of mutual fund AMCs to include risk management practices in their working.

$$\text{Market volatility risk} = [P_v * S_v * P_c]$$

Where,

P_v is probability of volatile market [$0 \leq P_v \leq 1$]

S_v is severity of volatility [$1 \leq S_v \leq 5$]

P_c is possibility to control the effect [$1 \leq P_c \leq 5$]

Score obtained by using this particular methodology will give an indication to mutual fund organizations whether to continue with the same portfolio or innovate some new fund scheme by diversifying their funds towards securities in the safe mode. Mutual fund managers are expected to be highly professional and informed with updated market movements as they have to use their specialized skills in managing the trusted funds. Market Volatility Risk Analysis (MvRA) provides an insight into considering the probabilities in estimating the direction of future course of action. In this methodology a suggestion has been proposed to allocate weights to the different aspects of investment management decision where AMCs based on their skills and available information track the various securities in which funds are invested and realize the need to review existing portfolio with induced innovation. Three basic aspects that have been covered in this methodology are estimating

the probable volatility (P_v) in a security based on forecasting ability of fund managers and anticipation of some announcement by the concerned organization. Allotted weights to probability have been taken in the same way as defined by the range of probability whereby 0 will indicate complete absence of volatility and 1 will indicate completely volatile market. However, there are rare chances of ($P_v = 0$) as most of the time stock prices do not show any consistency. Further, the next aspect in this methodology considers an estimation of severity of this volatility (S_v) with allotted weights ($\geq 1, \leq 5$) whereby the lowest range (1) indicates the least effect of volatility and the highest score (5) indicates a heavy impact due to volatility of security. Finally, the last parameter of this methodology demands introspection on the part of fund managers whereby based on the earlier discussed two parameters they will realize the possibility to control (P_c) or manage this volatility in the security. As the fund managers realize their ability to control ($P_c = 1$) even a heavy volatile security will be tackled whereby a sudden severe shift in security prices that are not anticipated ($P_c = 5$) will put a deep impact on portfolio returns and will enhance the severity of volatility.

As a decision tool MvRA guides the fund manager to take instant action whenever the boundaries pertaining to their action are about to cross the boundaries defined by mutual fund investors. Based on the different combination of weighted scores (Table 5.10) of three parameters, this methodology proposes that quantitative interpretation will be between 0 and 25 [$0 \leq \text{MvR} \leq 25$]. Different interpretation for all the scores have been clubbed under three categories which shows that in the first category [$0 \leq \text{MvR} \leq 5$] the lowest degree of risk is involved either because of no possibility of downtrend in the security prices or because of high possibility of anticipating the change in security prices that will be controlled. These types of securities are suitable particularly for conservative/risk averse investors who don't wish to assume high degree of risk.

Table 5.10 Decision rules for MvRA				
Score	Degree	Description	Investors	Future Action
$0 \leq MvR \leq 5$	Low	Safe security with negligible possibility to loose	Conservative/Risk Averse (Balancer)	Continue with the existing portfolio with track over the market volatility
$6 \leq MvR \leq 15$	Moderate	Reasonable indication of bearish trend in stock prices	Aggressive investors with high degree of tolerance	Aggressive investors may shift to debt and conservative investors to completely risk free securities
$16 \leq MvR \leq 25$	High	Possibility to witness extreme situation towards lower edge	None	Immediate shift to low risk profile security

Future course of action suggested in situation where securities $MvR \leq 5$ are to continue with the existing securities only. Category II [$6 \leq MvR \leq 15$] indicates that although possibility of extreme fall in prices cannot be witnessed but a careful diversification in the safe or risk free securities is required depending upon the investors risk appetite. The last category [$16 \leq MvR \leq 25$] suggests that uncertainty prevails in the stock behavior and any unexpected fall in prices can be expected. This particular security should not be carried on even for aggressive investors and immediate diversification is required for such kind of securities in the portfolio by replacing them with completely risk free securities.

5.6.3 Optimal Diversification

Expected role of mutual fund AMCs is to closely watch the market movements and understanding the investors' sentiment before constructing a well- diversified portfolio. Ultimate aim of constructing diversified portfolio is to make a balance between investors' expected return and market related return (R_m). Diversification is the most accepted practice that portfolio managers use to reduce portfolio risk. Although huge literature in the area of reducing portfolio risk suggests diversification but the question of concern is optimal number of securities that should be added to the portfolio in order to diversify risk. Excess diversification may not only result in increasing the fund management cost (including transaction cost for switching) but will also misalign the investor's objectives and fund manager's working philosophy. Many researchers endeavored to identify the optimal number of securities that should be included in the securities so that overall risk could be reduced (Statman, 1987) (Shawky, 2005).

The number of funds must be defined considering the pay-off between risk diversification and trading costs, reason being more number of securities determinate high performance stability but it also encourages increased transaction costs that ultimately results in negligible net gains (Statman, 2004). A simplified approach on decision of diversification demands comparing additional costs along with expected return that may accrue by including more number of securities in the portfolio. Diversification can contribute only if the marginal return provided by the added securities is more than marginal cost that accrue due to adding more number of securities in the portfolio. Return on mutual fund portfolio (R_p) at time (t) is proportionate to the weighted combination of various assets in the portfolio that can be expressed as:

$$E(R_{p,t}) = \sum_{i=1}^n w_i E(R_{i,t}) \quad (Eq. 1)$$

Expected portfolio Return is the sum total of risk free return (R_f) and weighted market related returns (R_m) that can be expressed as:

$$E(R_{p,t}) = \{\sum_{i=0}^n R_{f,t} + \sum_{i=0}^n W_i R_{m,t}\} \quad (Eq. 2)$$

Additional marginal return that can be obtained from the portfolio by adding more number of securities in the portfolio can be expressed as

$$E(MR_{(p,t)}) = \delta \{\sum_{i=1}^n R_{f,t} + \sum_{i=0}^n W_i R_{m,t}\} / \delta p \quad (Eq. 3)$$

Mutual fund portfolio construction is highly professional activity which cannot be separated from charges involved in managing these fund schemes. Overall expected costs $E(C_p)$ associated with mutual fund portfolio management at time (t) include entry /exit load (E_l / E'_l), management fee (M_f) and other costs (uncertainty), i.e.,

$$E(C_{p,t}) = E_l + E'_l + M_f + \varepsilon \quad (Eq. 4)$$

Addition in the portfolio management cost as a result of adding additional securities in the portfolio will be referred as expected marginal cost of portfolio $E(MC_p)$ where Eq. (4) will be expressed as

$$E(MC_{(p,t)}) = \delta E(C_{p,t}) / \delta p \quad (\text{Eq.5})$$

Issue of deciding about diversification and adding new securities in the portfolio can be resolved by comparing Equation (3) with (5) as this will help portfolio managers in taking proactive decision to mitigate risk which is possible because of the addition in the number of securities held in the portfolio. Comparing expected marginal return from the portfolio and expected marginal cost, a fund manager may decide where he needs to stop for adding more number of securities in the portfolio. A simple decision rule to guide fund managers, whether they should go on adding more number of securities in the portfolio is that $\{E(MR_{(p,t)}) - E(MC_{(p,t)})\} \geq 0$. Until the additional benefit gained by diversifying the portfolio with more number of securities are more than the additional cost that will be incurred to include these securities, more number of securities can be added.

5.7 FININOV

The present study has been undertaken with ultimate objective to develop a strategic framework for introducing innovation in mutual funds with due consideration of investors' expectations. For this purpose, the study has undertaken IRPA and the results provided that investors agree that existing mutual funds neither completely disclose the fundamentals of fund designed nor they perform as per investor's expectations and ultimately consider them poor in managing market volatility. These results provide an insight that mutual funds should induce innovation only with due understanding of investors' priorities. An analysis of investors' risk perception reveals that factors that contribute towards dissatisfaction among investors include:

Risk estimation and control by AMCs, credibility, disclosure practices of mutual funds, performance etc. On the other side, analysis of secondary data on MF performance reveals that AMCs are not able to manage market volatility, but, strategies adopted by fund managers in selecting securities in the portfolio have significant impact on their performance.

Prioritization of customer needs and expectation is critically important in order to satisfy investors. A secret catalyst for any breakthrough is to analyze potential impacts of a

particular innovation and further to align those outcomes with the investors' objectives. This section introduces 'FININOV' as a strategic framework which has identified seven C's that include *Communication, Confidence, Credibility, Commitment, Concern, Competence, and Continuous improvement (CI)* that should be embedded in any newly designed fund in order to ensure it a win-win game for both investors and AMCs. FININOV is a suggestive approach to align investor's expectations and AMC's actions towards complete satisfaction among investors (Figure 5.11).

Currently AMCs are required to flesh out existing fictions about investor's expectations and frame out completely new system that is conceptually richer and empirically more supportive in identifying what investors really need for which the root planning should start through effective *communication*. Moreover this communication process should not only be continued until investor finalizes his purchase decision but AMCs should also focus on post purchase reactions of investors. Mostly fund managers are wrongly blessed with misconceptions that success of their fund is directly related to heavy dose of innovation whereby they overlook post selection behavior of investors that comprise of the most relevant step that ensure final satisfaction.

Despite the fact realized, most of MFs are concentrating to improve only one parameter of investor's satisfaction and that is to improve the return they could provide to investors without paying any attention to quality of services expected by investors. Presence of intense competition in mutual fund industry is strongly pushing investors to change their attitude towards investors, so it is high time to develop their *core competence* along with *concern* for investors' investment objectives and finally giving a way to designing new fund schemes that can assure them not only the financial benefits but also value added quality services. As revealed from the findings of IRPA, investors are not found to be satisfied with the disclosure practices and performance of mutual fund AMCs. Thus, in order to prove that AMCs are concerned with the risk appetite of investors and invest accordingly, they are required to bring structural changes and strategically align their working philosophy that can meet investors' expectations.

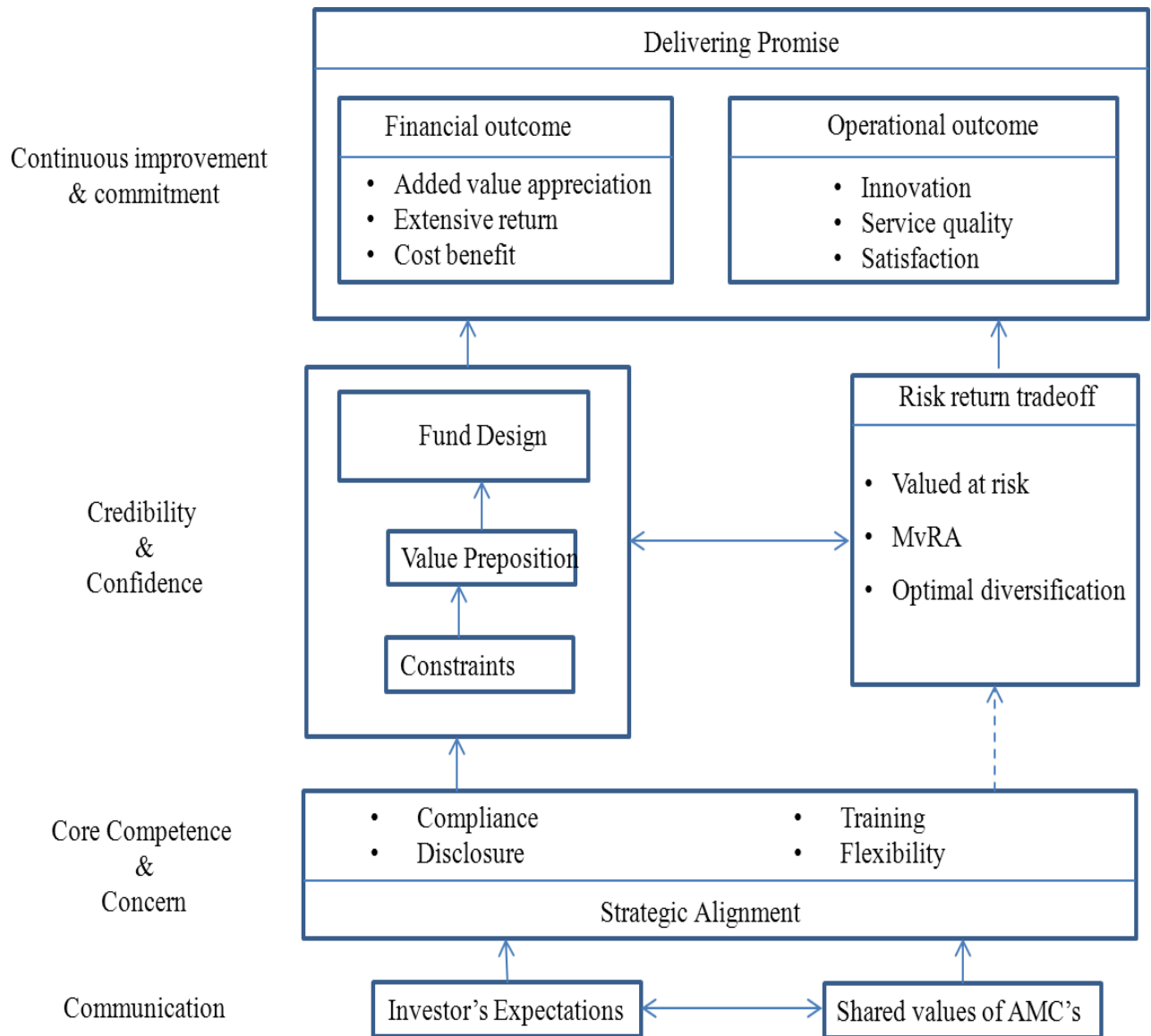


Figure 5.11 'FININOV': A Strategic Framework for Financial Innovations in mutual funds

Although mutual funds AMC's have realized the key mantra to success is designing new schemes with multi feature options for investors but still financial benefits offered in terms of RoI is generally considered as a true parameter to evaluate fund performance. AMC's approach to win investors' *confidence* require that fund managers should give due consideration to investment constraints and once the broad blueprint of fund design is portrayed it requires complete evaluation in the shape of validating value proposition. This framework also proposes that fund managers should also apply proactive risk management measures, i.e., Value at Risk (VaR), Market volatility Risk Analysis (MvRA) and systematic

diversification along with their specialized skills. Thus, before designing any new schemes first of all AMCs should clearly understand regulatory constraints in which they have to operate. Moreover, the net benefits they will be able to offer to investors can be measured by applying risk management practices.

The proposed framework will not only assure investors' satisfaction through innovations induced by investors' investment priorities but will also assure financial benefits to both mutual fund organizations and investors. The *Commitments* which fund managers make with investors before selling them a particular fund scheme can be fulfilled only when AMCs duly understand the risk perception of investors and invest funds accordingly. Last 'C' of this framework is based on the Japanese philosophy, i.e., 'Kaizen' which suggests *continuous improvement (CI)*. Despite higher RoI, many fund schemes fail and results in dissatisfaction among investors because the measures introduced are not followed continuously. So, the last two 'Cs' in this approach demands MFs to truly care for commitments that they have made to influence the buying behavior of investors and ultimately follow it thoroughly, i.e., they are not only required to consider investors' perception and preferences while introducing any new scheme but are also required to inculcate it while managing the funds. Most of the businesses have already admitted that to make any innovation commercially successful it should not only ensure the financial benefits but also consider service quality and customer satisfaction among completion of process.

The complete objective of this study has been to ensure superior innovation process for mutual funds so that AMCs design new fund schemes in accordance to risk perception of investors. Thus, the study has proposed a systematic framework FINIOV which guides and suggests mutual fund AMCs on how they should innovate new fund schemes in this complex financial environment. FINIOV not only ensures inclusion of investors' implicit and explicit expectations but also admit the constrained working of AMCs. Hence, aligning these two parameters the suggested framework directs the working of AMCs for designing new fund schemes or even restructuring existing fund schemes.

5.8 Concluding Remarks

Analysis of mutual fund performance has revealed that mutual fund AMCs differ in risk return trade off offered by them. Although impact of random movement of stock market influence mutual fund performance but mutual fund AMCs that use their superior skills to select quality stock and manage market volatility with timely diversification are able to outperform. The practice of mutual fund AMCs to invest heavily in equity share in anticipation of high RoI is a futile exercise. However, a portfolio carefully constructed with low risk securities and efficiently monitored may yield better returns. Finally, 'FININOV' has been presented as a strategic framework that guides mutual fund AMCs to align their business practices with investors' expectations. FININOV is a suggested framework which is constructed after considering the findings of IRPA as well as working styles of mutual fund AMCs. Thus, it aims at synthesizing the two extreme philosophies in order to make any innovation a complete success.

CHAPTER – VI

DISCUSSION & CONCLUSION

This chapter provides a brief summary of complete study, major findings drawn and their discussion with previous literature. The last section covers the implications of the study and finally gives the suggestions for further research.

6.1 The study in Retrospect

In an attempt to mark their presence mutual fund AMCs are encouraged to design new fund schemes. But despite the fact that mutual funds in India embedded their foot prints more than half a century ago they are yet to attain their position in the global markets. The main reason for this incomplete success cannot be put on the working of AMCs in India because even Indian investors are admitted to be conservative (Rajarajan, 2003; Sultana, 2009). AMCs approach to innovate new schemes is not sufficient and financial engineering should be directed towards process innovation. Thus, the present research aimed to examine the role of both the investors and the AMCs that should be synthesized to make innovations completely successful. Hence, the objectives of study included analysis of risk perception of investors on the one hand and on the other side analyzing the working and performance of AMCs in India. Finally, the findings of above have been blended to suggest a strategic framework FININOV to guide AMCs to consider multivariate factors before introducing innovative funds or even restructuring the existing fund schemes.

To achieve the above objective the study was carried out on 400 existing investors of mutual funds for the purpose of IRPA. Working and performance of mutual funds has been evaluated through secondary data available. AMCs ability to design portfolio mix, manage risk return trade-off and market volatility has been examined. Finally, fusion of these findings has been composed in order to frame FININOV.

The preliminary review of literature revealed the poor performance of mutual funds in India. Moreover, available secondary data has revealed the growth of innovative funds introduced

by various AMCs in India. Based on related findings of these studies poor working style of mutual fund AMCs in terms of their ability to manage market volatility was hypothesized. On the other side, the basic objective of the study was to suggest a systematic framework for innovations in mutual funds that can guide fund managers to align their working style with investors' expectations. Thus, based on this an attempt has been made to understand the risk perception of investors which was carried out through well-structured questionnaire. The survey not only aimed at understanding investors' risk perception but also identified the factors that contribute to investors' expectations.

The findings of the study have revealed that investors consider mutual funds as risky investment. Moreover, the factors that influence this decision as identified in the present study are: investors' age, knowledge, income, worries, probability to lose. It has also been revealed that investors admit mutual funds' performance is subject to trend in the stock market and fund managers do not possess specialized skills to protect them from loss during downtrend (Sarkar and Majumdar, 1995; Mishra and Rehman, 2001; Anand and Murgiah, 2004). Analysis of investors' responses has revealed that investors understand that although mutual fund investment possesses risk but in the long run investors are optimistic and confident to get expected returns.

The analysis of secondary data has also been conducted to examine the mutual funds ability to select and design portfolio mix and ultimately manage risk return trade-off. The findings suggest that AMCs investment style has a significant impact on the returns, fund will generate at a particular risk level. These findings support the earlier studies conducted to analyze the investment styles of fund managers and how these specialized strategies helped them to be ahead of their competitors (Chan *et. al.*, 2002; Rao, 2006; Gottesman and Morey, 2006; Brown *et.al.*, 2008; Eichholtz *et. al.*, 2009). Moreover, to examine the performance of mutual funds in terms of their ability to manage market volatility, secondary data for NAVs of 36 months has been compared with SENSEX movements and it has been revealed that all the funds have behaved in a similar direction as the moves of market forces. Moreover, growth rate in terms of capital appreciation attained by equity based MFs is not significantly different from market growth rate. Thus, any unprofessional investor who would have invested his funds in stock market during the same period would have got similar returns.

Hence, it can be interpreted that mutual fund AMC's are not able to protect investors from losses during downtrend in the market and during uptrend they are not able to yield above average returns. These findings of the study are consistent with findings of Statman, 1999; Malkiel, 2003.

Finally, after understanding the risk perception of investors and AMC's ability to manage volatility, few risk management strategies have been suggested that are prerequisite to FININOV. Aligning the investors' expectations and shared values AMC's fund managers can follow FININOV that directs them toward a systematic way for financial innovations.

6.2 Research contribution

Financial innovation being the lifeblood of financial engineering seeks to adapt the existing financial instruments and develops new ones that enable financial market participants to cope more effectively in the dynamic environment. Application of financial engineering on mutual fund investment in the present scenario is relevant because the investors are becoming more aware and demanding. Thus, it becomes imperative to design a strategic framework for mutual fund AMC's that will not only stimulate inherited risk present in mutual funds, but in chorus will ensure restructured cash flows. In case of Indian scenario, AMC's are already in the process of designing new fund schemes. These practices need alignment of AMC's working with investors' expectations. Thus, the present study endeavors to design a complete innovation process that will consider the requirements of both the investors and the AMC's.

The present study brings to light the various factors that contribute towards the risk perception of investors. Age, income and knowledge of investors have a significant impact on the risk perception of investors. Age is the most significant determinant of investors' decision for risky investment. Study by Bodie *et. al.* (1992); Strong and Taylor (2001) highlight that investors in the young age are less risk averse than investors in the age near to their retirement. Their findings revealed that as the people get older they prefer to invest in less risky securities as with age their risk tolerance reduces. As people age they face a short investment span over which they have to receive return on investment and in young age investors have sufficient time to recover loss, if any. Even the findings of the present study

have admitted age as an important determinant of risk perception. Moreover, findings of IRPA also revealed that as investors' age increases they become risk averse. The findings of the present study contradict the findings of Schooley and Worden (1999) who propounded that wealthy investors are more conservative with their money, whereas low income people with low income are willing to assume more risky payoffs. The present study has revealed that investors in the high income group are less risk averse and have optimism in their behavior.

On the other side, research findings also highlight that mutual fund managers differ in their investment style. Stock selection ability of fund managers may enable them to outperform in the market. There is not much scope of predicting the behavior of stock market but adopting the risk management practices fund managers may be able to assume calculated risk. Thus, the present study encourages fund managers to understand the factors influencing investors' behavior and adopting proactive strategies to tackle market forces before introducing innovations in their schemes.

The major findings of the study are as follows:

- i) Tax saving is the major investment objective of mutual fund investors. Investors with different demographic base have revealed that they prefer to invest in mutual funds because of tax saving investment. However, preference for investing in mutual funds for capital appreciation comes afterwards.
- ii) Investors differ in their choice for preferring various investment avenues, basically due to different risk level associated with these investments. Among the various investment avenues, investors prefer insurance and bank securities more than the mutual fund investment.
- iii) Mutual funds have mandatory requirement to completely disclose the fundamental risk involved. Mostly research studies focus on effects of risk without considering how investors perceive risk, as disclosed risk has a significant impact on financial decisions of investors (Ganguly, *et. al.* 1994; Schrand and Elliott, 1998). Study by Koonce *et. al.* (2004) demonstrated that loss outcome information contained in

mandate risk disclosure directly influences investors' risk judgment. The findings of the present study have revealed that investors are not convinced with complete disclosure practices of mutual funds which ultimately gives way to configure negative perception towards mutual funds. Moreover, the analysis of age wise investors' responses on disclosure practices also reveals that investors in the age > 50 years find it difficult to understand the disclosed risk than investors in the young age group. These findings foster the issue to bring necessary structural changes and simplify the disclosure practices.

- iv.) Perception of investors towards working style of mutual fund AMCs is a strong determinant of investors' risk perception. Existing literature reveals that investors' perception and decision on risk tolerance are significantly influenced by their knowledge Shaw, 1996; Schooley and Worden, 1999; Grable, 2000) .Study by Chen and Tsai (2009) provided that investors' education and knowledge are an important demographic factors thought to increase a person's capacity to evaluate risks inherent to the investment procedure. These factors endow investors with higher financial risk perceptions and have a bearing on in individual investors' portfolio choices or financial investment decision. The perception of investors towards working of mutual funds has been analyzed with reference to their knowledge level. The analysis reveals that investors are not found to be satisfied with the working of mutual fund AMCs. A significant association is revealed between investors' knowledge level and their perception about performance of mutual funds.
- v). Responses of investors on preferred level of risk, when different pay-offs are offered to them reveal that investors do not prefer to assume extreme high or extreme low risk. Mean score of investors' opinion (M= 2.95) on preferred choice of risk return calculus has revealed that investors prefer median alternative when they are offered different alternatives reflecting higher the risk, higher the return. These findings support the earlier findings on individuals' attitude to avoid extreme positions (Simonson and Tversky, 1992; Benartzi and Thaler, 2002). However, these preferences somewhat vary with income and age level. Investors in the young age group and high income

have revealed their high risk taking preference in comparison to investors in the old age and low income group.

- vi) Age (Morin and Suarez, 1983; Bodie *et. al.* 1992; Riley and Chow, 1992; Palsson, 1996; Heaton and Lucas, 2000; Steinberg, 2005), income (Riley and Chow, 1992; Cicchetti and Dubin, 1994; Shaw, 1996; Bernheim *et. al.*, 2001; Ajmi, 2008), Education/ knowledge (Crimmon and Wehrung, 1990; Mankiw and Zeldes, 1991; Haliassos and Bertaut, 1995; Grimes and Snively, 1999) have been identified as significant factors that shape the risk perception of investors. Based on these findings an attempt has been made to understand investors' risk perception along-with important socio-economic factors. The overall analysis reveal that although investors admit that mutual fund investment is risky but their responses vary significantly with different levels of socio-economic status. Based on these findings the first hypothesis (H_1) has been accepted. Thus, despite mutual funds' effort to design new fund schemes to suit investors' requirements investors may consider mutual fund a risky investment. The findings of survey have also revealed that investors have somewhat optimistic opinion about the working of AMCs and they are found to be confident about the returns that they will get. These results expose that investors admit mutual funds are vulnerable to market fluctuations but they are confident to get returns in the long run. Moreover, these findings also confirm the second hypothesis of this study (H_2) that investors may be confident about returns from mutual funds.
- vii). For the purpose of verifying correlation between investors' confidence in returns from mutual funds and their risk perception along-with factors influencing these decision, canonical correlation has been conducted. Various factors that have been included in the dependent variable category are: investors' confidence in returns from MF, investors' preferred risk level and investors' risk perception. Age, income, knowledge, credibility, worried and probability have been included as independent variables. Results of canonical correlation reveal that a strong relationship exists ($r=0.788$, $p<0.001$) between set of dependent and independent variables.

- viii). For a closer examination of relationship between investors' risk perception towards mutual funds and its determinants, step wise multiple regression has also been used taking investors' confidence in mutual fund returns as dependent variable and Age, income, knowledge, worried, probability estimation, investors' opinion about downtrend in the stock market as independent variables. Analysis of these results provides $R = 0.668$ ($R^2 = 0.446$) and *adjusted* $R^2 = 0.439$ which is significant at 0.1 percent level ($p < 0.001$). This analysis reveals that socio economic factors, i.e., age, income and knowledge are significant determinants of risk perception of mutual fund investors. Moreover, step wise multiple regression has also been carried for examining the relationship between investors' confidence in returns from MF as criterion variable and a set of independent variables. These findings reveal that investors' confidence in return is determined by their perception towards AMC's ability to manage and control risk along- with age, worried and probability to lose. Analysis of multivariate statistic for investors' confidence in return from mutual funds reveal that $R = 0.704$ ($R^2 = 0.496$) and *adjusted* $R^2 = 0.490$, which provides that 49% variance in investors' confidence can be predicted from Investors' trust in AMC's working, credibility, age and probability. These results are found significant at 0.1 percent level ($p < 0.001$).
- ix). Analysis of secondary data has revealed that Indian mutual fund industry has been growing at a very fast pace. During the last ten year period, industry has grown at nearly 22.29% CAGR. Total net assets of mutual fund industry in India grew by 22.29% (CAGR) during 1999 -2009. Moreover, AMC's have also endeavored to tap the untapped potential markets by designing new schemes and as a result presently 933 schemes are operating in India.
- x). Fund managers differ in their investment styles. These sophisticated strategies adopted by fund managers help them in outperforming their performance in comparison to their competitors. Among the four funds under the study SBIMEF invests majority of funds in equity stock, i.e., 88.34% whereas ICICIPEF seems to be taking calculated risk by investing only 70.86% funds in equity stock. High level risk taken by SBIMEF seems to be paying it the highest return of 27.31% during last one month whereas ICICIPEF gets only 15.03% during the same period. UTIEF also seems to follow the

pattern of SBIMEF investing more in equity stock (86.36%), but the stock selection abilities of fund managers are doubtful in this case as they provided 19.04% return during last one month. These were comparatively quite less compared to 27.31% provided by SBIMEF for same proportion of equity stock held in their portfolio. Comparison of returns during last one year also show that these funds provided the highest negative return (-4.73%) among four funds under the study. Among the four Balance funds UTIBF invest heavily in equity stock (80%), whereas SBIMBF invests 72% of their fund corpus in equity shares. But the analysis of funds' RoI reveals that absolute returns of the SBIMBF, i.e., 9.80% is higher than RoI on UTIBF, i.e., 9.08% during 2007 bullish period. This fact again indicates that in case of fund composition merely selecting equity stocks to magnify fund returns is futile exercise as fund managers' differ in their stock selection ability and accordingly generate different risk return trade-off. Similarly, the analysis of income funds and balanced funds have revealed that fund managers should not move on the philosophy of 'Higher the risk, higher the reward'. These results support the earlier research findings [Sinha (1994); Lo (2000); Omrane and Guedhami (2005); Sinaee and Moradi (2009)]. Using the stock selection diligence and estimating the market timings fund managers can outperform.

Thus, findings of this study have revealed that fund managers differ in applying their professional diligence in selecting stock for the portfolio and with these different investment styles they are able to get superior returns. These findings support the earlier studies conducted to analyze the investment styles of fund managers and how these specialized strategies help them to be ahead of their competitors (Chan *et. al.*, 2002; Rao, 2006; Gottesman and Morey, 2006; Brown *et. al.*, 2008; Eichholtz *et. al.*, 2009). Moreover, the findings confirm the proposed hypothesis (H₃) that comparative performance of Mutual funds to manage risk return trade off may vary significantly.

- xi). In the Indian context mutual fund investors are found to be conservative and generally rely on past performance to select any mutual fund. In the present study to validate EMH and to explore whether there exists any pattern in stock market movement, an attempt has been made to examine randomness in the movement of Sensex and NAVs of Mutual fund using Run test. Results provided by this test validate that high degree

of randomness exist among NAVs of the mutual fund schemes. The analyses of plotted NAVs show technical indicators, but also support the unpredictability as indicated by Roberts (1959).

- xii). Existing literature on market efficiency provides that financial markets do not allow investors to earn above average return without accepting above average risks (Gosness *et. al.* 1996; Statman 1999; Bhana 2002). Study by Gosnell *et. al.* (1996) provided that when new information is released it is fully incorporated into the stock prices and thus, trading rules are incapable of producing superior returns. Malkiel (2005) also supported that professional investment managers in US and other developed countries do not outperform their index benchmark and also provides evidence that market prices do seem to reflect all available information. Similarly few studies on performance of mutual fund investment have explained mutual funds as poor in terms of their performance (Jain, 1982; Sarkar and Majumdar, 1995; Gruber, 1996). Korkeamaki and Smythe (2004) conducted empirical research on mutual fund performance for the specialized services offered by them and found them poor for the level of fee charged. They revealed that additional returns on mutual funds did not compensate investors in term of additional fee charged by them for their professional services.

Empirical evidences of the present study support EMH that all funds investing in equity stock or blend of equity and bonds perform almost similarly and move with market forces only. Fund managers have not been found to outperform using unique information available to them. These findings further confirm the hypothesis (H_4) that although mutual fund managers possess professional skills but still they are not able to reduce and manage market volatility. These findings highlight that that mutual fund schemes perform according to market trends only and thus, do not help investors in reducing the overall risk by applying their forecasting abilities. Thus, as most of the funds have shown their underperformance especially during the bearish trend, the hypothesis (H_4) is confirmed. Hence, despite the professional skills fund managers possess, mutual funds may not be able to reduce risk from market volatility.

The final outcome of both primary and secondary data have been amalgamated in order to develop a strategic framework FININOV which allows financial products to be designed/ restructured so that mutual funds' service style may match with investors' expectations. This framework will also ensure the fine tuning of existing mutual funds to improve their value on risk-return calculus in response to changing market conditions. FININOV aims to make innovation process complete by focusing on both ends of mutual funds, i.e., the investors' expectations and the working constraints of AMCs. Moreover, as the secondary data have revealed that forecasting the market movements exactly is very crucial, few risk management strategies have been embedded in FININOV that will guide AMCs to assume calculated risk in accordance with investors' risk appetite. The blending of these working philosophies will ensure that MFs deliver their committed returns.

6.3 Implications of the study

The present study has laid emphasis on identifying the factors that are responsible for creating gap in investors' perception which are helpful to financial intermediaries in tapping the untapped potential of investors and even retaining the existing investors. Mostly investors are lured by stock market based financial products in anticipation of getting abnormal returns, whereas the incomplete knowledge about this process may turn their savings to reverse gear. Thus, the present study emphasizes that fund managers are required to completely understand the investors' perception before channelizing their savings into stock market. The ultimate objective of the study to develop FININOV has endeavored to align the investors' expectations and working styles of managers.

Age, income and investors' knowledge are the three important parameters that determine the broad perception of investors. Thus, AMCs will be able to design fund schemes keeping in mind the different socio economic base of investors. The study has highlighted a few parameters like transparency, assurance and commitment which financial intermediaries should focus upon to retain their existing investors. Therefore, financial intermediaries should focus on the service quality arrangements viz. transparency, assurance, responsiveness and commitment at the foremost priority. The study has also highlighted that

mutual fund investors are unable to understand the disclosed risks. Thus, these findings not only suggest that regulatory bodies should simplify the disclosure norms, but also provide that investors should also learn in detail about the disclosed risks before investing. Investors' negligence to carefully read the disclosures ultimately frames their negative perception about the working of mutual funds.

This study has managerial implications as the result reveal that fund managers cannot outperform the markets by applying 'Higher the Risk, Higher the Reward' principle. In stock market phenomenon no universally accepted rules can be framed to consistently beat the market. Fund managers however, may use their superior skills for selecting stocks carefully and monitoring the time to trade in order to get higher returns. The findings of study have identified that AMCs which are able to carefully select and monitor the portfolio outperform their competitors. Thus, working on the suggested risk management practices and aligning their practices with investors' expectations, AMCs may be able to get the high returns at the calculated risk.

Another implication of the study is that policy makers may adopt their working philosophy which not only ensures regulatory compliance but also give due weightage to investor orientation. This suggests that the present study is a basis of amelioration for investors, AMCs, policy makers and regulatory bodies which can intensify the designing of fund schemes to cater to investors' needs.

6.4 Constraints and Limitations

Like most research, a study can hardly be perfect. As such, this study also has limitations. However, these limitations also present opportunities for future research. Successful implementation of financial engineering methodology can ensure promising value added services to the investors by introducing innovation in the existing financial products and processes. Mutual fund AMCs are already in the process of designing new fund schemes by diversifying their funds in various securities or designing new schemes with varied blends of equity and debt. However, in view of the scope, this study is confined to innovation

process only. Thus, the study has further scope to design new financial products by applying optimization techniques.

The study has limitation of resource constraints and as a result for primary data, investors from Punjab only have been taken. Thus, the results may be true for sample chosen from Punjab. In the future work data collection can be extended to include investors from all over India. Moreover, for comparing the performance of mutual funds only selected funds have been analyzed. The analysis of working can be extended to a large number of funds and application of systematic optimization techniques can be suggested to guide fund managers to optimally select funds from a given set of choices. Further, the strategies used by fund managers to forecast and manage market volatility can be analyzed.

6.5 Recommendations for Future Research

Future research should be focused on an in depth analysis of investors' sentiments and expectations that may cause over and under reactions in the stock market. Moreover, a thorough understanding of investors' behavior can further be extended to develop an automated artificial intelligence based mechanism that will match investors' expectations and AMC's constraints to generate an optimal portfolio. Thus, to summarize, following aspects may be incorporated in further research:

- i). The present Study has been conducted on a small sample of 400 investors from Punjab. However, in a large country like India, behavior of investors may differ with geographical dispersion. Thus, an in depth analysis of investors' varied perception along-with culture impact may be studied.
- ii). An experimental study to understand the risk taking behavior of investors can also be done.
- iii). A few risk management studies have already been suggested in the present study. They can be further extended to develop automated software where based on investors' preferences optimal portfolio may be designed and monitored.

Publications from the Present Research

Accepted

- Nidhi Walia & Dr. (Ms) Ravi Kiran (2011) “Does Portfolio Mix Influence The Mutual Fund Performance?” Accepted for Publication in *European Journal of Finance, Economics and Administrative Sciences(EJFEAS)* **EuroJournals**
(*Index in **Social Science Citation Index (SSCI), SCOPUS**)
- Nidhi Walia & Dr. (Ms) Ravi Kiran (2011) “Understanding the risk anatomy of experienced Mutual Funds’ investors” Accepted for publication in *Journal of Behavioral Finance (JBF)*. **Taylor & Francis**
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Published

- Nidhi Walia & Dr. (Ms) Ravi Kiran (2010) “Efficient Market Hypothesis, Price volatility and performance of Mutual Funds” *Global Journal of Management and Business Research (GJMBR)*, Vol.10, No.2, pp. 42-50.
- Nidhi Walia & Dr. (Ms.) Ravi Kiran (2010)“Market volatility, Diversification and Proactive Risk Management for Mutual funds” *Global Business and Management Research(GBMR)*, Vol II, No.3, pp 198-207.
- Nidhi Walia & Dr. (Ms.) Ravi Kiran (2009), “ An analysis of investors’ risk perception towards mutual fund services” *International Journal of Business and Management (IJBm)*, Vol. 4, No. 5, pp 106-120.
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ANNEXTURE – A

QUESTIONNAIRE

INVESTOR'S RISK PERCEPTION ABOUT MUTUAL FUNDS

Dear Sir / Madam,

Mutual funds are constantly accelerating financial markets by providing more lucrative and promising solutions to investors. Thus, it is high time to gather investor's responses and extract useful information. In this connection I request you to read the following items carefully and answer them. The answers given by you will be held confidential and used purely for academic purpose.

PART A: Personal Data

1.1 Name: _____

1.2 Add: _____

1.3 Age: (✓) Under 30 ☐ 30 – 50 ☐ 50 above ☐

1.4 Marital Status: (✓) Married ☐ Unmarried ☐

1.5 Area: (✓) Urban ☐ Semi Urban ☐ Rural ☐

1.6 Education: (✓) Graduate ☐ Post Graduate ☐ Under Graduate ☐

1.7 Profession: (✓) Businessman ☐ Salaried ☐ Professional ☐

1.8 Annual income: < 1.5 Lakh ☐ 1.5 – 3 Lakh ☐ 3 – 5 Lakh ☐ > 5 Lakh ☐

1.9 Your propensity to save (how much proportion of your income you save): (✓)
Less than 10% ☐ 10% - 20% ☐ 20% - 30% ☐ More than 30% ☐

1.10 Investment of a person depends upon regularity of income, and further it calls for willingness of investor to assume risk. You assume your financial position to be: (✓)
Very stable ☐ Somewhat stable ☐ Moderately stable ☐ Unstable ☐ Very unstable ☐

PART B: Investor's Knowledge

2.1 How you describe your knowledge about investment avenues: (✓)
Very little knowledge ☐ Some Knowledge ☐ Moderate Knowledge ☐

Good working Knowledge ☐ Extensive knowledge ☐

2.2 What is your main objective behind investment? (✓)
Tax reduction ☐ To provide for retirement ☐ Contingency ☐

Capital appreciation ☐ Children education/marriage ☐

2.3 You prefer to invest in (Please rank your preferences from 1 – 8, 1 being most preferred and 8 least preferred):

Insurance ☐ PPF ☐ Shares/Bonds ☐ Mutual funds ☐

Post office ☐ Bank deposit ☐ Real estate ☐ Gold ☐

Part C: Investor's Preference for Mutual funds

3.1 Which of the following mutual funds you preferred while investing: (✓)

UTI ☐ SBI ☐ ICICI ☐ Reliance ☐

3.2 Evaluate following parameters of Mutual funds services on the basis of your experience (Tick the appropriate level, 1 being minimum and 5 being highest)

MF Services	Before Investment					After Investment				
Transparency	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Responsiveness	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Communication	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Commitment (for return)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Assurance	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

3.3 Based on your experience with mutual funds explain whether you were clarified each statement /term associated with mutual funds investment? (✓)

	Strongly Agree	Agree	Moderate Agree	Disagree	Strongly disagree
<i>Disclosed all the fundamental risks</i>	☐	☐	☐	☐	☐
<i>Disclosed entry/ exit load that will bear on sale/purchase</i>	☐	☐	☐	☐	☐
<i>Explained about contents of flexible portfolio in which your money will be invested</i>	☐	☐	☐	☐	☐
<i>Explained illustrative examples given are not a guaranteed return</i>	☐	☐	☐	☐	☐
<i>Informed about maturity/ Liquidity of investment</i>	☐	☐	☐	☐	☐
<i>Clearly explained about % of allocated fund that you will receive</i>	☐	☐	☐	☐	☐

3.4 Based on your experience and problems encountered while investing in Mutual Fund's, please indicate which of the following statement best explains your opinion: (✓)

	Strongly Agree	Agree	Moderate Agree	Disagree	Strongly disagree
<i>Actual returns don't match with expected returns.</i>	☐	☐	☐	☐	☐
<i>MFs are poor to respond to volatility in the market.</i>	☐	☐	☐	☐	☐
<i>High Hidden Cost.</i>	☐	☐	☐	☐	☐
<i>Funds not Invested according to investor's objectives.</i>	☐	☐	☐	☐	☐
<i>Agents/Brokers are not well Informed</i>	☐	☐	☐	☐	☐
<i>AMCs not able to protect the interest of investors.</i>	☐	☐	☐	☐	☐
<i>Mutual funds don't possess strong integrated</i>	☐	☐	☐	☐	☐

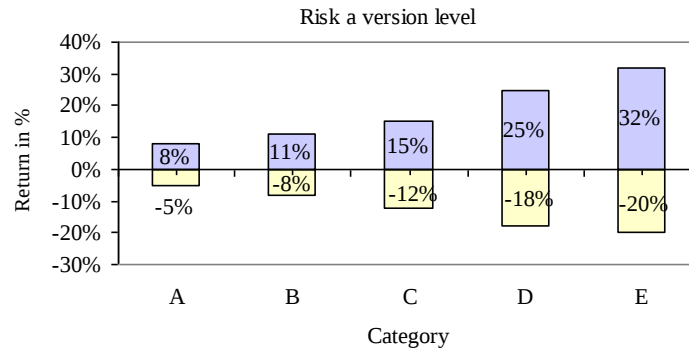
Part D: Investor's Risk Perception

4.1 If Mutual Funds tendency to assume risk is clarified to you, will you be willing to assume risk realizing high-risk means higher return. (✓)

Strongly Agree ☐ Agree ☐ Moderate Agree ☐ Disagree ☐ Strongly disagree ☐

4.2 Assume mutual funds are vulnerable to market risk & following graph shows a range of potential gains/losses of hypothetical portfolio in which of the following you will prefer to invest. (✓)

- A ☐
B ☐
C ☐
D ☐
E ☐

**Part E: Please read the following statements and tick appropriate circle. (✓)**

1 for minimum and
5 for maximum

- | | | |
|------|---|---------------------|
| 5.1 | To what extent risk involved in mutual funds cause you worry. | (1) (2) (3) (4) (5) |
| 5.2 | To what extent do you think risks in mutual funds are precisely estimated by AMC's of Mutual funds? | (1) (2) (3) (4) (5) |
| 5.3 | Do you think risk involved in mutual fund can be controlled by skills and diligence of AMC's. | (1) (2) (3) (4) (5) |
| 5.4 | What do you think is the probability of loosing your investment in mutual funds? | (1) (2) (3) (4) (5) |
| 5.5 | If there is sharp decline in stock market, how much loose you expect from MF investment? | (1) (2) (3) (4) (5) |
| 5.6 | If there is uptrend in the stock market how big gain would you expect? | (1) (2) (3) (4) (5) |
| 5.7 | To what extent do you think claims made in mutual fund advertisement are credible? | (1) (2) (3) (4) (5) |
| 5.8 | How confident do you feel that you will get expected annual return from your MF investment? | (1) (2) (3) (4) (5) |
| 5.9 | How confident do you feel that you will realize expected total return at the time of selling your mutual funds units? | (1) (2) (3) (4) (5) |
| 5.10 | Overall how risky is MF as an investment. | (1) (2) (3) (4) (5) |

Thank you very much for your kind co-operation and for sparing time to complete this Questionnaire.

ANNEXURE – D

SPSS OUTPUT OF CANONICAL CORRELATION (Stability)

Dependent Variables: Confidence in AR, Confidence in TR, Overall Risk

Independent Variables: Age, Income, Knowledge, Worried, Probability, Credibility

Correlations for Set-1

	VAR00001	VAR00006	VAR00009	VAR00045	VAR00048	VAR00051
VAR00001	1.0000	-.0412	-.2876	.1575	.0018	-.2122
VAR00006	-.0412	1.0000	.4066	-.1049	-.1394	.0495
VAR00009	-.2876	.4066	1.0000	-.2256	-.1955	.2216
VAR00045	.1575	-.1049	-.2256	1.0000	.4694	-.0294
VAR00048	.0018	-.1394	-.1955	.4694	1.0000	-.0550
VAR00051	-.2122	.0495	.2216	-.0294	-.0550	1.0000

Correlations for Set-2

	VAR00052	VAR00053	VAR00054
VAR00052	1.0000	.6863	-.3190
VAR00053	.6863	1.0000	-.2558
VAR00054	-.3190	-.2558	1.0000

Correlations Between Set-1 and Set-2

	VAR00052	VAR00053	VAR00054
VAR00001	-.3563	-.3176	.2662
VAR00006	.2351	.1939	-.2286
VAR00009	.3195	.2913	-.3222
VAR00045	-.2750	-.2873	.4160
VAR00048	-.2988	-.2402	.4461
VAR00051	.3925	.3460	-.1521

Canonical Correlations

1	.712
2	.268
3	.093

Test that remaining correlations are zero:

	Wilk's	Chi-SQ	DF	Sig.
1	.454	311.522	18.000	.000
2	.920	32.716	10.000	.000
3	.991	3.421	4.000	.490

Standardized Canonical Coefficients for Set-1

	1	2	3
VAR00001	.386	.187	-.171
VAR00006	-.223	-.092	.270
VAR00009	-.143	.146	-.203
VAR00045	.291	-.279	1.000
VAR00048	.422	-.428	-.868
VAR00051	-.339	-.780	-.051

Raw Canonical Coefficients for Set-1

	1	2	3
VAR00001	.535	.260	-.237
VAR00006	-.254	-.104	.307

VAR00009	-.140	.143	-.200
VAR00045	.276	-.265	.949
VAR00048	.436	-.442	-.897
VAR00051	-.369	-.849	-.056

Standardized Canonical Coefficients for Set-2

	1	2	3
VAR00052	-.440	-.661	1.158
VAR00053	-.265	-.226	-1.332
VAR00054	.579	-.884	-.024

Raw Canonical Coefficients for Set-2

	1	2	3
VAR00052	-.433	-.651	1.140
VAR00053	-.254	-.217	-1.274
VAR00054	.579	-.884	-.024

Canonical Loadings for Set-1

	1	2	3
VAR00001	.555	.270	.044
VAR00006	-.403	.010	.208
VAR00009	-.568	.028	-.112
VAR00045	.615	-.451	.585
VAR00048	.637	-.532	-.394
VAR00051	-.495	-.760	-.028

Cross Loadings for Set-1

	1	2	3
VAR00001	.395	.072	.004
VAR00006	-.287	.003	.019
VAR00009	-.404	.008	-.010
VAR00045	.438	-.121	.054
VAR00048	.453	-.142	-.037
VAR00051	-.352	-.203	-.003

Canonical Loadings for Set-2

	1	2	3
VAR00052	-.807	-.535	.252
VAR00053	-.715	-.454	-.531
VAR00054	.787	-.615	-.052

Cross Loadings for Set-2

	1	2	3
VAR00052	-.574	-.143	.023
VAR00053	-.509	-.122	-.049
VAR00054	.560	-.165	-.005

Redundancy Analysis:

Proportion of Variance of Set-1 Explained by Its Own Can. Var.

	Prop Var
CV1-1	.303
CV1-2	.190
CV1-3	.093

Proportion of Variance of Set-1 Explained by Opposite Can.Var.

	Prop Var
--	----------

CV2-1	.154
CV2-2	.014
CV2-3	.001

Proportion of Variance of Set-2 Explained by Its Own Can. Var.

	Prop Var
CV2-1	.594
CV2-2	.290
CV2-3	.116

Proportion of Variance of Set-2 Explained by Opposite Can. Var.

	Prop Var
CV1-1	.301
CV1-2	.021
CV1-3	.001

----- END MATRIX -----

ANNEXURE – E

SPSS OUTPUT FOR MULTIPLE REGRESSION ANALYSIS (Step wise)

Dependent Variable: Confidence in TR

Independent Variable: Credibility, Worried, Age, Probability, Risk Estimation by AMCs, Risk Control by AMCs

Descriptive Statistics

	Mean	Std. Deviation	N
Confident of Total return	3.3000	1.04534	400
Credibility of Advertisement	2.8375	.91826	400
Risk estimation by AMC	3.1875	1.13382	400
Risk control by AMC	3.1400	1.18909	400
worried about risk	2.9025	1.05393	400
Age	1.7375	.72104	400
Probability to lose	2.9000	.96816	400

Correlations

		Confident of Total return	Credibility of Advertisement	Risk estimation by AMC	Risk control by AMC	worried about risk	Age	Probability to lose
Pearson Correlation	Confident of TR	1.000	.346	.627	.555	-.287	-.318	-.240
	Credibility	.346	1.000	.285	.239	-.029	-.212	-.055
	Risk estimation	.627	.285	1.000	.577	-.253	-.249	-.195
	Risk control	.555	.239	.577	1.000	-.221	-.261	-.293
	worried	-.287	-.029	-.253	-.221	1.000	.158	.469
	Age	-.318	-.212	-.249	-.261	.158	1.000	.002
	Probability	-.240	-.055	-.195	-.293	.469	.002	1.000
Sig. (1-tailed)	Confident of TR	.	.000	.000	.000	.000	.000	.000
	Credibility	.000	.	.000	.000	.279	.000	.136
	Risk estimation	.000	.000	.	.000	.000	.000	.000
	Risk control	.000	.000	.000	.	.000	.000	.000
	worried	.000	.279	.000	.000	.	.001	.000
	Age	.000	.000	.000	.000	.001	.	.486

	Probability	.000	.136	.000	.000	.000	.486	.
N	Confident of TR	400	400	400	400	400	400	400
	Credibility	400	400	400	400	400	400	400
	Risk estimation	400	400	400	400	400	400	400
	Risk control	400	400	400	400	400	400	400
	Worried	400	400	400	400	400	400	400
	Age	400	400	400	400	400	400	400
	Probability	400	400	400	400	400	400	400

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Risk estimation		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Risk control		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
3	Credibility		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
4	worried		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
5	Age		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Confident of Total return

Model Summary^f

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.627 ^a	.393	.392	.81538	.393	257.787	1	398	.000	
2	.670 ^b	.449	.446	.77793	.056	40.242	1	397	.000	
3	.687 ^c	.472	.468	.76220	.023	17.555	1	396	.000	
4	.698 ^d	.487	.481	.75274	.014	11.026	1	395	.001	
5	.705 ^e	.497	.491	.74609	.010	8.071	1	394	.005	1.780

a. Predictors: (Constant), Risk estimation

b. Predictors: (Constant), Risk estimation, Risk control

- c. Predictors: (Constant), Risk estimation, Risk control, Credibility
d. Predictors: (Constant), Risk estimation, Risk control, Credibility, worried
e. Predictors: (Constant), Risk estimation, Risk control, Credibility, worried, Age
f. Dependent Variable: Confident of Total return

ANOVA^f

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	171.390	1	171.390	257.787	.000 ^a
	Residual	264.610	398	.665		
	Total	436.000	399			
2	Regression	195.743	2	97.872	161.723	.000 ^b
	Residual	240.257	397	.605		
	Total	436.000	399			
3	Regression	205.942	3	68.647	118.163	.000 ^c
	Residual	230.058	396	.581		
	Total	436.000	399			
4	Regression	212.189	4	53.047	93.622	.000 ^d
	Residual	223.811	395	.567		
	Total	436.000	399			
5	Regression	216.682	5	43.336	77.853	.000 ^e
	Residual	219.318	394	.557		
	Total	436.000	399			

- a. Predictors: (Constant), Risk estimation by AMC
b. Predictors: (Constant), Risk estimation by AMC, Risk control by AMC
c. Predictors: (Constant), Risk estimation, Risk control, Credibility
d. Predictors: (Constant), Risk estimation, Risk control, Credibility, worried
e. Predictors: (Constant), Risk estimation, Risk control, Credibility, worried, Age
f. Dependent Variable: Confident of Total return

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.457	.122		11.968	.000		
	Risk estimation	.578	.036	.627	16.056	.000	1.000	1.000
2	(Constant)	1.150	.126		9.128	.000		
	Risk estimation	.424	.042	.460	10.081	.000	.667	1.500
	Risk control	.254	.040	.289	6.344	.000	.667	1.500
3	(Constant)	.785	.151		5.199	.000		
	Risk estimation	.392	.042	.425	9.337	.000	.644	1.553

	Risk control	.239	.039	.271	6.045	.000	.661	1.513
	Credibility	.182	.044	.160	4.190	.000	.911	1.098
4	(Constant)	1.235	.201		6.129	.000		
	Risk estimation	.369	.042	.400	8.776	.000	.626	1.596
	Risk control	.226	.039	.257	5.759	.000	.654	1.529
	Credibility	.190	.043	.167	4.420	.000	.908	1.101
	Worried	-.123	.037	-.124	-3.320	.001	.925	1.082
5	(Constant)	1.602	.238		6.735	.000		
	Risk estimation	.359	.042	.389	8.593	.000	.622	1.607
	Risk control	.212	.039	.241	5.405	.000	.644	1.553
	Credibility	.173	.043	.152	3.998	.000	.889	1.125
	worried about risk	-.113	.037	-.114	-3.059	.002	.916	1.092
	Age	-.156	.055	-.108	-2.841	.005	.891	1.123

a. Dependent Variable: Confident of Total return

Excluded Variables^f

	Model	Beta In	T	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Credibility	.182 ^a	4.588	.000	.224	.919	1.088	.919
	Risk control	.289 ^a	6.344	.000	.303	.667	1.500	.667
	worried	-.137 ^a	-3.451	.001	-.171	.936	1.068	.936
	Age	-.172 ^a	-4.360	.000	-.214	.938	1.066	.938
	Probability	-.122 ^a	-3.110	.002	-.154	.962	1.040	.962
2	Credibility	.160 ^b	4.190	.000	.206	.911	1.098	.644
	Worried	-.115 ^b	-3.010	.003	-.150	.928	1.078	.650
	Age	-.139 ^b	-3.623	.000	-.179	.917	1.090	.652
	Probability	-.072 ^b	-1.852	.065	-.093	.913	1.095	.633
3	worried	-.124 ^c	-3.320	.001	-.165	.925	1.082	.626
	Age	-.119 ^c	-3.120	.002	-.155	.899	1.112	.638
	Probability	-.076 ^c	-1.988	.048	-.100	.913	1.095	.627
4	Age	-.108 ^d	-2.841	.005	-.142	.891	1.123	.622
	Probability	-.026 ^d	-.626	.531	-.032	.741	1.349	.626
5	Probability	-.044 ^e	-1.040	.299	-.052	.727	1.376	.612

a. Predictors in the Model: (Constant), Risk estimation by AMC

b. Predictors in the Model: (Constant), Risk estimation, Risk control

c. Predictors in the Model: (Constant), Risk estimation, Risk control, Credibility

d. Predictors in the Model: (Constant), Risk estimation, Risk control, Credibility, worried

e. Predictors in the Model: (Constant), Risk estimation, Risk control , Credibility, worried, Age

f. Dependent Variable: Confident of Total return

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	Risk estimation by AMC	Risk control by AMC	Credibility of Advertisement	worried about risk	Age
1	1	1.942	1.000	.03	.03				
	2	.058	5.802	.97	.97				
2	1	2.885	1.000	.01	.01	.01			
	2	.066	6.619	.91	.05	.41			
	3	.049	7.655	.08	.94	.58			
3	1	3.810	1.000	.00	.00	.01	.01		
	2	.095	6.328	.06	.11	.29	.40		
	3	.049	8.780	.00	.85	.68	.02		
	4	.045	9.208	.94	.04	.02	.58		
4	1	4.666	1.000	.00	.00	.00	.00	.00	
	2	.180	5.086	.00	.07	.09	.00	.35	
	3	.077	7.767	.00	.02	.17	.80	.13	
	4	.049	9.722	.00	.78	.69	.05	.00	
	5	.027	13.161	.99	.13	.04	.14	.52	
5	1	5.501	1.000	.00	.00	.00	.00	.00	.00
	2	.240	4.790	.00	.05	.07	.01	.08	.21
	3	.114	6.948	.00	.02	.02	.07	.41	.46
	4	.076	8.492	.00	.01	.18	.70	.23	.02
	5	.049	10.590	.00	.81	.65	.05	.01	.01
	6	.020	16.540	1.00	.10	.07	.17	.27	.30

a. Dependent Variable: Confident of Total return

ANNEXURE – F

Multiple Regression Analysis (Step Wise)

Dependent Variable: Confidence in AR

Independent Variable: Credibility, Worried, Age, Probability, Risk Estimation by AMCs, Risk Control by AMCs

Descriptive Statistics

	Mean	Std. Deviation	N
Confident of Annual return	3.2175	1.01626	400
Credibility of Advertisement	2.8375	.91826	400
Risk estimation by AMC	3.1875	1.13382	400
Risk control by AMC	3.1400	1.18909	400
worried about risk	2.9025	1.05393	400
Age	1.7375	.72104	400
Probability to lose	2.9000	.96816	400

Correlations

		Confident of Annual return	Credibility of Advertisement	Risk estimation by AMC	Risk control by AMC	worried about risk	Age	Probability to lose
Pearson Correlation	Confident of AR	1.000	.392	.571	.558	-.275	-.356	-.299
	Credibility	.392	1.000	.285	.239	-.029	-.212	-.055
	Risk estimation	.571	.285	1.000	.577	-.253	-.249	-.195
	Risk control	.558	.239	.577	1.000	-.221	-.261	-.293
	worried	-.275	-.029	-.253	-.221	1.000	.158	.469
	Age	-.356	-.212	-.249	-.261	.158	1.000	.002
	Probability	-.299	-.055	-.195	-.293	.469	.002	1.000
Sig. (1-tailed)	Confident of AR	.	.000	.000	.000	.000	.000	.000
	Credibility	.000	.	.000	.000	.279	.000	.136
	Risk estimation	.000	.000	.	.000	.000	.000	.000
	Risk control	.000	.000	.000	.	.000	.000	.000
	Worried	.000	.279	.000	.000	.	.001	.000
	Age	.000	.000	.000	.000	.001	.	.486
	Probability	.000	.136	.000	.000	.000	.486	.

N	Confident of AR	400	400	400	400	400	400	400
	Credibility	400	400	400	400	400	400	400
	Risk estimation	400	400	400	400	400	400	400
	Risk control	400	400	400	400	400	400	400
	worried	400	400	400	400	400	400	400
	Age	400	400	400	400	400	400	400
	Probability	400	400	400	400	400	400	400

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Risk estimation by AMC		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Risk control by AMC		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
3	Credibility of Advertisement		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
4	Age		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
5	Probability to lose		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Confident of Annual return

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.571 ^a	.326	.325	.83508	.326	192.911	1	398	.000
2	.636 ^b	.404	.401	.78637	.078	51.828	1	397	.000
3	.671 ^c	.450	.446	.75644	.046	33.040	1	396	.000
4	.688 ^d	.474	.468	.74111	.023	17.557	1	395	.000
5	.704 ^e	.496	.490	.72606	.022	17.548	1	394	.000

a. Predictors: (Constant), Risk estimation by AMC

b. Predictors: (Constant), Risk estimation by AMC, Risk control by AMC

c. Predictors: (Constant), Risk estimation by AMC, Risk control by AMC, Credibility of Advertisement

d. Predictors: (Constant), Risk estimation by AMC, Risk control by AMC, Credibility of Advertisement, Age

e. Predictors: (Constant), Risk estimation by AMC, Risk control by AMC, Credibility of Advertisement, Age, Probability to lose

ANOVA^f

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	134.529	1	134.529	192.911	.000 ^a
	Residual	277.549	398	.697		

	Total	412.078	399			
2	Regression	166.578	2	83.289	134.688	.000 ^b
	Residual	245.499	397	.618		
	Total	412.078	399			
3	Regression	185.484	3	61.828	108.052	.000 ^c
	Residual	226.593	396	.572		
	Total	412.078	399			
4	Regression	195.127	4	48.782	88.817	.000 ^d
	Residual	216.951	395	.549		
	Total	412.078	399			
5	Regression	204.378	5	40.876	77.539	.000 ^e
	Residual	207.700	394	.527		
	Total	412.078	399			

a. Predictors: (Constant), Risk estimation by AMC

b. Predictors: (Constant), Risk estimation by AMC, Risk control

c. Predictors: (Constant), Risk estimation by AMC, Risk control, Credibility

d. Predictors: (Constant), Risk estimation, Risk control, Credibility, Age

e. Predictors: (Constant), Risk estimation, Risk control, Credibility, Age, Probability

f. Dependent Variable: Confident of Annual return

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.585	.125		12.709	.000		
	Risk estimation	.512	.037	.571	13.889	.000	1.000	1.000
2	(Constant)	1.232	.127		9.677	.000		
	Risk estimation	.335	.043	.374	7.889	.000	.667	1.500
	Risk control	.292	.041	.342	7.199	.000	.667	1.500
3	(Constant)	.735	.150		4.908	.000		
	Risk estimation	.291	.042	.325	6.997	.000	.644	1.553
	Risk control	.270	.039	.316	6.901	.000	.661	1.513
	Credibility	.248	.043	.224	5.748	.000	.911	1.098
4	(Constant)	1.325	.203		6.516	.000		
	Risk estimation	.274	.041	.306	6.695	.000	.638	1.568
	Risk control	.248	.039	.291	6.410	.000	.649	1.542
	Credibility	.223	.043	.202	5.221	.000	.893	1.120
	Age	-.227	.054	-.161	-4.190	.000	.899	1.112
5	(Constant)	1.976	.253		7.821	.000		
	Risk estimation	.267	.040	.297	6.636	.000	.636	1.571
	Risk control	.210	.039	.246	5.375	.000	.613	1.632
	Credibility	.225	.042	.203	5.375	.000	.893	1.120
	Age	-.246	.053	-.175	-4.611	.000	.893	1.120

	Probability	-.165	.039	-.157	-4.189	.000	.907	1.103
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a. Dependent Variable: Confident of Annual return

Excluded Variables^f

	Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Credibility	.250 ^a	6.089	.000	.292	.919	1.088	.919
	Risk control	.342 ^a	7.199	.000	.340	.667	1.500	.667
	worried	-.139 ^a	-3.316	.001	-.164	.936	1.068	.936
	Age	-.228 ^a	-5.566	.000	-.269	.938	1.066	.938
	Probability	-.195 ^a	-4.766	.000	-.233	.962	1.040	.962
2	Credibility	.224 ^b	5.748	.000	.278	.911	1.098	.644
	worried	-.113 ^b	-2.833	.005	-.141	.928	1.078	.650
	Age	-.190 ^b	-4.814	.000	-.235	.917	1.090	.652
	Probability	-.138 ^b	-3.445	.001	-.171	.913	1.095	.633
3	worried	-.126 ^c	-3.283	.001	-.163	.925	1.082	.626
	Age	-.161 ^c	-4.190	.000	-.206	.899	1.112	.638
	Probability	-.143 ^c	-3.723	.000	-.184	.913	1.095	.627
4	worried	-.111 ^d	-2.946	.003	-.147	.916	1.092	.622
	Probability	-.157 ^d	-4.189	.000	-.206	.907	1.103	.613
5	worried	-.052 ^e	-1.243	.215	-.063	.734	1.362	.612

a. Predictors in the Model: (Constant), Risk estimation by AMC

b. Predictors in the Model: (Constant), Risk estimation by AMC, Risk control

c. Predictors in the Model: (Constant), Risk estimation, Risk control, Credibility

d. Predictors in the Model: (Constant), Risk estimation, Risk control, Credibility, Age

e. Predictors in the Model: (Constant), Risk estimation, Risk control, Credibility, Age, Probability

f. Dependent Variable: Confident of Annual return

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	Risk estimation by AMC	Risk control by AMC	Credibility of Advertisement	Age	Probability to lose
1	1	1.942	1.000	.03	.03				
	2	.058	5.802	.97	.97				
2	1	2.885	1.000	.01	.01	.01			
	2	.066	6.619	.91	.05	.41			
	3	.049	7.655	.08	.94	.58			
3	1	3.810	1.000	.00	.00	.01	.01		

	2	.095	6.328	.06	.11	.29	.40		
	3	.049	8.780	.00	.85	.68	.02		
	4	.045	9.208	.94	.04	.02	.58		
4	1	4.629	1.000	.00	.00	.00	.00	.01	
	2	.210	4.694	.00	.04	.06	.01	.42	
	3	.086	7.325	.00	.06	.20	.65	.06	
	4	.049	9.677	.00	.84	.67	.02	.00	
	5	.026	13.444	.99	.06	.07	.31	.51	
5	1	5.508	1.000	.00	.00	.00	.00	.00	.00
	2	.227	4.924	.00	.05	.08	.01	.25	.05
	3	.123	6.694	.00	.01	.04	.03	.38	.37
	4	.076	8.503	.00	.05	.09	.79	.01	.16
	5	.049	10.582	.00	.85	.63	.00	.00	.00
	6	.017	18.153	1.00	.04	.15	.15	.35	.41

a. Dependent Variable: Confident of Annual return

ANNEXURE – G **SPSS Output of Multiple linear Regression Analysis (Step-Wise Method)**

Dependent Variable: Level of Risk

Independent Variable: Credibility, Worried, Age, Probability, Investors' Knowledge, Income, Downtrend in Stock market

Descriptive Statistics

	Mean	Std. Deviation	N
Level of risk	2.9575	1.07870	400
Credibility	2.8375	.91826	400
worried about risk	2.9025	1.05393	400
Age	1.7375	.72104	400
Probability to loss	2.9000	.96816	400
Investor's knowledge	2.7025	1.01813	400
Income	2.4150	.88018	400
Downtrend in stock market	3.8175	1.09645	400

Correlations

		Level of risk	Credibility	worried about risk	Age	Probability to lose	investor's knowledge	Income	Downtrend in stock market
Pearson Correlation	Risk Level	1.000	.322	-.275	-.491	-.201	.481	.327	-.117
	Credibility	.322	1.000	-.029	-.212	-.055	.222	.050	.095
	Worried	-.275	-.029	1.000	.158	.469	-.226	-.105	.327
	Age	-.491	-.212	.158	1.000	.002	-.288	-.041	.171
	Probability	-.201	-.055	.469	.002	1.000	-.196	-.139	.221
	knowledge	.481	.222	-.226	-.288	-.196	1.000	.407	.001
	Income	.327	.050	-.105	-.041	-.139	.407	1.000	.094
	Downtrend	-.117	.095	.327	.171	.221	.001	.094	1.000
Sig. (1-tailed)	Risk Level	.	.000	.000	.000	.000	.000	.000	.010
	Credibility	.000	.	.279	.000	.136	.000	.162	.029
	Worried	.000	.279	.	.001	.000	.000	.018	.000
	Age	.000	.000	.001	.	.486	.000	.206	.000
	Probability	.000	.136	.000	.486	.	.000	.003	.000
	knowledge	.000	.000	.000	.000	.000	.	.000	.495
	Income	.000	.162	.018	.206	.003	.000	.	.030
	Downtrend	.010	.029	.000	.000	.000	.495	.030	.
N	Risk Level	400	400	400	400	400	400	400	400
	Credibility	400	400	400	400	400	400	400	400
	worried	400	400	400	400	400	400	400	400
	Age	400	400	400	400	400	400	400	400

Probability	400	400	400	400	400	400	400	400	400
knowledge	400	400	400	400	400	400	400	400	400
Income	400	400	400	400	400	400	400	400	400
Downtrend	400	400	400	400	400	400	400	400	400

Variables Entered/Removed^a

Model	Variables Entered	Variable Removed	Method
1	Age		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Knowledge		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
3	Income		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
4	Credibility		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
5	worried		. Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Level of risk

Model Summary^f

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.491 ^a	.241	.239	.94073	.241	126.6	1	398	.000	
2	.606 ^b	.367	.364	.86009	.126	79.13	1	397	.000	
3	.631 ^c	.399	.394	.83963	.031	20.57	1	396	.000	
4	.654 ^d	.428	.422	.82023	.029	19.96	1	395	.000	
5	.668 ^e	.446	.439	.80769	.019	13.36	1	394	.000	1.590

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, investor's knowledge

c. Predictors: (Constant), Age, investor's knowledge, Income

d. Predictors: (Constant), Age, investor's knowledge, Income, Credibility

e. Predictors: (Constant), Age, knowledge, Income, Credibility, worried

f. Dependent Variable: Level of risk

ANOVA^f

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	112.057	1	112.057	126.621	.000 ^a
	Residual	352.221	398	.885		
	Total	464.277	399			

2	Regression	170.598	2	85.299	115.308	.000 ^b
	Residual	293.680	397	.740		
	Total	464.277	399			
3	Regression	185.104	3	61.701	87.521	.000 ^c
	Residual	279.174	396	.705		
	Total	464.277	399			
4	Regression	198.532	4	49.633	73.774	.000 ^d
	Residual	265.745	395	.673		
	Total	464.277	399			
5	Regression	207.249	5	41.450	63.539	.000 ^e
	Residual	257.028	394	.652		
	Total	464.277	399			

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, investor's knowledge

c. Predictors: (Constant), Age, investor's knowledge, Income

d. Predictors: (Constant), Age, investor's knowledge, Income, Credibility

e. Predictors: (Constant), Age, knowledge, Income, Credibility of, worried

f. Dependent Variable: Level of risk

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.235	.123		34.469	.000		
	Age	-.735	.065	-.491	-11.253	.000	1.000	1.000
2	(Constant)	2.896	.188		15.421	.000		
	Age	-.575	.062	-.385	-9.229	.000	.917	1.090
	Knowledge	.393	.044	.371	8.896	.000	.917	1.090
3	(Constant)	2.602	.194		13.383	.000		
	Age	-.599	.061	-.401	-9.811	.000	.910	1.098
	Knowledge	.304	.047	.287	6.430	.000	.761	1.314
	Income	.238	.052	.194	4.536	.000	.828	1.207
4	(Constant)	2.018	.231		8.752	.000		
	Age	-.557	.060	-.373	-9.225	.000	.888	1.126
	Knowledge	.269	.047	.254	5.729	.000	.739	1.353
	Income	.245	.051	.200	4.785	.000	.828	1.208
	Credibility	.208	.046	.177	4.468	.000	.926	1.080
5	(Constant)	2.468	.258		9.555	.000		
	Age	-.534	.060	-.357	-8.930	.000	.878	1.138
	Knowledge	.240	.047	.226	5.117	.000	.718	1.392
	Income	.241	.051	.197	4.777	.000	.827	1.209

	Credibility	.214	.046	.182	4.671	.000	.925	1.082
	Worried	-.145	.040	-.141	-3.655	.000	.938	1.066

a. Dependent Variable: Level of risk

Excluded Variables^f

		Model	Beta In	T	Sig.	Partial Correlation	Collinearity Statistics		
							Tolerance	VIF	Minimum Tolerance
1	Credibility	.228 ^a	5.271	.000	.256	.955	1.047	.955	
	Worried	-.202 ^a	-4.699	.000	-.230	.975	1.025	.975	
	Probability	-.200 ^a	-4.700	.000	-.230	1.000	1.000	1.000	
	Knowledge	.371 ^a	8.896	.000	.408	.917	1.090	.917	
	Income	.308 ^a	7.519	.000	.353	.998	1.002	.998	
	Downtrend	-.034 ^a	-.765	.445	-.038	.971	1.030	.971	
2	Credibility	.171 ^b	4.201	.000	.207	.927	1.079	.890	
	worried	-.139 ^b	-3.419	.001	-.169	.940	1.064	.884	
	Probability	-.133 ^b	-3.308	.001	-.164	.959	1.043	.879	
	Income	.194 ^b	4.536	.000	.222	.828	1.207	.761	
	Downtrend	-.053 ^b	-1.309	.191	-.066	.968	1.033	.888	
3	Credibility	.177 ^c	4.468	.000	.219	.926	1.080	.739	
	worried	-.135 ^c	-3.395	.001	-.168	.939	1.065	.740	
	Probability	-.122 ^c	-3.104	.002	-.154	.955	1.047	.741	
	Downtrend	-.070 ^c	-1.755	.080	-.088	.960	1.041	.761	
4	Worried	-.141 ^d	-3.655	.000	-.181	.938	1.066	.718	
	Probability	-.118 ^d	-3.070	.002	-.153	.954	1.048	.721	
	Downtrend	-.094 ^d	-2.421	.016	-.121	.944	1.060	.739	
5	Probability	-.069 ^e	-1.601	.110	-.080	.757	1.321	.713	
	Downtrend	-.054 ^e	-1.323	.187	-.067	.843	1.187	.717	

a. Predictors in the Model: (Constant), Age

b. Predictors in the Model: (Constant), Age, investor's knowledge

c. Predictors in the Model: (Constant), Age, investor's knowledge, Income

d. Predictors in the Model: (Constant), Age, investor's knowledge, Income, Credibility of Advertisement

e. Predictors in the Model: (Constant), Age, investor's knowledge, Income, Credibility of Advertisement, worried about risk

f. Dependent Variable: Level of risk

ANNEXURE – H

SPSS Output of Multiple linear Regression Analysis (Step-Wise Method)

Dependent Variable: Overall Risk in MF

Independent Variable: Credibility, Worried, Age, Probability, Knowledge, Income, Downtrend in Stock Market

Descriptive Statistics

	Mean	Std. Deviation	N
Overall risk in MF	3.4050	.99924	400
Credibility of Advertisement	2.8375	.91826	400
worried abt risk	2.9025	1.05393	400
Age	1.7375	.72104	400
Probability to lose	2.9000	.96816	400
investor's knowledge	2.7025	1.01813	400
Income	2.4150	.88018	400
Downtrend in stock market	3.8175	1.09645	400

Correlations

		Overall risk in MF	Credibility of Advertisement	worried about risk	Age	Probability to lose	investor's knowledge	Income	Downtrend in stock market
Pearson Correlation	Overall risk in MF	1.000	-.152	.416	.266	.446	-.322	-.229	.290
	Credibility	-.152	1.000	-.029	-.212	-.055	.222	.050	.095
	worried	.416	-.029	1.000	.158	.469	-.226	-.105	.327
	Age	.266	-.212	.158	1.000	.002	-.288	-.041	.171
	Probability	.446	-.055	.469	.002	1.000	-.196	-.139	.221
	knowledge	-.322	.222	-.226	-.288	-.196	1.000	.407	.001
	Income	-.229	.050	-.105	-.041	-.139	.407	1.000	.094
	Downtrend	.290	.095	.327	.171	.221	.001	.094	1.000
Sig. (1-tailed)	Overall risk in MF	.	.001	.000	.000	.000	.000	.000	.000
	Credibility	.001	.	.279	.000	.136	.000	.162	.029
	worried	.000	.279	.	.001	.000	.000	.018	.000
	Age	.000	.000	.001	.	.486	.000	.206	.000
	Probability	.000	.136	.000	.486	.	.000	.003	.000
	knowledge	.000	.000	.000	.000	.000	.	.000	.495
	Income	.000	.162	.018	.206	.003	.000	.	.030
	Downtrend	.000	.029	.000	.000	.000	.495	.030	.
N	Overall risk in MF	400	400	400	400	400	400	400	400
	Credibility	400	400	400	400	400	400	400	400
	Worried	400	400	400	400	400	400	400	400
	Age	400	400	400	400	400	400	400	400

	Probability	400	400	400	400	400	400	400	400
	knowledge	400	400	400	400	400	400	400	400
	Income	400	400	400	400	400	400	400	400
	Downtrend	400	400	400	400	400	400	400	400

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Probability to lose		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Age		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
3	worried		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
4	Income		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
5	Downtrend in stock market		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
6	knowledge		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Overall risk in MF

Model Summary^g

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.446 ^a	.199	.197	.89542	.199	98.888	1	398	.000	
2	.519 ^b	.269	.266	.85622	.070	38.277	1	397	.000	
3	.553 ^c	.306	.300	.83587	.036	20.559	1	396	.000	
4	.573 ^d	.328	.321	.82325	.023	13.237	1	395	.000	
5	.588 ^e	.346	.338	.81313	.018	10.894	1	394	.001	
6	.598 ^f	.358	.348	.80667	.012	7.335	1	393	.007	1.814

a. Predictors: (Constant), Probability to lose

b. Predictors: (Constant), Probability to lose, Age

c. Predictors: (Constant), Probability to lose, Age, worried about risk

d. Predictors: (Constant), Probability to lose, Age, worried about risk, Income

e. Predictors: (Constant), Probability to lose, Age, worried about risk, Income, Downtrend in stock market

f. Predictors: (Constant), Probability to lose, Age, worried about risk, Income, Downtrend in stock market, investor's knowledge

g. Dependent Variable: Overall risk in MF

ANOVA^g

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	79.286	1	79.286	98.888	.000 ^a
	Residual	319.104	398	.802		
	Total	398.390	399			
2	Regression	107.347	2	53.673	73.214	.000 ^b
	Residual	291.043	397	.733		
	Total	398.390	399			
3	Regression	121.711	3	40.570	58.067	.000 ^c
	Residual	276.679	396	.699		
	Total	398.390	399			
4	Regression	130.682	4	32.670	48.205	.000 ^d
	Residual	267.708	395	.678		
	Total	398.390	399			
5	Regression	137.885	5	27.577	41.709	.000 ^e
	Residual	260.505	394	.661		
	Total	398.390	399			
6	Regression	142.657	6	23.776	36.538	.000 ^f
	Residual	255.733	393	.651		
	Total	398.390	399			

a. Predictors: (Constant), Probability to lose

b. Predictors: (Constant), Probability to lose, Age

c. Predictors: (Constant), Probability to lose, Age, worried

d. Predictors: (Constant), Probability to lose, Age, worried, Income

e. Predictors: (Constant), Probability to lose, Age, worried, Income, Downtrend

f. Predictors: (Constant), Probability , Age, worried, Income, Downtrend , knowledge

g. Dependent Variable: Overall risk in MF

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.070	.142		14.623	.000		
	Probability to lose	.460	.046	.446	9.944	.000	1.000	1.000
2	(Constant)	1.432	.170		8.419	.000		
	Probability	.460	.044	.446	10.388	.000	1.000	1.000
	Age	.368	.059	.265	6.187	.000	1.000	1.000
3	(Constant)	1.220	.173		7.071	.000		
	Probability	.354	.049	.343	7.210	.000	.774	1.291
	Age	.320	.059	.231	5.432	.000	.969	1.033
	worried	.207	.046	.219	4.534	.000	.755	1.324
4	(Constant)	1.721	.219		7.869	.000		
	Probability	.336	.049	.325	6.897	.000	.766	1.306
	Age	.313	.058	.226	5.389	.000	.967	1.034
	worried	.201	.045	.212	4.461	.000	.754	1.326

	Income	-.172	.047	-.152	-3.638	.000	.977	1.023
5	(Constant)	1.476	.228		6.462	.000		
	Probability	.318	.048	.308	6.581	.000	.757	1.322
	Age	.286	.058	.206	4.933	.000	.948	1.055
	worried	.164	.046	.173	3.576	.000	.709	1.410
	Income	-.196	.047	-.173	-4.144	.000	.955	1.047
	Downtrend	.133	.040	.146	3.301	.001	.851	1.176
6	(Constant)	1.821	.260		7.006	.000		
	Probability	.304	.048	.295	6.310	.000	.748	1.337
	Age	.239	.060	.172	3.971	.000	.868	1.152
	worried	.149	.046	.157	3.257	.001	.699	1.430
	Income	-.144	.051	-.126	-2.825	.005	.815	1.227
	Downtrend	.142	.040	.155	3.534	.000	.845	1.183
	investor's knowledge	-.126	.046	-.128	-2.708	.007	.729	1.372

a. Dependent Variable: Overall risk in MF

Excluded Variables^g

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Credibility	-.128 ^a	-2.873	.004	-.143	.997	1.003	.997
	worried	.265 ^a	5.396	.000	.261	.780	1.283	.780
	Age	.265 ^a	6.187	.000	.297	1.000	1.000	1.000
	knowledge	-.244 ^a	-5.537	.000	-.268	.962	1.040	.962
	Income	-.170 ^a	-3.810	.000	-.188	.981	1.020	.981
	Downtrend	.201 ^a	4.464	.000	.219	.951	1.051	.951
2	Credibility	-.075 ^b	-1.707	.089	-.085	.952	1.050	.952
	worried	.219 ^b	4.534	.000	.222	.755	1.324	.755
	knowledge	-.181 ^b	-4.022	.000	-.198	.879	1.137	.879
	Income	-.159 ^b	-3.725	.000	-.184	.979	1.022	.979
	Downtrend	.158 ^b	3.588	.000	.177	.922	1.085	.922
3	Credibility	-.082 ^c	-1.910	.057	-.096	.951	1.052	.754
	knowledge	-.160 ^c	-3.625	.000	-.179	.869	1.151	.746
	Income	-.152 ^c	-3.638	.000	-.180	.977	1.023	.754
	Downtrend	.118 ^c	2.647	.008	.132	.871	1.148	.713
4	Credibility	-.076 ^d	-1.809	.071	-.091	.950	1.053	.753
	knowledge	-.115 ^d	-2.397	.017	-.120	.733	1.363	.733
	Downtrend	.146 ^d	3.301	.001	.164	.851	1.176	.709
5	Credibility	-.098 ^e	-2.344	.020	-.117	.930	1.076	.709
	knowledge	-.128 ^e	-2.708	.007	-.135	.729	1.372	.699
6	Credibility	-.083 ^f	-1.950	.052	-.098	.906	1.104	.699

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- a. Predictors in the Model: (Constant), Probability to lose
 - b. Predictors in the Model: (Constant), Probability to lose, Age
 - c. Predictors in the Model: (Constant), Probability to lose, Age, worried
 - d. Predictors in the Model: (Constant), Probability to lose, Age, worried, Income
 - e. Predictors in the Model: (Constant), Probability, Age, worried, Income, Downtrend in stock market
 - f. Predictors in the Model: (Constant), Probability, Age, worried, Income, Downtrend, knowledge
 - g. Dependent Variable: Overall risk in MF