Chapter I
INTRODUCTION AND METHODOLOGY
In the contemporary economy characterised by rising inflation rate on the one hand and the declining interest rates on small saving schemes on the other, investment in capital market has become inevitable for small investors. As investment in capital market directly is a risky affair, investors with meagre savings look for a safe investment vehicle which can carry them into capital market and provide the benefit of diversification of risk. Mutual funds have emerged as an appropriate investment vehicle and a preferred investment destination in this context. Retail/small investors used to rely more on investment avenues like bank deposits, post office savings etc., which provide liquidity, assured returns and tax benefits. But these avenues do not offer the benefit of investing in capital market and the real purchasing power of the investors is likely to decline with these investments when the rate inflation rises. Further, the interest rates on these avenues have been slashed down from time to time with a view to channelise the savings to capital market and thereby regain the confidence of inventors which they have lost since 1992 due to stock market crises/debacle in 1992 and 2001.

Mutual fund industry has played an important role in restoring the confidence of investors during the volatility period of Indian stock market. The industry proved its worthiness and provided cushion to the market during the recent market mayhem in May –June 2006 by becoming the net buyers when the FIIs turned net sellers. Thus, the Mutual Funds which were originally established for the sake of retail inventors, have now emerged as dominant players in the Indian capital market.

A mutual fund is an investment company or trust that pools the resources from number of investors, who share common investment goal, and then diversifies its investment into the securities of different industrial sectors and companies in order to
realize potential returns with reasonable safety. In the era of globalization, rapid price fluctuations are occurring in financial assets like equity shares, bonds and also in physical assets like real estate, gold silver etc. Therefore, an individual investor finds it difficult to keep track of ownership of his assets, investments, brokerage dues and bank transaction, etc. In this context, mutual funds have emerged as a better alternative investment avenue.

A mutual fund is the most suitable investment for the common man as it offers an opportunity to invest in a diversified, professionally managed portfolio relatively at a low cost. Anybody with an investible surplus of a few hundred rupees can invest in mutual funds. Changes in the economic scenario, falling interest rates of bank deposits, volatile nature of capital market and recent bitter experience of investors in making direct investment in capital market instruments led to the increasing importance of mutual funds. They have been playing a significant role in financial inter-mediation, development of capital markets and growth of the financial sector as a whole. The active involvement of mutual funds in economic development can be seen by their dominant presence in the money and capital market. These institutions have come to assume to such of significant that they now completely dominate the entire financial market.

Mutual fund industry started in India with the establishment of Unit Trust of India (1964), which was the only player in the mutual fund industry up to 1987. In 1987, the government permitted public sector banks and financial institutions to join the fray. From 1993 onwards the industry was opened up for private sector and foreign players have started setting up mutual funds in India.
Growing asset size and increasing investor interest in mutual funds has also attracted a number of new players to the industry over the past couple of years. The past year has seen the global mutual fund behemoth—Fidelity—enter the market and foreign banks such as ABN Amro, HSBC and Standard Chartered expand their suite of mutual fund offerings. At the same, Indian-owned funds have been ceding stake in their mutual fund business to foreign partners.

The Indian mutual fund industry’s assets under management (AUM) race from Rs.3-lakh crores to Rs.4 lakh crores has come in just nine months (May 2004). The fastest-ever AUM growth shows the dominant role of private and foreign players in the domestic market, after the government opened the mutual fund doors to the private sector in 1993. The inflows to fixed income schemes contributed nearly 70-75 per cent of this growth, reflecting the rising retail interest in participating in the secondary market through mutual funds.

The total 29 of the mutual funds in the country crossed the Rs.1 lakh crores in June 2003, a decade after the private sector entered the mutual fund business. The industry touched the Rs. 2 lakh crores mark after two years and three months in September 2005. However, the growth rate of the industry scaled in the following year, as the next milestone of Rs.3 lakh crores was reached after 11 months in August 2006.
Table 1.1
Growth in Assets under Management of Mutual fund Industry in India

<table>
<thead>
<tr>
<th>Year</th>
<th>Duration</th>
<th>AUM (Rs. in Cr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar-1965</td>
<td>Since 1964</td>
<td>25</td>
</tr>
<tr>
<td>Mar-1987</td>
<td>22 years</td>
<td>4,564</td>
</tr>
<tr>
<td>Mar-2003</td>
<td>6 years</td>
<td>47,000</td>
</tr>
<tr>
<td>Jun-2003</td>
<td>Since 1993</td>
<td>1,00,000</td>
</tr>
<tr>
<td>Sept-2005</td>
<td>27 months</td>
<td>2,00,000</td>
</tr>
<tr>
<td>Aug-2006</td>
<td>11 months</td>
<td>3,00,000</td>
</tr>
<tr>
<td>May-2007</td>
<td>9 months</td>
<td>4,00,000</td>
</tr>
</tbody>
</table>

Source: AMFI quarterly Updates

The domestic Mutual fund industry has grown 50 per cent in the year 2006. It is a scope for Mutual funds could witness 5-6 times growth in the next 7-8 years, as the Mutual fund industry has become a globally significant player and is attracting a bigger chunk of household investments.

Statement of the Problem

Mutual funds have become the primary investment vehicle for small investors interested in the stock market and have virtually replaced the fixed deposits, post office savings, banks, GPF and other small savings. Like in developed countries mutual funds in India also have become the mainstay of the stock market. The growth of mutual funds in India is expected to surpass the growth of banks, finance companies and insurance companies in the near future.

Mutual funds which have performed well and gained confidence of Investors since their inception in 1964, stared loosing their confidence with CRB Mutual fund scam in 1997, wherein a SEBI registered mutual fund company disappeared with
investors money and when it was found in 1998 that there was a huge drop in the NAV of US-64, which is the biggest and flagship mutual fund in India. The impact of these could be clearly seen in the decline of market value of the assets under the country 252 mutual fund schemes from Rs. 80,000 Crores in 1997 to Rs. 69,862 Crores in 1998. During the same period there was a two fold increase in bank deposits, 86 per cent growth in the corpus of National Savings Schemes, Kisan Vikas Patra, Post Office time deposits and 376 per cent growth in the corpus of Public Provident Fund. Thus mutual funds which were considered as post liberalization India's most vibrant vehicle for individual investment, evoked contempt and have been a big led down during 1997-2000.

The present study with the overall objective of measuring the performance of mutual funds during 2001-2005 assumes significant in this context. Before highlighting the need, specific objectives and methodology of the present study, a review of various studies conducted in the area of mutual funds are presented here brief.

REVIEW OF LITERATURE

The available literature on the performance of mutual funds relates two important aspects viz, performance evaluation and market timing. Brief reviews of these studies are presented here.

Review of studies on Performance Evaluation

Treynor in his study (1965)\(^2\) entitled “How to Rate Management of Investment Funds”, developed an approach that takes beta (a measure of systematic risk) to assess the premium generated by a mutual fund scheme per unit of risk. This measure has
been frequently used both by researchers and practitioners for performance evaluation of mutual funds.

Sharpe in his study (1966)\(^3\) entitled "Mutual Fund Performance", is a well acknowledged and widely quoted work on performance evaluation. He not only developed a composite measure for performance evaluation (Sharpe's reward to variability ratio) that considers both return and risk and tested the same in evaluating the performance of 34 open-ended mutual funds during the period 1944-63. On the basis of the results, Sharpe concluded that average mutual fund performance was markedly inferior to that of DJIA. An analysis of relationship between fund performance and its expense ratio indicated that good performance was associated with low expense ratio. However, a low relationship was discovered between size and performance.

In Jenson's classic study (1968)\(^4\) on "The Performance of Mutual Funds in the period 1945-1964", the excess fund returns were regressed upon the excess market returns to estimate the characteristic line of the regression model. He examined the performance of 115 open-end mutual funds over the period 1945-1964. He reported that mutual funds did not appear to achieve abnormal performance when transaction costs were taken into account. Thus, the result of the study lent support to the strong form of efficient market hypothesis. He reported that the estimated values of the parameters remained constant over the estimation period. He estimated alpha values to draw inference for superior performance on mutual funds.

He reported that 76 out of 115 mutual funds in his sample realised negative risk-adjusted returns after accounting for management fees and transition costs. Thus,
he concluded that evidence on mutual fund performance indicated not only that these 115 mutual funds were on an average not able to predict security prices well enough to outperform a buy-the-market-and-hold policy, but also, that there was every little evidence that any individual fund was able to do significantly better than that which he expected from mere random chance. He further observed that these conclusions hold even when fund returns were measured gross of management expenses. Thus, he concluded that on an average the funds apparently were not quite successful enough in their trading activities to recoup even their brokerage expenses.

Fama (1972) developed a methodology for evaluating “investment performance of managed portfolios”. He suggested that the over all performance could be broken down into several components. He argued that the observed returns of a fund could be due to ability of fund managers to pick up the best securities at a given level of risk i.e., their selectivity ability. Some portion of this return could also arise due to the prediction of general market price movements i.e., their timing ability. The study also suggested techniques for measuring effects of foregone diversification in the event of an investment manager deciding to concentrate his holding in what he considered as a few winners. It also suggested a multi-period model that allowed evaluations both on a period-by-period and on cumulative basis. According to him the return on a portfolio could be subdivided into two parts. The return for security selection (Selectivity) and return for bearing risk (risk). Various finer subdivisions of both selectivity and risk were also suggested. The model developed by him combined concept from modern theories of portfolio selection and capital market equilibrium with those of traditional concepts of what constituted good portfolio management.
Gupta (1974) evaluated the performance of select mutual funds by classifying them into various subgroups in terms of their broad investment objectives for the period 1962-71. For this purpose, he used performance measures suggested by Sharpe, Treynor and Jensen. He used two indices i.e., DJIA and S&P 500 as a proxy for the market portfolio. He reported that the results obtained from using these performance models were more or less identical. Further, almost all-mutual fund subgroups outperformed the market when DJIA was used and all but income and balanced groups when S&P500 were used. It was also shown that return per unit of risk varied with the level of volatility assumed and that funds having higher volatility exhibited superior performance than the others. It was also reported that all types of funds outperformed the market irrespective of choice of market index and performance measure.

Klemosky (1977) evaluated the performance of 158 mutual funds to see whether there was a consistency in performance of fund managers for the period 1968-1975. For this purpose, he studied rank correlation over different two-year and four-year periods. The results showed some consistency in performance between four-year period and relatively low consistency between adjacent two-year periods.

Kon and Jen (1978) estimated the systematic risk and performance of 49 mutual funds over the period 1960-71 by utilising monthly price data. The study reported that mutual fund managers individually and, on an average, were unable to consistently forecast the future prices of individual securities well enough to recover their research expenses, management fees, and commission expenses.
Reilly (1982) studied performance of 20 open-end mutual funds over 15 years period, 1966-80. He found that mean return of the sample funds was quite close to that of the market. However, in terms of fund return, 12 funds outperformed the market. The study noted large range of funds returns indicating inadequacy of portfolio diversification. Likewise, the two risk measures (standard deviation and beta) exhibited a wide range, but generally consistent with expectations. Specifically, 14 funds had a standard deviation larger than that of the market that was found consistent with the lack of complete diversification.

The performance of individual funds was consistent for alternative performance evaluation models. In terms of Sharpe, 13 funds showed a higher value than that for the market. Similarly, in terms of Treynor measure, 14 funds had a higher value in comparison to the market. He reported that in terms of Jensen 13 of the 20 funds exhibited positive intercepts. However, he found only one of positive intercepts being statistically significant. These results seem to indicate that, on an average, sample funds outperformed the market during the period of study.

Cumby and Glen (1990) examined the performance of 15 US based internationally diversified mutual funds during the period 1982-88 by using Jensen measure, and Grinblatt and Titman’s positive period weighting method. The study did not notice any evidence that the funds, either individually or as a whole, provided investors with performance that surpassed that of a broad international equity index over the study period.

Barua et.al (1991) made a pioneering attempt to evaluate the performance of Master Share scheme of UTI from the investor's point of view. They employed the
capital asset pricing model (CAPM) and computed the risk of the Master Share Scheme (for the period 1987-1991). The risk-adjusted performance is measured by using Sharpe, Treynor and Jensen measures. The study concludes that Master Share has performed better in systematic risk, but not in terms of total risk.

Jaideep and Sudip Majumdar (1994) evaluated the performance of five growth oriented schemes for the period February 1991 to August 1993. They have employed the CAPM and Jensen measure to evaluate the performance. They have also evaluated the boom period performance of the selected schemes during the first quarter of 1992 by employing Jensen model. They concluded that the selected mutual fund schemes have not offered superior returns during the study period. However, they concluded that in the boom period the funds performed well.

Ajay Shah and Susan Thomas (1994) studied the performance evaluation of 11 mutual fund schemes on the basis of market price data. The weekly returns were computed for these schemes since their commencement in April 1994. Jensen and Sharpe measures were used to evaluate the superior performance of the schemes. They concluded that except UGS 200 and UTI, none of the schemes earned superior returns than the market in general.

Gruber (1996) attempted to resolve the puzzle relating to fast growth of mutual funds in spite of inferior performance of actively managed portfolios. The study reported that on average mutual fund had negative performance compared to the market and provided evidence to support the persistence of performance. It resolved the puzzle that sophisticated clientele withdrew money from mutual funds in the event
Gupta and Sanjay Sehgal (1997)\textsuperscript{15} study aimed at evaluating the investment performance of mutual funds in India during the 1992-1996. The researchers made use of both weekly price and NAV of 80 schemes managed by 25 mutual funds, 10 of which are in the public sector, including the UTI. The BSE National Index has been used as a market proxy, while the implicit yield on 91-day treasury bills has been used as a surrogate for the risk free rate of return. The study found that the sample funds have performed reasonably well with regard to rate of return and Sharpe measure relative to relevant benchmark portfolios (using both price as well as NAV data). The results as per the Treynor are relatively less encouraging. Only three of the sample funds reported positive alpha as per the Jensen measure. A large number of sample schemes exhibited positive net selectivity using the Fama measure. Thus, fund managers have shown limited stock selection skills. On the whole, the fund managers’ performance was considered as moderate.

Allen and Tan (1998)\textsuperscript{16} performed tests of the persistence of mutual fund managers’ rates of return and risk adjusted returns in UK on 131 open-ended mutual funds from 1989-1995 base on of weekly returns for these funds. They found that both low returns and risk-adjusted returns exhibited strong evidence of persistence in the long run which appears to reverse in the short-run. In order to establish the relationship between performance and volatility, they divided the fund into two group high and low variance. They found that performance in both of these groups exhibited repeat-winner patterns suggesting that superior performance be not conditional purely by risky investment strategies.
Jayadev M (1998) evaluated the performance of 62 mutual fund schemes using monthly NAV data for varying period between 1987-1995. He observed superior performance for bulk (30 out of 44) of the sample schemes when total risk was considered. However, in terms of systematic risk only 24 out of 44 schemes outperformed the benchmark portfolio. He found that Indian mutual funds were not properly diversified and in terms of Fama's measure selectivity ability of the fund manager is poor.

Amitabh Gupta (2000) in his thesis made an attempt to examine the "investment Performance of Indian Mutual funds" in terms of a) Rate of Return b) Sharpe Ratio c) Treynor Ratio d) Jensen differential returns e) Sharpe differential returns and f) Fama's Components of investment performance. For this purpose he used the weekly NAV data for 73 Mutual fund schemes during a period of five years i.e., from April 1, 1994 to March 31, 1999. The study indicated a mixed performance of the selected schemes. While some schemes have outperformed the market, some other schemes have underperformed the market. The study also found that some of the schemes, are not adequately diversified and the risk and return characteristics for the Indian mutual fund schemes in general are not in conformity with their stated objectives.

Ramesh Chander's (2000) has made a study on performance Appraisal of Mutual funds analysed the investment performance of 34 schemes during a period of four years (January 1994 to December 1997) by using both primary and secondary data. The study observed that majority of the sample mutual fund schemes have recorded superior performance as compared to market portfolio. Open-ended mutual funds have outperformed close-end schemes in terms of superior returns. In relation to
investment objective, income schemes have outperformed both growth and balanced schemes. On the contrary, the sample schemes have exhibited poor performance and in terms of time weighted return. A majority of fund schemes have outperformed the benchmark in Sharpe's measure. In contrast, a significant majority of schemes have exhibited inferior performance in terms of Treynor measure.

Narasimhan and Vijayalakshmi (2000)\textsuperscript{20} in their study entitled "Performance Analysis of Mutual funds in India. An empirical evaluation of diversification and timing performance", focussed on the performance of 76 mutual fund schemes with particular reference to diversification benefits and fund managers timing ability to invest in right stock at the right time. It was observed that Mutual funds in general have shifted from holding a large diversified portfolio to a lean portfolio. The study examined the impact of this change on the performance of funds. It was also observed that funds frequently invest in stock which has a strong positive correlation between them which is against the principle of developing sound and well diversified portfolio. The study concluded that many mutual funds have outperformed the BSE-30 Index (SENSEX) in 1999, partly due on account of restructuring their investments and partly on account of negative performance of Sensex during the period. The holdings of a large number of schemes of mutual funds are compared with top performing stocks of the period under study. The results failed to show any superior performance of mutual funds.

Paitpal Singh and Singla (2000)\textsuperscript{21} made an attempt to evaluate the performance of mutual funds on the basis of monthly returns compared to benchmark returns. For this purpose risk adjusted performance measures suggested by Jensen, Treynor and Mazuy and Sharpe are employed. The sample consist of a total 12 growth oriented
mutual funds selected on the basis of stratified random sampling. The study observed that most of the growth oriented mutual funds have not performed better than their benchmark indicators except UGS 5000 and Master Plus 91. Growth oriented mutual funds are expected to offer the advantage of diversification, market timing and selectivity. So in the sample under study UGS 5000, Master Plus 91 are found to highly diversified due to which it has reduced the total risk of the portfolio.

Sethu (2001) in his study entitled “The Mutual Fund Puzzle” used weekly NAV data for 19 open-ended growth schemes in India for the period April 1995-July 1999. His study used three alternatives indices for equity markets viz. NSE Nifty, BSE Sensitive Index and S&P CNX 500. The 91-day treasury auction rate was used as the risk-free rate. The important observations of the study are inadequate diversification of mutual fund portfolios, zero excess return after adjusting for systematic risk and inability of fund managers in precisely predicting the market movements.

Nalini Prava Tripathy (2002) made a study a comprehensive evaluation of 31 equity linked schemes from 1994-95 to 2001-02. He concluded that stock selection is one of the most important characteristics of a fund manager and selectivity techniques and diversification abilities bring out the expected rewards. Nine schemes out of 31 schemes have higher returns due to selectivity only. All other schemes show lack of net selectivity and diversification. He found that the risk and return characteristics for the Indian mutual fund schemes are not in conformity with their stated objectives.
Dhoot and Vishal Saxena's (2001) study gives a clear picture of index funds of public as well as private sector. It was found that there are five index funds, 1) The IDBI Principal Index Fund, 2) the Franklin India Index fund, 3) the UTI Nifty funds, 4) The UTI Master Index funds and 5) the UTI Index Select Equity fund. Out of these first three funds tracking the Nifty and UTI Master Index fund follows the Sensex and the UTI Index select equity fund tries to follow both indices. A significant majority of sample schemes has once again exhibited inferior performance in terms of Jensen's measure. The overall performance based upon Fama's methodology reveals that majority of schemes have outperformed the benchmark portfolio.

Vaishnavi (2003) in her study made an attempt to evaluate the performance of SBI Mutual funds. NAVs of Mutual funds are considered as the most important measure of performance, it was observed that the NAV's of the majority of the schemes of SBI mutual funds, are more than their Face Values indicating a satisfactory performance. The performance of SBI Mutual Fund was measured by using Sharpe model. The study revealed that out of thirteen schemes selected for the study, ten schemes have outperformed the market. Greater competition among players in the Mutual fund industry has led to higher quality of investment performance and better serving standards.

Gurucharan Singh (2003) in his study entitled "Mutual Funds-Performance Evaluation of Equity funds", selected 10 equity schemes during the period 2001-2002. According to him investors who have time to research can build up a quality portfolio consisting of 10-15 stocks. If they don't have time they should opt for diversified mutual funds with a reasonably long term track record and at the appropriate time which will reduce portfolio risk.
Sindu (2004)\textsuperscript{27} in her study made an attempt to examine the "Performance Evaluation of Indian Private Sector Mutual Funds" in terms of (a) Rate of Return (b) Sharpe Ratio (c) Treynor Ratio (d) Jensen differential returns (e) Sharpe differential returns and (f) Fama's Components of investment performance. For this purpose she used Daily NAV during 1998-2002. The empirical results observed that 28 out of 75 schemes have superior performance than the benchmark portfolio in terms of total risk (Sharpe Ratio) and 35 schemes have superior performance as per Treynor ratio. According to Jensen measure there are 45 schemes which have positive alpha value and 57 schemes have positive differential returns, thereby indicating superior performance. Fama's measure confirms that the returns earned out of selectivity are very low and the impact of diversification is low. The study found that the mutual fund schemes in general have not succeeded in maintaining balance between security selection and diversification of the portfolio.

Sinadhi and Jain (2005)\textsuperscript{28} in their study made an attempt to assess the financial performance of equity mutual funds in terms of profitability for a nine year period, 1993-2002. A sample of 36 equity mutual funds has been drawn from 21 asset management companies belonging to private and public sectors. The study revealed that overall inferior performance of mutual funds compared to risk-free return of 364 days T-bills during the study period. It is borne out of the fact that only one-fourths of the equity mutual funds have been able to generate superior returns than the risk-free returns and also they observed that private sector sponsored mutual funds have been able to earn returns much higher than the market returns. The private equity mutual funds seem to have followed superior fund management practices backed by well-researched 'stock selection' and 'timing skills'.
In the case of public sector sponsored mutual funds, the fund managers seem to have followed poor investment strategies that have resulted in inferior performance by the PSU sponsored equity mutual funds. They also seem to have lacked the skills to identify superior stocks for their portfolios.

Kulbhushna Chandel and Verma (2005) in their study confined to evaluate the performance of mutual funds on the basis of weekly returns compared with risk free security returns and BSE Index. Among these 25 schemes, only sector-specific schemes floated by different institutions have been observed. To evaluate the performance of funds three performance measures- Sharpe, Treynor and Jensen have been used. It is observed that the performance of sample schemes during the study period has been satisfactory.

Muthappan and Danodharan (2006) in his thesis made an attempt to evaluate the performance of Indian Mutual Fund schemes in the framework of risk and return during the period April 1, 1995 to March 31, 2000. Performance measures used are Sharpe ratio, Treynor ratio, Jensen measure, Sharpe differential return measures and Fama’s components of performance. The study concluded that the risk and return of mutual fund schemes are not in conformity with their stated investment objectives. Further, sample schemes are not found to be adequately diversified. The funds are able to earn higher returns due to selectivity; however the proper balance between selectivity and diversification is not maintained. The analysis made by the application of Fama’s measure indicates that the returns out of diversification are very less. Based on the empirical investigation, it is observed that the Indian Mutual funds are not properly diversified.
Sanjay and Vishal (2006)\textsuperscript{31} in their study entitled “An empirical Analysis of Performance Evaluation of Mutual fund Schemes in India”, made an attempt to evaluate investment performance of mutual funds in terms of risk and returns. The study examined the funds sensitivity to the market fluctuations in terms of beta and appraises investment performance of mutual funds with risk adjustment by applying, the theoretical parameters as suggested by Sharpe, Treynor and Jensen. The sample scheme consists of top performer schemes of mutual fund companies in India based on average return during the last five years (2000-01 to 2004-05). The broad 100 shares based BSE National Index was used as a proxy to find out whether the schemes and funds are able to beat the market or not.

Prasad Rao and Satya Sekhar’s (2006)\textsuperscript{32} in their study entitled “Leaders Vs Laggards: An Appraisal of selected mutual funds” reveals the importance of time factor. The longer the investment, the lesser the return. It was also found that there is a nominal positive correlation between Sharpe measure and NAV. It is suggested that Net Asset Value Analysis (NAV) can be utilized by long-term investors. They concluded that performance in the short-run may not give the same results in the long-run.

**Review of studies on Market Timing Ability**

Treynor and Mazuy (1966)\textsuperscript{33} in their study “Can Mutual Funds Outguess the Markets”, developed a methodology for testing mutual fund’s historical success in anticipating major turns in the stock market and then tested the same on a sample of 57 open-ended mutual funds during the 10 years period, 1953-1962. The study found no evidence that the investment managers of any of the 57 funds had successfully outguessed the market. They observed that mutual fund managers did not succeed in
reducing fund's beta in a bearish market and increase the same in a bullish one in order to earn higher risk-adjusted returns. Out of 57 funds examined by them, only one fund has succeeded in adjusting its beta according to market movements.

Henriksson and Merton (1984)\textsuperscript{34} examined the performance of the investment managers by using both the parametric and non-parametric tests for testing their of fund managers ability. He studied the market-timing ability of 115 open-ended U.S. mutual funds for the period 1968-80. He reported that mutual fund managers were not able to follow an investment strategy that successfully times the return on the market portfolio. The study observed strong evidence of non-stationary in the performance parameters for both the parametric and non-parametric tests and no evidence forecasters success in market timing ability especially in predicting large changes in the value of the market-portfolio. The study found that a majority of the sample mutual fund schemes have recorded superior performance as compared to the benchmark.

Chen and Stockum (1986)\textsuperscript{35} adopted a generalized varying parameter regression procedure to examine mutual funds selectivity, beta instability, and timing decisions simultaneously. Their model allowed beta non-stationarity to include both market timing and random beta behavior. They found that in their sample of 43 funds, around 30 per cent had selectivity, 19 per cent had random betas, and 14 per cent had significantly negative market timing performance.

Koh, Koh and Hin (1989)\textsuperscript{36} evaluated the investment performance of investment trusts and unit trusts of Singapore during 1980 to 1987. Market timing ability was used as one of the parameters for performance evaluation of the fund
managers. They observed that the evidence was inconclusive as to the presence of market timing amongst Singapore fund managers.

Lee and Rahman (1990) examined market timing and security selection abilities of 93 funds over a period of 87 months from January 1977 to March 1984 and found that at the individual level, there was some evidence of superior micro and macro forecasting abilities on the part of the fund managers.

Cole and IP (1993) investigated the performance of Australian equity trusts. They evaluated the overall performance as well as the components of performance in terms of selectivity and market timing. Of 27 trusts based on their monthly returns, they found evidence that portfolio managers were unable to earn overall positive excess risk-adjusted returns, thereby supporting strong from market efficiency. However, the excess returns made by some trusts due to their market timing ability did not support the strong from market efficiency. The poor overall performance of portfolio managers was mainly attributable to their inability to identify superior investments.

Chen and Jang (1994) studied stock selection and market timing performance of 15 US-based international mutual funds using a modified model, and found evidence of a positive market timing ability in some of the funds but little evidence of stock selection.

Grahman and Harvey (1996) studied the market timing abilities and volatility implied in investments allocation recommendations. The study investigated over 1500 asset allocation recommendations for the period 1980-1992 and found little
evidence that hot recommendations contained adequate information regarding future market returns; further; some recommendations even appeared to have short-run insight over the common level of predictability.

Bello and Janjigian (1997)\textsuperscript{41} used an extended version of the Treynor and Mazuy model to include the non-S&P500 assets while using S&P 500 assets as the original proxy for the market. They found evidence of market timing abilities which is in sharp contrast with the findings using the original Treynor Mazuy model.

Thripalraju and Prabhakar Patil (1997)\textsuperscript{42} study examined to measure security selection and market timing- known as micro and macro forecasting abilities of fund managers to generate excess return. The study evaluated the performance of tax saving schemes (ELSS) launched 22 schemes over five year period from 1990-91 to 1994-95, are selected. Most of the funds managers are by and large know to be actively managing their funds. Some fund managers from UTI and LIC had superior capabilities. The majority of the selected schemes showed good diversification but poor net selectivity. The market conditions many times were bad, the managers timing yield positive returns in most of the cases.

Rao and Venkateswaralu (1998)\textsuperscript{43} examined the market timing abilities of fund managers of UTI's nine closed-ended schemes. The data set comprised daily closing prices of the schemes from their respective listing dates to March 1998. They employed both the Treynor-Mazuy and Henriksson-Merton models were reported that UTI's fund managers were not able to time the market in general.
Goetzman, Irngersoll, and Ivemovic (2000) argued that monthly frequency might fail to capture the contribution of a manager’s timing abilities to fund returns because for most of the funds, the decisions regarding market exposures are made more frequently than monthly.

Chance and Hemler (2001) examined the performance of 30 widely acknowledged market timers whose recommendations were widely executed in customers accounts. The study analysed both unconditional and conditional timing ability on a daily basis and found evidence of significant ability across all tests and portfolio. It also documented evidence that successful ability disappeared when recommendations of successful timers were observed monthly instead of daily.

Jiang (2001) developed a non-parametric test for examining manager’s market timing ability and found an average negative parameter for actively managed equity funds. The relation between market timing ability and fund characteristics was considered to be very weak. The study concluded that market timing was fund specific and very difficult to predict by observational characteristics.

Gupta (2001) conducted a comprehensive study to evaluate investment performance and market timing abilities of investment managers in India. The results could not provide credence to the successful market-timing proposition.

Sethu (2001) his study used weekly NAV data for 18 open-ended growth schemes in India for the period April 1995-July 1999. His study used three alternative indices for equity market Viz. NSE Nifty, BSE Sensitive Index and S&P CNX500. The 91-days treasury auction rate was used as the risk-free rate. He concluded that the
fund portfolios are not adequately diversified; the excess returns after adjusting for systematic risk is zero and the portfolio do not show any market timing.

Lhabitant’s (2001) study concluded that, there was neither skilful market timing nor clever security selection abilities over the study of selected mutual funds.

Biswadeep Mishra (2002) made a study entitled “Selectivity and Timing Skills of Mutual funds in India”, during April 1992 and December 1996. The study evaluates the performance of mutual funds based on 24 selected schemes having data of at least 24 months. The study concluded that about 25 per cent of the schemes possess market timing skills exclusively whereas the remaining schemes exhibited unstable beta due to both market timing and non-market rated factors.

Chander (2003) studied portfolio performance attribution in relation to the following characteristics-nature, sponsorship and investment objectives. It noted that fund managers failed to forecast the market movements correctly. The study observed superior investment performance in private sector sponsored growth funds.

Ramesh Chander (2006) in his study made an attempt to examine the market timing abilities of investment managers operating in the Indian capital market. This study is based on the performance outcome of 80 investment schemes from the public as well as the private sector for the five-year period encompassing January 1998 through December 2002. It was observed that majority of fund managers failed to time the market successfully-only 12.5 per cent the schemes as per Treynor and Muzuy measure and 43.75 per cent as per Henriksson and Merton measure exhibited
successful market timing. Thus, the study concluded that the fund managers are not very successful in estimating the market timing.

Soumya Guha Deb, Ashok Banerjee and Chakrabarti (2007)\(^{53}\) in their study explore the market timing ability and the stock selection ability of the Indian mutual fund managers during January 2000 to June 2005. They used traditional as well as conditional model with monthly and weekly data frequency. In both TM and HM models, they have found very little evidence of market timing, particularly using the monthly data frequency. Weekly data were also used in their analysis to see the impact of data frequency on the results. It was observed that, while the number of positive timers marginally increased, there was no improvement in the number of significant positive timers. Overall, among all the 768 possible cases in the unconditional models there were only four cases of significant positive market timing at 10 per cent level of significance and only one case of significantly positive market timing at 5 per cent level of significance.

A few articles also appeared in the business new papers (The Economic Times, Financial Express and Business Standard) and the periodicals (Dalai Street, Business Today, Business World and Business India) about the performance evaluation of mutual fund schemes the growth, trends and significance of mutual funds which are briefly reviewed here.

Anil Abraham\(^{54}\) in his article stated that the ideal portfolio of an investor should have a mix of both equity and debt. He studied some of the balanced schemes offered by Mutual funds and concluded that these schemes exactly suit the needs of
both risk-taking and risk-averse investors as they invest funds in a portfolio composed of both equity and debt investments.

Rajiv Handa and Arathi Ananthan\textsuperscript{55} in their article has clearly brought out the fact that among the top ten fund mobilisers in the capital market in India, Mutual funds stood third. They found that the savings mobilized by the mutual funds have far exceeded the savings mobilized by the banking sector.

Lakshman\textsuperscript{56} in his article emphasised the importance of mutual funds by saying that mutual fund industry raised to such a level in India that it could replace Fixed Deposits, Post Office Savings Deposits and even GPF. He also opined that mutual funds are gradually coming of age in India and are likely to attract more funds than the commercial banks in India. According to him, the mutual fund schemes have the potential to replace all known investment avenues.

Sahu and Jena\textsuperscript{57} in their article have stated that the mutual fund is an attractive investment vehicle which has all the characteristics required by investors i.e. yield, liquidity, safety and concern for investors. They analysed the present scenario of mutual funds in India, its recent developments, the investment pattern of the raised funds and investors' perception of different mutual fund schemes and their preference for certain scheme over other schemes. Through this study they concluded that the mutual fund industry in India shows clear prospectus and hence there is a need for proper supervision, guidance and control of these funds.

Madhu Panigrahi\textsuperscript{58} in his article has observed that the current economic reforms and liberalization have broadened the scope for the mutual fund industry to
grow manifold in terms of number of payers, schemes and investors. He has examined the reasons for increasing interest of investors in the mutual fund industry by comparing the growth of UTI Vs. other mutual funds also the growth of ingestible funds in UTI, other public sector mutual funds. He concluded saying that the Mutual fund industry can further be developed with the introduction of Money Market Mutual Funds, Bond Market Mutual Funds, Sector Specific Funds, Index Funds, Environment Funds, etc., as these will cater to the specific needs of investors.

Frederik D' Silva⁵⁹ has pointed out the drawbacks of investment in equity. The equity has turned out to be less attractive due to the low growth rate of companies, falling rupee, higher fiscal deficit and the tendency of Foreign Institutional Investors to become net sellers. Investment in gold is not attractive because the investor does not earn anything in the form of interest or dividend. Further, there is no scope to benefit from capital appreciation as the gold prices are declining. There has been a depressed trend in real estate investment and it will continue to witness a weak trend in the near future. Coming to investment in mutual funds, Frederik said that, they offer tremendous potential and have proved somewhat a better investment position in relation to other investment avenues.

Sameer Purohit⁶⁰ in his article has stated that the Money Market Mutual Funds could pose a real challenge to commercial banks as investment in this combines safety with returns. The other reason why the Money Market Mutual Funds score over the other reason why the Money Market Mutual Funds score over the bank short-term deposits is that, the short-term bank deposits are renewed after every 15 days. While the Money Market Mutual Fund is free to exit from the schemes any time after the initial lock-in period is over. According to Sameer Purohit, the twin
objectives of Money Market Mutual Funds can be achieved by allowing retail investors the access to money market instruments and providing an added depth to the secondary market, if the fund managers are given more freedom.

Gangadharan emphasized the need for uniform norms for mutual fund valuation and accounting practice. He has identified certain factors like change in the attitude of household investors, higher sale value and higher returns of mutual funds than that of bank deposits, tax shelter etc., as the main reason for growth of mutual fund industry. He has also identified the causes for the collapse of the industry due to the vested interest of Board of Directors, funds inability to pay dividends, political instability, lack of transparency, etc., and made suggestions to make the prospects of mutual funds brighter.

Sunil Damania has expressed mutual funds to be the best investment avenue of today's investor who aims always at descent returns and transparency. The cost of indexation benefits and tax-free returns are making mutual funds more attractive as against other fixed income instruments. According to Sunil Damania, the growth of mutual fund industry can be made faster with the introduction of pension and retirement plans.

Sridhar Narayan and Simal Kanuga have said that the tax advantage offered to mutual fund investors in the Union-Budget 1999-2000 has produced large number of short-term investors known to the industry as dividend strippers. The process of dividend stripping involves, investing in the dividend plan of a mutual fund schemes, receiving dividend, and then redeeming the units once they are quoted ex-dividend. This incurs a short-term capital loss and hence receives tax shelter against existing or
future capital gains. According to the authors, this process could adversely affect the overall returns to the long-term investors as large amounts are invested for every short-term and further the fund managers are insisted to maximize returns besides maintaining liquidity and safety of the portfolio. With a view to provide satisfactory returns to the long-term investors, they have suggested that an exit load for a brief period around the dividend payment date should be imposed.

Selvaraj has said that mutual funds have opened up a new way of investing as a part of it, it has encouraged offshore fund besides its varied existing schemes, in order to attract foreign investments. The tax benefits offered by mutual funds also play a vital role in the investment decisions of the mutual fund investor. Selvaraj has expressed that the success of any business depends upon the degree of information reach to target audience via communication media. He has studied that the advent of E-Commerce has made the investors better informed. It has shrunk physical boundaries facilitating the investors to invest world over. It is also capable of ensuring major economic benefits to investors.

In the present competitive environment, this industry has provided a fair return on the investments of its investors. Considering the importance of mutual funds, several academicians have tried to study the performance of various funds. Initially, their studies have focused on timing and investment abilities of fund managers. Later, several researchers have tried to study the various factors and their impact on fund performance. These factors include potential measurement errors from survivorship bias and misspecification of the benchmark, the impact of fund expenses and economic of scale, to the personal characteristics of fund managers. Further, few studies reviewed the performance evaluation and market timing ability, but there is no
research work on the performance evaluation of mutual funds which covers investment pattern, performance evaluation and timing ability of fund managers and there is no a detail study after UTI flagship. Therefore, the present study “Performance of Mutual Fund in India” (A comparative study of selected Public and Private sector Mutual Fund Schemes) has gained significance.

**Objectives of the present Study**

1. To study the growth and development of Mutual Fund industry in India.
2. To analyse the investment pattern of the selected Mutual fund schemes
3. To evaluate the performance of selected Mutual fund schemes in terms of their return and risk and thereby fund manager’s stock selection skills.
4. To analyse the market timing ability of the selected Mutual funds and
5. To make appropriate suggestions for the development of Mutual Fund Industry in India.

**Methodology**

The present study made an attempt to analyse the performance of 10 out of 29 Mutual funds currently operating in India. Further, 60 schemes have been chosen for detailed study out of the 450 schemes floated by all Mutual funds in India as on 31 March, 2005. Thus, the sample consists of 33.3 per cent of Mutual funds and about 14 per cent of the schemes.

**Data Sources**

The study is based on the secondary data. For evaluating the performance of the sample schemes the adjusted monthly NAV data during April 2000 – March 2005 have been used. The necessary data have been collected from various investment

The Investment pattern, Performance evaluation and Market timing ability of selected mutual fund schemes has been compared with the BSE Sensex and NSE Nifty which is considered as proxy for the market. The data on Indices have been collected from the websites www.Bseindia.org and www.nseindia.org. Generally, Treasury Bills of different duration are used as a surrogate for risk-free asset in studies conducted both in India and abroad. In this study the monthly yields on 91-days Treasury Bills have been used as a surrogate for risk-free rate of return. The 91-day Treasury Bill rate has been collected from ICRA Money and Finance Bulletin.

**Performance Evaluation of Mutual Funds**

From the investor’s point of view, the purchase of mutual fund units is one among the several alternatives of disposing his personal savings. Hence, performance analysis can be made by assessing the performance of funds with the relative merits and demerits of alternative forms of investment avenues. In such a case, the numbers of investment alternatives available to the investor and his reasons or motivations for holding investment in mutual funds are to be known.

There are two approaches to understand the bewildering array of investment opportunities. The traditional approach is to view each type of investment as unique
and describing its characteristics in detail. The modern approach is to select several attributes, which are common to all investment and then attempt to measure to what extent a particular investment possesses these attributes. Out of several attributes, two attributes or characteristics, which are extremely important to all types of investment avenues, are return and risk. All investors are interested in maximum returns out of a mutual fund. However, these returns are to be achieved with minimum risk. There is always a trade-off between risk and return. In the preset study these two attributes, return and risk have been considered for detailed analysis, and for this, sample mutual fund schemes are evaluated on these lines by adopting in the following section.

**Performance Evaluation Measures**

The idea behind the performance evaluation is to compare the returns obtained by the portfolio (or a mutual fund schemes) through active management by the investment manager. Such portfolio chosen for comparison are often referred as 'benchmark portfolio'. Such random portfolios can be many. Hence, a stock market index can be selected as a benchmark portfolio. To carry on this exercise, two types of techniques are applied- measures that consider total risk and measures that consider systematic risk.

The performance of selected mutual fund schemes has been evaluated by using six performance measures: (a) Rate of Return (b) Sharpe measure (c) Treynor measure (d) Jensen differential return measure, (e) Sharpe differential return measures, (f) Fama’s Components of Investment Performance.
Return

For each mutual fund schemes in the sample, the returns have been calculated taking monthly Net Asset Values from April 2000 to March 2005. The NAVs are adjusted assuming dividends are reinvested at the ex-dividend NAV.

The return is calculated by using the following formula.

\[ R_{pt} = \frac{\text{NAV}_t - \text{NAV}_{t-1}}{\text{NAV}_{t-1}} \]

Where, \( R_{pt} \) is the difference between Net Asset Values (NAVs) for two consecutive days divided by the NAV of the preceding day. ‘\( t \)’ and ‘\( t-1 \)’ indicate month end month beginning respectively, \( t, t-1, t-2, t-3, \ldots \). In is the natural logarithm to the base ‘e’.

The average return on the market portfolio is determined as follows:

\[ R_p = \frac{1}{n} \sum_{t=1}^{n} R_{pt} \]

Where, \( R_p \) is the average return on the mutual fund schemes. It is also called an average return on the portfolio.

Benchmark portfolio is general measure of overall performance. By investing in benchmark portfolio the investor should maximize return for the risk taken. Benchmark portfolio have only systematic risk and unsystematic risk is diversified almost BSE SENSEX is assumed as benchmark. SENSEX is a value-weighted portfolio consisting of 30 companies. It is a broad based index and it is believed that it represents market portfolio. The value of market index on the respective date of NAV is taken and market returns are computed. As all the mutual funds are not announcing
the NAV's on the same date, market returns may also slightly different in a particular period. BSE Sensex Index is taken as benchmark.

The returns on market portfolio are computed as follows:

\[
R_{mt} = \frac{\text{Index } t - \text{Index } t-1}{\text{Index } t-1}
\]

\[\text{...... (1.3)}\]

Where,

\[
R_{mt} \text{ is the returns on the basis of BSE Sensex index.}
\]

The average return on market index is as follows:

\[
R_m = \frac{\sum_{i=1}^{n} R_{mt}}{n}
\]

\[\text{......(1.4)}\]

Where,

\[
R_m \text{ is the average return on the market.}
\]

Risk

Risk is the variability of actual return from expected return. Risk in holding securities is generally associated with the possibility that realized returns will be less than expected returns. The difference between the required rate of return on mutual fund investment and the risk free return is the risk premium.

Standard deviation

Standard deviation is a measure of total risk. In the present study, the standard deviation of monthly returns has been taken as the measure of risk. It is used to measure the variation in individual returns from the average expected returns over a certain period. Higher standard deviation means a greater fluctuation in expected return.
\[
\sigma_p = \frac{1}{n} \sum_{t=1}^{n} \left( \frac{(R_{pt} - R_p)^2}{2} \right)^{1/2}
\]

where, \( \sigma_p \) is the total risk of the portfolio.

The total risk on the market line portfolio is computed as follows:

\[
\sigma_m = \frac{1}{n} \sum_{t=1}^{n} \left( \frac{(R_{mt} - R_p)^2}{2} \right)^{1/2}
\]

where, \( \sigma_m \) is the total risk of the market portfolio.

**Beta**

Beta measures the systematic risk and shows how sensitive the return of a security is in relation to the market return. It is calculated by relating the return on a security with return for the market. By convention, market will have beta 1. Mutual funds are said to be volatile, more volatile or less volatile. If beta is greater than 1, the stock is said to be risker than market and the refer aggressive. If beta is less than 1, the indication is that stock is less risky in comparison to market and it is defensive. If beta is zero then the risk is the same as those of the market stocks with negative beta are rarely found.

The beta estimated form the following formula is,

\[
R_{pt} = \alpha + \beta R_{mt} + \epsilon_p
\]

Where,

- \( R_{pt} \) is the return on the mutual fund scheme
- \( R_{mt} \) is the return on market index i.e. SENSEX
- \( \epsilon_p \) is the error term
- \( \alpha \) is the constant term
- \( \beta \) is the systematic risk
Alpha

The size of the alpha exhibits the stock's unsystematic return and its average return independent of market return. If the fund produces the expected return at the level of risk assumed, the fund would have an alpha equal to zero. A positive alpha indicates that the fund produced return greater than expected for the risk taken. Alpha is calculated by comparing the fund's actual performance with the risk adjusted expected return.

b) Sharpe's Measure

In this measure, performance of a fund is evaluated on the basis of a Ratio, which relates the returns generated by a fund over and above risk free rate of return and the total risk associated with it. According to Sharpe, it is the total risk of the fund that the investors are concerned about. So, this measure evaluates mutual funds on the basis of reward per unit of total risk. Symbolically, it can be written as:

$$\text{Sharpe Measure} = \frac{(R_p - R_f)}{\sigma_p}$$ ...... (1.8)

Where,

- \(R_p\) represents return on fund,
- \(R_f\) is risk free rate of return and
- \(\sigma_p\) is standard deviation of the fund.

While a high and positive Sharpe Ratio shows a superior risk-adjusted performance of a fund, a low and negative Sharpe Ratio is an indication of unfavorable performance.
c) Treynor’s Measure

This performance measure evaluates funds on the basis of ratio of return generated by the fund over and above risk free rate of return during a given period and systematic risk associated with it (beta). Symbolically, it can be represented as:

\[
\text{Treynor's Measure} = \frac{(R_p - R_f)}{\beta} \quad \text{...(1.9)}
\]

Where,

- \(R_p\) represents return on fund,
- \(R_f\) is risk free rate of return and
- \(\beta\) is beta of the fund.

All risk-averse investors would like to maximize this value. While a high and positive Treynor's Measure shows a superior risk-adjusted performance of a fund, a low and negative ratio is an indication of unfavorable performance.

Comparison of Sharpe and Treynor

Sharpe and Treynor measures are similar in a way, since they both divide the risk premium by a numerical risk measure. The total risk is appropriate when we are evaluating the risk return relationship for well-diversified portfolios. On the other hand, the systematic risk is the relevant measure of risk when we are evaluating less than fully diversified portfolios or individual stocks. For a well-diversified portfolio the total risk is equal to systematic risk. Rankings based on total risk (Sharpe measure) and systematic risk (Treynor measure) should be identical for a well-diversified portfolio, as the total risk is reduced to systematic risk. Therefore, a poorly diversified fund that ranks higher on Treynor measure, compared with another fund that is highly diversified, will rank lower on Sharpe Measure.
Differential Return Measures

It may be recalled that both Sharpe and Treynor ratios are relative measures of the performance. However, the differential return measures of Jensen and Sharpe are absolute measures of performance and reflect whether or not fund managers are able to generate returns in excess of equilibrium returns. Thus, this study utilizes both these differential return measures.

d) Jensen Differential Measure

This measure was developed by Michael Jensen and is sometimes referred to as the Differential Return Method. This measure involves evaluation of the returns that the fund has generated in relation to the returns actually expected out of the fund given the level of its systematic risk. The surplus between the two returns is called Alpha, which measures the performance of a fund compared with the actual returns over the period. Required return of a fund at a given level of risk ($\beta$) can be calculated as:

$$R_p - R_f = \alpha + \beta (R_m - R_f) + \epsilon_p \quad \text{...(1.10)}$$

Where,

- $R_p$ = Average return on the portfolio
- $R_m$ = average market return
- $R_f$ = risk free rate of return
- $\alpha$ = Intercept measuring of the forecasting ability of the manager
- $\beta$ = Systematic risk measure
- $\epsilon_p$ = error term.

After calculating it, alpha can be obtained by subtracting required return from the actual return of the fund.
Higher alpha represents superior performance of the fund and vice versa. Limitation of this model is that it considers only systematic risk not the entire risk associated with the fund and an ordinary investor can not mitigate unsystematic risk, as his knowledge of market is primitive.

e) Sharpe Differential Measure

Sharpe has applied this measure to know the incremental returns earned by the mutual fund manager for the given level of risk.

\[ R_p - \left[ R_f + (R_m - R_f) \frac{\sigma_p}{\sigma_m} \right] \]

The value so arrived indicates the quantum of incremental (differential) return earned by the scheme (fund) over the expected return (which is indicated in brackets in the above formula) for the given level of risk. This is called Sharpe's differential return. This ability of the managers both in the stock selection and diversification are reflected in this measure.

It a portfolio is well diversified, the two measures (Jensen and Sharpe) should indicate same quantum of differential returns. For a portfolio which is imperfectly diversified, the differential return out of Sharpe measure will be smaller. The difference can be interpreted as decline in performance resulting from lack of diversification. A comparison of these two facilitates how well the fund manager has balanced the portfolio in selection of securities and diversification.

f) Fama’s Decomposition Measure

The purpose of performance evaluation is to identify the mistakes and suggest a direction for making necessary corrections. In is context, a comparison of Sharpe’s
differential returns and Jensen's alpha reveals the impact of selectivity and diversification of the fund return. Further, decomposition measures suggested by the Fama are helpful.

According to Fama, portfolio return constitutes four components. They are

a) Risk-Free return \( R_f \)  

b) Compensation for systematic risk \( \{ \beta (R_m - R_f) \} \)

c) Compensation for inadequate diversification \( (R_m - R_f) (\sigma_p / \sigma_m - \beta) \)

d) Net Superior returns due to selectivity \( (R_p - R_f) - (\sigma_p / \beta_m) (R_m - R_f) \)

In the above, second and third measures indicate the impact of market risk (Systematic risk) and diversification. By altering systematic and Unique risk a portfolio can be reshuffled to get desired level of return. A portfolio manager can earn superior return by identifying the undervalued securities through constant research and professional acumen. The ability of selectivity can be known with the help of the fourth component.

**Measures of Testing Market Timing Ability**

Several methods have been suggested in the literature to test the market-timing abilities of fund managers. But, two pioneering works in this filed are proposed by Treynor and Mazuy (1966) and other suggested by Henriksson and Merton (1981). Most of the later studies have essentially used modified versions of these two basic models. These models have been used to test the market timing abilities of selected fund managers in this study.
**Treynor and Mazuy Model**

Treynor and Mazuy (1966) developed an exclusive model to measure investment manager’s market timing abilities. The formula of this model is obtained by adding squared extra return in the excess return version of the Capital Asset Pricing Model (CAPM) as given below.

\[ R_p - R_f = \alpha + \beta (R_m - R_f) + \gamma (R_m - R_f)^2 + \varepsilon_p \] ... (1.13)

Where,

- \( R_p \) = Return on the fund,
- \( R_m \) = Return on the market portfolio
- \( R_f \) = Risk free return
- \( \varepsilon_p \) = random error return; and \( \alpha, \beta \) and \( \gamma \) are parameters of the model.

This model involves running a regression for excess investment return as dependent variable and the excess market return as independent variable, the value of coefficient of squared excess market return (\( \gamma \)) acts as a measure of market timing ability of the fund managers, which has been tested for significance using t-test. Significant and positive \( \gamma \) values provide evidence in support of the investment manager’s successful market timing abilities. Treynor and Mazuy argued that when fund managers are concentrating only on stock selection and not on market timing, the average beta of the portfolio over time remains fairly constant. And the plots in graph of the fund’s excess return versus market’s excess return over risk free rate would be a straight line. If the fund managers attempts to time the market and changes the beta of the fund’s portfolio but is unsuccessful in correctly assessing the market direction, the plots in the graph would still show a linear pattern. If the fund manager is successful in correctly assessing the market direction, the plots in the graph would lie
above the linear relationship in the up-market conditions and below the linear relationship in the down-market conditions.

**Henriksson and Merton model**

Henriksson and Merton (1981) have proposed an improved timing sensitive model to test the market timing abilities of the fund managers. This model clearly has the potential to provide much richer insights into the nature and sources of managed portfolio performance differentials. It has been argued that in the Treynor and Mazuy formulation portfolio's beta fluctuates over many values, depending on the size of the market's excess returns. However, in terms of Henriksson and Merton formulation the fund beta would take only two values: a large value when the market is expected to do well i.e., when $R_m > R_f$ (up-markets) and a small value when the markets are not expected to do well i.e., when $R_m < R_f$ (down-markets). Therefore, it is argued that a successful market timer would select a high up-market beta and a low down market beta. Thus, such a relationship can be estimated by the following equation using a dummy variable.

$$(R_p - R_f) = \alpha + \beta (R_m - R_f) + \mu [D(R_m - R_f)] + \epsilon_p \quad \text{...(1.14)}$$

Where, $D$ is a dummy variable that equals "0" for $R_m - R_f$ and -1 for up markets and down markets respectively.

To consider the effective equations for different values of $R_m - R_f$

<table>
<thead>
<tr>
<th>Values of $R_m - R_f$</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 0</td>
<td>$R_p - R_f = a + b (R_m - R_f) + \epsilon_p$</td>
</tr>
<tr>
<td>= 0</td>
<td>$R_p - R_f = a + \epsilon_p$</td>
</tr>
<tr>
<td>&lt; 0</td>
<td>$R_p - R_f = a + (b - c) (R_m - R_f) + \epsilon_p$</td>
</tr>
</tbody>
</table>
Hence, the beta of the portfolio is $\beta$ in a bull or up-market and $(\beta - \mu)$ in a bear or down markets. Thus, under this formulation, parameter $\mu$ indicates the difference between the two betas and positive and significant value of $\mu$ would indicate market timing ability of the fund managers. Thus, the magnitude sign and significance of parameters $\mu$ in both the models represent the market timing abilities of the fund managers while those of the parameter $\alpha$ represent the stock selection ability of the fund managers.

**ORGANISATION OF THE STUDY**

The study is organised in six chapters including the present one. Chapter two discusses the growth and development of mutual fund industry. The third chapter examines the investment pattern of selected mutual funds. Chapter four presents the results pertaining to the performance of evaluation of selected mutual funds while chapter five discusses the results in respect of market-timing abilities of the managers. The final chapter presents the summary and conclusions of the study.
References

1) AMFI Quarterly Update


