

Performance Evaluation of Mutual Fund in India: An Empirical Study

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Abstract

In India, a large number of mutual fund schemes are available. Indian and foreign mutual fund institutions provide the schemes jointly. Generally, they provide different types of schemes like income, growth, balanced, gilt etc. These schemes are made in such a way that they fulfill certain objectives. Here, open-ended balanced mutual fund schemes are considered to examine the performance in the context of Indian capital market. The study uses popular measures of Treynor & Mazuy and Fama to achieve the major objectives, namely stock-selection, market timing and diversification performances of the open-ended balanced mutual fund schemes. The basic finding of the study is that the schemes have provided satisfactory returns to the investors. But, the managers have failed to reduce the magnitude of diversifiable risk. Therefore, the schemes have excessive unsystematic risk. Moreover, the managers cannot predict the market movement at right time; as a result, the managers are unsuccessful to generate extra returns due to poor market timing performance. Similarly, the managers cannot predict the security prices correctly due to poor stock selection performance.

Keywords: Mutual Fund, Market-timing, Stock-selection, Net-selectivity, Diversification, Risk, Fama, Treynor & Mazuy

Introduction

Concisely, an investment may be described as sacrifice of certain amount at present with the expectation of future reward. When an investor goes for investment, generally some questions arise in his/her mind like where

to invest, when to invest, how much to invest along with the questions of probable return and risk. In Indian financial market, a large number of investment avenues are available to the investors. Mutual fund is one of them, which plays a significant role in mobilizing savings from the small investors and allowing them to take part in the equities and securities of the industrial organisations with comparatively lower degree of expected risk that prevails in the capital market. Generally, the mutual fund institutions provide to the investors a large number of mutual fund schemes with a range of stated objectives. But, it is not an easy task for the investors to select the right scheme(s) among the various options/ offers, which are available in the market. Not only that but also the investors do not know where their monies are invested. Because, the investors believe that their monies are managed by the expert managers. Generally, the mutual fund organisations invest a certain portion of collected monies in different securities, which provide safety, easy liquidity and fixed return. But, the remaining portion of collected monies is invested in different companies. Sometime, they say that the monies are invested in companies like infrastructure, gold, mines, real estate, chemicals etc. They do not inform the investors the names of the companies, their present activities, past records, liquidity position, debt-equity ratio, profitability ratio, whether or not the companies are blue chips and or green companies, whether or not they follow sustainable investment practices. However based on the available information, the performance evaluation of mutual funds is made. This study also examines the performance of the open-ended balanced type of mutual fund schemes in India. The superior performance exclusively depends on the managers' efficiency in the stock selection, market

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timing and diversification activities, which can bring in benefits for the investors in the form of additional, return with reduced risk.

In this paper, an attempt has been made to examine various aspects of mutual fund performance namely overall performance, selectivity, net selectivity, risk, diversification and market – timing. Fama's (1972) decomposition model is applied in order to evaluate the overall performance, selectivity, net selectivity, risk and diversification performances while, Treynor & Mazuy (1968) model is utilized in order to examine the market – timing efficiency of the mutual fund managers.

Review of Previous Studies

Evidence on Developed Economics

Most of the earlier research works are conducted by using the models offered by Sharpe, Treynor and Jensen. Treynor's (1965) reward-to-volatility ratio distinguishes between total risk and systematic risk. In Treynor's model, it is assumed that portfolios are well diversified and there is no scope of diversifiable risk. Therefore, only beta (systematic) is the appropriate measure of risk. Alternatively, reward-to-variability ratio (1966) of Sharpe considers total risk. There is no distinction between total risk and systematic risk. Therefore, according to this model total variability is the appropriate risk measure. It may be said that return is not the only measure of performance, risks obviously also contribute to that. After Sharpe, Treynor and Jensen, in 1972, E.F. Fama proposes another model, which also seeks to evaluate portfolio performance. The earlier research works using risk and return framework mainly remained confined to a single period. But, Fama's model is able to evaluate portfolio performance on different dimensions namely stock-selection, market-timing, diversification and return from bearing risk and the model is applicable not only to the single period but also in case of multi-period horizons. A series of earlier research works examine the market – timing performance of mutual fund managers but no satisfactory results have been reported. In connection with these evidences Merton (1981), Veit & Cheney (1982), Becker *et al.* (1999) and Athanassakas *et al.* (2002) etc. examine the market timing performances and their results support the past views. In fact, evidence on market-timing efficiency is scanty. In 1966, Treynor & Mazuy,

hereafter refereed to as T&M, developed a model to test market – timing performance and the test reports that only one fund out of 67 sample funds exhibit significant market – timing performance. Similarly, Henrikson & Merton (1981), hereafter referred to as H&M, tested market – timing performance. They reported that only 3 funds out of 116 funds focused statistically significant market – timing performance. G. Artikis examines the performance of bond mutual fund managers in Greece by taking into consideration 30 domestic bond mutual funds over a period from 15/3/1999 to 31/12/2001 by using Treynor & Mazuy model. The study reported that 90% of the fund managers have the ability to select under priced securities, 20% of the sample mutual funds have the ability to time the market correctly, and another 20% of the sampled mutual funds have got successes in selecting under priced securities and outguessing the market at right time. Similarly, in 2001, Filippas-Psoma examine mutual fund performance in Greece by taking into account 17 Greek equity mutual funds. They apply Treynor & Mazuy model for their research purposes. But, the study reports that all but four of the mutual funds have failed to exhibit superior market-timing performance. In 2005, Santa, Costa Tusi and Silva evaluate the performance of 307 Brazillian stock mutual funds over a period from April 2001 to July 2003 by employing stochastic frontiers. They register ten actively managed funds and the bottom ten funds for the said period. Their study reports that the efficiency of a fund is increased with the increase of management skills that ultimately beat the market. However, their study also reports no relationship between fund size and performance. In 2004, Jordan *et al.* examine the mutual funds performance that closed their doors to new investors for the period 1995 to 2001. They obtain data from centre for research in security prices mutual fund database and employ Sharpe, Treynor, Jensen and Fama-French models for performance measurement. Their study reports that mutual funds that have closed their doors to the new investors have performed well in the 12 months before the closing according to the above-mentioned performance measures and it is found that the performance of funds tended to decline relative to its previous performance after closing.

Evidence on Emerging Economics

The emerging economics are not far behind than the developed economics on the issue “performance

evaluation of mutual funds". However, the research on mutual fund performance starts in the emerging economics after a long period. However, in USA, the research on mutual fund starts after the year of 1931. When the mutual fund market in developed countries became popular then the developing countries like India, Thailand, China and Pakistan understood the importance of mutual fund investment, which ultimately influenced the market economy of a country. However, the concept of mutual fund was first introduced in India after the establishment of UTI in 1964. Nevertheless, the research on mutual fund starts in India in between 1980 and 1990. After 1990, the research on mutual fund in India has gradually increased. A large number of research scholars like academicians as well as professionals now engage in mutual fund research. The researchers in India have solved many problems relating to mutual fund operations and shown new insights on mutual fund operations. Although, most of the researchers have empirically examined the mutual fund performance based on some standard models developed by Sharpe, Treynor, Jensen, T&M, M-M etc. Here, some important research works are discussed below.

In 1991, A.K. Sengupta conducts a survey to examine the scenario of mutual funds in India over the period from 1980 to 1990. He examines the growth potential of mutual funds in terms of fund size, number and types of schemes and examines their role in corporate sector and capital market. He uses panel data for his study and reports that liberalisation and deregulation are the major factors for the growth of mutual funds industry in India. M. Jaydev (1996) examines the performance of mutual fund schemes in India over a period from 1992 to 1994. His study focuses on three aspects namely 1. To examine diversification performance; 2. To examine market-timing performance; and 3. To evaluate selectivity performance of the selected mutual fund schemes. Therefore, he considers two open-ended growth schemes and collected monthly net asset values (NAVs) of those schemes for his study. He employed Jensen, Treynor and Sharpe models. The study reports that the performances offered by those selected schemes are very poor in all respects. In 2001, Gupta & Gupta conduct a study on Indian mutual funds industry. They report various different pictures like amount of total asset under management, types of players (UTI, Public sector banks, insurance companies, and private sectors funds), total number of mutual funds companies, total assets and number of schemes etc on

mutual funds in their study. El-Khoury (1993), examines the risk-return relationship by taking into account the data on Amman stock exchange. The study reports that the debt-equity ratios of the funds are not correlated with the required return. In 2005, Shah & Hijazi examine mutual fund performance in Pakistan over a period from 1997 to 2004 on sample of equity and balanced funds. They use the earlier commonly accepted models for the performance evaluation of mutual funds (i) Sharpe measure (ii) Treynor measure and (iii) Jensen differential measure. They report that some funds have negative Sharpe ratio but on overall basis, the Sharpe ratio was 0.47 as compared to the market (0.27). Similarly, all the funds have offered returns, which are less than their respective beta values, but on overall basis the Treynor ratio is which is 0.13, which according to the authors may be considered reasonable risk premium per one percent of systematic risk. Finally, their study report that some of the funds have negative alpha but on overall basis, the alpha value of the funds industry is 6.03. In 2007, Kapil Choudhary examines the components of investment performance of fund managers of 50 equity investments in India for the eight-year periods starting from January 1998 through December 2005. He uses Fama's decomposition theory as a measure of investment performance. The study reports that on an average all the investment managers are able to select the right stocks but no statistically significant market – timing performance is found. However, in terms of risk bearing and diversification activities all the investment managers exhibit positive performance. In 2008, Gupta & Upadhyay conduct a study to investigate the movement of equity growth fund prices as to whether they are random or systematic by taking into consideration 27 equity mutual funds over a period from 2001 to 2005. They use run test and serial correlation or auto-correlation test for this purposes. While the empirical results using run test advocates in favour of weak form of market efficiency and the serial correlation analysis provides evidence in favour of strong form of market efficiency. In 2007, Vanniarajan, Shajahan & Archana conduct a field survey on 250 retail and 250 institutional investors in five major cities of south Tamil nadu to examine the factors that influence the investors to purchase mutual funds. Their study reported that the important factors leading to invest in mutual funds are liquidity, savings, income, motivation, and capital gain. In 2008, Seghal & Jhanwar conduct a study on mutual fund performance on two areas namely stock – selection and market – timing. They use

60 open-ended mutual funds performance by taking into consideration daily data as well as monthly data and employ Jensen, Carhart-four factor model, T&M, H&M and Bollen & Busse model for their test purposes. Their study reports that if they use daily data instead of using monthly data then stock selection performance would be improved.

Objectives of the Study

The objective of the present study is:

1. To examine the overall performance.
2. To look at the selectivity performance and net selectivity performance.
3. To evaluate the risk performance.
4. To scrutinize the diversification performance.
5. To observe the market-timing performance.
6. To check up the degree of relationship among the performance components.

Data

Types of Data & Their Sources

The objective of the study is to examine the mutual fund performance in relation to end result variables in the form of ex-post returns. In this context, it is necessary to evaluate mutual fund performance with regard to their adequacy and effectiveness in terms of ex-post returns. In other words, the study intends to accumulate required familiarity to make new insights into mutual fund performance based on ex-post return and risk. Accordingly, an attempt is made to analyze investment performance of sampled schemes and commented on the adequacy of this performance by attributing it to different activities of the mutual fund managers. The study examines mutual fund performance based on results of a sample of mutual funds because of large and diverse nature of entire universe of these funds. The study is mainly based on secondary data. The secondary data are used to examine and evaluate the ex-post performance of mutual funds. The study uses closing monthly net asset value of sample mutual fund schemes. Initially, 35 open-ended balanced types of mutual fund schemes are considered. Finally, 30 schemes are selected after the exclusion of schemes, which have

provided returns below the risk-free rate. It is observed that some of the schemes have stopped their operations during the study period also taken into consideration. The data on net asset value (NAV) are used to examine the performance. The preference for use of such data over price data is guided by the consideration that these are not affected by the double incidence of market volatilities. The information of NAV is obtained from secondary sources like amfindia.com, websites of respective mutual funds, mutualfundindia.com etc. The respective sources are crossed-checked with other sources that to ensure validity of the data and observed same.

Selection of Benchmark Index

In order to evaluate the investment performance of sample schemes, they must be compared with the selected benchmark portfolio. As the majority of the sample schemes has greater equity exposure, this study uses BSE Sensex as a benchmark portfolio, which is considered an appropriate market proxy for investment performance comparison and evaluation. The choice in favour of BSE-Sensex over other sensexes is primarily on account of its superiority for a larger standing apart from the following other considerations favouring its choice:

- i. As the large section of mutual fund investors are small and their mind psychologically favours BSE-Sensex.
- ii. BSE-Sensex is the most preferred indicator in the securities market and regarded as the sensitivity of capital market barometer.
- iii. About 60% of market capitalisation is accounted for by the BSE-Sensex. Therefore, it gets greater weightage.

The BSE-Sensex is also considered as an appropriate market proxy. The reason behind it as under:

- a. A majority of mutual fund resources are invested in equities. The growth funds are, however, excessively invested therein.
- b. BSE-Sensex being an all equity benchmark is based on blue chip equities of high profile companies, which yields regular return in the form of dividend and has good potential for capital appreciation.
- c. It is registered as the pulse of domestic stock market in India.

The monthly information on this benchmark portfolio is obtained from the website of Bombay Stock Exchange (www.bseindia.org).

The performance of mutual funds either individually or as a group in relation to the fund objectives are rated as superior or inferior and excess performance. If a mutual fund experiences performance above the benchmark portfolio then it is termed as superior. On the other hand, if the performance is below the benchmark portfolio it is said as inferior. In case a mutual fund generates performance above the benchmark portfolio, then, it is rated as excess performance.

Selection of Risk Free Rate

Generally, Treasury bills of different durations are used as a surrogate for risk-free assets in studies of developed as well as emerging economics. In this study, the monthly yield of 7-year Government dated securities of Government of India is used as a market proxy for risk-free rate of return. The reason behind using this security is that it carries a fixed rate of return, which is paid annually or semi-annually. These securities enjoy a high rate of liquidity and safety since they are backed by the Government interest is usually paid by means of coupons, which may be redeemed at any bank. These data are collected from RBI's annual reports and reports on Currency and Finance of Reserve Bank of India (RBI).

Study Period

With a view to examine the performance of the open-ended mutual fund schemes, a period of twelve calendar years (1st January 2001 – December 2012) is taken into consideration, which is long enough to have seen a variety of ups and downs in the stock market and recent enough as well to reflect the complete picture about mutual fund performance. This is because the mutual fund industry in India is newly developed. It was during the past ten years that this industry experienced a wide spread number of newcomers and launched varieties of schemes and the investors became more aware of the mutual funds being a trusted avenue for savings.

Methodology

The methodology is the tool used to attend the purpose of an investigation; a way of solving problems and

creating knowledge. The methodology is usually divided into qualitative and quantitative methods, which are distinguished in the way they analyze and treat information (Holme & Solvang¹, 1997). Quantitative research should be measurable' the measures are used to describe, explain, and aim to generate validity. On the other hand, the qualitative research is characterized by investigators trying to understand how people experience themselves, their existence and environment (Lundahl & Skarvard², 1999).

This study is related to quantitative in nature. A huge number of data are obtained and processed to find a relationship. In a quantitative method, information is converted into figures and quantities from which statistical analysis is made. The advantage of quantitative methods is its efficiency; it is easier to process a large quantity of figures (Holme & Solvang, 1997).

Several research techniques can be selected when evaluating mutual fund performances. When the area of interest is not yet fully covered, an explorative study can be used. If there already exists considerable research within the area of interest and the purpose of the study is to explain or describe some parts of the subject, a descriptive research technique is used. In cases when extensive information is available for the subject in mind and theories and models have already been formulated, the study is said to be hypothesis verifying. This technique concentrates on tests of given assumptions to examine their accuracy (Davidson & Patel³, 2003).

The present study uses two well-known and academically established models to evaluate the performance of the open-ended balanced mutual fund schemes namely Treynor & Mazuy model (1966) and Fama's model (1972). Treynor & Mazuy model is used to examine the market – timing performance of the mutual fund managers. The model is as under:

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + \gamma_i (R_m - R_f)^2 + e_i \quad (1)$$

where R_i = Rate of return of i^{th} mutual fund scheme's, R_f = risk – free rate of return, α_i = intercept, β_i = beta coefficient

¹ Holme, I.M. & Solvang, B.K., 1997, *Forskningsmetodik; Kvantitativa metoder*, Studentlitteratur, Lund.

² Lundhal & Skarvard, 1999, *Utredningsmetodik for Samhallsvetare Och ekonomer*, Studentlitteratur, Lund.

³ Davidson & Patel, 2003, *Forskningsmetodikens grunder – Att Planera, Genomfora, Och, rapportera, en undersokning*, Studentlitteratur, Lund.

(a measure of systematic risk), R_m = market rate of return, γ_i = gamma coefficient (a measure of market – timing performance), e_i = error term with zero mean and constant standard deviation.

The above equation is a parabolic regression equation that helps to estimate the coefficient of square excess return (gamma coefficient), which acts as a numerical measure of market timing performance. The variables, which are considered for this regression equation, are excess return of the schemes as dependent variable, excess return of the market and excess squared market return as independent variables respectively. It is generally assumed that the statistically significant positive gamma value reflects as the superior market timing performance. Therefore, higher is the gamma value better will be the performance.

The monthly rates of return of the mutual fund schemes and the market (BSE Sensex) are computed through the formula as under:

$$R_{i,t} = \log \frac{NAV_{i,t}}{NAV_{i,t-1}} \quad (2)$$

$$R_{m,t} = \log \frac{Market\ Index_t}{Market\ Index_{t-1}} \quad (3)$$

where R_{it} is the return of the i^{th} scheme at the end of the time (month) t . $NAV_{i,t}$ is the net asset value of the i^{th} scheme at time (month) t and $NAV_{i,t-1}$ is the net asset value of the i^{th} scheme at the end of the previous time (month) period ‘ $t-1$ ’.

Market model is used for the computation of α_i , β_i and e_i (error term) values. The model is as under:

$$R_i = \alpha_i + \beta_i R_m + e_i \quad (4)$$

The study uses Fama model to evaluate the overall performance. The model can be expressed as under:

$$F_p = (R_i - R_f) - (\sigma_i/\sigma_m) * [R_m - R_f] \quad (5)$$

where F_p is the Fama’s portfolio performance evaluation model, R_i is the return of i^{th} scheme, R_f is the risk-free rate of return; σ_i is the standard deviation of i^{th} scheme and σ_m is the standard deviation of the market return.

According to the return performance of a portfolio, Fama divided the model into four components is as under:

- i. R_f = Risk-free rate return (6)

- ii. $\beta_i(R_m - R_f)$ = Compensation for systematic risk (7)

- iii. $(R_m - R_f) \{(\sigma_i/\sigma_m) - (\beta_i)\}$ = Compensation for inadequate diversification (8)

- iv. $(R_i - R_f) - (\sigma_i/\sigma_m) * (R_m - R_f)$ = Net superior return due to selectivity (9)

Thus, the overall performance, selectivity performance, net-selectivity performance, risk performance and diversification performance of the open-ended balanced mutual fund schemes are examined by using the above model.

From equation 3, the overall performance can be measured as under:

$$(R_i - R_f) \quad (10)$$

Hence, the overall performance is the difference between the return from the i^{th} scheme and the return from the risk-free asset.

However, the overall performance can further be divided into two separate components as under:

$$(R_i - R_f) = [R_i - R_m(\beta_i)] + [R_m(\beta_i) - R_f] \quad (11)$$

Thus, the overall performance of the i^{th} mutual fund scheme is the difference between the return on the i^{th} scheme and the return on the risk-free asset. Moreover, the overall performance can be divided into two parts namely selectivity and risk. The selectivity measures how well the i^{th} scheme performs relative to a market index with the same level of risk. On the other hand, the second term provides the premium (excess return) from the decision to take on for undertaking positive amounts of risk. It is determined by the level of risk chosen (β_i) and the difference between the return on the market index (R_m) and the return on the risk-free asset (R_f).

Intuitively, to some extent the portfolio decision may have involved putting more eggs into one or a few baskets that would be desirable to attain portfolio efficiency. Actually, the manager places his stakes on a few securities with the hope of that they are winner. In other words, to the extent that $\sigma(\hat{R}_i) \beta_i$, the portfolio manager decides to take on some portfolio dispersion that could have been diversified away because he thinks that he has some securities on his disposal on which he pays concentration to create more resources. The results of such a decision can be evaluated in terms of the following breakdowns of selectivity.

$$R_i - R_m(\beta_i) = \text{Net Selectivity} + [R_m(\sigma(\hat{R}_i) - R_m(\beta_i))] \quad (12)$$

$$\text{Or, Net Selectivity} = [R_i - R_m(\beta_i)] - [R_m(\sigma(\hat{R}_i) - R_m(\beta_i))] \quad (13)$$

where $R_i - R_m(\beta_i) = \text{Selectivity}$ and $R_m(\sigma(\hat{R}_i) - R_m(\beta_i)) = \text{Diversification}$

By definition, $R_m(\sigma(\hat{R}_i))$ is the return on the combination of the risk-free asset (f) and the market portfolio (m) that has return dispersion equivalent to that of the actual portfolio chosen. Thus, diversification measures the extra portfolio return that the winners' managers have to produce in order to make concentration of resources in them. If the net selectivity is not positive then the managers take on excessive diversifiable risks and therefore, the winners managers have failed to compensate it in terms of providing extra return.

Thus, the return may be positive or negative. If the return from net selectivity is negative, then it is confirmed that the managers have allowed excessive diversifiable risk and therefore, the managers of those winners schemes have failed to earn extra return from stock selection activities. Therefore, it may be said that return from selectivity is the relevant measure of schemes' performance. But, return from diversification is always non-negative. The diversification performance is measured in statistical term popularly known as coefficient of determination (r^2). The value of r^2 cannot be negative. Here, diversification measures the extra return of a scheme that the managers have to earn in order to take responsibility of resources in their disposal to invest in diversifiable securities in the financial markets. At the time of bull period, the market rate of return exceeds the risk-free return ($R_m > R_f$) then it is expected that the managers earn extra returns from the diversification performance for bearing diversifiable risk {that is, $\sigma_i(R_i) - \beta_i$ } and in the condition of bear market ($R_f < R_m$), it is assumed that the managers have lost the opportunity of earning extra returns from diversification activities for bearing diversifiable risk.

It is assumed that the investor has a target level of risk β_i for the i^{th} mutual fund scheme. Then the overall performance due to risk can be allocated to the investors as well as to the managers, which may be shown as under:

$$[R_m(\beta_i) - R_f] = [R_m(\beta_i) - R_m(\beta_t)] + [R_m(\beta_t) - R_f] \quad (14)$$

Here, $R_m(\beta_i) - R_f = \text{Risk}$, $R_m(\beta_i) - R_m(\beta_t) = \text{Managers' risk}$ and $R_m(\beta_t) - R_f = \text{Investors' risk}$

where $R_m(\beta_i)$ is the return from the i^{th} mutual fund scheme with the target level of market risk. Therefore, manager's risk is that part of overall performance where the manager takes decision on a given level of risk identified by β_i and the difference from the investors' target level of risk like β_t . Similarly, the investors' risk is also a part of overall performance that comes out from the fact, which is positive.

However, the managers' risk is caused by the market-timing decision. Actually, the managers chose a portfolio at a fixed level of risk which is higher or lower than the investors' target level of risk because he/she assumes that the risky portfolio in general would do abnormally well or not during the specified period. However, if an estimate of $E(\hat{R}_m)$ is available, then a more relevant measure of the results of such a market-timing decision can be obtained. Therefore, if ex-ante market model is applied

$$\text{like } E(\hat{R}_i) = R_f + \frac{E(\hat{R}_m) - R_f}{\sigma(\hat{R}_m)} * \frac{\text{cov}(\hat{R}_i, \hat{R}_m)}{\sigma(\hat{R}_m)} \text{ then,}$$

it is possible to subdivide the risk as under:

$$\begin{aligned} [R_m(\beta_i) - R_f] &= \{ [R_m(\beta_i) - E(\hat{R}_m(\beta_i))] \} \\ &\quad - \{ [R_m(\beta_T) - E(\hat{R}_m(\beta_T))] \} \\ &\quad + [E(\hat{R}_m(\beta_i)) - E(\hat{R}_m(\beta_T))] \\ &\quad + [R_m(\beta_T) - R_f] \end{aligned} \quad (15)$$

Here, $R_m(\beta_i) - E(\hat{R}_m(\beta_i)) = \text{Total timing}$, $R_m(\beta_T) - E(\hat{R}_m(\beta_T)) = \text{Market Conditions}$, $R_m(\beta_T) - R_f = \text{Investors' risk}$, $[R_m(\beta_i) - E(\hat{R}_m(\beta_i))] - [R_m(\beta_T) - E(\hat{R}_m(\beta_T))] = \text{Managers' timing}$, $E(\hat{R}_m(\beta_i)) - E(\hat{R}_m(\beta_T)) = \text{Managers' expected risk}$;

where the risk is the combination of managers' timing, managers' expected risk, and investors' risk. Again, the managers' timing is the difference between the total timing and market conditions, where the market condition is the difference between the return from the market index with a target level of risk and the expected return of that portfolio. Similarly, the managers' expected risk is the difference between the expected return from the market index with a level of risk and the expected market return with the target level of risk. Briefly, it is the incremental expected return from the managers' decision to take on a non-target level of risk. Total timing is the

difference between the ex-post return with a level of risk β_i and the ex-ante expected return. It will be positive if $R_m > E(\hat{R}_m)$ and it will be negative when $R_m < E(\hat{R}_m)$. The managers' timing is the difference between total timing and market conditions that measures the excess of total timing over timing performance, which is generated by choosing the market portfolio with the target level of risk. The managers' timing is only positive when the sign of the difference between β_i and β_T are the same or the sign of the difference between R_m and $E(\hat{R}_m)$, that is, when the chosen level of market risk is above (below) the target level and R_m is above (below) $E(\hat{R}_m)$. It is more sensitive than the total timing as a measure of the results of a timing decision.

Sometime, the target level of risk is not meaningful to evaluate managers' performances. When the target level of risk is not meaningful and if the expected value is available then the breakdown of risk (13) can be obtained by treating the market index as the target portfolio as under:

$$\begin{aligned} [R_m(\beta_i) - R_f] = & \left\{ [R_m(\beta_i) - E(\hat{R}_m(\beta_i))] \right\} \\ & - \left\{ [R_m - E(\hat{R}_m)] \right\} \\ & + [E(\hat{R}_m(\beta_i)) - E(\hat{R}_m)] \\ & + [R_m - R_f] \end{aligned} \quad (16)$$

where, $E(\hat{R}_m(\beta_i)) - E(\hat{R}_m) =$ Expected deviation from market and $R_m - R_f =$ Marker risk

The purpose of this construct is mainly to suggest some ways in which available theoretical and empirical results on portfolio and asset-pricing models can provide the basis of useful procedures for performance evaluation. However, the various breakdowns of portfolio performance discussed above are hardly unique. Actually, the breakdown of portfolio performance should be chosen, which is helpful to a particular situation. For example, if the target level of risk is meaningful then the subdivision of risk given in (13) is hardly complicated, therefore, the approximate effects of the market-timing decision might still be separated as under:

$$\begin{aligned} [R_m(\beta_i) - R_f] = & [R_m(\beta_i) - E(\hat{R}_m(\beta_i))] \\ & + [E(\hat{R}_m(\beta_i)) - E(\hat{R}_m(\beta_T))] \\ & + [E(\hat{R}_m(\beta_T)) - R_f] \end{aligned} \quad (17)$$

where $E(\hat{R}_m(\beta_T)) - R_f =$ Investors' expected risk

Here, the investors' expected risk measures the expected contribution to overall performance from the investors' decision to have a positive target level of risk.

Alternatively, it may be shown that if the target level of risk is meaningful for a particular situation and if the expected value line is available, then risk can nevertheless be subdivided as under:

$$[R_m(\beta_i) - R_f] = [R_m(\beta_i) - E(\hat{R}_m(\beta_i))] + [E(\hat{R}_m(\beta_i)) - R_f] \quad (18)$$

where $E(\hat{R}_m(\beta_i)) - R_f =$ Total expected risk

The common problems of any time series data and regression-based model are normality, stationarity, heterosedasticity and autocorrelation. The normality and stationarity problems of time series data are tested by using JB test and DF test respectively. Similarly, the heterosedasticity and autocorrelation problems are corrected by using respectively White's correction test and Durbin-Watson correction test.

Results and Discussion

The overall performances ($R_i - R_f$) of the open-ended balanced mutual fund schemes are empirically examined and the outcomes are presented in Table 1. As expected, it is observed from the table that the overall performance of the individual schemes is positive. This means that, all the schemes have offered positive returns to the investors. Then, ranks are given to the schemes based on their overall performances. According to their performances, the first rank is obtained by Tata Balanced fund (3.1008) and the second rank is posted to Escorts Balanced fund-Growth option (3.0833) and so on. It is also found that, some of the schemes have outperformed the market, and those schemes have provided to the investors abnormally higher rate of returns. The schemes are Alliance 95 fund-Growth (1.6653 > 1.2913), DSP Merrill lynch balanced fund-dividend (2.0802 > 1.7348), PNB Balanced growth fund-growth (2.1777 > 1.7646), PNB Balanced growth fund-income (2.2050 > 1.7646), Prudential ICICI Balanced plan-growth option (1.9978 > 1.9450), Tata balanced fund (3.1008 > 2.2692) and Escorts balanced fund-growth option (3.0833 > 2.2692). Then, the average overall performance of the schemes is computed (1.49801), which is also lower than the average overall performance of the market

Table 1: Overall Performance of the Open-Ended Balanced Mutual Fund Schemes

Sl. No	Name of the schemes	$(R_i - R_f)$	Rank	$(R_m - R_f)$	$R_i - R_m$
1	Alliance 95 fund-Dividend	0.8907	26	1.2913	-0.401
2	Alliance 95 fund-Growth	1.6653	12	1.2913	0.374
3	Birla balance-plan A (dividend)	1.0006	24	1.9450	-0.944
4	Birla balance-plan B (Growth)	1.4714	15	1.9450	-0.474
5	DSP Merrill lynch balance fund-dividend	1.0201	21	1.9450	-0.925
6	DSP Merrill lynch balance fund-Growth	2.0802	6	1.9450	0.135
7	Franklin India balance fund-dividend	1.6209	13	1.7348	-0.114
8	Franklin India balance fund-growth	1.7959	9	1.7348	0.061
9	Templeton India children's asset plan-edu. plan	0.7236	28	1.9450	-1.221
10	Templeton India pension plan-dividend	0.3674	30	1.9450	-1.578
11	Templeton India pension plan-growth	1.2925	17	1.9450	-0.815
12	GIC balanced fund	1.7132	10	1.4883	0.225
13	ING Vysya balance fund-dividend option	1.1218	20	1.9450	-0.823
14	ING Vysya balance fund-growth	1.7060	11	1.9450	-0.244
15	JM balanced fund-dividend	1.0127	23	1.9450	-0.932
16	JM balanced fund-growth	1.1569	19	1.9450	-0.788
17	Kotak balance	1.3751	16	1.9450	-0.570
18	PNB Balanced growth fund-growth	2.1777	5	1.7646	0.413
19	PNB Balanced growth fund-income	2.2050	4	1.7646	0.441
20	Principal MF balanced fund(old)-dividend .plan	0.7530	27	1.7434	-0.991
21	Prudential ICICI Balanced plan-dividend	1.0142	22	1.9450	-0.931
22	Prudential ICICI Balanced plan-growth option	1.9978	7	1.9450	0.053
23	Sundaram BNP Paribas balance fund-App option	1.8708	8	1.9450	-0.074
24	HDFC Children gift fund-investment	1.5312	14	2.2692	-0.738
25	HDFC Children gift fund-saving	0.5834	29	2.2692	-1.686
26	Tata balanced fund	3.1008	1	2.2692	0.832
27	Escorts balanced fund-dividend option	0.9914	25	2.2692	-1.278
28	Escorts balanced fund-growth option	3.0833	2	2.2692	0.814
29	LIC MF Balanced fund-Dividend	1.2603	18	2.6732	-1.413
30	LIC MF Balanced fund-Growth	2.3571	3	2.6732	-0.316

index (1.95601). The average performance of the selected schemes is found to be lower than the market average. The correlation coefficient between excess return of the schemes and that of the market is 0.171, which is very low and not statistically significant.

Correlation between $(R_i - R_f)$ & $(R_m - R_f) = 0.171$

Stock-Selection Performance of the Open-Ended Balanced Schemes

The overall performance can further be attributed to the performance due to selectivity and performance

due to risk. The breakdown of overall performance due to selectivity and risk is shown in equation (11). The selectivity performance means the ability of the mutual fund managers to predict the security prices correctly from the volatile market, which can add extra reward in the form of return into the portfolio. Therefore, the investors like those managers who are able to satisfy them by offering extra return due to stock-selection performance. Now, the outcomes of selectivity performances are presented in Table 2. It is found that five schemes have offered to the investors' negative extra returns and the remaining schemes have provided positive extra returns. The highest

Table 2: Extra - Return due to Selectivity Performance

Sl. No	Name of the Scheme	Extra Return due to selectivity	Rank
1	Alliance 95 fund-Dividend	-0.008	25
2	Alliance 95 fund-Growth	0.832	8
3	Birla balance-plan A (dividend)	-0.011	26
4	Birla balance-plan B (Growth)	0.426	18
5	DSP Merrill lynch balance fund-dividend	0.152	20
6	DSP Merrill lynch balance fund-Growth	1.045	4
7	Franklin India balance fund-dividend	0.796	10
8	Franklin India balance fund-growth	0.933	7
9	Templeton India children's asset plan-education pl	0.239	19
10	Templeton India pension plan-dividend	-0.385	29
11	Templeton India pension plan-growth	0.591	13
12	GIC balanced fund	0.809	9
13	ING Vysya balance fund-dividend option	0.059	23
14	ING Vysya balance fund-growth	0.494	16
15	JM balanced fund-dividend	0.075	22
16	JM balanced fund-growth	0.509	15
17	Kotak balance	0.587	14
18	PNB Balanced growth fund-growth	0.636	12
19	PNB Balanced growth fund-income	0.660	11
20	Principal MF balanced fund(old)-dividend .plan	0.037	24
21	Prudential ICICI Balanced plan-dividend	0.114	21
22	Prudential ICICI Balanced plan-growth option	1.012	5
23	Sundaram BNP Paribas balance fund-Appre. Opt.	1.129	3
24	HDFC Children gift fund-investment	0.442	17
25	HDFC Children gift fund-saving	-0.188	27
26	Tata balanced fund	2.191	1
27	Escorts balanced fund-dividend option	-0.287	28
28	Escorts balanced fund-growth option	1.967	2
29	LIC MF Balanced fund-Dividend	-0.387	30
30	LIC MF Balanced fund-Growth	0.978	6

extra return due to stock-selection performance is offered by Tata balanced fund (2.191) and the lowest extra return is delivered by LIC MF balanced fund-dividend (-0.387). The average extra return of all the schemes due to stock-selection performance is 0.5142, which is positive that speak for good stock selection performance of the fund managers. Moreover, the correlation coefficient between excess return of the schemes due to overall performance and extra return due to stock-selection performance is computed (0.910), which is very high and statistically significant. This indicates that managers' stock selection

performance has significant bearing upon the funds return generating ability.

Correlation coefficient between $(R_i - R_f)$ & $R_i - R_m(\beta_i) = 0.910$

Return Performance Due to Net-Selectivity

The selectivity performance can further be divided into two components namely performance due to net selectivity and performance due to diversification. The breakdown of selectivity performance is shown in equation (12).

Table 3: Extra Return Performance Due to Net-Selectivity

Sl. No	Name of the Scheme	Net selectivity performance
1	Alliance 95 fund-Dividend	-8.0581
2	Alliance 95 fund-Growth	-13.3589
3	Birla balance-plan A (dividend)	-14.2019
4	Birla balance-plan B (Growth)	-19.1562
5	DSP Merrill lynch balance fund-dividend	-14.0335
6	DSP Merrill lynch balance fund-Growth	-26.1038
7	Franklin India balance fund-dividend	-16.9261
8	Franklin India balance fund-growth	-18.4856
9	Templeton India children's asset plan-education .plan	-6.4341
10	Templeton India pension plan-dividend	-5.3018
11	Templeton India pension plan-growth	-11.0270
12	GIC balanced fund	-13.7831
13	ING Vysya balance fund-dividend option	-23.4518
14	ING Vysya balance fund-growth	-43.0934
15	JM balanced fund-dividend	-14.5532
16	JM balanced fund-growth	-23.9062
17	Kotak balance	-17.0838
18	PNB Balanced growth fund-growth	-7.1342
19	PNB Balanced growth fund-income	-7.4110
20	Principal MF balanced fund(old)-dividend .plan	-10.7782
21	Prudential ICICI Balanced plan-dividend	-14.0453
22	Prudential ICICI Balanced plan-growth option	-35.6273
23	Sundaram BNP Paribas balance fund-Appreciation option	-28.7880
24	HDFC Children gift fund-investment	-30.1317
25	HDFC Children gift fund-saving	-9.5652
26	Tata balanced fund	-64.5737
27	Escorts balanced fund-dividend option	-20.0817
28	Escorts balanced fund-growth option	-91.6923
29	LIC MF Balanced fund-Dividend	-32.5255
30	LIC MF Balanced fund-Growth	-63.9023

The additional return due to net selectivity performance is the excess extra return due to selectivity performance over the excess additional return due to diversification performance. The net-selectivity performance may be positive or negative. If the extra return due to selectivity performance is greater than the additional return due to diversification performance, then it is positive and otherwise it is negative. If the net selectivity performance is negative, this implies that the scheme bears more diversifiable risk that the managers could not reduce. The extra return performance due to net selectivity is presented in Table 3. It is observed that the return performance of

the schemes due to net selectivity is negative because the mutual fund managers have failed to reduce the magnitude of diversifiable risk of the open-ended balanced mutual fund schemes through proper diversification activities.

Return Performance Due to Risk

The overall performance can further be attributed into selectivity performance and risk performance. This breakdown is presented in equation (11). It implies the return of the scheme(s) due to risk performance. It measures the excess additional return of the market index

Table 4: Return Performance Due to Risk Performance

Sl. No	Name of the Scheme	$R_m(\beta_i) - R_f$	Rank
1	Alliance 95 fund-Dividend	0.899	17
2	Alliance 95 fund-Growth	0.834	21
3	Birla balance-plan A (dividend)	1.012	12
4	Birla balance-plan B (Growth)	1.045	10
5	DSP Merrill lynch balance fund-dividend	0.868	19
6	DSP Merrill lynch balance fund-Growth	1.035	11
7	Franklin India balance fund-dividend	0.825	22
8	Franklin India balance fund-growth	0.863	20
9	Templeton India children's asset plan-education .plan	0.485	30
10	Templeton India pension plan-dividend	0.752	25
11	Templeton India pension plan-growth	0.702	28
12	GIC balanced fund	0.905	16
13	ING Vysya balance fund-dividend option	1.062	9
14	ING Vysya balance fund-growth	1.212	6
15	JM balanced fund-dividend	0.9379	14
16	JM balanced fund-growth	0.6471	29
17	Kotak balance	0.788	23
18	PNB Balanced growth fund-growth	1.542	3
19	PNB Balanced growth fund-income	1.545	2
20	Principal MF balanced fund(old)-dividend .plan	0.716	27
21	Prudential ICICI Balanced plan-dividend	0.898	18
22	Prudential ICICI Balanced plan-growth option	0.9863	13
23	Sundaram BNP Paribas balance fund-Appreciation option	0.742	26
24	HDFC Children gift fund-investment	1.089	8
25	HDFC Children gift fund-saving	0.7713	24
26	Tata balanced fund	0.909	15
27	Escorts balanced fund-dividend option	1.2787	5
28	Escorts balanced fund-growth option	1.116	7
29	LIC MF Balanced fund-Dividend	1.648	1
30	LIC MF Balanced fund-Growth	1.379	4

that has risk equal to β_i over the risk free rate. The empirical result of return performance due to risk is presented Table 4. It is found that the extra return performance of all the open-ended balanced schemes due to risk is positive. Then, rank is given to the schemes based on their risk performances. The highest rank is given to LIC MF Balanced fund – dividend that has generated extra return of 1.648 and the second rank is posted to PNB Balanced growth fund – income (1.545) and so on. The average return performance due to risk is 0.9831. The correlation coefficient between return due to risk performance and return due to overall performance is computed and found positive (0.402) and statistically significant. Therefore, it

may be said that the risk and return are positively related. If the magnitude of risk increases then it is expected that the return will also be increased.

Correlation between $R_m(\beta_i) - R_f$ & $(R_i - R_f) = 0.402$ (Significant at 5% level)

Performance Due to Diversification

The selectivity performance can further be divided into net selectivity and diversification. The breakdown of selectivity performance is shown in equation (12). By definition, diversification means the extra return on the

Table 5: Diversification Performance of the Open-Ended Balanced Mutual Fund schemes

Sl. No	Name of the Scheme	$R_m(\sigma(R_i)) - R_m(\beta_i)$	Rank
1	Alliance 95 fund-Dividend	8.0501	4
2	Alliance 95 fund-Growth	14.1909	11
3	Birla balance-plan A (dividend)	14.2463	12
4	Birla balance-plan B (Growth)	19.5822	18
5	DSP Merrill lynch balance fund-dividend	14.1855	10
6	DSP Merrill lynch balance fund-Growth	27.1492	21
7	Franklin India balance fund-dividend	17.7221	16
8	Franklin India balance fund-growth	19.4186	17
9	Templeton India children's asset plan-education plan	6.6731	2
10	Templeton India pension plan-dividend	4.9168	1
11	Templeton India pension plan-growth	11.618	8
12	GIC balanced fund	14.5921	13
13	ING Vysya balance fund-dividend option	23.5108	20
14	ING Vysya balance fund-growth	43.5874	27
15	JM balanced fund-dividend	14.6282	14
16	JM balanced fund-growth	24.4152	22
17	Kotak balance	17.6708	15
18	PNB Balanced growth fund-growth	7.7702	3
19	PNB Balanced growth fund-income	8.071	5
20	Principal MF balanced fund(old)-dividend plan	10.8152	7
21	Prudential ICICI Balanced plan-dividend	14.1593	9
22	Prudential ICICI Balanced plan-growth option	36.6393	26
23	Sundaram BNP Paribas balanced fund-App option	29.917	23
24	HDFC Children gift fund-investment	30.5731	24
25	HDFC Children gift fund-saving	9.3772	6
26	Tata balanced fund	66.7647	29
27	Escorts balanced fund-dividend option	19.7947	19
28	Escorts balanced fund-growth option	92.9668	30
29	LIC MF Balanced fund-Dividend	34.3253	25
30	LIC MF Balanced fund-Growth	65.4337	28

combination of the risk-free asset (R_f) and the market portfolio (R_m) that has return dispersion equivalent to that of the actual portfolio chosen over the market portfolio that has risk equal to β (a measure of systematic risk). The outcome of diversification performance is presented in Table 5. It is observed that the managers of the open-ended balanced mutual fund schemes have failed to reduce the extent of diversifiable risk through proper diversification activities. Therefore, the schemes have excessive quantum of diversifiable risks. The highest diversifiable risk is borne by Escorts Balanced fund – dividend option (92.9668). Similarly, Templeton India Pension plan – dividend scheme has lowest diversifiable risk (4.9168).

But, in overall sense, the diversification performance of all the schemes is found to be unsatisfactory.

Performance Due to Market Timing

The empirical result of market timing performance is presented in Table 6. It presents the gamma coefficients, the t-values (t-statistics) in parenthesis, the values of the coefficient of determination r^2 and the values of the Durbin-Watson coefficient, for each mutual fund scheme in the sample. Here, gamma coefficient acts as a numerical measure of market timing performance. It is observed that

Table 6: Market-timing Performance of the Open-Ended Balanced Mutual Fund Schemes

Sl. No	Name of the Scheme	Market-timing test (γ_i)	Durbin-Watson (d)
1	Alliance 95 fund-Dividend	-0.004 (-0.583)	1.901
2	Alliance 95 fund-Growth	-0.010 (-1.582)	1.923
3	Birla balance-plan A (dividend)	0.000 (-0.074)	1.987
4	Birla balance-plan B (Growth)	0.001 (0.159)	1.870
5	DSP Merrill lynch balance fund-dividend	-0.014 (-2.378)	1.945
6	DSP Merrill lynch balance fund-Growth	0.001 (0.126)	1.956
7	Franklin India balance fund-dividend	0.002 (0.345)	2.052
8	Franklin India balance fund-growth	0.001 (0.286)	2.234
9	Templeton India children's asset pl-Edu .pl	0.006 (1.403)	1.898
10	Templeton India pension plan-dividend	0.006 (1.217)	1.886
11	Templeton India pension plan-growth	0.005 (1.225)	1.913
12	GIC balanced fund	0.002 (0.312)	1.956
13	ING Vysya balance fund-dividend option	-0.001 (-0.072)	2.342
14	ING Vysya balance fund-growth	-0.003 (-0.221)	2.220
15	JM balanced fund-dividend	-0.005 (-0.825)	2.134
16	JM balanced fund-growth	-0.006 (-0.558)	1.934
17	Kotak balance	0.010 (1.728)	1.942
18	PNB Balanced growth fund-growth	-0.008 (-1.236)	1.986
19	PNB Balanced growth fund-income	-0.006 (-0.917)	1.994
20	Principal MF balanced fund(old)-div .plan	0.005 (0.571)	1.976
21	Prudential ICICI Balanced plan-dividend	0.000 (0.012)	2.107
22	Prudential ICICI Balanced plan-growth opt	0.003 (0.2990)	1.981
23	Sundaram BNP Paribas bal fund-Appr opt	-0.004 (-0.430)	1.889
24	HDFC Children gift fund-investment	-0.007 (-0.713)	1.910
25	HDFC Children gift fund-saving	0.001 (0.131)	1.906
26	Tata balanced fund	-0.007 (-0.637)	1.955
27	Escorts balanced fund-dividend option	0.006 (0.760)	2.235
28	Escorts balanced fund-growth option	-0.004 (-0.226)	2.123
29	LIC MF Balanced fund-Dividend	-0.019 (-1.805)	1.890
30	LIC MF Balanced fund-Growth	-0.008 (-0.6890)	2.001

Note: 1. Figures in parenthesis are respective t-values. 2. Estimation of the TM model with due care on White heteroskedasticity correction per mutual fund scheme.

the market-timing performances of fifteen (15) schemes are negative and the remaining schemes are positive. The statistically significant market timing performance is absent. The average market-timing performance is found to be negative (-0.0019). Furthermore, the Durbin-Watson (d) coefficients of the individual schemes are more or less two that indicates no evidence of autocorrelation in the residuals.

Conclusion

The present study has empirically examined the mutual fund performance of the open-ended balanced mutual fund schemes in India over a period from January 2001 to December 2012. It is observed that the schemes have provided positive extra returns to the investors and some of the schemes have out performed the market, though, the average performance of the schemes is lower than the

market index. The extra returns due to stock-selection performance of five schemes out of thirty schemes are positive. Here, the managers of the open-ended balanced mutual fund schemes under examination cannot predict the security prices correctly when the market index of the BSE is used and therefore, the extra return performance due to net-selectivity is also negative. However, the schemes have provided positive returns due to risk performances. Actually, the mutual fund investment is subject to market risk. The managers have taken risks on behalf of the investors and managed to provide rewards to the investors in the form of extra returns. However, the study also reveals that the schemes have higher diversifiable risks and the managers do not possess the ability of risk minimisation mechanism when BSE index is used. The study also shows that the market timing performances of the sample schemes of different mutual fund companies are unsatisfactory. The managers of the sample schemes do not possess the ability to outguess the market movement correctly, which is reflected through the statistically insignificant gamma values (a measure of market timing ability). These are the specific activities (selectivity, market timing, diversification, risk etc) of mutual fund, which influence the mutual fund performance favourably or unfavourably. Beyond these, some factors, such as past record of management performance, profitability ratio, debt-equity ratio, liquidity ratio, responsible investment promoting by mutual fund companies, sustainability report (which is an emerging issue to the investment company) etc. may be taken into consideration at the time of mutual fund performance evaluation. Moreover, the disclosure of the names of the companies in which funds are invested may be helpful for the general investors. It is, therefore, necessary for the Indian mutual fund managers to be efficient in specific activities along with special attention to other factors that ultimately attract new domestic and foreign investors.

References

- Artikis, P. G. (2004). Bond mutual fund managers performance in Greece. *Journal of Managerial Finance*, 30(10), 1-6.
- Choudhary, K. (2007). The components of investment performance of fund managers: evidences from Indian capital market, *Abhigyan*, 16-27.
- El Khouri, R. (1993). Risk-return relationship: Evidence from Amman stock exchange. *Yarmouk University the Middle East business and economic review*, 5(2).
- Fama, E. F. (1972). Components of investment performance. *The Journal of Finance*, 27(3), 551-567.
- Filippas, N. D., & Christine, P. (2001). Equity mutual fund managers performance in Greece. *Journal of Managerial Finance*, 27(6), 68-74.
- Gupta, O. P., & Gupta, (2001). *Research methodology for performance evaluation of mutual funds*. Chandigarh: University Business School, Punjab University, Chapter 30.
- Gupta & Upadhyay. (2008). A study of movement of equity growth fund's prices: Random vs. systematic. *Indian Journal of Accounting*, 38(2), 46-55.
- Henrikson, R., & Merton, R. C. (1981). On market timing and investment performance. II. Statistical procedures for evaluating forecasting skills. *The Journal of Business*, 54, 513-533.
- Jensen, M. (1968). The performance of mutual funds in the period 1945-1964. *The Journal of Finance*, 23, 389-416.
- Jaydev, M. (1996). Mutual fund performance: An analysis of monthly returns. *Finance India*, 10(1), 73-84.
- Jordan, D. B., Jorgensen, D. R., & Smolira, C. J. (2003/2004). The performance of mutual funds that close to new investors. *The Journal of Investment Consulting*, (6)2, 47-57.
- Santo, A., Tusi, J., Costa, N. D., & Silva, S. D. (2005). Evaluating Brazilian mutual funds with stochastic frontiers. www.economicsbulletin.com, 13/EB-05M20002A.pdf.
- Seghal, S., & Jhanwa, N. (2008). On stock selection skills and market timing abilities of mutual fund managers in India. *International Research Journal of Finance and Economics*, 15, 307-317.
- Sengupta, A. (1991). Mutual funds scenario and strategic issues. *Journal of Banking and Finance*, 1(3), 3-8.
- Shah, S. M. A., & Hijazi, S. T. (2005). Performance evaluation of mutual funds in Pakistan. *The Pakistan Development Review*, 44(4), 863-876.
- Sharpe, W. F. (1966). Mutual fund performance. *Journal of Business*, 39, 119-138.
- Treynor, J. L. (1965). How to rate management of investment funds. *Harvard business Review*, 43(1), 63-75.
- Treynor, J. L., & Mazuy, J. (1966). Can mutual funds outguess the market? *Harvard Business Review*, 44, 131-139.
- Vanniaranjan, T., Shajahan, U. S., & Archana, R. (2008). "Factors leading to mutual funds purchases: A customer segment analysis. *Indian Journal of Finance*, 38(92), 66-76.