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Performance Evaluation of Indian Equity Mutual Funds against Established Benchmarks Index

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Abstract

In this paper, an attempt has been made to analyses the performance of equity mutual funds industry against risk free rate and benchmarks return over the five years. The samples consists 10 growths oriented- open ended- equity mutual fund schemes belong to 5 public and 2 private mutual fund companies. Results are tested through risk-return analysis, Coefficient of Variation, Treynor's ratio, Sharp's ratio, Jensen's measure, Fama's measure and Regression analysis. The data used is monthly closing NAVs and benchmark market index closing for the study period of April 2007 to March 2012. The risk return analysisrevealed that out of 10 schemes 3 have underperform the market, 7 are found to havelower total risk than the market and all the schemes have given returns higher than risk free rates. The Treynor ratio of all the mutual funds scheme are over perform the benchmark market index and Sharpe ratio of 3 mutual funds scheme underperform the benchmark market index. The result of regression analysis suggests that benchmark market return index has statistically significant impact on mutual fund return at 5% level of significance.

Keywords: Equity mutual funds; Benchmark index; Performance evaluation; Risk-return analysis; Regression analysis

Introduction

A mutual fund is a professionally managed type of collective investment scheme that pools money from many investors and invests in stocks, bonds, short term money market instrument and other securities. Mutual funds have become a widely popular and effective way for investors to participate in financial markets in an easy, low cost fashion, while muting risk features by spreading the investment across different types of securities, also called as diversification. Mutual funds have played important role in financial market in recent decades so it is pertinent to study the performance of mutual funds as it become the investors. The investment performance of mutual funds has been extensively examined for the development of capital market. The purpose of this paper is to evaluate the performance of equity funds during the period 2007-2012. The statistics revealed that the world mutual fund industry managed financial assets of $ 25.59 trillion and the number of mutual funds has also grown to 73343 funds worldwide at the end of March 2012, including 28358 equity funds contribute nearby 38% of total scheme. The Indian mutual fund industry has gained immense experience and continues to reinvent itself gradually, exhibiting steady growth over the last decade. The mutual fund industry in India began with setting up of the Unit Trust of India (UTI) in 1964 by the government of India. In 1987 public sector banks and two insurance companies (LIC and GIC) were allowed to launch mutual fund. Securities Exchange and Board of India (SEBI), regulatory body for Indian capital market, formulated comprehensive regulatory framework for Mutual funds in 1993 and allowed private corporate bodies to launch mutual fund schemes. Opening up the industry door to private sector banks and financial institution in 1993 had ushered in a new era in the evolution of Indian mutual fund sector. Foreign asset management companies were also allowed to set up their funds. With the entry, competitive efficiency in the industry showed a tremendous improvement and led to an applicable increase in the number and variety of scheme offered to the investors in terms of risk return preferences, maturity period and tax benefits. Asset under management (AUM) of the industry registered an increase from 47000 crore in March 1993 to a mind boggling nearby Rs. 670000 crore in March 2012. As per the report if Association of Mutual Funds of India (AMFI), there were 44 mutual fund houses covering Indian public sector and joint ventures with foreign players as against only 9 public sector mutual funds in 1993. The industry has recorded a compound annual growth rate of 15.43% in asset under management over the period of March 2007 to March 2012, at the same time when stock market and financial institution witnessed the heavy crushed by financial crisis.

Review of Literature

Literature on mutual funds performance evaluation is enormous. In this section, a few research studies that have influenced the preparation of this paper are discussed. Dhanda [1] made an attempt to study the performance evaluation of selected open ended schemes in terms of risk and return relationship by using rate of return, Beta, Standard Deviation, Sharp Ratio and Treynor Ratio. BSE-30 has been used as a benchmark to study the performance of mutual fund in India and the study period has been taken from April 1, 2009 to March 31, 2011. The finding of the study revealed that only three scheme have performed better than benchmark. Kumar Lenin Nooney and Devi Rama Vengapandu [2] evaluated the performance of selected mutual funds using average rate of return, standard deviation, Risk/Return, Sharpe ratio, Treynor ratio, Jenson Ratio and tested the hypothesis with ANOVA analysis. The sample for the study consists of 340 mutual funds belonging to Money market, Debt, Equity and Balanced category funds and further classified into public and private funds. The analysis of the study showed that there is no significant difference between the returns of private and public mutual funds. Gohar et al. [3] compared the performance of different types of mutual funds in Pakistan and

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concluded that equity funds outperform income funds. Sample has been selected on the ranking of companies as per Pakistan Credit Rating Agency (PACRA) and the data will be collected for five years from 2005 to 2009 on monthly basis. The finding showed that within equity funds, broker backed category shows better performance than institutional funds and institutional funds are outperforming broker backed funds among income funds. Prince and Bacon [4] in their research paper analyzed the small cap growth stock sector of mutual fund industry against risk-free and market returns over the ten years 1997-2006. In this paper result were tested against a toolkit of performance of benchmarks to see if expected performance closely corresponds to actual results. The results indicated that some excess returns have been generated however beyond a handful of the funds, it is impossible to rely upon a single benchmark as a reliable indicator of even past performance. The evidence tends to support market efficiency since for the most part, the actively managed funds examined in this study produced returns that were largely expected. Debashish [5] attempted to study in his paper the performance of selected scheme of mutual funds based on risk return relationship models and measures. A total of 23 scheme offered by six private sector mutual funds and three public sector mutual funds have been studied over the time period April 1996 to March 2009. The overall analysis found Franklin Templeton and UTI being the best performers and Birla Sunlife, HDFC and LIC mutual funds showing the poor below average performance when measured against the risk- return relationship models and measures. This paper concluded as in times of high stock market volatility, mutual funds are the best source of investments with assured and adequate returns provided the selection of mutual funds is in the right direction. Somya [6] used some additional, measures like information ratio, appraisal ratio and M^2 measure other than conventional performance measures to bring out additional information about the competence of the fund manager. He was observed that study period from Jan2000 to Dec 2005 could broadly divided into two phases, the first being a bear period while the second one being a predominantly bull period. He found that, during the out of sample period, which is an outright bull period, the funds have outperformed well on the average but their benchmarks have performed even better. Deb et al. [7] evaluated return based analysis of equity mutual funds in India using quadratic optimization of an asset class factor model proposed by William Sharpe. The data used in the study covers the period from January 2000 to January 2005. They found the styles benchmarks of each sample of equity funds as optimum exposure to eleven passive asset class indexes. They also analyzed the relative performance of the funds with respect to their style benchmarks. The result of the study showed that the funds have not been able to beat their style benchmarks on the average. Panwar and Madhumathi [8] used sample of public sector and private sector funds of varied net asset to investigate the differences in characteristics of asset held, portfolio diversification on investment performance for the period May, 2002 to May, 2005. The study found that public sector sponsored funds do not differ significantly from public sector sponsored funds in terms of mean returns percentage. The study was also found that there was a statistical difference between sponsorship classes in terms ESDAR (excess standard deviation adjusted returns) as a performance measure, Noulas and Athanasios [9] evaluated the performance of Greek equity funds during the period 1997-2000. The evaluation was based on the analysis of risk and return. The first three years were characterized by positive returns of the stock market and the fourth year was year of rapid fall of the stock market with respect to risk and return. The result showed that there were big differences among the equity mutual funds with respect to risk and return and the result indicated that there was a positive relation between risk and return for the whole period while the betas for all funds were smaller than one. Rao Narayan and Ravindram [10] examined the performance evaluation of Indian mutual fund industry in a bear market was carried out through relative performance index, risk-return analysis, Treynor's ratio, Sharpe's ratio, Jensen's ratio and Fama's measure. The data was monthly closing NAV's collected from AMFI for the period of Sep. 98 to April 02 (bear period) of 269 open ended scheme. They excluding the funds whose return were less than risk free returns, 58 schemes were used for further analysis. The result of relative measures suggested that most of the mutual fund schemes in the sample of 58 were able to satisfy investor's expectation by giving excess returns over expected returns based on both premiums for systematic risk and total risk.

Objective of the study

The study has set the following specific objectives.

1. To measure the return earned by the sample mutual funds schemes and compare against the benchmark market returns.
2. To examine the degree of correlation that exists between fund and market return.
3. To evaluate the performance of equity mutual fund scheme understand the impact of benchmark index on mutual fund performance.
4. To find out the mutual fund schemes offering the advantages of diversification, along with adequate systematic risk compared to market beta risk.

Hypothesis of the study

The specific hypothesis which are tested as follows:

1. $H_{0;}$ Variation in market index return has not significant impact on the return of mutual fund scheme.

   H_1: Variation in market index return has significant impact on the return of mutual fund scheme.

2. H_0 = Funds Sharpe Ratio – Benchmark Sharpe Ratio = 0

   H_1 = Funds Sharpe Ratio – Benchmark Sharpe Ratio ≠ 0

3. Funds Tryenor Ratio – Benchmark Treynor Ratio = 0

   H_1 = Funds Treynor Ratio – Benchmark Treynor Ratio ≠ 0

4. $H_0 = \alpha = 0$

   $H_1 = \alpha \neq 0$

Data and sources of study

The study aimed at analyzing the performance of open ended Indian mutual funds schemes which are primarily equity based. The period of the study is from April 2007 to March 2012 (60 months). This time period has been taken because of last decade we have the same economic conditions in India and analysis will give a trend of at least ten years.The samples consists 10 growths oriented- open ended- equity mutual fund schemes belong to 5 private and 2 bank sponsored mutual fund companies. These seven mutual fund companies were selected on the basis of highest average asset under management in the industry as these companies accounted for 65.18% of the total AAUM. The total asset under management was 664791 crore and equity schemes consist of 23.82% of total AAUM at the end of March 2012. The Table 1 represents the sample mutual fund schemes and their respective

Fund name	Option	Code	Benchmark index	Code
Birla Sunlife Equity Fund	Growth	X_1	BSE 200	M_1
Birla Sunlife Frontline Equity Fund	Growth	X_{11}	tBSE 200	M_1
HDFC Equity Fund	Growth	X_2	S&P CNX 500	M_2
HDFC Long Term Equity Fund	Growth	X_{21}	S&P CNX NIFTY	M_3
ICICI Prudential FMCG Fund	Growth	X_3	CNX FMCG	M_4
Magnum Equity Fund	Growth	X_4	S&P CNX NIFTY	M_3
Reliance Long term Equity Fund	Growth	X_5	BSE 200	M_1
Reliance Regular Saving- Equity Fund	Growth	X_{51}	BSE 100	M_5
Templeton India Equity Income Fund	Growth	X_6	BSE 200	M_1
UTI Leadership Equity Fund	Growth	X_7	S&P CNX NIFTY	M_3

Table 1: Mutual funds and benchmark index taken as sample.

benchmark index of the scheme. The code is given to all the schemes and benchmark index for the convenient in analysis and interpretation.

The study has used secondary data. Monthly Net asset value (NAV) data of the selected mutual funds along with the monthly closing index value of the benchmark market indices are taken from the official websites mutual funds, Bombay stock exchange (www.bseindia.com) and National stock exchange (www.nseindia.com).

Research Methodology

Return

For each mutual fund scheme under study, the monthly returns are computed as:

return= $(NAV_t - NAV_{t-1})/ NAV_{t-1}$

Where NAV_t is Net Asset Value of a mutual fund scheme for a month t, NAV_{t-1} is the Net Asset Value for month (t-1). For the benchmark index, the return is calculated as:

return= $(Index_t - Index_{t-1})/ Index_{t-1}$

Risk

The risk is calculated on the basis of month-end NAV. The following measures of risks associated with mutual funds have been for the study:

Standard Deviation- The total risk is measured by the standard deviation of the monthly returns which was calculated using the following formula:

$$\sigma = \sqrt{\frac{1}{n-1}\sum_{t=1}^{n}(R_t - \bar{R})^2}$$

where,

σ = Standard Deviation, n= number of monthly return

R_t = monthly returns of the mutual fund, $\bar{R}$ = mean return of the mutual fund

The square of the standard deviation is called the variance. Variance= $(\sigma)^2$

Coefficient of variation-expresses the total risk undertaken by the mutual funds under consideration per unit of returned achieved. More specifically, the coefficient of variation was given by:

$$Coefficient\ of\ Variation = \frac{\sigma}{\bar{R}}$$

Beta(β)- Beta estimate the systematic risk, is the fund's volatility as regard market index measuring the extent of co movement of fund with that of the benchmark index.

$$\beta = \frac{\text{Covariance between fund return and market return}}{\text{Variance of market return}}$$

Higher the values of beta indicate a high sensitivity of fund returns against market return and the lower the value indicate lower sensitivity.

Risk free rate

A risk free rate asset has zero variability of returns. In this study the average weekly yield of 91 days Treasury bills have been taken as a risk free rate.

Sharpe technique

Sharpe [11] devised an index of portfolio performance measure, referred to as reward o variability ratio. The Sharpe ratio provides the reward to volatility trade-off. It is the ratio of the fund portfolio's average excess return divided by the standard deviation of the return and is given by:

$$S_P = S_p = \frac{\text{Risk Premium}}{\text{Total risk}}$$

$$\text{Fund's } S_p = \frac{R_p - R_f}{\acute{o}_p} \qquad \text{Benchmark's } S_p = \frac{R_m - R_f}{\acute{o}_m}$$

Where S_P= Sharpe Ratio, R_p= portfolio return, R_m= market return R_f= risk free return, σ_p= standard deviation of the portfolio, σ_m= standard deviation of the market

Treynor Technique

Treynor [12] conceived an index of portfolio performance called as reward to volatility ratio based on systematic risk. It is denoted by T_P is the excess return over the risk free rate per unit of systematic risk, in other words it risk premium per unit of systematic risk.

$$T_p = \frac{\text{Risk Premium}}{\text{Systematic risk}}$$

$$\text{Fund's } T_p = \frac{R_p - R_f}{\beta_p} \quad \text{Benchmark's } T_p = \frac{R_m - R_f}{\beta_m}$$

Where β_p = Beta of the portfolio, β_m= Beta of the market

Sharpe measure

In Sharpe measure variance explained by the index could be refereed as the systematic risk and the unexplained variance is called or unsystematic risk. Sharpe suggested that systematic risk and unsystematic risk for a fund can be measured as:

Systematic risk = $\beta^2 \times Var(R_m)$

Unsystematic risk (Unique risk) = $Var(R_p) - [\beta^2 \times Var(R_m)]$

Where $Var(R_p)$= Variance of mutual fund scheme return, $Var(R_m)$= Variance of market return.

Jensen alpha

Jensen [13] propound Jensen Alpha measures which is the intercept from the Sharpe- Linter CAPM regression of portfolio excess return on the market portfolio excess returns over the sample period. Jensen's alpha is the arithmetic difference of the portfolio's return from the return of a portfolio on the securities market line with the same beta (Appendix 1). Jensen defines his measure of portfolio performance as the difference between the actual return on a portfolio in any particular holding period and the expected returns on that portfolio conditional on the risk free rate, its level of systematic risk and the actual return on the market portfolio. Jensen's alpha measures is given by the-

J_p= Portfolio Return- CAPM Return= $R_p - \{R_f + \beta(R_m - R_f)\}$

Fama measures

Fama [14] measures breaks down the observed return into four components:

i. Risk free return R_f

ii. Compensation for systematic risk $\beta(R_m - R_f)$

iii. Compensation for inadequate diversification $(R_m - R_f)\{(\sigma_p/\sigma_m)-\beta)\}$

iv. Net superior returns due to selectivity $(R_p - R_f)-\{(\sigma_p/\sigma_m)(R_m - R_f)\}$

The second and third measures indicate the impact of diversification and market risk. By altering systematic and unique risk a portfolio can be reshuffled to get the desired return. Fama performance measures denoted by F_p are defined as:

F_p= Portfolio Return – Risk free return – Returns due to all risks

$= (R_p - R_f)-\{(\sigma_p/\sigma_m)(R_m - R_f)\}$

A positive value for F_p indicates that the fund earned returns higher than expected returns and lies above CML and a negative value indicates that the fund earned return less than expected returns and lies below CML.

Limitation of the Study

The limitations of the study are here under:

i. The study deals with only selected equity schemes of sampled fund houses operating in India

ii. The study is restricted to five years starting from April 2007 to evaluate the performance of the selected schemes of selected MFs but not their inception.

iii. The study is confine only to Indian mutual fund industry.

Empirical Results

The following section presents the results of the analyses of performance of sample funds. These sample funds were managed by Asset Management Companies (AMC) in India during the study period. The performance of sample equity funds were evaluated using different measures which are summarized in Tables 2-6.

Table 2 shows the compound growth rate of sample mutual fund scheme and benchmark index return for the period 2007-08 to 2011-12. The return of all the funds and market are positive except the return in 2008-09. In this year all the scheme provided negative return due to the financial crisis. At the end of financial year 2011-12, ICICI Prudential FMCG Fund (X_3) gave the highest return whereas the Birla Sun Life Equity Fund (X_1) provide the lowest return n all the sample schemes.

Table 3 shows the average risk and return of various sample scheme and benchmark index. In terms of average return X_{51} fund gave the highest return and the X_7 gave the lowest return in all the samples. X_{51} is the most risky and X_3 is the less risky in the entire sample scheme. It also shows that average return of 8 samples schemes is greater than the average of benchmark index and average risk of 3 sample schemes is greater than the average risk of benchmark index. The cross sectional average return of sample fund schemes is 0.1482 more than average return of benchmark index which is 0.1225. Risk free rate is 0.0007 which is taken from average weekly yield of 91 days Treasury bills. This table also revealed that out of 10 schemes 2 have underperform the market, 7 are found to havelower total risk than the market and all the schemes have given returns higher than risk free rates.

Testing of hypothesis- regression analysis of mutual funds scheme and benchmark index

In regression analysis, Mutual funds are taken as dependent variable and benchmark index is taken as independent variable. In this section certain hypotheses have been developed to make conclusion based on the following the hypotheses of the study. The Null Hypothesis statement (H_0) states that variation in market index return has not significant impact on the return of mutual fund scheme. The

	2007-08	2008-09	2009-10	2010-11	2011-12
X_1	14.649	-16.399	11.935	9.911	5.507
X_{11}	17.327	-10.586	17.923	17.793	11.782
X_2	9.677	-13.994	18.769	21.850	14.836
X_{21}	5.713	-16.735	8.334	12.025	8.019
X_3	20.083	-9.667	11.934	16.998	23.929
X_4	16.210	-13.977	13.279	13.695	10.042
X_5	10.249	-15.663	11.272	11.184	7.762
X_{51}	39.732	-7.071	27.596	23.379	15.686
X_6	15.025	-14.065	15.431	16.155	10.903
X_7	11.030	-15.410	6.218	6.934	3.358
M_1	15.981	-15.776	10.671	10.692	5.903
M_2	13.221	-16.043	9.215	9.228	4.988
M_3	15.817	-13.050	9.469	10.677	5.677
M_4	20.555	3.200	16.906	22.601	27.354
M_5	17.061	-14.862	10.746	10.887	6.060

Table 2: Compound growth performance of the sample mutual funds scheme and benchmark index.

Mutual Fund Scheme	R_p	σ_p	R_m	σ_m	R_F	Benchmark index
X_1	0.1188	0.3164	0.1172	0.3237	0.0007	M_1
X_{11}	0.1547	0.2890	0.1172	0.3237	0.0007	M_1
X_2	0.1782	0.3088	0.1121	0.3278	0.0007	M_2
X_{21}	0.1236	0.2792	0.1097	0.3046	0.0007	M_3
X_3	0.1883	0.2359	0.1980	0.2013	0.0007	M_4
X_4	0.1503	0.3113	0.1097	0.3046	0.0007	M_3
X_5	0.1233	0.3005	0.1172	0.3237	0.0007	M_1
X_{51}	0.1999	0.3544	0.1166	0.3197	0.0007	M_5
X_6	0.1545	0.3117	0.1172	0.3237	0.0007	M_1
X_7	0.0907	0.2854	0.1097	0.3046	0.0007	M_3
Average	0.1482	0.2993	0.1225	0.3058	0.0007	

Table 3: Risk and return analysis.

Alternative Hypothesis (H_1) assumes that variation in market index return has significant impact on the return of mutual fund scheme. Regression equation [$R_p = \alpha + \beta(R_m) + e_t$] follow the linear relationship between mutual fund return and market benchmark index return. It signifies the value of parameter intercept (α) and slope (β). Intercept shows the return of mutual funds (R_p) when the return of market benchmark index (R_m) is zero whereas slope shows the rate of change in mutual fund return in respect to market return. Following result are found in testing the sample schemes in respect to their benchmark index with the help of E Views (Appendix 2).

The Result shows that benchmark index has significant impact on changes in return of mutual fund schemes. The coefficient beta and constants are used to construct the regression model. The positive value coefficient (0.0952) means that independent variable have the positive relationship with dependent variable and vice versa. The correlation value shows the high degree of correlation between the variables. The value of R^2 in the table interpreted as the fraction of the variance of the dependent variable explained by the independent variables. It shows that 94% of the changes in the X_1scheme are explained by its benchmark index M_1. The P value is less than 0.05 which confirms that our model is significant. The null hypothesis (H0) is rejected and alternate hypothesis is accepted, so it means that independent variable can be used to predict the value of dependent variable.

The result of all the tests shows that benchmark index has significant impact on changes in return of mutual fund schemes. We found the positive value coefficient in all cases which reflect that benchmark index have the positive relationship with return of mutual fund schemes. The values of R^2 range from 88% to 96% which shows that major portion of changes in return of mutual fund schemes are determine by benchmark index except ICICI Prudential FMCG Fund where the value is 68%. The intercept value is also found positive in all results except two schemes i.e. ICICI Prudential FMCG Fund andUTI Leadership Equity Fund. The P value in all the cases is less than 0.05 which support the rejection of null hypothesis and acceptance of alternate hypothesis.

Table 4 reveals the value of Treynor and Sharpe Ratio of sample mutual funds and benchmark index. Sharpe ratio of the sample mutual fund schemes have the positive Sharpe value indicating that vast majority of equity mutual fund have produce greater return as compare to risk free rate. Higher the Sharpe ratio value of the sample equity funds for the period compared to the market portfolio clearly indicates that reward to variability ratio has been superior in the case of equity funds leading to conclusion that equity mutual funds have propounds superior risk adjusted return than the market return. Treynor Ratio's measure evaluation based on risk adjusted return and assesses risk adjusted in terms of return per unit of systematic risk. The ratio measured reward defined as the portfolio return in relation to the market fluctuations. It is aptly referred to the reward to volatility ratio. It was found that 8 out of 10 schemes over perform the market and 2 underperform the market in terms of Sharpe Ratio. Treynor ratio shows that the entire scheme outperforms the market as the Treynor ratio value is higher as compare to the Treynor value of benchmark index. Shape Ratio provide the better picture as the fund ICICI Prudential FMCG Fund(X_3) gave the highest Sharpe value and the highest compounded return in all the sample schemes. In terms of Treynor Value HDFC Equity Fund(X_2)has the highest value. Sharpe measure's result in It also reveals that that the average unique risk is very high (Var=0.0191, σ=6.38%) with the low degree of diversification at 7.28%. The fund managers have to improve diversification.

In Table 5, Jensen Models suggests that 8 schemes have provided excess returns over CAPM returns against fact that all the schemes providing excess returns over the risk free rates. $X_{51,}$ with α=0.0784, indicating a positive investment capabilities and X_3 and X_7 with negative performance. Statistically significant positive value of α indicates superior investment performance of mutual funds. Result of Fama's measure have been placed in Table 5 consisting of expected additional return for assuming market risk (Risk Premium) and expected additional return for inadequate diversification. Excess of actual return over expected return of the mutual fund, can be contributed to the superior stock selectivity of the mutual fund manager and is known as Net selectivity. Analyzing the Fama's components of investment performance, it is evident that expected risk premium for the schemes are very high with a maximum of 19.12 % for X_3funds and minimum of 9.56% for X_{21}. In average risk premium expected is found to be very high (11.33%) contribute a substantial portion of actual average monthly return (14.82%) earned by the scheme due to high systematic riskrepresented by their beta value closer to market beta. In the net selectivity front 3 schemes (30%) have shown negative return and the rest 7 scheme (70%) have reported positive net selectivity indicating superior stock selection of the fund managers. The average net selectivity is positive 1.8% it can be said that equity mutual funds in India are generating satisfactory returns by their active stock selection exercise.

Table 6 shows the risk adjusted performance comparison of mutual fund scheme and benchmark index. The result revealed that in terms of Sharpe ratio, eight mutual fund schemes outperformed the benchmark index and all the schemes outperformed in terms of Treynor's index. Jensen ratios indicate that eight schemes realized the portfolio return greater than CAPM return. Paired Sample T-test is applied to check the statistically comparison of risk adjusted performance evaluation. The

	Treynor Ratio		Sharpe Ratio		Sharpe Measure	
Scheme Name	Fund	Benchmark Index	Fund	Benchmark Index	Unique Risk	Systematic Risk
x_1	0.1241	0.1007	0.3734	0.3600	0.0053	0.0968
x_{11}	0.1762	0.1007	0.5328	0.3600	0.0035	0.0816
x_2	0.1964	0.0948	0.5750	0.3400	0.0079	0.0896
x_{21}	0.1401	0.0956	0.4401	0.3579	0.0070	0.0728
x_3	0.1936	0.1734	0.7952	0.9802	0.0177	0.0377
x_4	0.1536	0.0956	0.4804	0.3579	0.0087	0.0898
x_5	0.1399	0.1007	0.4079	0.3600	0.0105	0.0820
x_{51}	0.1912	0.1005	0.5621	0.3626	0.1155	0.0124
x_6	0.1688	0.1007	0.4934	0.3600	0.0095	0.0887
x_7	0.0997	0.0956	0.3155	0.3579	0.0056	0.0772
Average	0.1583	0.1058	0.4975	0.4196	0.0191	0.0728

Table 4: Treynor& Sharpe Ratio and Unique Risk & Diversification Extent.

Fund	Jensen Measure	Fama Measure		
		R_β	R_{id}	F_p
x_1	0.0072	0.1109	0.0030	0.0042
x_{11}	0.0521	0.1018	0.0022	0.0500
x_2	0.0768	0.1007	0.0043	0.0724
x_{21}	0.0272	0.0956	0.0045	0.0228
x_3	-0.0036	0.1912	0.0405	-0.0441
x_4	0.0434	0.1062	0.0050	0.0384
x_5	0.0205	0.1021	0.0063	0.0141
x_{51}	0.0784	0.1208	0.0860	-0.0076
x_6	0.0477	0.1061	0.0055	0.0421
x_7	-0.0084	0.0985	0.0035	-0.0120
Average	0.0341	0.1133	0.0160	0.0180

Table 5: Jensen & Fama Measure.

Number of Funds	10
Mean Fund's Sharpe Ratio	0.49758
Mean Fund's Treynor Ratio	0.15836
Mean Jensen's Ratio	0.0341
Funds with Sharpe ratio>Benchmark Sharpe Ratio	8
Funds with Treynor ratio>Benchmark Treynor Ratio	10
Funds with Portfolio Retun>CAPM Return	8
Standard Deviation of Funds Sharpe Ratio	0.1334
Standard Deviation of Funds Treynor Ratio	0.0324
Standard Deviation of Jensen's Ratio	0.3085
T Statistics (H_0=Funds Sharpe Ratio – Benchmark Sharpe Ratio= 0) (H_1=Funds Sharpe Ratio – Benchmark Sharpe Ratio≠ 0)	1.960 (0.082)
T Statistics (H_0=Funds Treynor Ratio – Benchmark Treynor Ratio= 0) (H_1=Funds Treynor Ratio – Benchmark Treynor Ratio≠ 0)	5.211 (0.001)
T Statistics (H_0=α=0), (H_1=α ≠ 0)	3.499 (0.007)
Correlation between Funds and Benchmark Index' Sharpe ratio	0.777
Correlation between Funds and Benchmark Index' Treynor ratio	0.393
Correlation between Fund Return and CAPM Return	0.530

Note- 1- Level of Significance=5%, Two Tailed Test.
2- Results are based on 60 months return from April 2007 to March 2012.

Table 6: Comparative Analysis of Risk Adjusted Performance.

hypothesis of equality of means between the Sharpe ratio and Treynor ratio between the mutual funds and benchmark index provided the different interpretation. The null hypothesis is accepted at 5% level of significance as the P value is 0.082 signifies that mean equality of Sharpe ratio between mutual funds and benchmark index. In case of Treynor ratio P value is 0.001 (less than 0.05) stands for rejection of null statement that mean fund's Treynor ratio is equal to mean benchmark's Treynor ratio. Jensen α value is tested with one sample T-test to determine whether the performance indicated by the alpha is statistically significant. The null hypothesis of neutral performance is that alpha is equal to zero is rejected as the test found the P value is 0.007 a positive alpha value is usually interpreted as a superior performance and a negative as reflecting inferior performance.

Conclusion

In this paper we did a regression based analysis of equity funds in India and analyzed their performance with respect to benchmark indexes. The study conducts a comparative performance between

equity mutual fund schemes and benchmark indexes over the five economic periods. It is observed that influence of market factor is closely effected behavior of mutual funds returns. The correlation is found between mutual funds and benchmark index returns are significantly high. These funds are also observed to have high R^2 values (Coefficient of Determination) indicating the better diversification of the fund portfolio. The beta coefficient in most of the sample schemes was lower than one indicates that these mutual funds followed defensive investment policy. The result shows that performance of the majorityof sample mutual fund schemes are outperform the market benchmark indexes in term of Treynor and Sharpe ratio based on historical monthly returns. The reasons of outperformance of the funds that fund managers are efficient. They are diversifying the funds in different stocks which are generating higher returns. Fama's measure revealed that 70% of the mutual fund schemes have reported positive net selectivity indicating superior stock selection of the fund managers. Mutual fund managers also outperform the Market through their superior security selection and timing. The analysis shows that Indian Asset Management Company has been able to beat their benchmarks on the average. One of the lacunas of this study is that only open ended growth oriented equity schemes have been analyzed for the sample mutual funds. Future research may attempt to investigate and compare the balanced or income oriented schemes with equity oriented schemes.

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