

## **MEASUREMENT OF RISK AND RETURN PERFORMANCE OF MUTUAL FUNDS IN INDIA: AN INVESTMENT ANALYSIS APPROACH**

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### **ABSTRACT**

This research is conducted to examine the investment performance of the Indian mutual fund schemes from April 2000 to March 2014. To achieve the major objective of the study, various portfolio evaluation techniques are applied on a sample size of 62 mutual fund schemes developed by **Treynor (1965)**, **Sharpe (1966)** and **Jensen (1972)**. The research also characterized the results on the risk and return relationship of sample mutual fund schemes managed by asset management companies with their benchmark index. The study found that majority of the schemes are not providing significant positive return in terms of relative risk adjusted measures and absolute risk adjusted measures within the study period.

**KEYWORDS:** Investment, Risk- Return, Mutual Fund Schemes, Benchmark Index

### **1. INTRODUCTION**

Investment could be associated with the different activities, but the common target in these activities is to employ the money during the time period seeking to enhance the wealth of investor. Investors can use direct or indirect type of investing. Direct investing is realized using financial markets and indirect investing involves financial intermediaries. The primary difference between these two types of investing is that applying direct investing investors buy and sell financial assets and manage individual investment portfolio themselves. Consequently, investing directly through financial markets investors take all the risk and their successful investing depends on their understanding of financial markets, its fluctuations and on their abilities to analyze and to evaluate the investments and to manage their investment portfolio. Contrary, using indirect type of investing investors are buying or selling financial instruments of financial intermediaries (financial institutions) which invest large pools of funds in the financial markets and hold portfolios. Indirect investing relieves investors from making decisions about their portfolio.

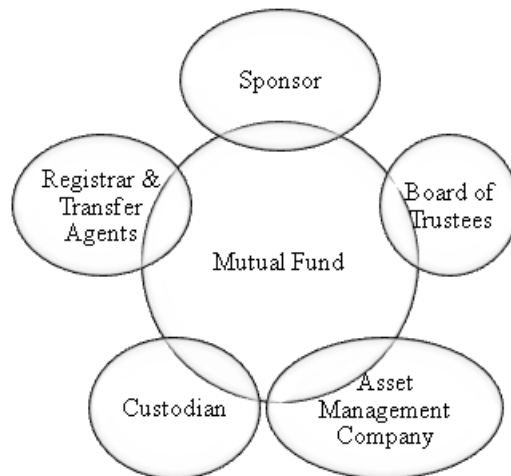
A mutual fund is a financial intermediary which acts as an instrument of investment. It collects funds from different investors to a common pool of investible funds and then invests these funds in a wide variety of investment opportunities. The investment may be diversified to spread risk and to ensure a good return (dividend or capital gain or both) to the investors. The mutual funds employed professional experts called asset management companies that manage and conduct the investment analysis and then select the portfolio of securities where the funds are to be invested. U.S. Securities and Exchange Commission define mutual Fund as a form of collective investment that pools money from many investors and invests the money in stocks, bonds, short-term money market instruments, and/or other securities (*Kamble R. M., 2013, p. 1*). Some of the features of the mutual funds are:

- Mutual fund is a pool of financial resources. Investor brings their individual funds together. Sometimes, the funds

which otherwise may not come for investment in the capital market, are invested through mutual funds.

- Mutual funds are professionally managed. The resources collected by mutual funds are managed by professional asset management companies which are expert in investment. These companies can undertake specialized investment analysis such as fundamental analysis, technical analysis etc which are not otherwise expected on the part of individual investors.
- Mutual fund is an indirect investment. The individual investors invest in mutual fund which in turn invests in shares, debenture and other securities in the capital market. The proportionate funds given by investors are represented by the units of mutual funds. Investors own these units and the securities are owned by the mutual funds. Investors have no direct claim on these securities.
- Investment in mutual funds is not a borrowing lending relationship. Investors do not lend money to the mutual funds, rather they invest. In fact, the investors own mutual funds. Consequently the investors have to share gains or loss in operation of the mutual funds.
- Mutual fund is a representative of investors. The mutual funds collect the funds from investors under a particular investment scheme. As a representative, the mutual fund has to invest these funds as per the designated scheme only.

In a nutshell, a mutual fund mobilizes the savings of a large number of small investors and invest the amount in common investment. Investors get the benefit of diversifying their portfolio and experience the professional services of asset management companies to make the best investment opportunities (*Rustagi R.P. 2008, p.70*).



*Source: Association of Mutual Funds in India*

**Figure 1: Structure of Mutual Funds**

The structure of the mutual fund is categorized in the following constituents:

### **Sponsor**

Sponsor of a mutual fund is akin to the promoter of a company as he gets the fund registered with SEBI. Under SEBI regulations, sponsor is defined as any person who acting alone or in combination with another body corporate

establishes the mutual fund. Under the Indian trust act 1882, a sponsor creates mutual fund trust, which is the main body in creation of mutual funds.

### **Board of Trustees**

Trustees may be appointed as an individual or as a trustee company with the prior approval of SEBI. According to SEBI regulations, 1996, trustees mean board of trustees or Trustee Company who hold the property of mutual fund for the benefit of the unit holders. SEBI requires that each mutual fund shall have a custodian who is independent and registered with it. SEBI regulations provide for the appointment of a custodian by trustees of the mutual fund who are responsible for carrying on the activities of safe keeping of securities and participating in any clearing system on behalf of mutual fund.

### **Asset Management Company (AMC)**

A mutual fund is set up as a trust which has a sponsor AMC. An asset management company is a legal entity formed by the sponsor to run the mutual fund. The asset management company must be registered by SEBI. It manages the funds of the mutual fund schemes by making investment in various types of securities.

### **Custodian**

Though the securities are bought and held in the name of trustees, they are not kept with them. The responsibility of safe keeping the securities is on the custodian. Securities, which are in material form, are kept in safe custody of a custodian and securities, which are in 'De-Materialized' form, are kept with a Depository participant, who acts on the advice of custodian. They ensure that delivery has been taken of the securities, which are bought, and that they are transferred in the name of the mutual fund. They also ensure that funds are paid out when securities are bought.

### **Registrar & Transfer (R&T) Agents**

Registrar and transfer (R&T) agents are responsible for creating and maintaining investor records kept in numbered account called folios and servicing them. They accept and process investor transactions and also operate Investor Service Centers (ISCs) which acts as official points for accepting investor transactions with a fund.

## **II. REVIEW OF LITERATURE**

Risk and Return performance is always a debatable area in the field of research. So many researchers have been conducted in the performance evaluation of mutual funds in Indian as well as international context. **Garg (2014)** conducted research to evaluate the performance of mutual funds for the period between 2002-03 to 2012-13 the research used primary and secondary data to evaluate the financial performance and the performance of the mutual funds from investor's point of view. This study also evaluated the impact of regulatory norms on the performance of mutual funds. Author concluded that most of the sample schemes outperform the market and average performance was found in Sharpe Treynor and Jensen Measure. **Vasantha (2013)** in their research paper evaluated the performance of selected open ended equity diversified mutual fund in the equity market. For this purpose the study consist of sample of 5 schemes and data was taken from January 2008 to December 2012, a period of 60 months. The analysis was based on portfolio performance technique such as Sharpe ratio, Treynor ratio and Jensen ratio. The study concluded that majority of the funds showed the negative return and a significant relationship was found between market return and scheme return. HDFC top 200 schemes had yield the highest average return among the sample in the study period. **Bahl & Rani (2012)** investigated the performance of 29 open ended, growth oriented equity schemes for the period of April 2005 to March 2011. They evaluated the performance on the

basis of Sharpe, Treynor and Jensen's measure and the result revealed that 48 % of the schemes had outperformed the benchmark return. The result also revealed that some schemes were facing the diversification problem, had underperformed the market. On the basis of Jensen measure 65 % of the schemes were showed positive alpha which indicate superior performance of the schemes. **Rahman Munibur & Barua (2012)** in their paper focused on evaluating the performance of more than 15 growth oriented mutual funds of DSE on the basis of monthly returns compared to benchmark returns. It is found that most of the mutual funds have performed better according to Jensen and Treynor measures but not up to the benchmark on the basis of Sharpe ratio. However very few mutual funds are well diversified and have reduced its unique risk. The growth oriented funds have not performed better in terms of total risk and the funds are not offering advantage of diversification and professionalism to the investors. **Gohar (2011)** compared the performance of different types of mutual funds in Pakistan and 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. **Mahmud & Mirza (2011)** examined the performance of Pakistan's mutual fund industry in the period characterized both by bullish and bearish markets during 2006-10. With consistently negative or insignificant alphas, no fund managers outperform the market. They found that presence of government backed schemes that guarantee a constant income stream makes it difficult for other investment to compete. Islamic funds are the fastest growing fund category in the country, struggling with the steady yield but have the potential to tap into a niche in the market. **Brown Keith (2011)** developed a holding based statistics to measure the volatility of a fund's style characteristics and demonstrate that on average funds with lower levels of style volatility significantly outperform more style volatile funds on risk adjusted basis. The period covered by the investigation was January 1978 to December 2009. They tested three specific hypotheses related to this issue,

- First a negative relationship exists between portfolio style volatility and future risk adjusted performance.
- Second relation between style volatility and future performance is separate and distinct from the roles played by the past performance and fund expenses.
- And third intentional and unintentional components of style volatility will have different impacts on future performance.

Keith concluded that deciding a less volatile investment style was an important aspect of the portfolio management process. **Prince & Bacon (2010)** 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 and it is impossible to rely upon a single benchmark as a reliable indicator of even past performance. The purpose of this paper was to test market theory by examining the performance of mutual funds.

In the benchmark studies in the field of portfolio evaluation, **Treynor (1965)** presented a new way of viewing performance results. He attempted to rate the performance of mutual funds graphically on a characteristics line. By incorporating various concepts, he developed a single line index called Treynor index. The systematic risk is risk which is common to all securities of the same class in the market. His index measures the risk premium of the portfolio where risk

premium equals the difference between the return of the portfolio and the riskless rate. The risk premium is related to the amount of systematic risk assumed in the portfolio, the higher the value of Treynor index, the better the performance of fund. **Sharpe (1966)** explained a modern portfolio theory about expected return. According to him the expected return on an efficient portfolio and its associated risk (unsystematic risk) are linearly related. By incorporating various concepts he developed a Sharpe index. In this paper he attempted to rate the performance on the basis of the optimal portfolio with the risky portfolio and a risk free asset is the one with the greatest reward to variability. The unsystematic risk is related to particular security due to inefficient management. Moreover he has examined 34 open-end mutual funds (period 1954-1963) and found considerable variability in the Sharpe ratio, ranging from 0.78 to 0.43. **Jensen (1968)** proposed an absolute measure of portfolio performance that may able to examine the efficiency of the portfolio managers and provides adequate control over the risk component. His model is a practical application of the theoretical results of the CAPM. After the establishment of Jensen measure in the perspective of stock selection and market timing, a large number of researcher's have empirically examined the above issues. He measured the differential return which is an indication of superior return.

The literature review provides the need to conduct the research especially in Indian context. In the Indian context, very few studies conduct the study based on daily data because daily data are significant to draw the inferences than monthly and yearly data. Present study used daily frequency to evaluate the risk and return relationship of mutual funds in India. The sample size and study period is also relatively large compared with earlier studies in order to provide meaningful observation. Therefore present study is an attempt to fill the uncovered area of existing literature.

### III. METHODOLOGY

#### Sample Schemes

The samples of mutual fund schemes are selected on the basis of schemes operating in the entire study period. First the asset management companies are selected which are in operation from 2000-01 to 2013-14. Then schemes are identified which are operating during the whole study period for selected companies. The study used a sample of 62 mutual fund schemes which belong to 19 Asset Management Companies, related to Bank sponsored, Institution and Private asset management companies. For the convenience in analysis, code is allotted to the sample mutual fund schemes and benchmark index.

**Table 1: Description of Sample Mutual Fund Schemes and Benchmark Index**

Sample Mutual Fund Scheme	Code	Benchmark	Code	Launch	Net Assets
Baroda Pioneer Equity Linked Saving Scheme 96	1	S&P BSE Sensex	R	3/1/1996	27.3
Birla Sun Life 95 – Growth	2	S&PBSE Sensex	R	2/1/1995	646.5
Birla Sun Life Advantage Fund – Growth	3	S&P BSE 200	O	2/1/1995	286.3
Birla Sun Life Buy India Fund – Growth	4	S&P BSE 200	O	1/1/2000	33.8
Birla Sun Life Gilt Plus Liquid Plan – Growth	5	S&P BSE Sensex	R	10/1/1999	26.1
Birla Sun Life Gilt Plus PF Plan – Growth	6	S&P BSE Sensex	R	10/1/1999	32.4
Birla Sun Life Income Plus – Growth	7	S&P BSE Sensex	R	10/1/1995	5129.1
Birla Sun Life India Opportunities Fund – Growth	8	CNX 500	A	12/1/1999	39.4
Birla Sun Life MNC Fund – Growth	9	CNX MNC	E	12/1/1999	443.9
Birla Sun Life Monthly Income Plan – Growth	10	S&P BSE Sensex	R	11/1/2000	115.1

Table 1: Contd.,

Birla Sun Life New Millennium – Growth	11	S&P BSE Teck	S	1/1/2000	68.5
CanaraRobeco Gilt PGS- Growth	12	S&P BSE Sensex	R	12/1/1999	18.8
CanaraRobeco Monthly Income Plan – Growth	13	S&P BSE Sensex	R	4/1/1988	207.3
DSP BlackRock Balanced Fund – Growth	14	S&P BSE Sensex	R	5/1/1999	482.3
DSP BlackRock Bond Fund - Retail Plan – Growth	15	S&P BSE Sensex	R	4/1/1997	292.1
Escorts Income Plan – Growth	16	S&P BSE Sensex	R	3/1/1998	28.1
Franklin India Bluechip– Growth	17	S&P BSE Sensex	R	11/1/1993	4787.8
Franklin India Opportunity Fund – Growth	18	S&P bse 200	O	2/1/2000	274.3
Franklin India Prima Plus – Growth	19	CNX 500	A	9/1/1994	2014.4
Franklin Infotech Fund – Growth	20	S&P BSE IT	P	8/1/1998	157.1
Franklin Templeton India Balanced Fund – Growth	21	S&P BSE Sensex	R	12/1/1999	215.2
Templeton India Pension Plan – Growth	22	S&P BSE Sensex	R	3/1/1997	246.7
HDFC Equity Fund – Growth	23	CNX 500	A	12/1/1999	10444.9
HDFC High Interest Fund- Dynamic Plan – Growth	24	S&P BSE Sensex	R	4/1/1997	867.5
HDFC Prudence Fund – Growth	25	S&P BSE Sensex	R	1/1/1994	5146
HDFC Tax Saver – Growth	26	CNX 500	A	3/1/1996	3505.3
HDFC Top 200 – Growth	27	S&P BSE 200	O	9/1/1996	10319.7
ICICI Prudential Balanced – Growth	28	S&P BSE Sensex	R	10/1/1999	640.1
ICICI Prudential FMCG – Growth	29	CNX FMCG	C	3/1/1999	217.4
ICICI Prudential Technology Fund – Growth	30	S&P BSE IT	P	1/1/2000	213.7
ICICI Prudential Top 100 Fund – Cumulative	31	CNX Nifty	F	6/1/1998	468.5
ICICI Prudential Top 200 Fund – Growth	32	S&P BSE 200	O	9/1/1994	446.2
ING Core Equity Fund – Growth	33	S&P BSE 200	O	5/1/1999	57/7
ING Income Fund - Regular Plan – Growth	34	S&P BSE Sensex	R	5/1/1999	11.7
JM Balanced – Growth	35	S&P BSE Sensex	R	12/1/1994	6.5
JM Equity – Growth	36	S&P BSE Sensex	R	12/1/1994	31.7
Kotak 50 – Growth	37	CNX Nifty	F	12/1/1998	627.4
Kotak Balance – Growth	38	S&P BSE Sensex	R	11/1/1999	341.3
Kotak Bond Deposit – Growth	39	S&P BSE Sensex	R	11/1/1999	150.82
L & T Triple Ace - Regular – Growth	40	S&P BSE Sensex	R	3/1/1997	1326.5
L & T Ultra Short Term Fund - Regular – Growth	41	S&P BSE Sensex	R	11/1/1997	795.57
LIC Nomura Bond Fund – Growth	42	S&P BSE Sensex	R	5/1/1999	140.5
LIC Nomura Equity Fund	43	S&P BSE Sensex	R	2/1/1993	288.7
LIC Nomura MF Growth Fund – Growth	44	S&P BSE Sensex	R	8/1/1994	67.2
LIC Nomura Tax Plan	45	S&P BSE Sensex	R	3/1/1997	28.7
PRINCIPAL Balanced Fund – Growth	46	S&P BSE Sensex	R	12/1/1999	16
PRINCIPAL Index Fund – Growth	47	CNX Nifty	F	6/1/1999	8.4
Reliance Growth – Growth	48	S&P BSE 100	N	10/1/1995	4105.7
Reliance Vision – Growth	49	S&P BSE 100	N	10/1/1995	2411.5

**Table 1: Contd.,**

SBI Magnum Balanced Fund – Growth	50	S&P BSE Sensex	R	10/1/1995	488.2
SBI Magnum Equity Fund – Growth	51	CNX Nifty	F	11/1/1990	1048.7
SBI Magnum Multiplier Plus 93 – Growth	52	S&P BSE 200	O	2/1/1993	1055.4
SBI Magnum Tax Gain Scheme 93 – Growth	53	S&P BSE 100	N	3/1/1993	4141.6
Sundaram Growth Fund – Growth	54	S&P BSE 200	O	3/1/1997	170.6
Tata Balanced Fund – Growth	55	S&P BSE Sensex	R	10/1/1995	616.2
Tata Ethical Fund - Appreciation (Formerly Select Equity Fund)	56	S&P BSE Sensex	R	5/1/1996	130.7
Tata Pure Equity Fund – Growth	57	S&P BSE Sensex	R	5/1/1998	616.1
Tata Tax Saving Fund	58	S&P BSE Sensex	R	3/1/1996	128.1
Tata Young Citizens Fund	59	S&P BSE Sensex	R	10/1/1995	173.7
Taurus Bonanza Exclusive Growth Scheme 95	60	S&P BSE 100	N	2/1/1995	19.8
Taurus Discovery Fund – Growth	61	S&P BSE Sensex	R	9/1/1994	21
Taurus Star share Fund – Growth	62	S&P BSE 200	O	1/1/1994	150.3

The study employed the secondary sources of data. For evaluating the performance of sample mutual fund schemes the historical Net Asset Value (NAV) is taken into consideration. Therefore, in the study daily NAV have been used for all the schemes for the period from April 2000 to March 2014. The data have been collected from the various websites such as SEBI, AMFI, Value Research India, R.R. Finance and respective websites of mutual funds. The daily change is observed for the sample mutual fund schemes, market index and 91 days T- bills for the above mention period. There were missing observations for some of the sample mutual fund schemes, resulting different number of observations for different schemes. The data of asset under management is taken from the various reports of AMFI.

### Objectives of the Study

- To analyze the risk and return relationship of the mutual funds schemes in India during the study period.
- To evaluate the investment performance of sample schemes managed by asset management companies along with benchmark index by using different portfolio measurement techniques.

### Tools Applied

Following are the investment evaluation techniques applied for the analyzing the performance of mutual funds in India.

### Return

The average return on the sample mutual fund schemes has been worked out using the daily return series by the following.

$$\text{Return} = (NAV_t - NAV_{t-1}) / NAV_{t-1}$$

Where,  $NAV_t$  is Net Asset Value of a mutual fund scheme for a day  $t$ ,  $NAV_{t-1}$  is the Net Asset Value for day  $(t-1)$ .

Similarly, the daily returns for the benchmark index have been computed. For the benchmark index, the return is calculated as:

$$\text{Return} = (\text{Index}_t - \text{Index}_{t-1}) / \text{Index}_{t-1}$$

The weekly yield on 91 days Treasury Bills are already in the return form.

### Risk

The risk is calculated on the basis of daily-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 daily returns which was calculated using the following formula:

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

Where,

$\sigma$  = Standard Deviation,  $n$  = number of daily returns

$R_t$  = returns of the mutual fund schemes  $\bar{R}$  = mean return of the mutual fund.

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

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

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

*Beta*( $\beta$ )- 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.

$$\beta = \frac{\text{Covariance between Mutual Fund Return and Market Return}}{\text{Variance of Market Return}}$$

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

### Treynor Measure

*Treynor (1965)* 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.

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

$$\text{Fund's } T_p = \frac{R_p - R_f}{\beta_p}$$

$$\text{Benchmark's } T_p = \frac{R_m - R_f}{\beta_m^1}$$

Where,

$T_p$  = denotes the Treynor Ratio,

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Market Beta ( $\beta$ ) is always 1.



$R_p$  = denotes the average return of the mutual fund scheme,

$R_f$  = denotes the average return on risk-free assets,

$\beta_p$  = denotes the Beta of the mutual fund scheme,

$R_m$  = denotes the average return of market or benchmark index,

$\beta_m$  = denotes the Beta of the market.

This Treynor measure shows the relationship between the return on the portfolio, above the risk-free rate, and its systematic risk. Calculation of Treynor ratio requires a reference index to be chosen to estimate the beta of the portfolio. The Treynor ratio is particularly appropriate for appreciating the performance of a well-diversified portfolio, since it only takes the systematic risk of the portfolio into account, i.e. the share of the risk that is not eliminated by diversification.

### Sharpe Measure

Sharpe (1966) devised an index of portfolio performance measure, referred to as reward to 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:

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

$$\text{Fund's } S_p = \frac{R_p - R_f}{\sigma_p} \qquad \text{Benchmark's } S_p = \frac{R_m - R_f}{\sigma_m}$$

Where,

$S_p$  = denotes the Sharpe Ratio,

$R_p$  = denotes the average return of the mutual fund scheme,

$R_f$  = denotes the average return on risk-free assets,

$\sigma_p$  = denotes the standard deviation of the mutual fund scheme,

$R_m$  = denotes the average return of market or benchmark index,

$\sigma_m$  = denotes the standard deviation of the market or benchmark index return.

This ratio measures the return of a portfolio in excess of the risk-free rate, also called the risk premium, compared to the total risk of the portfolio, measured by its standard deviation. Since this measure is based on the total risk of the portfolio, made up of the market risk and the unsystematic risk taken by the manager, it enables the performance of portfolios that are not very diversified to be evaluated. These measures also suitable for evaluating the performance of a portfolio that represents an individual's total investment

### Jensen Measure

Jensen (1968) propound Jensen Alpha measures which is intercept from the Sharpe- Linter CAPM regression which measure impact of market portfolio excess returns on portfolio excess return. 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. 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-

$$\text{Differential Return} = \text{Portfolio Return} - \text{CAPM Return}$$

Or

$$\alpha = R_p - \{R_f + \beta (R_m - R_f)\}$$

Where,

$\alpha$  = Differential return earned by the schemes

$R_p$  = denotes the average return of the portfolio (mutual fund scheme),

$R_f$  = denotes the average return on risk-free assets,

$\beta$  = denotes the Beta of the mutual fund scheme,

A positive and significant alpha indicates that mutual fund scheme has generated average return greater than the return on the benchmark index thereby indicating a superior performance. The value of alpha has been tested at 5 per cent level of significance.

#### IV. EMPIRICAL ANALYSIS

In this section, we tried to test our statement that investment performance of mutual fund schemes managed by asset management companies is not providing consistent risk adjusted return to unit holders in Indian capital market with the help of Treynor measure, Sharpe Measure, Jensen Measure

**Table 2: Risk and Return Analysis (Funds vs. Benchmark Index)**

Scheme Name	Return of Scheme	Risk of Scheme	Return of Market	Risk of Market	Risk free Rate	Beta( $\beta$ )	Bench mark Index
1	0.00024	0.01736	0.00058	0.01616	0.00016	-0.04441	R
2	0.00057	0.01130	0.00056	0.01609	0.00016	0.07443	R
3	0.00047	0.01596	0.00055	0.01610	0.00016	0.02182	O
4	0.00063	0.01292	0.00056	0.01623	0.00016	0.06863	O
5	0.00029	0.00083	0.00057	0.01592	0.00016	-0.00008	R
6	0.00033	0.00353	0.00057	0.01594	0.00016	-0.00459	R
7	0.00033	0.00254	0.00057	0.01598	0.00016	-0.00009	R
8	0.00039	0.01682	0.00053	0.01599	0.00016	0.03434	A
9	0.00068	0.01081	0.00050	0.01380	0.00016	0.01699	E
10	0.00037	0.00259	0.00057	0.01600	0.00016	0.01092	R
11	0.00048	0.02427	0.00033	0.02132	0.00016	0.19234	S
12	0.00033	0.00322	0.00056	0.01597	0.00016	-0.00094	R
13	0.00033	0.00322	0.00056	0.01597	0.00016	-0.00051	R
14	0.00056	0.01010	0.00056	0.01599	0.00016	0.01408	R
15	0.00029	0.00175	0.00057	0.01597	0.00016	0.00009	R
16	0.00060	0.02478	0.00057	0.01588	0.00016	-0.00575	R

**Table 2: Contd.,**

17	0.00076	0.01470	0.00056	0.01591	0.00016	0.08293	R
18	0.00055	0.01724	0.00056	0.01620	0.00016	0.09054	O
19	0.00075	0.01401	0.00053	0.01602	0.00016	0.08038	A
20	0.00042	0.02018	0.00042	0.02413	0.00016	0.12730	P
21	0.00057	0.01034	0.00057	0.01592	0.00016	0.07881	R
22	0.00048	0.00614	0.00057	0.01589	0.00016	0.02017	R
23	0.00086	0.01479	0.00053	0.01591	0.00016	0.04373	A
24	0.00031	0.00226	0.00056	0.01610	0.00016	0.00127	R
25	0.00079	0.01019	0.00056	0.01611	0.00016	0.01363	R
26	0.00071	0.01640	0.00053	0.01590	0.00016	0.04575	A
27	0.00083	0.01486	0.00056	0.01623	0.00016	0.09069	O
28	0.00054	0.01216	0.00057	0.01613	0.00016	0.01536	R
29	0.00076	0.01154	0.00063	0.01428	0.00016	0.00434	C
30	0.00050	0.01780	0.00042	0.02413	0.00016	0.03396	P
31	0.02197	1.26844	0.00056	0.01602	0.00016	-0.90956	F
32	0.00067	0.01611	0.00056	0.01617	0.00016	0.03429	O
33	0.00033	0.01991	0.00056	0.01620	0.00016	0.04614	O
34	0.00031	0.00228	0.00057	0.01590	0.00016	0.00383	R
35	0.00024	0.01493	0.00056	0.01608	0.00016	-0.00924	R
36	0.00040	0.01676	0.00056	0.01608	0.00016	0.02429	R
37	0.00057	0.01495	0.00056	0.01602	0.00016	0.06151	F
38	0.00016	0.01283	0.00057	0.01614	0.00016	0.00178	R
39	0.00032	0.00225	0.00056	0.01597	0.00016	0.00039	R
40	0.00023	0.00224	0.00057	0.01597	0.00016	0.00333	R
41	0.00017	0.00757	0.00056	0.01598	0.00016	0.01161	R
42	0.00033	0.00483	0.00057	0.01599	0.00016	-0.00179	R
43	0.00046	0.01645	0.00057	0.01597	0.00016	-0.00662	R
44	0.00046	0.01638	0.00057	0.01598	0.00016	0.04976	R
45	0.00033	0.01580	0.00057	0.01596	0.00016	0.01851	R
46	0.00044	0.01125	0.00057	0.01592	0.00016	0.02082	R
47	0.00053	0.01584	0.00056	0.01606	0.00016	-0.00475	F
48	0.02211	1.27536	0.00053	0.01630	0.00016	-0.82431	N
49	0.00082	0.01455	0.00053	0.01630	0.00016	-0.00293	N
50	0.00037	0.01276	0.00057	0.01598	0.00016	0.00339	R
51	0.00034	0.01720	0.00057	0.01610	0.00016	0.01425	F
52	0.00046	0.01689	0.00056	0.01607	0.00016	0.04947	O
53	0.00030	0.01919	0.00054	0.01656	0.00016	0.01188	N
54	0.00058	0.01570	0.00056	0.01618	0.00016	0.07715	O
55	0.00056	0.01184	0.00056	0.01592	0.00016	0.01962	R
56	0.00048	0.01734	0.00057	0.01597	0.00016	0.01331	R
57	0.00070	0.01554	0.00057	0.01591	0.00016	0.08464	R
58	0.00024	0.01886	0.00056	0.01591	0.00016	0.03934	R

**Table 2: Contd.,**

59	0.00004	0.01233	0.00056	0.01592	0.00016	0.00507	R
60	0.00062	0.01694	0.00055	0.01664	0.00016	0.02003	N
61	0.02366	1.38213	0.00057	0.01613	0.00016	3.55354	R
62	0.00065	0.01748	0.00056	0.01626	0.00016	0.04947	O
Average	0.00154	0.07528	0.00055	0.01633	0.00016	0.05749	

*Note-* The serial Number represents the name of the sample mutual fund schemes and alphabets represents benchmark index as given in Table 1.

*Source:* Compile from daily return of the sample mutual fund schemes taken from SEBI and benchmark return taken from their respective website.

Table 2 shows the average risk and return of various sample schemes and benchmark index. In terms of average return Taurus Discovery Fund – Growth (Scheme No. 61) fund gave the highest return and the Tata Young Citizens Fund (Scheme No.59) gave the lowest return in all the samples. Taurus Discovery Fund – Growth (Scheme No. 61) is the most risky and Birla Sun Life Gilt plus Liquid Plan – Growth (Scheme No.5) is the less risky in the entire sample. Table also shows that average return of 27 samples scheme is greater than the average of benchmark index and average risk of 20 sample schemes is greater than the average risk of benchmark index. The cross sectional average return of sample fund schemes is 0.00154, more than average return of benchmark index which is 0.00055. Risk free rate is 0.00016 which is taken from average weekly yield of 91 days Treasury bills. This table also revealed that out of 62 schemes, 35 have underperform the market, 42 are found to have lower total risk than the market and all the schemes have given returns higher than risk free rates except Tata Young Citizens Fund (Scheme No. 59).

**Table 3: Treynor and Sharpe Measure  
(Sample Mutual Fund Schemes vs. Benchmark Index)**

Scheme Name	Treynor Ratio			Sharpe Ratio			Benchmark Index
	Fund	Benchmark	p Value	Fund	Benchmark	P Value	
1	-0.0018	0.0004	0.9177	0.0046	0.0257	0.7914	R
2	0.0055	0.0004	0.7485	0.0359	0.0249	0.0348*	R
3	0.0144	0.0004	0.3972	0.0197	0.0243	0.2471	O
4	0.0069	0.0004	0.6869	0.0365	0.0243	0.0323*	O
5	-1.5418	0.0004	0.0000*	0.1525	0.0254	0.0000*	R
6	-0.0362	0.0004	0.0346*	0.0471	0.0255	0.0060*	R
7	-1.9811	0.0004	0.0000*	0.0681	0.0255	0.0001*	R
8	0.0068	0.0004	0.6897	0.0139	0.0228	0.4151	A
9	0.0307	0.0003	0.0709	0.0482	0.0247	0.0045*	E
10	0.0195	0.0004	0.2570	0.0821	0.0255	0.0000*	R
11	0.0017	0.0002	0.9216	0.0133	0.0080	0.4353	S
12	-0.1822	0.0004	0.0000*	0.0532	0.0248	0.0017*	R
13	-0.3384	0.0004	0.0000*	0.0533	0.0248	0.0017*	R
14	0.0285	0.0004	0.0941	0.0397	0.0251	0.0196*	R
15	1.5419	0.0004	0.0000*	0.0760	0.0255	0.0000*	R
16	-0.0766	0.0004	0.0000*	0.0178	0.0255	0.2991	R

**Table 3: Contd.,**

17	0.0073	0.0004	0.6700	0.0410	0.0253	0.0162*	R
18	0.0043	0.0004	0.8025	0.0224	0.0244	0.1890	O
19	0.0074	0.0004	0.6653	0.0424	0.0230	0.0131*	A
20	0.0021	0.0003	0.9037	0.0130	0.0106	0.4452	P
21	0.0052	0.0004	0.7611	0.0397	0.0255	0.0206*	R
22	0.0157	0.0004	0.3596	0.0516	0.0255	0.0026*	R
23	0.0160	0.0004	0.3469	0.0474	0.0229	0.0054*	A
24	0.1169	0.0004	0.0000*	0.0656	0.0250	0.0001*	R
25	0.0465	0.0004	0.0064*	0.0621	0.0250	0.0003*	R
26	0.0120	0.0004	0.4820	0.0334	0.0229	0.0499*	A
27	0.0073	0.0004	0.6665	0.0448	0.0243	0.0086*	O
28	0.0244	0.0004	0.1528	0.0308	0.0251	0.0710	R
29	0.1387	0.0005	0.0000*	0.0522	0.0330	0.0022*	C
30	0.0101	0.0003	0.5536	0.0193	0.0106	0.2584	P
31	-0.0240	0.0004	0.1596	0.0172	0.0248	0.3132	F
32	0.0150	0.0004	0.3811	0.0318	0.0245	0.0624	O
33	0.0036	0.0004	0.8344	0.0083	0.0245	0.6281	O
34	0.0384	0.0004	0.0253*	0.0645	0.0256	0.0002*	R
35	-0.0082	0.0004	0.6293	0.0051	0.0250	0.7651	R
36	0.0099	0.0004	0.5597	0.0144	0.0251	0.3978	R
37	0.0066	0.0004	0.6972	0.0273	0.0248	0.1094	F
38	-0.0014	0.0004	0.9912	-0.0002	0.0251	0.9912	R
39	0.4122	0.0004	0.0000*	0.0713	0.0248	0.0000*	R
40	0.0221	0.0004	0.1972	0.0328	0.0255	0.0556	R
41	0.0010	0.0004	0.9510	0.0016	0.0248	0.9249	R
42	-0.0969	0.0004	0.0000*	0.0359	0.0255	0.0365*	R
43	-0.0454	0.0004	0.0082*	0.0183	0.0256	0.2871	R
44	0.0060	0.0004	0.7273	0.0182	0.0256	0.2894	R
45	0.0093	0.0004	0.5880	0.0109	0.0256	0.5256	R
46	0.0134	0.0004	0.4348	0.0247	0.0254	0.1485	R
47	-0.0775	0.0004	0.0000*	0.0232	0.0249	0.1740	F
48	-0.0266	0.0004	0.1154	0.0172	0.0226	0.3089	N
49	-0.2263	0.0004	0.0000*	0.0455	0.0226	0.0071*	N
50	0.0603	0.0004	0.0004*	0.0160	0.0255	0.3500	R
51	0.0127	0.0004	0.4611	0.0105	0.0252	0.5414	F
52	0.0060	0.0004	0.7271	0.0176	0.0249	0.3066	O
53	0.0120	0.0004	0.4853	0.0074	0.0231	0.6659	N
54	0.0054	0.0004	0.7529	0.0264	0.0245	0.1221	O
55	0.0205	0.0004	0.2305	0.0340	0.0253	0.0469*	R
56	0.0242	0.0004	0.1562	0.0186	0.0254	0.2763	R

57	0.0064	0.0004	0.7095	0.0347	0.0254	0.0425*	R
58	0.0021	0.0004	0.9026	0.0044	0.0254	0.7984	R
59	-0.0231	0.0004	0.5777	-0.0095	0.0253	0.5777	R
60	0.0231	0.0004	0.1803	0.0273	0.0234	0.1131	N
61	0.0066	0.0004	0.6982	0.0170	0.0251	0.3188	R
62	0.0098	0.0004	0.5642	0.0278	0.0244	0.1028	O
Average	<b>-0.0305</b>	<b>0.0004</b>		<b>0.0327</b>	<b>0.0242</b>		
Standard Deviation	0.3855	0.0000		0.0256	0.0036		
Maximum	1.5419	0.0005		0.1525	0.0330		
Minimum	-1.9811	0.0002		-0.0095	0.0080		

**Source:** Compile from daily return of the sample mutual fund schemes taken from SEBI and benchmark return taken from their respective website.

**Note-** P value at 5 per cent level of significance. \* indicate the significant value.

Table 3 reveals the value of Treynor and Sharpe Ratio of sample mutual funds and benchmark index along with the significance p value of sample mutual fund schemes. It was found that 15 (24.19 per cent) out of 62 schemes showed the negative value in terms of Treynor ratio and rest of the schemes (75.81 per cent) generate the positive value. Treynor ratio shows that the 16 (25.80 per cent) out of 62 schemes under performs the market and rest of the 46 (74.20 per cent) schemes out performs the market in terms of Treynor ratio. In terms of Treynor Value DSP Black Rock Bond Fund - Retail Plan – Growth (Scheme no. 15) has the highest value.

It can also be examine from the table that Sharpe ratio of the 60 sample mutual fund schemes have the positive (96.78 per cent) Sharpe value except two (3.22 per cent) schemes, indicating that vast majority of sample mutual fund schemes have produced greater return as compare to risk free rate. It is found that 25 out of 62 schemes underperform and rest of the 37 schemes over performs the market in terms of Sharpe ratio. Sharpe Ratio provides the better picture as the fund Birla Sun Life Gilt plus Liquid Plan- Growth (Scheme No. 5) gave the highest Sharpe value in all the sample schemes.

**Table 4: Testing of Hypothesis (Treynor Measure)**

Treynor Measure	Significant		Insignificant		Total
	Positive	Negative	Positive	Negative	
<b>Institutional</b>					
Bank Sponsored	1	2	3	1	7
Institutional		2	2	0	4
Private	6	6	34	5	51
<b>Total</b>	<b>7</b>	<b>10</b>	<b>39</b>	<b>6</b>	<b>62</b>
<b>Objective</b>					
Growth	1	3	29	3	36
Hybrid	2	1	8	3	14
Income	4	6	2	0	12
<b>Total</b>	<b>7</b>	<b>10</b>	<b>39</b>	<b>6</b>	<b>62</b>

**Source:** Researcher Compilation

Table 4 reveals the result of the hypothesis of treynor measure. It can be observed from the table that only 17 sample mutual fund schemes are significant at five per cent level of significance out of which 7 (11.29 per cent) are showing positive treynor measure value and 10 (16.12 per cent) schemes are showing negative value. Rest of the 45 (72.58 per cent) schemes is insignificant. In terms of sponsored institution, the bank sponsored asset management companies have 1 (14.28 per cent) schemes, Institutional have no scheme and private sponsored have 7 (85.71 per cent) schemes in positive significant schemes. In terms of investment objective, 1 (14.28 per cent) growth schemes, 2 (28.56 per cent) hybrid schemes, 4 (57.12 per cent) income schemes are found to be positive and significant. From these results it can be interpreted that only 7 (11.29 per cent) of the sample mutual fund schemes are reflect the significant positive relative risk adjusted return in terms of Treynor measure.

**Table 5: Testing of Hypothesis (Sharpe Measure)**

Sharpe Measure	Significant		Insignificant		Total
	Positive	Negative	Positive	Negative	
<b>Sponsored Institution</b>					
Bank Sponsored	2	0	5	0	7
Institutional	1	0	3	0	4
Private	24	0	25	2	51
<b>Total</b>	<b>27</b>	<b>0</b>	<b>33</b>	<b>2</b>	<b>62</b>
<b>Investment Objective</b>					
Growth	10	0	26	0	36
Hybrid	8	0	4	2	14
Income	9	0	3	0	12
<b>Total</b>	<b>27</b>	<b>0</b>	<b>33</b>	<b>2</b>	<b>62</b>

*Source: Researcher Compilation*

Table 5 reveals the result of the hypothesis. It can be observed from the table that only 27 sample mutual fund schemes (43.54 percent) are found to be positive and significant at five percent level of significance out of 62 schemes. Rest of the 35 schemes is insignificant. In terms of sponsored institution, the bank sponsored asset management companies have 2 (7.40 per cent) schemes, Institutional have 1 (3.70 per cent) scheme and private sponsored have 24 (88.88 per cent) schemes positive and significant. In terms of investment objective, 10 (37.03 per cent) growth schemes, 8 (29.62 per cent) hybrid schemes, 9 (33.33 per cent) income schemes are found to be positive and significant. From these results it can be interpreted that 27 schemes (43.54 per cent) of the sample mutual fund schemes have shown significant and positive relative risk adjusted return in terms of Sharpe measure.

**Table 6: Result of Jensen Measure**

Scheme No.	Fund Return	CAPM Return	Alpha	p- Value
1	0.00024	0.00014	0.00010	0.01700*
2	0.00057	0.00019	0.00038	0.00000*
3	0.00047	0.00017	0.00031	0.19600
4	0.00063	0.00019	0.00044	0.00000*
5	0.00029	0.00016	0.00013	0.09280
6	0.00033	0.00016	0.00017	0.22400
7	0.00033	0.00016	0.00017	0.96500

**Table 6: Contd.,**

8	0.00039	0.00017	0.00022	0.05500
9	0.00068	0.00017	0.00052	0.20200
10	0.00037	0.00017	0.00021	0.00000*
11	0.00048	0.00019	0.00029	0.00000*
12	0.00033	0.00016	0.00017	0.78400
13	0.00033	0.00016	0.00017	0.88600
14	0.00056	0.00017	0.00040	0.19000
15	0.00029	0.00016	0.00013	0.98200
16	0.00060	0.00016	0.00044	0.83100
17	0.00076	0.00019	0.00057	0.00000*
18	0.00055	0.00020	0.00035	0.00000*
19	0.00075	0.00019	0.00056	0.00000*
20	0.00042	0.00019	0.00023	0.00000*
21	0.00057	0.00019	0.00038	0.00000*
22	0.00048	0.00017	0.00031	0.00200*
23	0.00086	0.00018	0.00068	0.00600*
24	0.00031	0.00016	0.00015	0.59500
25	0.00079	0.00017	0.00063	0.20600
26	0.00071	0.00018	0.00053	0.00900*
27	0.00083	0.00020	0.00063	0.00000*
28	0.00054	0.00017	0.00037	0.23200
29	0.00076	0.00016	0.00060	0.75000
30	0.00050	0.00017	0.00033	0.00700*
31	0.02197	-0.00020	0.02217	0.50200
32	0.00067	0.00017	0.00050	0.04400*
33	0.00033	0.00018	0.00015	0.02800*
34	0.00031	0.00016	0.00015	0.11800
35	0.00024	0.00016	0.00008	0.55900
36	0.00040	0.00017	0.00023	0.17000
37	0.00057	0.00019	0.00038	0.00000*
38	0.00016	0.00016	0.00000	0.89300
39	0.00032	0.00016	0.00016	0.88200
40	0.00023	0.00016	0.00007	0.88200
41	0.00017	0.00017	0.00001	0.14700
42	0.00033	0.00016	0.00017	0.73700
43	0.00046	0.00016	0.00030	0.71000
44	0.00046	0.00018	0.00028	0.00500*
45	0.00033	0.00017	0.00016	0.27800
46	0.00044	0.00017	0.00027	0.08500
47	0.00053	0.00016	0.00037	0.77600
48	0.02211	-0.00014	0.02225	0.53400
49	0.00082	0.00016	0.00066	0.84200



**Table 6: Contd.,**

50	0.00037	0.00016	0.00020	0.80800
51	0.00034	0.00017	0.00017	0.43700
52	0.00046	0.00018	0.00028	0.00600*
53	0.00030	0.00017	0.00014	0.54800
54	0.00058	0.00019	0.00038	0.00000*
55	0.00056	0.00017	0.00039	0.12300
56	0.00048	0.00017	0.00032	0.47600
57	0.00070	0.00019	0.00051	0.00000*
58	0.00024	0.00018	0.00007	0.05200
59	0.00004	0.00016	-0.00012	0.69600
60	0.00062	0.00017	0.00045	0.25300
61	0.02366	0.00160	0.02206	0.01500*
62	0.00065	0.00018	0.00047	0.00700*
Average	0.00154	0.00018	0.00136	0.30395
Standard Deviation	0.00479	0.00019	0.00473	0.34113
Maximum	0.02366	0.00160	0.02225	0.98200
Minimum	0.00004	-0.00020	-0.00012	0.00000

Source: Compile from daily return of the sample mutual fund schemes taken from SEBI and benchmark return taken from their respective website.

Note- P value at 5 per cent level of significance. \* indicate the significant value.

Table 6 reveals the fund return, CAPM returns, Alpha value and significance p value by using Jensen measure. Jensen Models suggests that 61 schemes have provided excess returns over CAPM returns against the fact that all the schemes provided excess returns over the risk free rates. Reliance Growth Scheme - Growth, with  $\alpha = 0.02225$ , indicating a positive highest investment capabilities and Tata Young Citizens Fund  $\alpha = (-0.00012)$  which showed a negative performance. Statistically significant positive value of  $\alpha$  indicates superior investment performance of mutual funds.

**Table 7: Testing of Hypothesis (Jensen Measure)**

Jensen Measure	Significant		Insignificant		Total
	Positive	Negative	Positive	Negative	
<b>Institutional</b>					
Bank Sponsored	2	0	5	0	7
Institutional	1	0	3	0	4
Private	21	0	29	1	51
<b>Total</b>	<b>24</b>	<b>0</b>	<b>37</b>	<b>1</b>	<b>62</b>
<b>Investment Objective</b>					
Growth	20	0	16	0	36
Hybrid	4	0	9	1	14
Income	0	0	12	0	12
<b>Total</b>	<b>24</b>	<b>0</b>	<b>37</b>	<b>1</b>	<b>62</b>

Source: Researcher Compilation

The value of alpha is the measure of selectivity skills of the asset managers. The table 7 reveals the result of the hypothesis of Jensen measure. It can be observed from the table that only 24 (38.70 per cent) sample mutual fund schemes are significant at five per cent level of significance and shows the positive alpha value. Rest of the 38 (61.30 per cent) schemes is statistically insignificant. In terms of sponsored institution, the bank sponsored asset management companies have 2 (8.33 per cent) schemes, Institutional have 1 (4.17 per cent) schemes and private sponsored have 21 (87.5 per cent) schemes in positive significant alpha value. In terms of investment objective, 20 (83.33 per cent) growth schemes, 4 (16.67 per cent) hybrid schemes, no income schemes are found to be positive and significant. From these results it can be interpreted that 24 schemes (38.71 per cent) of the sample mutual fund schemes are reflect the significant positive selectivity skills by predicting the future prices using the Jensen Measure during the study period.

After applying the portfolio performance measures, it is found that majority of the schemes are not providing significant positive return in terms of relative risk adjusted measures and absolute risk adjusted measures.

## CONCLUSIONS

This paper evaluates the performance of sample mutual fund schemes and an empirical investigation of sample mutual fund schemes. The sample size of 62 schemes is taken from the institution sponsorship and investment objective for measuring the performance during the period of 2000 to 2014. From the Relative risk adjusted return analysis, it is found that 46 sample mutual fund schemes were outperform the benchmark index in Treynor Ratio and 37 sample mutual fund schemes were outperform the benchmark index in Sharpe ratio. Most of the outperforming schemes belong to growth and hybrid schemes. The Absolute risk adjusted return also provide the same picture as 24 schemes found positive and significant in Jensen Measure in which 20 schemes from growth, 4 belong to hybrid schemes. These positive and significant schemes generates the differential return i.e. fund return is more than CAPM return indicates the superior performance of stock selection ability of fund managers. The focus on equity related instruments in the asset allocation strategy is one of the important factors that enable mutual fund schemes to outperform the market. Long run investment especially in Blue Chip stocks also helped the fund manager to generate the positive risk adjusted return during the study period. The reason for superior performance is the expertise of fund managers in reducing the intensity of systematic and non-systematic risks through efficient portfolio construction. The result of the present study is consistent with earlier studies which also found similar kinds of results in the context of mutual fund companies in India over a period of 2000-01-2013-14.

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