A Study on Performance of Indian Mutual Fund Schemes based on Risk Adjusted Performance Indices: Treynor, Sharpe and Jensen Approaches

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Abstract

The evaluation of the performance of mutual funds has become a very interesting research topic both for academic researchers, managers of financial, banking and investment institutions. Thus, this study focused on the best and least Scheme based on the ranks provided by risk adjusted performance indices from the period from April 2010 to March 2015 available to investors in India.

The collected data are analyzed by using MS Excel package. The study Treynor, Sharpe and Jensen Indices for Secondary Data analysis by followed Benchmark S&P BSE Sensex to grant best possible accurate output for the financial period from 2010 to 2015. 33 Equity Diversified Mutual fund Schemes from top 10 Mutual fund Companies (based on AUM) were chosen for the study. This study concludes that UTI - MNC Fund (UGS 10000)-Growth Option, UTI - MNC Fund (UGS 10000)-Growth Option and ICICI Prudential Exports and Other Services Fund - Regular Plan – Growth are the best ranking schemes based on Treynor, Shapre and Jensen Ratios respectively. Moreover, SBI Magnum Multiplier Fund - REGULAR PLAN – Growth, Birla Sun Life Equity Fund - Growth - Regular Plan and SBI Magnum Multiplier Fund - REGULAR PLAN –Growth is the least ranked schemes respectively.

Keywords: Treynor Index, Sharpe Index and Jensen Index

1. INTRODUCTION

Mutual funds are institutions which pool the money from the public, invest in securities on behalf of investors and distribute the returns to the investors. They collect money from the public by issuing units. Investors are panic when they have many alternatives. Identifying the best scheme among the many alternatives (in terms of Risk and Return) is the biggest challenge to the mutual fund investors. Standard Deviation (σ) is the indicator of Measuring Risk (Volatility), which shows the tendency of an asset to fluctuate in price. Beyond the Standard Deviation (σ), the investors have to monitor various risk levels. Market Beta also considered for comparing the fund's returns. S&P BSE Sensex and Respective Fund's Benchmark's Index have been incorporated.

Graph No 1: Recent Trends of Stock Market Indices (CNX Nifty & S&P BSE Sensex)
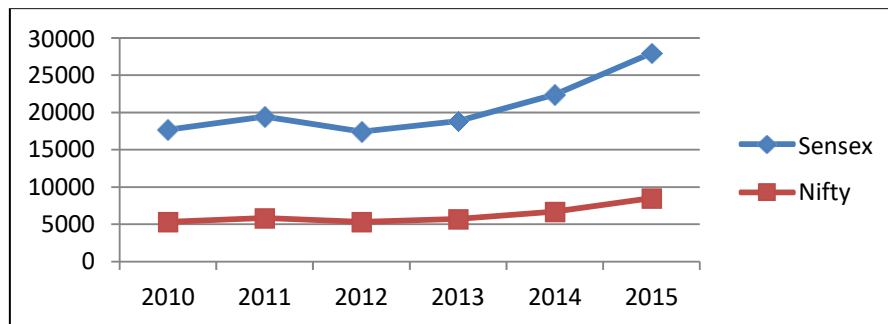
(Source: NSE & BSE)

By observing the above graph of Benchmarks (Graph No 1), Indices have relatively positive trends from past five years. This would attract the Real Asset investors to invest in Financial Assets that imply more panic to choose the better one.

Graph No 2: Trends in Asset under Management (AUM)
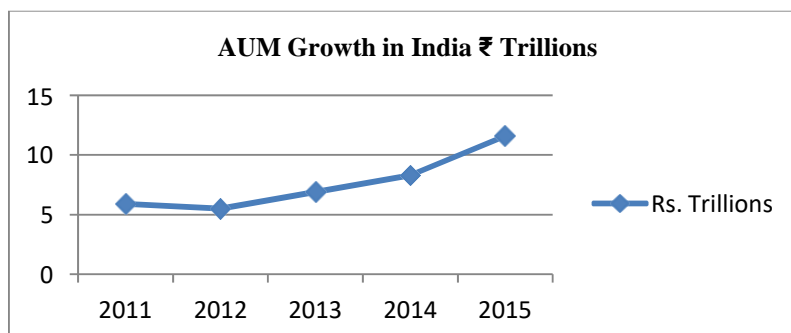
(Source: Investment Company Institute)

In the above Graph No 2, one can understand that there is a relative positive in AUM Trends from past four Years. Mutual fund investment trend disclose the attractiveness of Asset under Management day by day. Investors may be in a dilemma for choosing the best fund. But one can't identify the best fund based on not only the performance or return indicators, but also they seek the information beyond the just performance.

2. LITERATURE REVIEW – SELECT STUDIES

Pedersen and Rudholm-Alfvin (2003) examine the performance of financial institution stocks using a choice of traditional and alternative performance measures partly identical to the selection used in this work. They find that the rankings of the alternative performance measures are extremely positively correlated with each other and to the Sharpe Ratio. As the alternative performance measures do not lead to significantly different results compared to the Sharpe Ratio in their analysis, the authors recommend staying with this traditional measure as it is analytically convenient and traditionally supported by researchers and practitioners (Pedersen & Rudholm-Alfvin, p. 166).

Eling and Schumacher (2006) analyze the performance of different categories of hedge funds using the Sharpe Ratio and a selection of the most documented alternative performance measures similar to those described in this work. Their results show high correlations in the rankings across all performance measures as well. They further prove that the rankings are very robust to changes in underlying parameters. Thus, they conclude that the choice of the performance measure does not matter and that the Sharpe Ratio is sufficient for appraising risk-adjusted performance.

Glawischnig (2007) attempts to refute Eling and Schumacher (2006) by showing that the choice of performance measure has a considerable influence on the ranking. His analysis, however, also yields highly correlated rankings for all performance measures. Nevertheless, this author warns against dismissing the alternative performance measures. He points out that it is necessary to include the information contained in the higher moments of distributions even if they lead to the same result for the majority of observations. Yet, for some investment alternatives the additional information might lead to alterations in the ranking, which, even if small, might be significant for the decision of a particular investor (Glawischnig, 2007, p. 27).

Pedersen and Rudholm-Alfvin (2003) the discussed studies were based on hedge fund returns. This asset class is often criticized for suffering from severe selection biases (for a detailed discussion see for example Kaiser, Heidorn & Roder, 2009, p. 9) which might put the hitherto obtained statements about the usefulness of alternative performance measures into question. Hence, returns of the asset class of bank products shall be used in this work to determine whether alternative performance measures yield different results compared to the Sharpe Ratio.

3. RESEARCH METHODOLOGY

3.1 Objectives

To find the best and least ranked schemes in terms of Risk Adjusted Performance

3.2 Selection of Mutual Fund Companies

AMCs were chosen by based on top 10 Mutual fund companies (based on Asset under Management (AUM) as on March 31st, 2013). AUM of top 10 companies penetrates 80.20% out of the 44 Mutual fund companies in India. They are HDFC Asset Management Company Limited (16.21%), Reliance Capital Asset Management Ltd. (15.07%), ICICI Prudential Asset Mgmt. Company Limited (13.99%), Birla Sun Life Asset Management Company Limited (12.27%), UTI Asset Management Company Ltd (11.06%), SBI Funds Management Private Limited (8.75%), Franklin Templeton Asset Management (India) Private Limited (6.62%), Kotak Mahindra Asset Management Company Limited (KMAMCL) (5.63%), IDFC Asset Management Company Limited (5.24%) and DSP BlackRock Investment Managers Private Limited (5.15%).

3.3 Selection of Mutual Fund Schemes (Sample size)

249 Equity Diversified Schemes available out of 44 AMCs as on 31st March, 2013. This study contains all 33 Equity Diversified Schemes related to top 10 Mutual fund companies, either closed ended or open ended funds. Rest of the schemes were not taken into consideration due to various reasons like institutional plans, inception date is less than a year and they do not belong to top 10 AMCs. Those 33 schemes are displayed in Table No 1. S&P BSE Sensex has been taken as Benchmark for the study.

3.4 Data Collection

Secondary data was collected from different sources and compiled as per the requirement of the study. Data collected from AMFI, RBI, NSE, BSE, SEBI, Moneycontrol.com, Economic Times and various respective funds' websites.

3.5 Data Analysis Tools

Risk Adjusted Performance Indices

There are three indices available for measuring the risk adjusted performance

- The Treynor Index (Treynor, 1965)
- The Sharpe Index (Sharpe, 1966)
- The Jensen Index (Jensen, 1968)

1. The Treynor Index

In 1965, Treynor was the first researcher who computed a measure of the portfolio performance. A measure of a portfolio excess return per unit of risk equals to the portfolio rate of return minus the risk free rate of return, divided by the portfolio Beta. This is useful for assessing the excess return, evaluating investors to evaluate how the structure of portfolio to different levels of systematic risk will affect the return. Symbolically, the Treynor Index (T_p) is presented as:

$$Tp = \frac{Rp - Rf}{\beta p}$$

Where, Rp = Portfolio Rate of Return

Rf = Risk free Rate of Return

βp = Portfolio Bata

When Rp > Rf and βp > 0, Larger Treynor value appear. It means a better portfolio for all the investors regarding of their individual risk performance. Negative Treynor values occur in two situations.

When Rp < Rf, the Treynor value is negative because Rp < Rf, then one can judge the portfolio performance is very poor.

When βp < 0, the negativity becomes from beta, the fund's performance is superb.

There is another very important case, suppose that when Rp < Rf and βp both are negative, then Treynor value will become positive but in order to qualify the fund's performance as good or

bad, observe whether the Rp lies above or below the Security Market Line (SML). The Treynor Index used the Security Market Line as a benchmark. This Index has a geometric interpretation which is similar to the Sharpe Index.

2. The Sharpe Index

In 1966, Sharpe developed a composite measurement of portfolio performance which I very similar to the Treynor measure. The only difference being the Standard Deviation (σ) instead of Beta. The Sharpe Index is a measure of performance of the portfolio in given period of time.

In Sharpe Index, three things should be considered, the portfolio return, risk free rate of return and the standard deviation (σ) of the portfolio. Another thing is that for the risk free rate of return, use average return (over the given period of time). The standard deviation (σ) of the portfolio measures the systematic risk of the portfolio.

The Sharpe Index is computed by dividing risk premium of the portfolio by its standard deviation or total risk. Symbolically, the Sharpe Index is presented as below.

$$Sp = \frac{Rp - Rf}{\sigma p}$$

Here, Rp = Portfolio Rate of Return

Rf = Risk Free Rate of Return

σp = Standard Deviation

The Sharpe Index uses the Capital Market Line as a benchmark. The higher the Sharpe measure indicates a better performance because each unit of total risk (Standard Deviation) is rewarded with the greater excess return.

3. The Jensen Index

In finance, Jensen's Index is used to determine the required (excess) return of stock, security or portfolio by the Capital Asset Pricing Model (CAPM). Jensen Index utilizes the Security Market Line (SML) as a benchmark. At 1970's, this measure was first used in the evaluation of Mutual fund managers. This model is used to adjust the level of beta risk, so that riskier securities are expected to have higher returns. It allows the investor to statistically test whether portfolio produced an abnormal return relative to the overall capital market.

According to the Capital Asset Pricing Model (CAPM), in an equilibrium risk return model (Levy and Sarnat, 1984) the expected rate of return on an asset or portfolio is expressed as below.

$$ERp = Rp + (ERm - Rf)\ \beta p \quad \textbf{(1)}$$

Where, ERp = Expected Return of an asset or portfolio

Rf = Risk Free Rate of Return

ERm = Expected Return on the market portfolio

βp = Beta or Systematic Risk

To obtain Jensen Index, a time series regression of the security's return (Rp – Rf) is regressed against the market portfolio excess return (Rm – Rf).

Now

$$(Rp - Rf) = \alpha p + (Rm - Rf)\ \beta p + \varepsilon p \quad \textbf{(2)}$$

Where, Rp = Return on the Portfolio

Rf = Risk Free Rate of Return

αp = Jensen Index measure of the performance of the portfolio

βp = Beta or Systematic risk of the portfolio

Rm = Return of the market portfolio

εp = Portfolio Random Error Term.

Now by taking mean on both sides of equation (2), we obtain

$$(Rp - Rf) = \alpha p + (Rm - Rf)\ \beta p \quad \textbf{(3)}$$

By Levy and Sarnat 1984, the average error term εp is always zero.

So equation (3) become

$$\alpha p = Rp - (Rf + (Rm - Rf)\ \beta p \quad \textbf{(4)}$$

Within the framework of CAPM, αp should be zero. It means that the stock has performed exactly same as the market expected based on its systematic risk. The Jensen Index (αp) for a particular portfolio is identified by the vertical intercept of regression model described in equation (4), from the equation (4) it is clear that the higher the vertical intercept (αp), the greater the abnormal return achieved by the portfolio in excess of the market return.

4. DATA ANALYSIS AND INTERPRETATION

Table No. 1 Treynor Index, Sharpe Index and Jensen Index for the financial period 2010 – 2015 and followed benchmark is S&P BSE Sensex

SL NO	SCHEME CODE	SCHEME NAV NAME	TREYNOR INDEX	RANK	SHARPE INDEX	RANK	JENSEN INDEX	RANK
1	100740	UTI - MNC Fund (UGS 10000)- Growth Option	14.03	1	7.46	1	0.34	3
2	103312	ICICI Prudential Exports and Other Services Fund - Regular Plan - Growth	2.24	30	4.88	3	1.27	1
3	102594	ICICI Prudential Value Discovery Fund - Regular Plan - Growth	4.68	22	4.90	2	0.60	2
4	105817	Franklin India High Growth Companies Fund - Growth Plan	9.23	4	4.06	5	0.28	5
5	103111	Birla Sun Life India Gennext Fund- Growth Option	11.59	2	4.81	4	0.28	4
6	101161	Reliance Equity Opportunities Fund-Growth Plan-Growth Option	9.66	3	4.00	6	0.26	6
7	100520	Franklin India Prima Plus-Growth	8.86	5	3.61	7	0.22	9
8	102883	Franklin India Flexi Cap Fund- Growth Plan	7.62	9	2.99	10	0.22	8
9	106235	Reliance Top 200 Fund- Growth Plan -Growth Option	6.75	12	2.80	12	0.23	7
10	103024	SBI Magnum Multiplier Fund - REGULAR PLAN -Growth	-34.62	33	2.76	13	0.05	33
11	104339	Birla Sun Life Long Term Fund- Growth Option	6.86	11	2.75	14	0.21	10
12	101764	HDFC Capital Builder Fund - Growth Option	8.57	6	3.03	9	0.18	19
13	100033	Birla Sun Life Advantage Fund - Regular Growth	5.68	16	2.29	20	0.21	11
14	101228	ICICI Prudential Top 200 Fund - Regular Plan - Growth	5.62	17	2.35	18	0.20	13
15	103166	Birla Sun Life Equity Fund - Growth - Regular Plan	0.50	31	0.20	33	0.09	31
16	102846	Reliance NRI Equity Fund-Growth Plan-Growth Option	6.07	15	2.54	16	0.20	12

17	101144	ICICI Prudential Dynamic - Regular Plan - Growth	7.99	7	3.10	8	0.18	21
18	101762	HDFC Equity Fund - Growth Option	7.17	10	2.36	17	0.19	17
19	103819	DSP BlackRock Opportunities Fund-Regular Plan - Growth	6.39	13	2.59	15	0.20	15
20	103678	Templeton India Equity Income Fund-Growth Plan	5.00	20	2.31	19	0.18	22
21	100377	Reliance Growth Fund-Growth Plan-Growth Option	4.66	23	1.97	23	0.19	16
22	105875	DSP BlackRock Equity Fund - Regular Plan - Growth	6.27	14	2.29	21	0.19	18
23	107504	Birla Sun Life Special Situations Fund - Growth	4.51	24	1.95	24	0.20	14
24	101738	Birla Sun Life Dividend Yield Plus - Growth - Regular Plan	7.62	8	2.84	11	0.17	23
25	103040	Kotak Classic Equity Scheme---Growth	5.24	19	2.09	22	0.17	24
26	100496	Templeton India Growth Fund-Growth Plan	3.29	29	1.50	31	0.17	25
27	100380	Reliance Vision Fund-GROWTH PLAN-Growth Option	4.81	21	1.90	26	0.18	20
28	100119	HDFC Growth Fund - Growth Option	5.41	18	1.93	25	0.16	26
29	111863	IDFC Classic Equity Fund-Plan B-Growth	3.74	27	1.64	27	0.16	27
30	108596	IDFC Classic Equity Fund-Regular Plan-Growth	3.74	28	1.64	28	0.16	28
31	102760	HDFC Core and Satellite Fund - GROWTH	4.14	26	1.40	32	0.14	30
32	102948	HDFC Premier Multi-Cap Fund-Growth	4.49	25	1.61	29	0.15	29
33	102414	SBI CONTRA - REGULAR PLAN -GROWTH	-21.64	32	1.59	30	0.07	32

(Source: Author Calculations)

Table No. 1 discloses the values of Treynor, Sharpe and Jensen's Alpha and their ranks according to the best performer. 33 Schemes were chosen for the study for the financial period 2010 – 2015 (followed benchmark is S&P BSE Sensex).

Treynor Index indicates risk adjusted return i.e., excess return over risk free rate per unit of systematic risk means beta. In the above Table No. 1, the first column shows Treynor Index of different mutual fund schemes. Positive (+ve) Treynor Index demonstrates a superior risk adjusted performance of a fund, while a low and negative (-ve) Treynor Index shows an unfavorable risk adjusted the performance of a fund. Higher Treynor Index shown by UTI - MNC Fund (UGS 10000)-Growth Option (14.03) followed by Birla Sun Life India Gennext Fund-Growth Option (11.59), Reliance Equity Opportunities Fund-Growth Plan-Growth Option (9.66), Franklin India High Growth Companies Fund - Growth Plan (9.23) and Franklin India Prima Plus-Growth (8.86). 2 Schemes have negative values indicating that unfavorable risk adjusted returns for the investors. Those Schemes are SBI Magnum Multiplier Fund - REGULAR PLAN -Growth (-34.62) followed by SBI CONTRA - REGULAR PLAN - GROWTH (-21.64).

Sharpe Index indicates reward to variability ratio. It is excess returns over risk free return per unit of risk i.e., per unit of Standard Deviation. Positive values of Sharpe Index designate better performance. It is obvious from Table No. 1, UTI - MNC Fund (UGS 10000)-Growth Option (7.46) followed by ICICI Prudential Value Discovery Fund - Regular Plan - Growth (4.90), ICICI Prudential Exports and Other Services Fund - Regular Plan - Growth (4.88), Birla Sun Life India Gennext Fund-Growth Option (4.81) and Franklin India High Growth Companies Fund - Growth Plan (4.06). No Scheme has negative Sharpe values which mean bad performance and lesser returns from the investment. But top least unfavorable Schemes (low values) are Birla Sun Life Equity Fund - Growth - Regular Plan (0.20) followed by HDFC Core and Satellite Fund - GROWTH (1.40). Positive values indicating all Schemes are a favorable option for investment for current and potential investors.

Jensen's Alpha measures the differential return on securities. It is the regression of excess return of the Scheme (the dependant variable) with an excess return of market (the independent variable). Higher Jensen's Alpha indicates better performance. Higher alpha values from Table No. 1, ICICI Prudential Exports and Other Services Fund - Regular Plan - Growth (1.27), ICICI Prudential Value Discovery Fund - Regular Plan - Growth (0.60), UTI - MNC Fund (UGS 10000)-Growth Option (0.34), Birla Sun Life India Gennext Fund-Growth Option (0.28) and Franklin India High Growth Companies Fund - Growth Plan (0.28) indicating better performer among the selected mutual fund Schemes.

Top least funds (low alpha values) are SBI Magnum Multiplier Fund - REGULAR PLAN - Growth (0.05) and SBI CONTRA - REGULAR PLAN -GROWTH (0.07).

5. CONCLUSION

By observing the above calculations, one can understand that some of the funds have the best ranking based on Risk adjusted performance. Those funds are motioned clearly based on Treynor, Sharpe and Jensen with the followed benchmark S&P BSE Sensex.

	Treynor Index	Sharpe Index	Jensen Index
Favorable Risk Adjusted Performance (2010 – 2015)	UTI - MNC Fund (UGS 10000)- Growth Option (14.03)	UTI - MNC Fund (UGS 10000)- Growth Option (7.46)	ICICI Prudential Exports and Other Services Fund - Regular Plan - Growth (1.27)
Unfavorable Risk Adjusted Performance (2010 – 2015)	SBI Magnum Multiplier Fund - REGULAR PLAN -Growth (-34.62)	Birla Sun Life Equity Fund - Growth - Regular Plan (0.20)	SBI Magnum Multiplier Fund - REGULAR PLAN -Growth (0.05)

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