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Performance Evaluation of Selectivity Skills of Fund Managers in India: An Analysis of Index Funds

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ABSTRACT

The main objective of the study is to evaluate the risk adjusted performance of index mutual fund schemes for the period of recent 9 years starting from April 2008 to March 2017. In this paper, Sharpe Ratio, Treynor Ratio, Jensen Measure and Fama Measures is applied to find out whether sample index mutual fund schemes provide stock selection abilities to provide extra compensation. To serve the purpose, daily Net Asset Value (NAV) of 11 sample index schemes are taken into consideration which are in existence throughout the study period. The result of Sharpe Ratio shows 27.27 per cent of sample schemes and in terms of Treynor Ratio, 72.72 per cent of sample schemes are able to beat the benchmark index. In Jensen Measure, 81.81 per cent of the samples are found to positive and significant reflects the superior stock selection ability during the study period. Fama Measure shows the residual compensation (Net Selectivity) after adjusting return due to diversification from selectivity; only 27.27 per cent of sample schemes are able to provide positive net selectivity.

Keywords- Risk and return, Selectivity, Risk Premium, Risk Free rate of Return and Benchmark Index.

INTRODUCTION

A Mutual Fund is a trust that pools the savings of a number of investors who share a common financial goal. Mutual fund means a fund establish in the forms of trust by a sponsored to raise money by the trustee through the sale of units to the public under one or more scheme for investing in securities in accordance with issue regulation. Investment Company Institute (ICI) defined mutual fund is a financial service organisation that receives money from shareholders, invests it, earns return on it, attempts to make it grow and agrees to pay the shareholders cash on demand for the current value of his investment. Index funds are mutual funds that are designed to track the returns of a market index. An index is a group of securities that represents a particular segment of the market (stock market, bond market, etc.). Index funds will hold almost all of the securities in the same proportion as its respective index. The study attempts to analyze the performance of sample index schemes on daily basis for the most recent 9 years. This study is also compares the performance of index fund schemes with benchmark index during study period. Following are review of main studies related with performance evaluation of mutual fund schemes in Indian and international context.

Ayadi, Chaibi & Kryzanowski (2016) studied that Fund performance is positively related with the asset allocation to Canadian Equity and with whether the fund family's orientation is tilted more to equity or bond funds. Examination of funds in the tails of the performance distribution using the block-bootstrap method suggests that ''good luck" explains the before and after costs outperformance of extreme right-tail funds and no fund possesses truly superior management skills. **Hili, Pace & Grima (2016)** studied that investments in riskier and less efficient markets allow managers to 'beat the market' remains. It new insights on portfolios of the US, European and Emerging Market ('EM') domiciled equity mutual funds. They have taken sample of 137 equity funds over the period January 2004 to December 2014, which are then grouped into equally weighted portfolios according to the scheme's origin. **García, Vidal & Boubaker (2015)** studied the short-term persistence of equity mutual funds around the world between 1990 and 2013. The sample was collected

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from 35 countries. It present that superior performance is a short-lived phenomenon. They employed non-parametric methodology based on contingency tables, and used several statistical tests (the repeat winner, the odds ratio, and the Chi -square) to estimate the significance of the results. **Lemeshko & Rejnus (2015)** focussed on growth of mutual fund (developing country) but the return is abnormal. It shows the less positive correlation between developed country and developing country. The research examined the valuation of emerging markets funds performance and research by modern portfolio theory and theory of capital markets equilibrium. It also revealed that on an average, local equity funds do not generate abnormal returns. **Karthikeyan & Rahmathullah (2015)** aim at find out the factors affecting investment decision on mutual funds and its preference over retail investors. It helps mutual fund companies to identify the areas required for improvement and can also improve their marketing strategies. It helps the Mutual fund companies to create new and innovative product according to the orientation of investors.

Roy (2015) examined the stock selection and timing performance based on conditional as well as traditional performance (UTI). These were measure by Jensen and Treynor & Mazuy techniques to measure the performance of mutual fund 30 UTI securities to evaluate the market timing abilities of sample mutual fund schemes. **Shukla (2015)** studied the 5 categories of mutual fund i.e. mid & small cap, large-cap, multi cap, infrastructure and hybrid. This study analysed the financial performance in terms of risk return relationship of selected mutual fund schemes (5 categories ×3 mutual fund= 15 schemes) through the statistical parameters such as alpha, beta, standard deviation, r-squared, Sharpe ratio. Infrastructure and Mid & Small Cap funds have performed better than the benchmark, large cap and hybrid funds on return parameters. This can be attributed to change in business sentiments and focus on infrastructure which has led to increase in estimated growth prospects for the same. **Breloer, Scholz & Wilken (2014)** studied that impact of index momentum factors on the performance of international and global equity funds. These factors were analysed (i) the risk-adjusted performance, (ii) the performance persistence of funds, and (iii) luck versus skill in the cross-section of funds. They found that country and sector momentum clearly affect the performance of fund portfolios and individual funds. International funds clearly show a lower alpha based on the five-factor model compared to the one- and the three-factor model. It indicates that country and sector momentum factors clearly impact the evaluation of risk-adjusted performance and performance persistence of international fund. **Ashraf & Sharma (2014)** studied the performance of mutual fund on the basis of sample consists of 10 growth oriented- open ended- equity mutual fund schemes. The analysis conducted through risk-return analysis, Coefficient of Variation, Treynor's ratio, Sharp's ratio, Jensen's measure, Fama's measure and Regression analysis. They have taken monthly NAVs and benchmark market index for the period of April 2007 to March 2012. The analysis shows that Indian Asset Management Company has been able to beat their benchmarks during the study period. **Burlakanti & Chiruvoori (2013)** identified risk and returns of equity funds and comparing the same with bench mark returns and to help mutual fund investors in choosing better funds as investment avenues. **Narayanasamy & Rathnamani (2013)** analysed financial performance of selected mutual fund scheme, through the statistical parameters such as (alpha, beta, standard deviation, r-squared, Sharpe ratio).

The present study is different from earlier studies as performance evaluation of index funds are the untouched area specifically in Indian context. It fills the gap in the existing literature as study used the daily net asset value to evaluate the performance of sample index fund for the study period of 2008-09 to 2016-17.The daily frequencies provide accurate result as compare to monthly and yearly frequencies.

Objectives of the study

- To evaluate investment performance of sample index schemes during study period.
- To explore the risk and return characteristics of sample index schemes during study period.
- To compare the performance of sample index schemes with their benchmark index during study period.
- To inspect the stock selection ability of fund manager of sample index schemes in generating the risk adjusted return during study period.

Hypotheses of the study

- The sample index mutual fund schemes are not providing consistent risk adjusted return during the study period.
- The sample index mutual fund schemes are not able to beat the benchmark index during the study period.
- Fund Managers of sample index schemes are not having stock selection ability for generating superior return during study period.

RESEARCH METHODOLOGY

Data and Sources of Study

The study employed the secondary sources of data. For evaluating the performance of sample mutual fund index schemes the historical daily Net Asset Value (NAV) is taken into consideration. The Sample consists of 11 index mutual fund schemes which are in existence for the complete study period starting from April 2008 to March 2017. The study period is taken because it reflects the effect of downtrend due to global financial crisis, recovery and boom phase. The data have been collected from the various websites such as SEBI, AMFI, Value Research India, and respective websites of mutual funds. In order to have a meaningful evaluation, the schemes are comparing with their respected benchmark portfolios. The study consists of sample 11 index mutual fund schemes on the basis of availability of data. The details relating to the sample schemes and their respective benchmark index are given in Table 1.1.

Table 1.1 Descriptions of Sample Mutual Fund Schemes and Benchmark Index

Code	Scheme name	Benchmark Index
A1	Franklin India Index Fund Nifty Plan – Growth	Nifty CNX 50
A2	ICICI Prudential Nifty Index Fund – Growth	Nifty CNX 50
A3	Principal Index Fund – Growth	Nifty CNX 50
A4	HDFC Index Fund - SENSEX Plus Plan	Nifty CNX 50
A5	HDFC Index Fund - Nifty Plan	Nifty CNX 50
A6	Quantum index fund	Nifty CNX 50
A7	SBI Nifty Index Fund - Regular Plan – Growth	Nifty CNX 50
A8	LIC Nomura MF Index Fund - Sensex – Growth	Nifty CNX 50
A9	Birla Sun Life Index Fund – Growth	Nifty CNX 50
A10	LIC Nomura MF Index Fund - Nifty – Growth	Nifty CNX 50
A11	Tata Index Fund – Nifty	Nifty CNX 50

Source: Researcher Compilation

Techniques applied in Research

The various tools and techniques used in research are classified in investment performance measures and statistical techniques. The tools are -

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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.

$$T_P = \frac{R \quad P1}{S \qquad R}$$

$$\text{Fund's } T_P = \frac{R_p - R_f}{\beta_p} \qquad \text{Benchmark's } T_P = \frac{R_m - R_f}{\beta_m{}^3}$$

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:

$$S_P = \frac{R \quad P1}{T\epsilon \quad Ri}$$

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

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-

Differential Return= Portfolio Return- CAPM Return

Or

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

Fama Measures

As discussed earlier risk adjusted performance measures discussed earlier primarily judge the overall performance of a fund. However it is useful to breakdown the performance into the different components of performance. Thus, in addition to using the explicit risk- return trade off measures for performance evaluation of mutual funds, It may also evaluate the portfolio on the basis of decomposition of portfolio performance by using components of investment performance such as proposed by Fama.

Fama (1972) measures breaks down the observed return into four components:

Risk Free Return	R_f
Compensation for Systematic Risk	$\beta(R_m - R_f)$
Compensation for Inadequate Diversification	$(R_m - R_f)\{(\sigma_p/\sigma_m) - \beta)\}$
Net Superior Returns due to Selectivity	$(R_p - R_f) - \{(\sigma_p/\sigma_m)(R_m - R_f)\}$

However, Net selectivity is a more appropriate measure in case of diversified portfolio.

$$F_p = \text{Portfolio Return} - \text{Risk free return} - \text{Returns due to all risks}$$

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

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

Market Beta (β) is always 1.

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ANALYSIS AND INTERPRETATION

The analysis and interpretation of the data related with the hypotheses testing are as follows:

Table 1.2 Risk and Return of Sample Mutual Fund Schemes and Benchmark Index

Code	Rp	S.D.p	Rm	S.D.m	Rf
A1	0.000509	0.014088	0.000521	0.014076	0.00002
A2	0.000533	0.014245	0.000521	0.014076	0.00002
A3	0.000447	0.013893	0.000521	0.014076	0.00002
A4	0.000585	0.013161	0.000521	0.014076	0.00002
A5	0.000503	0.014052	0.000521	0.014076	0.00002
A6	0.000539	0.014168	0.000521	0.014076	0.00002
A7	0.000495	0.014032	0.000521	0.014076	0.00002
A8	0.000470	0.014019	0.000521	0.014076	0.00002
A9	0.000502	0.014234	0.000521	0.014076	0.00002
A10	0.000476	0.013992	0.000521	0.014076	0.00002
A11	0.000495	0.014080	0.000521	0.014076	0.00002
Average	0.000505	0.013997	0.000521	0.014076	0.00002

Source: Researcher Compilation

This table shows the risk and return of sample index schemes and benchmark index along with risk free rate of return during study period. From the table it can be observed that highest return is given by A4 scheme and A3 scheme provides lowest return among all the sample schemes on the basis of daily NAV. All the sample schemes provide positive return during the study period. The return of the market and risk of the market is constant for all the sample schemes and rate of 91 days Treasury bills are taken as risk free rate of return for the study period.

Table 1.3 Risk and Return Matrix

QUADRANT 1 **(Rp>Rm) (σp< σm)** ➢ HDFC Index Fund - SENSEX Plus Plan	**QUADRANT 2** **(Rp>Rm) (σp>σm)** ➢ ICICI Prudential Nifty Index Fund – Growth, ➢ Quantum index fund
QUADRANT 3 **(Rp<Rm) (σp < σm)** ➢ Principal Index Fund – Growth, ➢ HDFC Index Fund - Nifty Plan, ➢ SBI Nifty Index Fund - Regular Plan – Growth, ➢ LIC Nomura MF Index Fund - Sensex – Growth, ➢ LIC Nomura MF Index Fund - Nifty – Growth	**QUADRANT 4** **(Rp<Rm) (σp> σm)** ➢ Franklin India Index Fund Nifty Plan – Growth, ➢ Birla Sun Life Index Fund – Growth, ➢ Tata Index Fund – Nifty

Source: Researcher Compilation

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Risk and Return Matrix provides four quadrants represent the combination of risk and return. In first quadrant, fund return is greater than market return and fund risk is less than the market risk. It consists only one scheme i.e. HDFC Index Fund – Sensex Plus Plan. In second quadrant, fund return and risk both is more than the market risk than return which shows only two schemes i.e. ICICI Prudential NiftyIndex Fund-Growth and Quantum index fund. Third quadrant shows fund return and risk is less than market return and risk. In this quadrant, five sample schemes are lying i.e. Principal Index Fund – Growth, HDFC Index Fund - Nifty Plan, SBI Nifty Index Fund - Regular Plan – Growth, LIC Nomura Mf Index Fund - Sensex – Growth, LIC Nomura Mf Index Fund - Nifty – Growth exist. In last quadrant fund return is less than market return and fund risk is greater than market risk which consists of Franklin India Index Fund Nifty Plan – Growth, Birla Sun Life Index Fund – Growth and Tata Index Fund – Nifty.

Table 1.4 Results of Sharpe, Treynor and Jensen Measure

	Sharpe Ratio		Treynor Ratio		Jensen measure	
Code	**Scheme**	**Market**	**Scheme**	**Market**	**Alpha**	**P value**
A1	0.0346	0.0354	0.0028*	0.0004	0.000	0.000*
A2	0.0358*	0.0354	-0.0001	0.0004	0.000	0.000*
A3	0.0306	0.0354	0.0236*	0.0004	0.000	0.330
A4	0.0427*	0.0354	0.0065*	0.0004	0.001	0.000*
A5	0.0342	0.0354	0.0070*	0.0004	0.000	0.001*
A6	0.0364*	0.0354	0.0056*	0.0004	0.000	0.000*
A7	0.0337	0.0354	0.0230*	0.0004	0.000	0.323
A8	0.0319	0.0354	0.0115*	0.0004	0.000	0.048*
A9	0.0337	0.0354	0.0027*	0.0004	0.000	0.000*
A10	0.0324	0.0354	0.0093*	0.0004	0.000	0.015*
A11	0.0336	0.0354	0.0029*	0.0004	0.000	0.000*

Source: Researcher Compilation

This table reveals the result of Sharpe ratio, Treynor ratio, Sharpe measure and Jensen ratio. The sample schemes are also compared with the bench mark index i.e. NSE CNX50 in order to find out whether sample index schemes are able to beat their benchmark index or not. The Sharpe ratio which is also known as Reward to Variability Ratio revealed risk premium over per unit of unsystematic risk. The excess of Sharpe ratio of sample schemes over Sharpe ratio of market shows the sample schemes outperform the market. In the analysis, 27.27% of schemes are over performed and able to beat the benchmark index i.e. ICICI Prudential Nifty Index Fund – Growth, HDFC Index Fund - SENSEX plus Plan, Quantum index fund. Treynor ratio which is also called as Reward to volatility ratio shows risk premium per unit of systematic risk. It is found that 9 scheme out of all sample scheme over performed the benchmark performance i.e.81.81% of scheme are able to beat the market. These funds are Franklin India Index Fund Nifty Plan – Growth, Principal Index Fund – Growth, HDFC Index Fund - SENSEX plus Plan, HDFC Index Fund - Nifty Plan, Quantum index fund, SBI Nifty Index Fund - Regular Plan – Growth, LIC Nomura MF Index Fund - Sensex – Growth, Birla Sun Life Index Fund – Growth, LIC Nomura MF Index Fund - Nifty – Growth, Tata Index Fund – Nifty.

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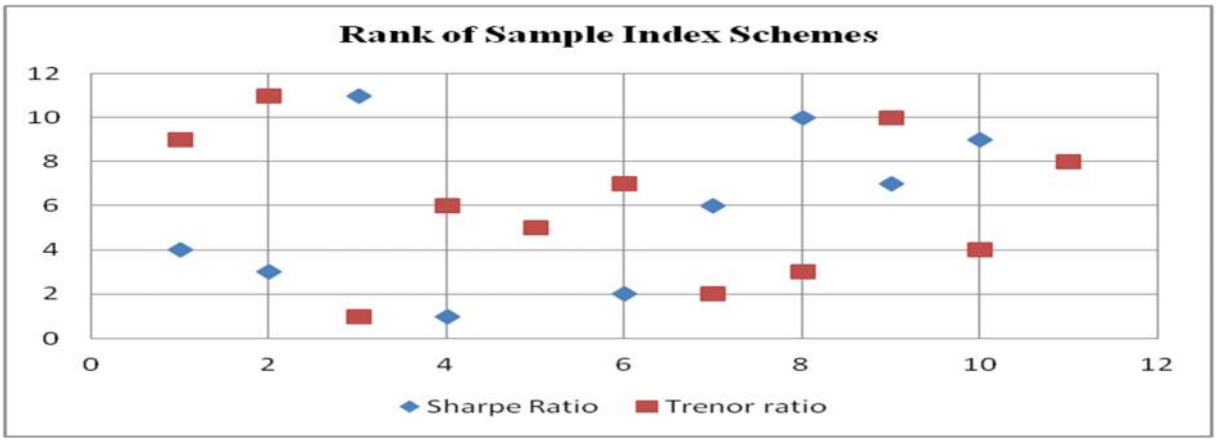
Figure-1 Rank of Sample Index Mutual fund Schemes



Source: Researcher's own Compilation

Jensen index is used to measure the risk adjusted performance of a portfolio in a relation to expected market return which is based on the capital assets pricing model (CAPM). It is the difference between Fund Return and CAPM Return represented by the symbol alpha. A positive and significant value shows the stock selection ability of the schemes in order to generate superior return. In this table all scheme shows provide positive return but 9 schemes (81.81 per cent) are found to be significant which reflect the higher stock selection ability of the schemes.

Table 1.5 Result of Fama Measure

Code	Risk Premium ß(Rm-Rf)	Diversification (Rm-Rf){(σp/σm)-ß}	Net Selectivity (Rp-Rf)-{(σp/σm)(Rm-Rf)}
A1	0.000088	0.000411	-0.000012
A2	-0.001499	0.002004	0.000006
A3	0.000011	0.000482	-0.000067
A4	0.000038	0.000428	0.000097
A5	0.000035	0.000463	-0.000016
A6	0.000044	0.000458	0.000015
A7	0.000011	0.000486	-0.000024
A8	0.000022	0.000475	-0.000049
A9	0.000091	0.000414	-0.000024
A10	0.000027	0.000469	-0.000042
A11	0.000084	0.000415	-0.000025

Source: Researcher Compilation

Fama Measure (1972) evaluate the performance of portfolio and develop the component of investment performance i.e. risk premium, diversification and Selectivity. The extra return available due to risk-taking attitude of fund manager is reflected by positive risk premium where as additional return available to fund manager due to diversifiable risk is shown by diversification. The Net Selectivity is the difference of selectivity and diversification which accounts for residual return. This table reveals that only one scheme shows the negative value in terms of risk premium and rest of the sample schemes shows the extra compensation due to diversification and risk taking attitude of fund managers. The net selectivity for 8 schemes (72.72 per cent) have shown negative return and the rest 3 scheme (27.28 per cent) have reported positive net selectivity indicating inferior stock selection of abilities of the fund managers in terms of Fama Measure.

CONCLUSION

In this paper, risk adjusted performance and selectivity abilities of Indian mutual fund schemes are examined with the help of performance evaluation models such as Sharpe Ratio, Treynor Ratio, Jensen Measure and Fama Measure with a sample size of 11 index mutual fund schemes. The daily Net Asset Value is taken to evaluate the performance of sample index schemes for the study period of 2008-09 to 2016-17. The analysis shows the mixed performance, result of Treynor Ratio reveals that 72.72 per cent of sample index schemes reflect the superior performance of during the study period whereas merely 27.27 per cent in case of Sharpe Ratio. The result of Jensen Measure supports the hypothesis that index mutual schemes generate superior return due to stock selection abilities as 81.81 per cent of sample index schemes shows the positive and significant value. The result of the Fama Measure reveals only 27.27 per cent of the sample index schemes shows the positive net selectivity after adjusting extra compensation due to diversification over a period of 2008-09 to 2017-18.

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