Index Funds: An Emerging Mutual Fund Investment Scheme

R. K. Sudhamathi

Abstract: ***Financial market is back bone of any economy. Innovation in financial instruments has given rise to mutual funds. Mutual funds are novel financial service which emerged in India during the year 1964. As mutual funds are professionally managed it is expected to give good return and also gives advantage of liquidity and diversification. Indian mutual fund industry has undergone a radical change and has grown by leaps and bounds in terms of products and asset under management. Right now Indian mutual industry is managing Rs. 16.5 Lakh Crore of funds. It has introduced many products such as income funds, equity funds, balanced funds, money market funds, fund of funds and many others. Out of these funds equity funds constitutes a major proportion. Equity funds are of many types such as sectoral funds, index funds, Equity Linked tax saving schemes, diversified funds etc. Out of these funds index funds is one of the recent origin which offers the primary advantage of earning the return equal to stock market. Index funds will follow a passive investment strategy where investment under these funds will replicate the movements of benchmark indices like Nifty, Sensex etc. Index funds are of wide range offered by many asset management companies. Identifying right schemes will benefit the investor by providing superior return. Thus in this study an attempt is made to analyse the performance of index mutual fund schemes listed in National Stock exchange. The study has taken 3 years data pertained to index mutual fund schemes to understand about its performance, risk etc. According to present study out of 13 mutual fund schemes 7 have returns higher than the nifty index. The study result based on three years data show the top three funds are HDFC Index Fund Nifty Plan, IDFC Nifty Fund Growth and UTI Nifty Index Fund – Growth. The bottom three funds are SBI Nifty Index, LIC Index Fund- Nifty- Growth, and IDBI Nifty Index Fund.***

Keywords: Mutual Funds, Index funds, Net Asset Value, Tracking error

I. INTRODUCTION

Financial market is back bone of any economy. Innovation in financial instruments has given rise to mutual funds. Mutual funds are novel financial service which emerged in India during the year 1964. As mutual funds are professionally managed it is expected to give good return and also gives advantage of liquidity and diversification. Indian mutual fund industry has undergone a radical change and has grown by leaps and bounds in terms of products and asset under management. Right now Indian mutual industry is managing Rs. 16.5 Lakh Crore of funds. It has introduced many products such as income funds, equity funds, balanced funds, money market funds, fund of funds and many others. Out of these funds equity funds constitutes a major proportion. Equity funds are of many types such as sectoral funds, index funds, Equity Linked tax saving schemes, diversified funds etc. Out of these funds index funds is one of the recent origin which offers the primary advantage of earning the return equal to stock market. Index funds will follow a passive investment strategy where investment under these funds will replicate the movements of benchmark indices like Nifty, Sensex etc. Index funds are of wide range offered by many asset management companies. Identifying right schemes will benefit the investor by providing superior return. Thus in this study an attempt is made to analyse the performance of index mutual fund schemes benchmarked with NSE nifty Index.

Revised Version Manuscript Received on February 27, 2017.

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II. REVIEW OF LITERATURE

Venkataraman, R. and Tilak Venkatesan (2016) evaluated the growth of mutual funds and exchange traded funds in India. The research was based on secondary data, for a period of 5 years from 2010 to 2015. The study recommends the fund houses to implement proactive strategies to reduce tracking error and make ETF's a better alternative for investment.

Musah, A., Senyo, D & Nuhu, E. (2014) studied market timing and selectivity performance of mutual funds in Ghana. The results show that in general mutual fund managers in Ghana are not able to effectively select stocks. All Sample mutual fund managers attain significant negative selectivity co-efficient and also most of them attain insignificant negative timing co-efficient.

Santhi, N S; Gurunathan, K Balanaga (2014) attempted to analyse the performance of growth-oriented ELSS mutual fund schemes. The NAV from 2006-07 to 2011-12 has been considered. The study showed that the average return of the most of the schemes is higher and the average risk is lower than the benchmark S&PCNX Nifty.

A. Objectives of the study:

1. To analyse the risk and return associated with index mutual fund schemes.
2. To measure the risk-adjusted performance of the index mutual fund schemes.
3. To analyse the stock selection ability of the index mutual fund managers.
4. To measure the tracking error of index mutual fund schemes.

III. RESEARCH METHODOLOGY

Research design: Descriptive research design is used for the study

Source of data: Secondary data has been used for study. AMFI website is used to collect the data related to NAV of various index fund schemes. NSE website is used to collect

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the data with regard to NIFTY index value. Daily NAV and NIFTY index value has been used for the study.

Period of study: The period of study is 3 years that is from January 2014 to December 2016.

Target Population

The target population of the study is open ended growth oriented index mutual fund schemes operating in India. There are about 24 actively operating open ended growth oriented mutual fund schemes as on December 2016. (Source: AMFI Monthly).

Funds Selected for the Study

Open-ended growth oriented index mutual funds schemes which has been benchmarked with NIFTY index and which have been performing during the period of study (i.e. January 2014- December 2016) and for which the data were available on continuous basis is taken for the study. On the basis of above criteria 13 funds were selected for the study.

Tools used for analysis

Fund Return:

The returns for the various mutual funds selected for the study is computed on the basis of the Net Asset Value (NAV) of the schemes using the formulae (S.Kevin, 2011).

$$R_p = \frac{NAVt - NAVt-1}{NAVt-1}$$

Where

R_p = Return on the fund
NAV_t=Net asset value for the time period t.
NAV_{t-1}=Net asset value for the time period t-1.
R_i= Mean return of fund
N= Total number of time period studied

Market Return:

Nifty index return is calculated by using the formulae (Khatri, 2008):

$$R_m = \frac{Mt - Mt-1}{Mt-1}$$

Where

R_m= Return on the Market
M_t = Market index value for the time period t.
M_{t-1}=Market index values for the time period t-1.

Annualized return:

An annualized total return is the geometric average amount of money earned by an investment each year over a given time period. For the present study annualised return is calculated by using excel function.

Standard deviation:

Standard deviation measures the variation in individual return from average return over a certain period of time. This helps in understanding the risk associated with the fund. This is calculated by using MS excel standard deviation function.

Beta:

Beta co-efficient compares the variability of fund's return to the market as a whole. It is a relative measure. By convention, the market will have beta 1.0. If the funds have beta value above the market then it is said to have higher risk than the market. If the beta value is less than the market then it is said to have less risk than the market. The beta is calculated by using the following formula (S.Kevin, 2011):

$$\text{Beta} = \frac{(\gamma_{im})(\sigma_m)(\sigma_m)}{(\sigma_m)^2}$$

γ_{im} = Correlation co-efficient between the returns of the fund and the returns of the market index.
σ_i = Standard deviation of returns of funds
σ_m = Standard deviation of returns of the market index
$(\sigma_m)^2$ = Variance of the market returns

Co-efficient of correlation:

Co-efficient of correlation allows in interpreting the extent of association of fund return with the market return. It is calculated by using MS excel correlation function.

Risk- Adjusted Performance Measure:

(i) Sharpe ratio: It is the ratio of excess return to risk as measured by the standard deviation of funds. The higher the ratio the better is the performance of the fund. The formula for calculating Sharpe ratio may be stated as (S.Kevin, 2011):

$$S_p = \frac{Ri - Rf}{\sigma p}$$

Where

S_p=Sharpe ratio for the fund
R_i = Average return on fund
σ_p = Standard deviation of return on fund
R_f = Return on risk free asset.

(ii) **Treynor Ratio:** It is the ratio of excess return to risk as measured by Beta of funds. The higher the ratio the better is the performance of the fund. The formula for calculating Treynor ratio may be stated as (S.Kevin, 2011) :

$$T_p = \frac{Ri - Rf}{\beta p}$$

Where

T_p=Treynor ratio for fund
R_i = Average return on fund
R_f = Risk-free rate
β_p = beta of portfolio

Stock selection ability of Mutual fund Mangers:

Jensen Measure: Jensen measure attempts to measure the differential return between the actual return earned on a portfolio and the return expected from the portfolio given its level of risk. The differential return is calculated as follows (S.Kevin, 2011):

$\alpha_p = R_p - E(R_p)$
$E(R_p) = R_f + \beta_p(R_m - R_f)$
Where,
α_p= Differential return earned
R_p= Actual return earned on the portfolio.
$E(R_p)$ = Expected portfolio return.
R_f= Risk-free return
β_p = beta of portfolio
R_m = Market return

If α_p has a positive value, it indicates that superior return has been earned due to superior management skills. When $\alpha_p = 0$, it indicates neutral performance. A negative value of α_p indicates that the portfolio's performance has been worse than that of the market. To rank the funds according to Jensen performance measure the

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formula α_p / β_p is used. The higher the ratio the better is the performance.

Risk-free rate of return (Rf)

In this study, post office time deposit rate of 1 year i.e. is 6.00% per annum is chosen as risk-free rate.

Tracking Error

Tracking error is defined as the annualised standard deviation of the difference in returns between the Index fund and its target Index. Lower the tracking error, closer are the returns of the fund to that of the target Index.

Steps for calculating tracking error:

Obtain the NAV values and the Target Index values for each day of the total time period required. Calculate the percentage change in the NAV and Target Index for each day over its previous day

$$\text{Percentage change in NAV} = \frac{NAV \text{ as on day } (t) - NAV \text{ as on day } (t-1)}{NAV \text{ as on day } (t-1)}$$

Calculate the difference between the percentage change in the NAV and the percentage change in the target Index for each day.

Calculate the standard deviation of the difference obtained from day(1) to day(n) in Step 3

Calculate the annualised tracking error as per the formula given below

Annualised tracking error *= Standard deviation obtained (Step 4) *sqrt (250)*

IV. DATA ANALYSIS AND INTERPRETATION:

A. Analysis on the Risk and Return Associated with Index Mutual Fund Schemes

Table 1 shows the analysis of risk and return associated with 13 index mutual fund schemes selected for the study. Annualised return of the index schemes ranges from 14.54% to 12.09%. The standard deviation of the index funds selected for the study shows very minor variation of 0.92 to 0.93. The beta of index funds ranges from 0.34 to 0.46. The correlation between index mutual fund schemes and nifty index ranges from 0.35 to 0.45. The market return based on nifty index is 12.90% with the standard deviation of 0.93. Thus the result shows that out of 13 funds 7 funds have outperformed the market. Based on annualised return top three funds are HDFC Index Fund (Annualised Return = 14.54%),IDFC Nifty Fund (Annualised Return = 14.41%), and UTI Nifty Index Fund (Annualised Return = 14.06 %). Bottom three funds based on annualised return are SBI Nifty Index Fund (Annualised Return = 12.66%), LIC Index Fund- Nifty- Growth (Annualised Return = 12.59%) and IDBI Nifty Index Fund (Annualised Return = 12.09%).

Table 1: Risk and Return Associated with Index Mutual Fund Schemes

S. No.	Name of the scheme	Annualized Return in Percent	Standard Deviation	Beta	Correlation between Index fund and Nifty Index
1	Birla Sunlife Index Fund - Growth	12.85%	0.93	0.44	0.45
2	HDFC Index Fund Nifty Plan - Growth	14.54%	0.92	0.44	0.45
3	Franklin India Index Fund Nifty Plan - Growth	13.92%	0.93	0.44	0.45
4	ICICI Prudential Nifty Index Fund - Growth	13.95%	0.92	0.44	0.45
5	IDFC Nifty Fund - Growth	14.41%	0.93	0.44	0.45
6	IDBI Nifty Index Fund - Growth	12.09%	0.93	0.45	0.45
7	LIC Index Fund - Nifty - Growth	12.59%	0.93	0.34	0.35
8	Principal Index Fund - Nifty - Growth	13.97%	0.93	0.45	0.45
9	Reliance Index Fund - Nifty Plan - Growth	13.05%	0.93	0.45	0.45
10	SBI Nifty Index Fund - Growth	12.66%	0.93	0.45	0.45
11	Tata Index Fund - Nifty	12.78%	0.93	0.46	0.46
12	Tarus Nifty Index Fund - Growth	12.72%	0.92	0.43	0.43
13	UTI Nifty Index Fund - Growth	14.06%	0.93	0.44	0.45
	NIFTY INDEX	**12.90%**	**0.93**		

Source: Computed from NAV of respective funds

Analysis on the Risk-Adjusted Performance Measure

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Table 2: Risk-Adjusted Performance Measure of Index Mutual Fund Schemes

S.No.	Name of the Scheme	Sharpe Measure		Treynor Measure		Total Rank	Composite Rank
		Ratio	Rank	Ratio	Rank		
1	Birla Sunlife Index Fund - Growth	10.05	8	21.01	13	21	11
2	HDFC Index Fund Nifty Plan - Growth	13.31	1	54.74	2	3	1
3	Franklin India Index Fund Nifty Plan - Growth	12.1	6	52.32	6	12	5
4	ICICI Prudential Nifty Index Fund - Growth	12.18	4	52.64	5	9	4
5	IDFC Nifty Fund - Growth	13.03	2	54.16	3	5	2
6	IDBI Nifty Index Fund - Growth	8.6	13	44.89	12	25	13
7	LIC Index Fund - Nifty - Growth	9.57	12	60.78	1	13	7
8	Principal Index Fund - Nifty - Growth	12.16	5	52.28	7	12	5
9	Reliance Index Fund - Nifty Plan - Growth	10.45	7	48.68	9	16	8
10	SBI Nifty Index Fund - Growth	9.69	11	47.1	10	21	11
11	Tata Index Fund - Nifty	9.9	9	46.58	11	20	10
12	Tarus Nifty Index Fund - Growth	9.85	10	49.36	8	18	9
13	UTI Nifty Index Fund - Growth	12.38	3	52.9	4	7	3

Source: Computed from NAV of respective funds

Table -2 shows the risk-adjusted performance measure of Index mutual fund schemes based on Sharpe and Treynor ratio. Funds were ranked according to Sharpe ratio and Treynor ratio, based on the ratios obtained under two measures separately. Then for the ranks obtained total rank was worked out and again the same was ranked, which was called as composite rank. Accordingly top three funds are HDFC Index Fund Nifty Plan, IDFC Nifty Fund Growth and UTI Nifty Index Fund – Growth. The bottom three funds are Birla Sunlife Index Fund, SBI Nifty Index Fund and IDBI Nifty Index Fund.

Analysis on the Stock Selection Ability of Mutual Fund Managers

Table 3: Stock Selection Ability of Mutual Fund Managers

S. No.	Name of the fund	Jensen Measure		
		Jensen Measure	α/β	Rank
1	Birla Sunlife Index Fund - Growth	5.13	11.55	10
2	HDFC Index Fund Nifty Plan - Growth	8.07	18.21	1
3	Franklin India Index Fund Nifty Plan - Growth	7	15.79	7
4	ICICI Prudential Nifty Index Fund - Growth	7.06	15.99	5
5	IDFC Nifty Fund - Growth	7.86	17.69	2
6	IDBI Nifty Index Fund - Growth	3.78	8.49	13
7	LIC Index Fund - Nifty - Growth	5.61	16.35	4
8	Principal Index Fund - Nifty - Growth	7.11	15.93	6
9	Reliance Index Fund - Nifty Plan - Growth	5.48	12.29	8
10	SBI Nifty Index Fund - Growth	4.79	10.73	12
11	Tata Index Fund - Nifty	4.91	10.78	11
12	Tarus Nifty Index Fund - Growth	4.99	11.72	9
13	UTI Nifty Index Fund - Growth	7.26	16.37	3

Source: Computed from NAV of respective funds

Table 3 shows the stock selection ability of the mutual fund managers according to Jensen alpha. To rank the funds alpha of the fund is divided by its beta. According to the values obtained top 3 funds are HDFC Index Fund Nifty Plan, IDFC Nifty Fund Growth and UTI Nifty Index Fund – Growth. The bottom three funds are Tata Index Fund – Nifty, SBI Nifty Index Fund – Growth and IDBI Nifty Index Fund – Growth.

Analysis on Tracking Error of Index Mutual Fund Schemes

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Table 4: Tracking Error of Index Mutual Fund Schemes

S. No.	Name of the fund	Fund Return	Nifty Index Return	Tracking Error
1	Birla Sunlife Index Fund - Growth	12.85%	12.90%	15.5
2	HDFC Index Fund Nifty Plan - Growth	14.54%	12.90%	15.4
3	Franklin India Index Fund Nifty Plan - Growth	13.92%	12.90%	15.46
4	ICICI Prudential Nifty Index Fund - Growth	13.95%	12.90%	15.43
5	IDFC Nifty Fund - Growth	14.41%	12.90%	15.45
6	IDBI Nifty Index Fund - Growth	12.09%	12.90%	15.49
7	LIC Index Fund - Nifty - Growth	12.59%	12.90%	16.82
8	Principal Index Fund - Nifty - Growth	13.97%	12.90%	15.51
9	Reliance Index Fund - Nifty Plan - Growth	13.05%	12.90%	15.46
10	SBI Nifty Index Fund - Growth	12.66%	12.90%	15.48
11	Tata Index Fund - Nifty	12.78%	12.90%	15.37
12	Tarus Nifty Index Fund - Growth	12.72%	12.90%	15.56
13	UTI Nifty Index Fund - Growth	14.06%	12.90%	15.45

Source: Computed from NAV of respective funds

Table 4 shows tracking error of index mutual fund schemes. Tracking error is the difference between returns of index funds and its target index. Lower the tracking error, closer are the return of the fund to that of the target index. The tracking error of funds ranges from 15.37 to 16.82. The funds with higher return have lower tracking error when compared to funds with lower return.

V. CONCLUSION

Index funds follow a passive investment similar to its target return. Choosing appropriate index funds will sometimes yield better return than the market. According to present study out of 13 mutual fund schemes 7 have returns higher than the nifty index. The study result based on three years data show the top three funds are HDFC Index Fund Nifty Plan, IDFC Nifty Fund Growth and UTI Nifty Index Fund – Growth. The bottom three funds are SBI Nifty Index, LIC Index Fund- Nifty- Growth, and IDBI Nifty Index Fund. Risk adjusted performance measure based on Sharpe and Treynor ratio also shows similar result for top three funds. The bottom 3 funds based on risk adjusted performance measure are Birla Sunlife Index Fund, SBI Nifty Index Fund and IDBI Nifty Index Fund. Stock selection ability of mutual fund managers also shows similar top 3 funds whereas the bottom 3 funds are Tata Index Fund – Nifty, SBI Nifty Index Fund – Growth and IDBI Nifty Index Fund – Growth. The study result also show that funds with higher return has lower tracking error when compared to funds with less return.

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