



PERFORMANCE EVALUATION OF INDEX MUTUAL FUND SCHEME IN INDIA

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Abstract

With passing time Indian mutual fund industry experiencing tremendous growth which was / is cooked by infrastructural development in India and supported by high saving and increasing foreign participation. During the period increasing income and awareness boosted risk taking ability of common investors and mutual fund became the most preferred and safest investment option among all class. After liberalization and globalization of Indian economy, market witness huge crowd towards the option of investing in mutual funds but investment in a particular funds needs a lot of specification like investor's objectives, cost, availability of funds, risk & return factors etc. and thus invite fundamental study for better future and growth. This paper aims to analyze the performance of Index fund through various performance measurement tools like average, standard deviation, Sharpe, Treynor and Jensen's measure. There are 8 scheme are selected for the analysis like HDFC Index fund, Birla sun life index fund, Franklin India index fund, GS CNX 500, ICICI pru index fund, Reliance index fund, TATA index fund, LIC nomura MF index fund. The study reveals that HDFC INDEX fund, GS CNX 500 and ICICI pru index fund are best performing fund in year 2011, 2012 and 2013 respectively. Investor who wants safety of their investment can invest in INDEXED fund because index fund provide same return as provided by the market return.

Key Words: Index Fund, Performance Measurement, Mutual Fund.

1. Introduction

The financial system comprises of financial institutions, instruments and markets that provide an effective payment and credit system that facility the channeling of funds from savers to the investors of the economy. Indian Mutual Funds have emerged as strong financial stability to the financial system. Mutual Funds have opened new vistas to investors and imported much needed liquidity to the system.

Mutual Funds are dynamic financial institutions, which play a crucial role in an economy by mobilizing savings and investing in the capital markets. Therefore, the activities of Mutual Funds have both short and long term impact on the savings and capital market and national economy.

Mutual Funds provide households an option for portfolio diversification and relative risk aversion through collection of funds from the households and makes investments in the stock and the debt market.

Concept of Mutual Fund

An investment vehicle that is made up of a pool of funds collected from many investors for the purpose of investing in securities such as stocks, bonds, money market instruments and similar assets. Mutual funds are operated by money managers, who invest the fund's capital and attempt to produce capital gains and income for the fund's investors. A mutual fund's portfolio is structured and maintained to match the investment objectives stated in its prospectus.

The Securities and Exchange Board of India (Mutual Funds) Regulations, 1996 defines a mutual fund as a 'a fund established in the form of a trust to raise money through the sale of units to the public or a section of the public under one or more schemes for investing in securities, including money market instruments'.

Concept of INDEX Mutual Fund

An **Index fund** is a mutual fund scheme that invests in the securities of the target Index in the same proportion or weightage. Though they are designed to provide returns that closely track the benchmark Index. Index funds carry all the risks normally associated with the type of asset the fund holds. So, when the overall stock market falls, you can expect the price of shares in a stock Index fund to fall, too. In short, an Index fund does not mitigate market risk -- the chance that the overall market for bonds or stocks will decline. Indexing merely ensures that your returns will not stray far from the returns on the Index that the fund mimics.



The underlying assumption of Indexed management is that financial markets are efficient over the long term, making it virtually impossible for active managers to consistently outperform market averages consistently. For this reason, Indexing has become popular with corporate pension fund managers who seek steady returns through a conservative, long term, low-risk investment strategy.

Evolution of IDEX fund

As equity markets in U.S evolved and became more sophisticated, the fund managers found it more and more difficult to outperform the Index net of trading costs, broker commissions, market spreads and taxes. It has been seen that over the last 20 years over 85% of active fund managers have underperformed the S&P 500. To add to that, as the mutual fund industry grew in size, it became difficult to say that a fund manager who had outperformed the Index this year would be able to do the same year after year. Realizing this, it was felt that if it was difficult to beat the Index consistently, one could at least get Index returns.

Thus, many Investment managers purchased stocks in proportion to the Index, either knowingly or simply by default. As a result this process became too known as closet Indexation. Out of this evolved the idea of a passive buy and hold portfolio with a reduced trading cost and with a greater control over the portfolio risk. These factors along with technological advancement formed the foundation for the development of Index funds.

Well Fargo bank pioneered Index funds offering its first product in 1971 with a \$ 6 million contribution from the Samsonite pension fund. The growth in Index funds thereafter has been a natural consequence of increased emphasis on equity investment by institutional investors around the world. However, in the US markets, the growth in Index funds and Index products gained momentum only from 1996.

2. Literature Review

Mayank V. Bhatt and Chetan C. Patel (2008) ^[5] studied the performance comparison of different mutual funds schemes in India through Sharpe index model and concluded that mutual funds are the most popular and safe parameter for an investor to invest.

Kavita Chavali and Shefali Jain (2009) ^[6] evaluated the performance of equity linked savings schemes and concluded that the fund chosen by the investor should match the risk appetite of the investor. Narayan Rao and M. Ravindran evaluated performance of Indian mutual funds in a bear market through relative performance index, risk-return analysis, Treynor ratio, Sharpe ratio, Jensen measure, and Fama's measure. The results of performance measures suggested that most of mutual fund schemes in the sample of 58 were able to satisfy investor's expectations by giving excess returns over expected returns based on both premium for systematic risk and total risk. Mutual Fund as an investment vehicle is capturing the attention of various segments of the society, like academicians, industrialists, financial intermediaries, investors and regulators.

Gupta and Sehgal (1997) ^[8] evaluated mutual fund performance over a four year period, 1992-96. The sample consisted of 80 mutual fund schemes. They concluded that mutual fund industry performed well during the period of study. The performance was evaluated in terms of benchmark comparison, performance from one period to the next and their risk-return characteristics.

Navdeep Aggarwal and Mohit Gupta (2007) ^[9], "performance of Mutual funds in India an empirical study" The study was conducted using CAPM and FAMA French model and concluded that the value addition of the fund depends on certain factors such as excess market returns, size factor, value factor and suggest that returns earned by Mutual funds were actually due to the exposure of these factors only and fund managers did not add any value.

Soumya Guha(2008) ^[10] "performance of Indian equity Mutual funds Vis-a-Vis their style benchmarks" has suggested that in her evaluation of fund managers performance found that Indian equity fund managers have not been able to beat their style benchmarks (William Sharpe ratio) on the average and pointed out the weaknesses of fund managers. Several researchers have tried to study the various factors and their impact on fund's performance.

Rao D. N (2006) ^[11] studied the financial performance of select open-ended equity mutual fund schemes for the period 1st April 2005 - 31st March 2006 pertaining to the two dominant investment styles and tested the hypothesis whether the differences in performance are statistically significant. The analysis indicated that growth plans have generated higher returns



than that of dividend plans but at a higher risk studied classified the 419 open-ended equity mutual fund schemes into six distinct investment styles.

Selvam et.al (2011) ^[12] studied the risk and return relationship of Indian mutual fund schemes. The study found out that out of thirty five sample schemes, eleven showed significant t-values and all other twenty four sample schemes did not prove significant relationship between the risk and return. According to t-alpha values, majority (thirty two) of the sample schemes' returns were not significantly different from their market returns and very few number of sample schemes' returns were significantly different from their market returns during the study period.

3. Need of the Study

Today, more and more private sector and public sector mutual funds are coming into the foray. An average investor is unable to take a decision as where to invest. As household sector's share is much larger in the country's savings it is utmost essential to guide their deployment in the right direction. Thus, there is a need for the present study to bring to light the performance of the mutual funds, which can help the retail investors to make valued judgment in terms of deploying their savings to the capital market through the mutual fund vehicle. With the growing institutionalization, retail investors are gradually keeping out of the primary and secondary market, and looking forward to mutual funds for their investments.

Among the mutual funds, it is expected that debt oriented schemes will continue to dominate the mutual fund industry satisfying the needs of yield, security and liquidity fairly well besides being attractive from the tax point of view. While equity oriented schemes will gain more significance in future, their popularity will depend on the conditions of the stock market and the kind of tax relief accorded to them. Hence, it is of utmost importance to study the performance of INDEX fund of mutual fund industry because it is an alternative of investment in stock market.

Investment objective typically is to achieve approximately the same return as a particular market index. An index fund will attempt to achieve its investment objective primarily by investing in the securities (stocks or bonds) of companies that are included in a selected index. The INDEX fund will be subject to the same general risks as the securities that are contained in the index.

4. Statement of Problem

Mutual fund pools the funds of small investor and invests it in the securities. As the investor do not know in which portfolio the fund manager will invest. Performance such as risk and return associated with each fund type will only affect the investor. Growth of Mutual Funds have posed difficulties to investors in making a selection of suitable schemes since there are more than 1000 schemes, as on December 2010. The issues related to the choice of schemes among the public and private sector funds on the one hand and high risk associated schemes such as equity funds on the other, have become highly important for every investor. As of today, there is a lack of clarity on the extent to which index funds in India are able to accurately track the index.

Much study has been conducted for performance evaluation of various mutual fund schemes like balanced fund, growth scheme, equity fund, open ended and close ended scheme etc. but there was no study conducted considering INDEX mutual fund scheme. Hence the present study has been made to fill this research gap and analyze the performance of INDEX mutual fund scheme.

5. Objective of Study/ Research Objective

1. To evaluate performance of INDEX fund by using Sharpe, Treynor and Jensen's ratio
2. To evaluate the performance of INDEX fund with its benchmark index to give ranking of INDEX fund by their outstanding performance.
3. To evaluate the performance of INDEX fund in term of return & risk.

6. Research Methodology

6.1. Data collection

Secondary data source is used. The study time period is from January 2011 to December 2013. Data about NAV of scheme is collected from website like www.amfiindia.com, www.mutualfundindia.com, www.researchonline.com, www.smctradeonline.com etc. Data regarding market performance is to be collected from NSE, BSE and money control website.

6.2. Scheme Selected



There are 8 scheme are selected for the analysis like HDFC Index fund, Birla sun life index fund, Franklin India index fund, GS CNX 500, ICICI pru index fund, Reliance index fund, TATA index fund, LIC nomura MF index fund.

6.3. Statistical tools

Statistical tool like average, Standard deviation, and covariance is used to calculate risk, return. Percentage etc. performance measurement tool like Sharpe' ratio, Treynor's ratio and Jensen's ratio and Kendall's co efficient of concordance and T - test is used to test the hypothesis

Portfolio Return: It refers to the yield from the scheme. It is calculated on the basis of NAV of the scheme.

$$R_p = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}}$$

Market Return: Market is calculated on the basis of monthly return of benchmark index like CNX Nifty and BSE Sensex.

$$R_m = \frac{\text{Market Index}_t - \text{Market Index}_{t-1}}{\text{Market Index}_{t-1}}$$

Beta reflects how volatile the return from an investment in response to market swings. It measures the impact of the market forces on return expected from funds. Beta is calculated by relating portfolio return with market return using regression analysis.

$$= \frac{(R_p - R_p') (R_m - R_m')}{(R_m - R_m')^2}$$

R_p = Return on portfolio

R_p' = Average Return

R_m = Market index return

R_m' = Average market return

Sharpe's Measure: According to Sharpe, it is the total risk of the fund that the investors are concerned about. So, this measure evaluates mutual funds on the basis of reward per unit of total risk. Symbolically, it can be written as:

$$\text{Sharpe Measure} = \frac{(R_p - R_f)}{\sigma_p}$$

R_p = Return on fund

R_f = Risk free rate of return

σ_p = Standard deviation of fund

Treynor's Measure: This performance measure evaluates funds on the basis of ratio of return generated by the fund over and above risk free rate of return during a given period and systematic risk associated with it (beta). Symbolically, it can be represented as:

$$\text{Treynor's Measure} = \frac{(R_p - R_f)}{\beta}$$

R_p = Return on fund

R_f = Risk free rate of return

β = Beta of portfolio

Jensen's Measure: This measure involves evaluation of the returns that the fund has generated in relation to the returns actually expected out of the fund given the level of its systematic risk. The surplus between the two returns is called Alpha, which measures the performance of a fund compared with the actual returns over the period. Required return of a fund at a given level of risk () can be calculated as:

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

R_p = Return on fund

R_f = risk free rate of return

α = Intercept measuring of the forecasting ability of the manager

β = Systematic risk measure

R_m = Return on Market index



7. Data Analysis and Interpretation - HDFC- INDEX Fund Nifty (G)

Table 1.1

Analysis of Return			
Month/Year	2011	2012	2013
Jan	-10.56	12.06	1.32
Feb	-1.65	2.38	-5.13
Mar	5.56	-0.98	-0.7
Apr	-1.35	-1.4	3.82
May	-2.49	-5.75	0.15
June	1.3	9.43	-1.39
July	-2.49	-0.84	-2.35
Aug	-9.31	0.41	-4.48
Sept	-2.08	8.49	3.47
Oct	9.79	-1.76	9
Nov	-8.21	4.04	-2.04
Dec	-6.45	0.54	1.35
Sum	-27.94	26.62	3.02
Average	-2.3283	2.218333	0.251667
S.D	5.96856	5.305472	3.919116

Table 1.2

Analysis of Beta			
Month/year	2011	2012	2013
Jan	1.00	0.99	0.87
Feb	0.89	0.36	1.02
Mar	0.99	1.05	1.14
Apr	0.98	1.02	0.95
May	0.96	0.97	0.25
June	1.10	1.06	0.9
July	0.60	0.97	0.91
Aug	0.99	0.96	1.02
Sept	0.64	0.99	1.03
Oct	1.00	1.01	0.99
Nov	1.02	0.94	1.01
Dec	1.03	1.02	0.91
Sum	11.20	11.34	11
Average	0.933333	0.945	0.916667
S.D	0.154292	0.187689	0.222847

It can be observed from the table 1.1 that in year 2011 average return earned was -2.33, in year 2012 it was 2.22 and in year 2013 it was 0.25. In year 2011 highest return earned in month of October that is 9.79. In year 2012 highest return earned in month of January (12.06). In year 2013 highest return earned in month of April (3.83).

Table 1.2 shows Beta value which indicate market volatility so highest beta value in indicate highest market risk. It can be observed from the table that in year 2012 (0.95), 2011 (0.93) and 2013 (0.92) market is less volatile.

Birla Sun life Index fund (D):

Table 1.3

Analysis of Return			
Month/Year	2011	2012	2013
Jan	-10.71	12.07	1.18
Feb	-1.69	2.6	-5.16
Mar	5.52	-1.02	-0.53
Apr	-1.76	-1.51	3.66
May	-2.62	-5.78	0.09
June	1.35	9.36	-1.53
July	-2.52	-0.91	-2.24
Aug	-9.32	0.34	-4.48
Sept	-2	8.38	3.43
Oct	9.66	-1.89	9.02
Nov	-8.3	3.96	-2.09
Dec	-6.47	0.45	1.33
Average	-2.405	2.170833	0.223333
S.D	5.96723	5.315992	3.905652

Table 1.4

Analysis of Beta			
Month/Year	2011	2012	2013
Jan	1	1	0.78
Feb	0.94	0.96	1.02
Mar	1	1.05	0.9
Apr	0.64	1.04	0.91
May	1.27	0.97	0.33
June	1.14	1.06	0.97
July	0.43	0.97	0.87
Aug	0.98	0.97	1.01
Sept	1.04	0.98	1.02
Oct	0.99	1.03	1
Nov	1.02	0.92	1.02
Dec	1.01	1.05	0.92
Average	0.955	1	0.895833
S.D	0.21928	0.04492	0.193224

It can be observed from the table that highest return was earned in year 2012 than year 2011 & 2013. In year 2012 average return was 2.17, in year 2011 it was -2.405 and in year 2013 the average return was 0.22.



It can be observed from the table 1.4 that in year 2011 and 2013 market is less volatile because beta value is less than 1. But in the year 2012 beta value was 1 which shows that NAV of Birla sun life index fund move in same direction as that of benchmark index CNX Nifty.

Franklin India Index Fund- NSE Nifty (D):

Table 1.5

Analysis of Return			
Month/year	2011	2012	2013
Jan	-10.6	12.09	1.29
Feb	-1.59	2.55	-5.17
Mar	5.53	-1.05	-0.72
Apr	-1.35	-1.45	3.7
May	-2.35	-5.69	0.21
June	1.37	9.37	-1.4
July	-2.47	-0.86	-2.26
Aug	-9.16	0.38	-4.3
Sept	-1.93	8.51	2.98
Oct	9.64	-1.8	8.82
Nov	-8.06	3.98	-2.21
Dec	-6.42	0.56	1.38
Average	-2.2825	2.215833	0.193333
S.D	5.91619	5.307179	3.828314

Table 1.6

Analysis of Beta			
Month/year	2011	2012	2013
Jan	1.01	1	0.78
Feb	0.91	0.74	1.05
Mar	0.98	1.07	1.41
Apr	0.93	1.04	0.79
May	0.4	0.96	-0.08
June	1.11	1.05	0.98
July	0.7	0.97	0.92
Aug	0.98	0.98	1.01
Sept	0.9	0.99	0.84
Oct	0.98	1.02	0.96
Nov	1	0.91	1.15
Dec	1.03	1.01	0.85
Average	0.91083	0.97833	0.888333
S.D	0.18875	0.08664	0.351486

From the Table 1.5 it can be observed that Franklin India Index Fund earned highest return in the year 2012. The average return earned by the fund in year 2011 was -2.28, in the year 2012 it was 2.22 and in year 2013 return earned by the fund was 0.19. In January 2011 (-10.6), in May-2012 (-5.69), and in February-2013 (-5.17) lowest return earned by fund.

Table 1.6 shows that average beta value in year 2011 was 0.91, in 2012 it was 0.98 and in year 2013 it was 0.89 which was less than 1 so it indicate that fund NAV was less volatile than that of benchmark index CNX Nifty.

GS CNX 500

Table 1.7

Analysis of Return			
Month/Year	2011	2012	2013
Jan	-11	13.2	0.07
Feb	-2.52	3.33	-6.27
Mar	5.23	-0.55	-1.43
Apr	-0.6	-1.72	3.77
May	-1.7	-6.07	-0.17
June	0.44	8.55	-3.05
July	-2.05	-1.12	-3.99
Aug	-9.03	-0.26	-4.04
Sept	-2.26	9.09	3.64
Oct	7.91	-1.71	8.53
Nov	-8.64	4.37	-1.2
Dec	-7.29	1.14	2.18
Average	-2.6258	2.354167	-0.16333
S.D	5.69385	5.55389	4.145441

Table 1.8

Analysis of Beta			
Month/Year	2011	2012	2013
Jan	1.01	0.99	0.7
Feb	0.48	0.92	1
Mar	0.99	1.01	1.04
Apr	0.97	1.02	0.96
May	1.08	0.99	0.05
June	1.12	1.05	0.95
July	1.26	0.95	0.94
Aug	1	0.99	0.98
Sept	1.02	1	0.99
Oct	0.99	1.02	0.99
Nov	1	0.94	1.08
Dec	1.01	1.09	0.96
Average	0.99417	0.9975	0.886667
S.D	0.18093	0.04693	0.279003

From the table 1.7 average return earned in year 2011 was -2.63, in year 2012 it was 2.35 and in the year it was -0.16. So it can be observed that in the year 2012 fund earned high return as compared to 2011 and 2013.

From the table 1.8 it can be said that in year 2011 Fund NAV and market volatility was highly correlated. In year beta was near about 1 so fund move in same direction as that of benchmark index CNX 500. But in year 2013 beta value was 0.89 so it indicates that market was less volatile in year 2013.



ICICI Pru Index Fund

Table 1.9

Analysis of Return			
Month/Year	2011	2012	2013
Jan	-10.68	11.64	1.3
Feb	-1.41	2.48	-5.03
Mar	5.42	-1.04	-0.67
Apr	-1.35	-1.43	3.81
May	-2.3	-5.55	0.15
June	1.27	9.17	-1.44
July	-2.35	-0.84	-2.28
Aug	-8.82	0.46	-4.37
Sept	-1.85	8.13	3.69
Oct	9.51	-1.78	8.99
Nov	-7.91	3.86	-2.17
Dec	-6.21	0.47	1.3
Average	-2.2233	2.130833	0.273333
S.D	5.82427	5.138761	3.911357

Table 1.10

Analysis of Beta			
Month/Year	2011	2012	2013
Jan	1.02	0.96	0.84
Feb	1.07	0.78	1
Mar	0.96	1.04	1.13
Apr	0.87	1.01	0.94
May	0.45	0.93	0.3
June	1.06	1.03	0.94
July	0.47	0.94	0.9
Aug	0.94	0.89	1
Sept	0.96	0.95	1.09
Oct	0.97	0.99	0.99
Nov	0.98	0.89	1.07
Dec	0.99	1.01	0.85
Average	0.895	0.95167	0.920833
S.D	0.21	0.07383	0.215342

Table 1.9 indicate that in the year 2012 the return was 2.13 which was higher than 2011 and 2013. The average return for the year 2011 was -2.22 and average return for the year 2013 was 0.27. In month of October 2011 (9.51), in month of January-2012 (11.64) and in month of October-2013 (8.99) fund earned high return.

It can be also observed from the table 1.10 that market was less volatile in year 2011, 2012 and 2013. So it can be said that fund NAV was less volatile than CNX Nifty index.

Reliance Index Fund (AD)

Table 1.11

Analysis of Return			
Month/Year	2011	2012	2013
Jan	-10.45	10.9	1.54
Feb	-1.41	2.54	-4.54
Mar	5.07	-0.98	-0.4
Apr	-1.46	-0.95	3.36
May	-2.34	-5.69	0.57
June	1.29	9.39	-0.82
July	-2.9	-0.76	-1.03
Aug	-9.12	1.08	-3.6
Sept	-2.14	7.96	2.55
Oct	9.56	-1.65	8.47
Nov	-7.73	4.08	-1.96
Dec	-6.44	0.63	1.31
Average	-2.3392	2.2125	0.454167
SD	5.79412	4.989099	3.448015

Table 1.12

Analysis of Beta			
Month/Year	2011	2012	2013
Jan	0.95	1	0.89
Feb	0.76	0.88	0.99
Mar	0.96	1.02	1.04
Apr	1.02	1.04	0.97
May	0.01	0.94	-0.44
June	1.01	1.02	0.87
July	0.81	0.97	0.95
Aug	1.02	1.01	1.02
Sept	1.51	0.99	0.94
Oct	1	1.01	0.99
Nov	0.99	0.9	1.05
Dec	1.05	1.06	0.93
Average	0.92417	0.98667	0.85
SD	0.34012	0.05483	0.410011

From the above table 1.11, it can be observed that in 2012 average return was high that is 2.21 as compared to 2011 and 2013. There was wide variation in return in year 2011 is observed. From the table 1.12, it can be seen that market volatility was less in year 2013 than was in 2011 and 2012. Average beta value in year 2011, 2012 and 2013 was 0.92, 0.99 and 0.85 respectively.



TATA Index Fund (D)

Table 1.13

Analysis of Return			
Month/Year	2011	2012	2013
Jan	-10.94	10.81	1.43
Feb	-1.2	2.39	-4.77
Mar	5.25	-0.97	-0.5
Apr	-1.5	-0.97	3.33
May	-2.49	-5.92	0.53
June	1.66	9.5	-0.94
July	-2.95	-0.82	-1.14
Aug	-8.81	1.01	-3.59
Sept	-2.32	7.88	2.57
Oct	9.5	-1.77	8.39
Nov	-7.88	4.01	-2.04
Dec	-6.31	0.55	1.13
Average	-2.3325	2.141667	0.366667
SD	5.86567	5.027271	3.468181

Table 1.14

Analysis of Beta			
Month/Year	2011	2012	2013
Jan	1.01	1	0.87
Feb	0.93	0.67	1.02
Mar	0.98	0.99	1.05
Apr	0.97	1.03	0.99
May	0.57	0.96	-0.62
June	1.11	1.04	0.89
July	0.9	0.97	0.96
Aug	0.98	1.01	0.99
Sept	0.09	0.99	0.99
Oct	0.99	1.03	1
Nov	1.02	0.9	1.05
Dec	1.02	1.07	0.84
Average	0.88083	0.97167	0.835833
SD	0.2816	0.10461	0.463474

From the above table it can be observed that average return in 2011, 2012 and 2013 was -2.33, 2.14 and 0.37 respectively. In 2012 return was high than was in 2011 and 2013. It can be also seen from the beta table that average beta value was 0.88, 0.97 and 0.83 in 2011, 2012 and 2013 respectively. So it can be said that market is less volatile in all the three year.

LIC Nomura MF Index Fund:

Table 1.15

Analysis of Return			
Month/Year	2011	2012	2013
Jan	-10.32	11.1	1.54
Feb	-1.34	2.38	-4.71
Mar	5.16	-0.79	-0.33
Apr	-1.37	-1.43	3.25
May	-2.36	-5.21	0.59
June	1.46	8.56	-1.21
July	-2.78	-7.5	-1.14
Aug	-8.79	0.6	-2.8
Sept	-2.19	7.96	2.64
Oct	8.66	-1.67	7.69
Nov	-7.42	4.09	-1.49
Dec	-6.13	0.46	1.16
Average	-2.285	1.545833	0.4325
SD	5.55358	5.583955	3.213687

Table 1.16

Analysis of Beta			
Month/Year	2011	2012	2013
Jan	0.94	1.1	0.91
Feb	0.77	2.23	1.02
Mar	0.96	0.74	0.93
Apr	1.06	0.98	0.94
May	0.27	0.81	-0.6
June	1.04	0.99	1.12
July	0.72	2.96	1.01
Aug	0.98	0.84	0.81
Sept	0.72	1.1	0.99
Oct	0.92	0.84	0.9
Nov	0.94	1.23	0.84
Dec	0.98	0.73	0.79
Average	0.86	1.212	0.81
SD	0.21804	0.68183	0.452378

From the above table it is shown that in year 2012 return was higher than 2011 and 2013. In 2012 return was 1.55 while in 2011 and 2013 it was -2.29 and 0.43 respectively. It is also observed that market is highly volatile in 2012. In this year fund NAV respond more than market movement. Average beta value in all the three year was 0.86, 1.21 and 0.81 respectively.



Rank Analysis for 2011											
SR.No	SCHEME NAME	Rp	Rm	SDp	Beta	Sharpe (P)	Rank	Treynor	Rank	Jensen	Rank
1	HDFC Index Fund (D)	- 2.33	- 2.31	5.97	1	-1.814	1	-10.83	1.5	-0.02	2
2	Birla sun life Index fund (D)	- 2.41	- 2.31	5.97	1	-1.827	3	-10.91	4	-0.1	4
3	Franklin India Index fund	- 2.28	- 2.31	5.92	0.99	-1.821	2	-10.889	3	-0.078	3
4	GS CNX 500	- 2.63	- 2.63	5.69	0.99	-1.956	8	-11.242	7	-0.111	5
5	ICICI pru Index fund	- 2.22	- 2.31	5.82	0.98	-1.842	4	-10.939	5	-0.126	6
6	Reliance Index fund (AD)	- 2.34	- 2.32	5.79	0.99	-1.872	6	-10.949	6	-0.128	7
7	TATA Index fund	- 2.33	- 2.32	5.87	1	-1.845	5	-10.83	1.5	-0.01	1
8	LIC Nomura MF Index fund	- 2.29	- 2.32	5.55	0.94	-1.944	7	-11.479	8	-0.619	8

Table 1.17

The problems in global economy was seen as a major reason for the downside in 2011 also, but concerns about domestic economic growth, a perceived notion of policy paralysis and slowdown in corporate sector added to the concerns towards the year-end. So there is negative impact of recession on both portfolio return and market return during the year 2011.

According to Sharpe's measure HDFC Index Fund (D) is given 1st rank, Franklin India Index Fund-2nd rank, Birla Sun life Index Fund-3rd rank, ICICI pru Index Fund -4th rank, TATA Index Fund-5th rank, Reliance Index Fund- 6th rank, LIC Nomura MF Index Fund- 7th rank and GS CNX 500- 8th rank.

According to Treynor's measure performance of HDFC Index Fund and TATA Index Fund are same. Franklin India Index Fund- 3rd rank, Birla Sun life Index Fund- 4th rank, ICICI pru Index Fund- 5th rank, Reliance Index Fund- 6th rank, GS CNX 500- 7th rank, LIC Nomura MF Index Fund- 8th rank is assigned.

According to Jensen's measure 1st rank is given to TATA Index Fund, HDFC Index fund- 2nd rank, Franklin India Index Fund- 3rd rank, Birla Sun life Index Fund- 4th rank, GS CNX 500- 5th rank, Reliance Index Fund- 7th rank and LIC Nomura MF Index Fund- 8th rank is given.

Rank correlation (2011):

Rank correlation between Sharpe & Treynor	0.7917
Rank correlation between Sharpe & Jensen	0.5952
Rank correlation between Treynor & Jensen	0.9226

Here Spearman's rank correlation is used to measure correlation between Sharpe, Treynor and Jensen's measure. Here correlation between Sharpe and Treynor is 0.7917 indicate high correlation. And correlation between Treynor & Jensen is 0.9226 which again indicate that there is strong correlation while there is low correlation between Sharpe & Jensen (0.5952). We can observe from the data that rank assigned by Treynor and Jensen are highly correlated with each other than Sharpe & Treynor and Sharpe & Jensen.



Rank Analysis for 2012											
SR.No	SCHEME NAME	Rp	Rm	SDp	Beta	Sharpe (P)	Rank	Treynor	Rank	Jensen	Rank
1	HDFC Index Fund (D)	2.22	2.22	5.31	1	-1.183	2.5	-6.28	2.5	0	2.5
2	Birla sun life Index fund(D)	2.17	2.22	5.32	1	-1.19	4	-6.33	4	-0.05	6
3	Franklin India Index fund	2.22	2.22	5.31	1	-1.183	2.5	-6.28	2.5	0	2.5
4	GS CNX 500	2.35	2.36	5.55	1	-1.108	1	-6.15	1	-0.01	4
5	ICICI pru Index fund	2.13	2.22	5.14	0.97	-1.239	5	-6.567	7	-0.278	7
6	Reliance Index fund (AD)	2.21	2.12	4.99	0.99	-1.261	7	-6.3535	5	0.0262	1
7	TATA Index fund	2.14	2.12	5.02	0.99	-1.267	8	-6.4242	6	-0.043	5
8	LIC Nomura MF Index fund	1.55	2.12	5.58	1.04	-1.246	6	-6.6827	8	-0.314	8

Table 1.18

According to Sharpe's measure GS CNX 500 has achieved 1st rank, HDFC Index Fund and Franklin India index fund achieved same rank, Birla sun life index fund- 4th rank, ICICI pru index fund- 5th rank, LIC Nomura MF index fund- 6th rank, Reliance index fund- 7th rank and TATA index fund has achieved 8th rank.

As per the Treynor's measure GS CNX 500 is given 1st rank, HDFC and Franklin India index fund given same rank for same performance. Birla sun life index fund is given 4th rank, Reliance index fund- 5th rank, TATA index fund- 6th rank, ICICI pru index fund-7th rank and LIC Nomura MF index fund is given 8th rank.

According to Jensen's measure 1st rank is given to Reliance index fund, HDFC and Franklin India index fund is given same rank, GS CNX 500- 4th rank, TATA index fund-5th rank, Birla sun life index fund- 6th rank, ICICI pru index fund- 7th rank and LIC Nomura MF index fund is given 8th rank.

Rank correlation (2012):

Rank correlation between Sharpe & Treynor	0.8096
Rank correlation between Sharpe & Jensen	0.2143
Rank correlation between Treynor & Jensen	0.6429

Rank correlation between the pairs of evolution is found to be positive indicating high degree of positive correlation between the ranks assigned by three measure formulated by Sharpe, Treynor and Jensen. The relationship between Sharpe and Treynor is highest (0.8096) whereas lowest between Sharpe and Jensen (0.2145). It is inferred that in year 2012 there is strong association between standard used by Sharpe to assign rank and standard used by Treynor to assign rank.

Table 1.19

Rank Analysis for 2013											
SR.No	SCHEME NAME	Rp	Rm	SDp	Beta	Shapre	Rank	Treynor	Rank	Jensen	Rank
1	HDFC Index Fund (D)	0.25	0.19	3.92	0.99	-2.105	2	-8.3333	4	-0.023	4
2	Birla sun life Index fund (D)	0.22	0.19	3.91	0.99	-2.118	4	-8.3636	5	-0.053	5
3	Franklin India Index fund	0.19	0.19	3.83	0.96	-2.17	5	-8.6563	6	-0.332	7
4	GS CNX 500	-0.16	-0.14	4.15	0.98	-2.087	1	-8.8367	8	-0.192	6
5	ICICI pru Index fund	0.27	0.19	3.91	0.99	-2.105	3	-8.3131	3	-0.003	1
6	Reliance Index fund (AD)	0.45	0.38	3.45	0.99	-2.333	6	-8.1313	2	-0.011	3
7	TATA Index fund	0.37	0.38	3.47	1	-2.343	7	-8.13	1	-0.01	2
8	LIC Nomura MF Index fund	0.43	0.38	3.21	0.92	-2.514	8	-8.7717	7	-0.599	8



According to Sharpe's measure GS CNX 500 is given 1st rank, HDFC index fund- 2nd rank, ICICI pru index fund- 3rd rank, Birla sun life index fund- 4th rank, Franklin India index fund- 5th rank, Reliance index fund- 6th rank, TATA index fund- 7th rank and LIC Nomura MF index fund is given 8th rank.

According to Treynor's measure TATA index fund got 1st rank, Reliance index fund- 2nd rank, ICIC pru index fund- 3rd rank, HDFC index fund- 4th rank, Birla sun life index fund-5th rank, Franklin India index fund- 6th rank, LIC Nomura MF index fund- 7th rank and GS CNX 500 is given 8th rank.

As per the Jensen measure ICICI pru index fund achieved 1st rank, TATA index fund-2nd rank, Reliance index fund- 3rd rank, HDFC index fund- 4th rank, Birla sun life index fund- 5th rank, GS CNX 500- 6th rank, Franklin India index fund-7th rank and LIC Nomura MF index fund is given 8th rank.

Rank correlation (2013)

Rank correlation between Sharpe & Treynor	-0.2857
Rank correlation between Sharpe & Jensen	0.1419
Rank correlation between Treynor & Jensen	0.8571

In year 2013 it can be observed that relationship between Sharpe & Treynor (-0.2857) was very low because negative rank correlation indicate low degree of association. While relationship between Treynor & Jensen's measure was high because value of rank correlation was 0.8571 which was higher than Sharpe & Jensen's measure of rank correlation. So we can say from the data that there was no association in standard used by Sharpe and Treynor to assign rank.

8. HYPOTHESIS TESTING

- 1) **Hypothesis (H₀):** There is no significant difference between performance measure used by Sharpe, Treynor and Jensen's measure.

Table 1.20

SR.No	SCHEME NAME	2011		2012		2013	
		R	S	R	S	R	S
1	HDFC Index Fund (D)	4.5	81	7.5	36	10	12.25
2	Birla sun life Index fund (D)	11	6.25	14	0.25	14	0.25
3	Franklin India Index fund	8	30.25	7.5	36	18	20.25
4	GS CNX 500	20	42.25	6	56.25	15	2.25
5	ICICI pru Index fund	15	2.25	19	30.25	7	42.25
6	Reliance Index fund (AD)	19	30.25	13	0.25	11	6.25
7	TATA Index fund	7.5	36	19	30.25	10	12.25
8	LIC Nomura MF Index fund	23	90.25	22	72.25	23	90.25
Sum Total		108	318.5	108	261.5	108	186
Average (R_j)		13.5		13.5		13.5	
Kendall's Coefficient (W)		0.8426		0.6931		0.4921	
p value		0.0131		0.04		0.1705	

Here Kendall's coefficient of concordance is used to test the significance of equality of ranks assigned by Sharpe, Treynor and Jensen. The value of Kendall's coefficient of concordance (W) is 0.8426 for year 2011, 0.6931 for year 2012 and 0.4921 for year 2013. The 5% level of significance is used to test the significance. Respective p- value is 0.0131, 0.04 and 0.1705 for the year 2011, 2012 and 2013 which is less than 0.05 so null hypotheses is rejected. So it can be inferred that there is significance difference in standard used by Sharpe, Treynor and Jensen to measure the performance of Index fund.



2) **Hypothesis (H0):** There is no significance difference between average fund return and average market return.

SR.No	SCHEME NAME	2011		2012		2013	
		Rp	Rm	Rp	Rm	Rp	Rm
1	HDFC Index Fund (D)	-2.33	-2.31	2.22	2.22	0.25	0.19
2	Birla sun life Index fund (D)	-2.41	-2.31	2.17	2.22	0.22	0.19
3	Franklin India Index fund	-2.28	-2.31	2.22	2.22	0.19	0.19
4	GS CNX 500	-2.63	-2.63	2.35	2.36	-0.16	-0.14
5	ICICI pru Index fund	-2.22	-2.31	2.13	2.22	0.27	0.19
6	Reliance Index fund (AD)	-2.34	-2.32	2.21	2.12	0.45	0.38
7	TATA Index fund	-2.33	-2.32	2.14	2.12	0.37	0.38
8	LIC Nomura MF Index fund	-2.29	-2.32	1.55	2.12	0.43	0.38
Average		-2.3537	-2.35375	2.12375	2.2	0.2525	0.22
SD		0.12432	0.111732	0.241657	0.081416	0.192632	0.173205
T Cal		1		0.4196		0.7280	
T tab		2.145		2.145		2.145	

Here T – test is used to test the hypothesis that there is no significant difference between average fund return and average market return. In the year 2011, T calculated value is 1. In 2012 calculated value is 0.4196 and in year 2013 calculated value is 0.7280. At 5% level of significance table value is 2.145. So calculated value for all the three year is less than table value so null hypothesis is accepted that means there is no significant difference in fund return and market return.

9. FINDINGS

From the above analysis it can be seen that we have used Sharpe, Treynor and Jensen measure to evaluate the performance of INDEXED fund. So as per this ranking HDFC INDEX fund is best performing fund in year 2011. In year 2012 GS CNX 500 is best performing fund while in year 2013 ICICI pru index fund is best performing fund. It is also analyzed that Treynor's measure and Jensen's measure use for rank analysis is highly correlated. Form the Kendall's coefficient of concordance it is inferred that standard used by Sharpe, Treynor and Jensen are different. T-test is used to know whether there is difference in fund return and market return or not. So from the above analysis it is said that INDEXED fund provide similar return as provided by market return which is ultimate objective of INDEXED fund scheme.

10. CONCLUSION

The study has compared various INDEXED fund scheme. Summary of result is presented in different table. In India, innumerable mutual fund scheme are available to general investor which generally confound them to pick best out of them. This study provides some insights on mutual fund performance so as to assist the common investors in taking the rational investment decisions for allocating their resources in correct mutual fund scheme. The data employed in the study consisted of monthly NAVs for the open-ended schemes. The study utilized benchmark portfolios according to the scheme objective such as BSE Sensex, CNX Nifty, and CNX 500 for all schemes. The performance of sample mutual fund schemes has been evaluated in terms of return and risk analysis, and risk adjusted performance measures such as Sharpe ratio and Treynor ratio. The study reveals that HDFC INDEX fund, GS CNX 500 and ICICI pru index fund are best performing fund in year 2011, 2012 and 2013 respectively. Investor who wants safety of their investment can invest in INDEXED fund because index fund provide same return as provided by the market return.

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