

A COMPARATIVE ANALYSIS: PERFORMANCE EVALUATION OF SBI & LIC MUTUAL FUNDS IN INDIA

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Abstract: The study attempts to evaluate the past performance of selected open ended equity funds. The study is based on the secondary data restricted for a period of 2 years i.e, 1st April 2018 to 31st March 2020. It has been segregated the data based on quarters. The study has done on two mutual fund companies namely, Life insurance Corporation of India, and State bank of India to analyze the performance of selected schemes namely “SBI Equity hybrid fund direct plan growth, LIC Equity hybrid fund direct plan growth. The objective of this research work is to analyze the financial performance of selected open end fund schemes though statistical analyze the statistical parameters like correlation coefficient, beta, Sharpe ratio, Treynor ratio, Information ratio, Sortino ratio. The calculation part of correlation coefficient has been implemented between the quarters of same company, and the same statistical tool has been used to measure the relationship between Nav, & sensex of 4 quarters. In addition to this it has measure the relationship between the same quarters of LIC & SBI.

Keywords: Mutual funds, Performance, Ratios, LIC, SBI.

INTRODUCTION:

Mutual fund is a one such domain in financial instruments where it gives an eye opening to not only researchers but also to the investors. The most important characteristic of mutual fund is it pools money from different investors and invests in various financial instruments such as stocks bonds, short term money market instruments etc. One of the good features in mutual fund is it helps to the investors who are very oblivious in capital markets. Based on their risk appetite they would go for investment in various financial avenues. Especially, the small investors don't have sound knowledge, sufficient time, experience, and more over they don't have resources to help them for accessing the capital markets. They have to take the assistance of intermediary which helps them to achieve their objectives by taking professional expertise.

1) Primary Objective: -

To make comparative performance analysis of Life Insurance Corporation & State Bank of India Mutual fund companies of 4 quarters.

2) Secondary Objectives: -

- i) To know the correlation coefficient of LIC & SBI.
- ii) To know the correlation coefficient of BSE Sensex with LIC & SBI.
- iii) To know the correlation coefficient of LIC & SBI within the quarters respectively.

iv) To know the Sharpe ratio, Treynor ratio, information ratio, beta, risk, return, of LIC & SBI for quarter ended.

NEED AND SIGNIFICANCE OF STUDY: -

As far as this study is concerned It has relied upon with the time bound such as Quarter1, Quarter2, Quarter3, Quarter4 of two companies namely LIC Mutual fund and SBI Mutual fund companies. The two reasons behind segregating the time factor are market is highly volatility due to influence of both external and internal factors. Such as, supply & demand, monetary policy, government policy, inflation, international issues, company profits, company governance. The second reason is the research has done in minimum way to assess the correlation coefficients between the quarters, within the quarters of the same company and comparison of NAVS' of two companies, comparison of NAV and Sensex values quarter ended period. In addition to this implementation of Sharpe ratio, Sortino ratio, information ratio, and Treynor ratio.

LITERATURE REVIEW: -

Literature review on mutual fund performance evaluation is very large. The following are the few literature review regarding to this study.

1. **Mishra, Rehman (2000)** the performance of mutual fund is measured with the help of using lower partial moment risk i.e., downside risk it has measured by considering only those returns which are below a pre-specified target rate like risk free rate.
2. **Ramasamy et al, (2003) agreed** that three parameters in mutual fund performance are consistent historical data (Performance), Size of funds, Cost of transaction have greater impact on the performance.
3. **Panwar et al, (2005)** measured the residual variance (RV) as the measure of mutual fund portfolio diversification. RV has direct impact on sharpe fund performance.
4. **Agrawal (2006)**, An empirical study: The Indian mutual fund industry pricing mechanism on its valuation
5. **Sukhwinder Singh et al (2012)** Measured performance evaluation of selected open ended mutual funds in India. It was examined comparative performance of selected open-ended schemes and the benchmark index is BSE 30. The statistical tools are implemented are reward to variability & volatility, beta

RESEARCH METHDOLOGY: -

1. **Data:** The data has collected from the secondary sources, it includes NAV value has collected from AMFI and BSE Sensex values have collected from bseindia.com. The schemes names are equity hybrid fund direct plan growth in both the companies.
2. **Period of Study:** The period of study has been done for 2 years i.e., 1st April 2018 to 31st March 2020.
3. **Benchmark Index:**
For conducting this study, the BSE index 200 has been chosen as the benchmark index.

TOOLS USED FOR DATA ANALYSIS: -

1. **Sharpe Ratio: -** Sharpe (1966) an index of portfolio performance measure, commonly known as ratio of reward to variability. It is the ratio

of the fund portfolio's average excess return divided by the standard deviation of returns and it is given by: -

$$\text{sharpe ratio} = \frac{R_{rm} - R_f}{\sigma_m}$$

R_{rm}= Mean return on mutual fund portfolio

R_f= Risk free

return

σ_m= Standard deviation of excess return.

1. **Treynor Ratio: -** The ratio measures the relationship between the funds additional return over the risk free and fund volatility measured by β. It also explained as the risk premium earned per unit of risk taken. It is calculated as the mean return of the portfolio in excess of the risk-free return divided by the portfolio beta.

$$\text{Treynor ratio} = \frac{R_{rm} - R_f}{\beta_i}$$

R_{rm} = Mean return on mutual fund portfolio

R_f = Mean risk-free return.

σ = Standard deviation of excess return

2. **Beta:-** Beta is also called systematic risk it represents volatility in the net asset values of the fund. NAV value will be more responsive of a fund with respective to changes in the market fluctuations. Beta is calculated by relating the returns on a mutual fund with the returns in the market. There are 3 criteria are there is β: -

If β>1:- It indicates that the security is more volatile than the market.

If β<1:- It indicates that the security is less volatile than the market.

If β=1: - It indicates that the security moves with the market.

$$\beta_i = \frac{\text{cov } r_i, r_m}{\text{Var}_{r_m}}$$

B_i=market beta of asset i

Cov=Covariance

Var=Variance

R_m=Average expected rate of return on the market.

R_i= Expected return on an asset i

Information ratio: -The information ratio developed by treynor and black, in the year 1973. It assesses the managerial ability skill to produce excess return from a benchmark index. The information ratio which is sometimes called the appraisal ratio. In another words it is defined by the residual return of the portfolio return when compared to its residual risk.

$$\text{Information ratio} = \frac{R_t - B_t}{w}$$

Where

(R_t-B_t) = Difference between fund return and the index return. This is called active return.

R_t= Portfolio return

B_t= Benchmark return.

W= Standard deviation of the active return. This is also called tracking error.

Sortino Ratio: - Sortino ratio is an alteration of the Sharpe ratio, but the Sortino ratio has given much emphasis on downside deviation rather than standard deviation. It concentrates only those returns falling below a user specific target or required rate of return are considered risky. It has drawn attention that even **NOBEL LAUREATE HARRY MARKOWITZ**, when he developed modern portfolio theory in 1959. The derivation of downside deviation has evolved in Henry Markowitz theory, the downside deviation is relevant to measure risk would be more appropriate rather than the standard deviation to the investors.

In the early 1980's Dr. Frank Sortino did the extensive research to come up with an improved measure to risk adjusted return. According to Sortino, V Brian Rom's idea at investment terminologies to call new measure the Sortino ratio. The first reference of this ratio was in financial executive magazine (August 1980) and the first calculation was published in a series of articles in the journal of risk management (September 1981).

$$S=(R-T)/TDD.$$

Where R= the average period return.

T= the target or required rate of return for the investment strategy under consideration.

The Sortino ratio 'S' defined as

$$S=(R-T)/TDD$$

Where, R= the average period return.

T=the target or required rate of return for the investment strategy under consideration.

TDD=the target downside deviation.

Target downside deviation (TDD): -TDD is defined as the root mean square of the deviations of the realized returns under performance of 'O'

$$TDD= \sum_{i=1}^n p_i(0, x)^2$$

Limitation of the study: -

- 1) This paper has confined to open ended schemes namely SBI equity hybrid fund direct plan growth, LIC equity hybrid fund direct plan growth. The secondary data has collected for a period of 2 years.
- 2) Time is too short to conduct the study due to shortage of time only.

DATA PRESENTAION AND ANALYSIS

Table: -1 Correlation Coefficients of LIC & SBI for the year ended 2018-2019

SBI 2018-2019					
LIC 2018-2019	Quarters	Q1	Q2	Q3	Q4
	Q1	0.616			
	Q2		0.705		
	Q3			0.987	
	Q4				0.113

Sources: - Authors compilation.

Table: -2 Correlation Coefficients of LIC & SBI for the year ended 2019-2020

SBI 2019-2020					
LIC 2019-2020	Quarters	Q1	Q2	Q3	Q4
	Q1	-0.505			
	Q2		0.641		
	Q3			0.949	
	Q4				0.997

Sources: - Author compilation.

Table: -3 Correlation Coefficients of SBI Mutual fund for the year ended 2018-2019

Quarters	Q1	Q3
Q2	0.271	
Q4		0.524

Sources: - Author compilation

Table: - 4 Correlation Coefficients of SBI Mutual fund for the year ended 2019-2020

Quarters	Q1	Q3
Q2	-0.079	
Q4		-0.390

Sources: -Author compilation.

Table: -5 Correlation Coefficient of LIC Mutual fund for the year ended 2018-2019

Quarters	Q1	Q3
Q2	-0.480	
Q4		0.417

Sources: - Author compilation.

Table: -6 Correlation Coefficient of LIC Mutual fund for the year ended 2019-2020

Quarters	Q1	Q3
Q2	0.267	
Q4		-0.617

Sources: - Author compilation.

Table: -7 Correlation Coefficient of Sensex and State Bank of India mutual fund for the year ended 2018-2019

SBI 2018-2019					
SENSEX 2018-2019	Quarters	Q1	Q2	Q3	Q4
	Q1	0.510			
	Q2		0.962		
	Q3			0.885	
	Q4				0.931

Sources: - Author compilation.

Table: -8 Correlation Coefficient of Sensex and State Bank of India mutual fund for the year ended 2019-2020

SBI 2019-2020					
SENSEX 2019-2020	Quarters	Q1	Q2	Q3	Q4
	Q1	0.931			
	Q2		0.914		
	Q3			0.969	
	Q4				0.973

Sources:- Author Compilation

Table:-9 Correlation Coefficient of Sensex and LIC Mutual fund for the year ended 2018-2019

LIC 2018-2019					
SENSEX 2018-2019	Quarters	Q1	Q2	Q3	Q4
	Q1	0.535			
	Q2		0.094		
	Q3			-0.624	
	Q4				-0.183

Sources:- Author compilation

Table:-10 Correlation Coefficient of Sensex and LIC Mutual fund For the year ended 2019-2020.

SENSEX 2019-2020	LIC 2019-2020				
	Quarters	Q1	Q2	Q3	Q4
	Q1	-0.247			
	Q2		0.538		
	Q3			-0.824	
	Q4				-0.344

Sources: -Author compilation

Table-11 Calculation of following ratios of SBI for the year ended 2018-2020

Compo nents	State Bank of India 2018-2019				State Bank of India 2019-2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Total return	1.2%	0.2 %	3.3%	4.6%	2.4 %	- 0.1 %	5.0	- 1.0 %
Std dev(daily)	0.4%	0.5 %	0.7%	0.4%	0.6 %	0.8 %	0.4%	2.0 %
Std dev(annualized)	3.3%	4.0 %	5.7%	3.4%	4.6 %	6.2 %	3.4%	15.6 %
No of trading days	64	61	60	62	64	61	60	62
Risk free rate	7.5%	7.5 %	7.5%	7.5%	7.5 %	7.5 %	7.5%	7.5 %
Specific risk-free rate	1.333 %	1.271	1.25	1.292	1.333	1.27	1.25 %	1.29
Beta	0.586	0.685	0.427	0.553	- 0.071	- 0.05	0.1	- 0.006
Sharpe ratio	- 40.05	- 31.96	- 21.335	- 36.202	- 28.67	- 20.41	- 35.55 %	- 14.74
Treynor ratio	- 2.255	- 1.851	- 2.850	- 2.251	18.515	25.53	- 12.04 %	36.26
Sortino ratio	0.586	0.685	0.427	0.553	- 0.026	- 0.036	0.016	- 0.024
Information ratio	197.03%	- 10.4 %	0.018%	-69%	1.1 %	26 %	-3.6%	13%

Sources: - Author Compilation

The table: 11 exhibit the state bank of India mutual fund performance during the period of 2018-2020 quarter wise performance by considering the above financial values. In the year 2018-2019 the

maximum total return of SBI mutual fund performance is 4.6% in Q4 and minimum total return is -0.1% in Q2, in next year 2019-2020 the maximum return is 5 in Q3, and the minimum return is -1.0%. In the year 2018-2019 the maximum standard deviation 0.7% in Q3, the minimum standard deviation is 0.4% in Q1&Q4 respectively. In the next subsequent year, the maximum standard deviation is 2.0% in Q4 and the minimum standard deviation is 0.4% in Q3. Maximum Annualized standard deviation of SBI mutual fund is 15.6% Q4 in the year 2019-2020 and the minimum standard deviation is 3.3% Q1 in 2018-2019. Under the specific risk-free rate, the maximum value is 1.333% Q1 2018-2019 and the same value and the same quarter in the next subsequent year i.e., 2019-2020. And the minimum value is 1.25% in Q3 2018-2019, and the same value is there for next subsequent year i.e., 2019-2020. The highest beta value in the year 2018-2019 is 0.685 in Q2 and the minimum beta value is 0.427 in the next subsequent year 2019-2020 the maximum value is 0.1 in Q3, and the minimum value is -0.071 in Q1. In the year 2018-2019 the maximum Sharpe ratio value is -21.34 in Q3 and the minimum value is -40.05 in Q1 it means each additional unit of risk is taking the investor is losing the value of -21.34 and -40.05 respectively. And the next subsequent year 2019-2020 the minimum value of SBI Mutual fund is -35.55 and the maximum value is -14.74. For each additional unit of risk is taking the value is losing -35.5% and -14.74% respectively. In the year 2018-2019 the maximum treynor ratio is -1.85% and the minimum treynor ratio is -2.85% it means for each unit of undiversifiable risk taken the maximum amount of value is losing with -1.85% and the minimum amount of value is losing -2.85%. in the next consecutive year the maximum value is 36.26% in Q4 and the minimum value is -12.04% in Q3 it means for every additional unit of un diversifiable risk taken the maximum return is 36.26% reciprocal of this is for every additional unit of un diversifiable risk is taken the investor is losing -12.04%. In the year 2018-2019 the maximum sortino ratio is 0.685 in Q2 and the minimum value of sortino ratio is 0.427 Q3. Next year 2019-2020 the maximum sortino ratio is 0.016 in Q3 and the minimum value is -0.036 in Q2. The higher the sortino ratio is better. In the maximum information ratio during the period of study is 197.03% in Q1 and the minimum value is -100.4% Q2 2018-2019, in the next subsequent year 2019-2020 the maximum value is 26% in Q2

and the minimum value is -3.6% in Q3.

Table:-12 Calculation of following ratios of LIC for the year ended 2018-2020

Compo nents	LIC 2018-2019				LIC 2019-2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Total return	1.8%	- 3.0 %	- 1.9%	3.8%	- 3.3 %	- 0.7 %	-5.3%	23%
Std dev(daily)	0.5%	0.6 %	0.8%	0.5%	0.6 %	0.8 %	1.03 %	2.1 %
Std dev(annualized)	3.9%	5.0 %	5.9%	3.7%	4.4 %	6.2 %	8.15 %	16.8 %
No of trading days	64	64	60	62	64	63	62	63
Risk free rate	7.5%	7.5 %	7.5%	7.5%	7.5 %	7.5 %	7.5%	7.5 %
Specific risk-free rate	1.33 %	1.33 %	1.25 %	1.3%	1.33 %	1.31 %	1.3%	1.31 %
Beta	0.112	0.227	0.037	0.034	- 0.065	- 0.12	0.072	0.15
Sharpe ratio	- 33.53	- 27.306	- 21.633	- 35.96	- 30.4	- 21.20	- 0.165	- 6.45
Treynor ratio	- 11.71	0.227 %	- 34.13	- 39.21	21.120	11.04	- 18.69	- 7.155
Sortino ratio	- 0.584	- 0.291	- 0.017	- 0.015	- 0.026	- 0.036	0.016	- 0.024
Information ratio	-84%	- 91.6	7.14 %	47.62%	15.48%-	- 63.52%	- 31.53 %	- 29.05%

Sources:- Authors's compilation.

Results & Discussions:-

The Pearson correlation coefficient r can take a range of values from -1 to +1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association that is as the value of one variable increases so does the value of the other variables. A value less than 0 indicates a negative association. That is as the value of one variable increases the value of the other variable decreases. Tables: -1 summarizes the correlation coefficient results of LIC & SBI 2018-2019 are Q1 =0.61, 0.71,0.98, and 0.11 respectively. Similarly, Table: -2 the correlation coefficient of SBI& LIC 2019-2020 are Q1 = -0.50, 0.64, 0.94, 0.99 respectively.

Table: -3 In order to evaluate and interpret the relationship between one quarter to another quarter

intra correlation coefficient is a good method from the investors' point of view because the correlation coefficient of SBI Mutual fund for the year ended 2018-2019 Q1&Q2 is 0.271 and Q3&Q4 is 0.524 respectively.

The table 4 summarise SBI 2019-2020Q1 & Q2 is -0.079, Q3 & Q4 is -0.390 respectively.

In the similar way Table: 5 summarizes correlation coefficient of LIC mutual fund for the year ended 2018-2019 Q1&Q2 is -0.480 Q3&Q4 0.417 respectively.

Table:-6 projected the values of intra correlation coefficient of LIC Mutual fund for the year ended 2019-2020 Q1 & Q2 0.267, Q3&Q4 -0.617 respectively.

Table: - 7 represented the correlation coefficient values of Sensex & SBI Mutual fund for the year ended 2018-2019 are as follows: - Q1 0.51 0.962,0.88,0.93 respectively. Table: - 8 represents the correlation coefficient of Sensex & SBI Mutual fund for the year ended 2019-2020 are as follows: - Q1=0.93,0.91,0.96,0.97 respectively.

Table: -8 represents the correlation coefficient of Sensex & SBI Mutual fund for the year ended 2019-2020 are as follows:- Q1=0.931,0.914,0.969,0.973 respectively.

Table:-9 represents the correlation coefficient of sensex & LIC 2018-19 are as follows:- Q1:-0.53, 0.09, -0.62,-0.18 respectively.

Table: -10 represents the correlation coefficient of Sensex & LIC 2019-2020 are as follows: - Q1:- 0.24,0.53,-0.824,-0.344 respectively.

Table: -12 it exhibits the LIC Mutual fund performance during the period of 2018-2020 quarter wise performance by considering the above financial values. In the year 2018-2019 the maximum total return of LIC mutual fund performance 3.8% in Q4 and the minimum return -3.0%. In the next year 2019-2020 the maximum return is 23% in Q4 and the minimum return is -5.3%. In the 2018-2019 the maximum standard deviation (daily) is Q3 is 0.8% and the minimum standard deviation is 0.5% in Q4&Q1 respectively. In the year 2018-2019 maximum annualized standard deviation is 5.9% in Q3 and the minimum is 3.7% in Q4 in the consecutive year the highest annualized standard deviation is 16.8% in Q4, and the minimum is 4.4% respectively. Specific risk factor almost same in all the quarters during the period of study. In 2018-2019 the highest beta value is 0.03 in Q3, and the lowest beta value is 0.11 in Q1, in the next year the highest beta value 0.15% in Q4 and the lowest beta

value is -0.12% respectively. The maximum sharpe ratio is -21.63 and the minimum value is -35.9 and the next year i.e., 2019-2020 the maximum value is -0.165 and the minimum value is -30.4 respectively. For each additional unit of risk is taking the maximum value is loosing -21.63 and the minimum value is -35.9. In the next year the maximum value is loosing -0.16 and the minimum value is -30.4. In the 2018-2019 the maximum treynor ratio is 0.227 and the minimum value is -39.21% respectively in the next year the maximum treynor ratio is -18.69 and the minimum value is -21.12. It means for each unit of undiversifiable risk taken the maximum amount of value is gaining 0.227 and the loosing the value is -39.215 in the next consecutive year the maximum value is 21.120 it means for each unit of undiversifiable risk taken the maximum amount of value is gaining is 21.120 in the similar way for each unit of undiversifiable risk taken the amount of value is loosing -18.69. In the year 2018-2019 maximum sortino ratio is -0.015 in Q4 and the minimum sortino ratio is -0.584 in the next year 2019-2020 the maximum sortino ratio is 0.016 in Q3 and the minimum sortino ratio is -0.036 respectively. Higher the ratio better it is. The maximum information ratio during the period of study is 47.62 in Q4 and the minimum value is -91.6 in the next year the maximum value is 15.48 and the minimum value is -63.5% respectively.

Conclusion: It is concluded that correlation coefficient of LIC & SBI during the period of study is positive relation except -0.505 in Q1. During the period of study, the intra correlation coefficient is positive in the year 2018-2019 and negative in the next subsequent year. There is having inversely relationship between the Q1&Q2 of LIC Mutual fund in the year 2018-2019. And direct relationship is there between the Q3&Q4. In the next year 2019-2020 there is having direct relation between Q1&Q2 and the inversely proportionate is there in Q3&Q4 of LIC Mutual fund. During the period of study 2018-2019 correlation coefficient of SBI Mutual fund is direct relationship between the Q1&Q2 and Q3& Q4. In the next subsequent year 2019-2020 inversely relationship between Q1&Q2 and Q3&Q4. Correlation coefficient of LIC Mutual fund for the year ended 2018-2019 is inversely proportionate of Q1& Q2 and directly proportionate of Q3 & Q4. In the next consecutive year first & second quarters are directly proportionate and the next immediate quarters i.e., Q3& Q4 inversely proportionate. Correlation coefficient of sensex and SBI Mutual

fund the two-year periods of all quarters are positively correlated. The two years of correlation coefficient of sensex & LIC mutual fund in the year 2018-2019 are positively correlated of Q1&Q2 and the immediate quarter of the same year is inversely proportionate. In the next consecutive year 2019-2020 Q1, Q3, Q4 are inversely proportionate and directly proportionate is Q2 only. The sharpe, treynor, sortino and information ratios are maximum negative way.

Scope for further research: -

In addition to the time bound factor, it would be better to add Jensen alpha, fama model, M-squared model by comparing with different schemes, with different stock exchanges, broader scope is there to implement and compare.

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