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"COMPARATIVE PERFORMANCE ANALYSIS OF SELECTED MUTUAL FUND SCHEMES IN TAX SAVER CATEGORY"

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ABSTRACT

The performance evaluation of mutual fund schemes is very important area considering the interest of various stakeholders of Mutual fund industry especially the investors. There are 38 mutual fund houses in India which do offer similar mutual fund schemes for investment. Hence it becomes vital for the asset management companies to perform better compared to benchmark as well as other competitors' similar schemes.

This research is aimed at performing detailed analysis of performance of select mutual fund schemes in Tax saver category (growth plan).

This research study will be beneficial for the prospective & existing investors for making informed decision about their future investment decisions. Also, it will help the mutual fund houses especially the asset management companies to compare their performance with benchmark & other competitors so as to take corrective actions in order to attract new investors & retain the existing ones.

The methodology used for this research paper is 'Descriptive & Analytical Research'. This study makes use of various statistical tools like Standard Deviation, Co-Variance, Co-Relation, R-Squared, Beta for achieving its objective. The data is considered for the period of five years i.e. 2015 to 2019.

The benchmark index for comparison of funds' performance is S&P BSE 100.

OBJECTIVES OF THE STUDY:

1. To calculate the various statistical parameters for determining the degree of overall risk in all the select mutual fund schemes
2. To calculate the various statistical parameters for determining the degree of systematic risk in all the select mutual fund schemes
3. To make the peer comparison of the returns of all select mutual fund schemes & the benchmark index.
4. To carry out overall comparative analysis of all select mutual fund schemes with respect to risk & return.

RESEARCH METHODOLOGY

1. Population:

All the Mutual fund schemes in Tax Saver category offered by all the Mutual Fund houses in India. So the population size is 38. (Source: www.valueresearchonline.com)

2. Sample Size:

Overall three mutual fund schemes are taken as sample size

- a. Nippon India Tax Saver (ELSS) Fund
- b. LIC Mutual Fund Tax Plan
- c. HSBC Tax Saver Equity Fund

3. Sample Frame:

The names of all mutual funds schemes in Tax saver category are gathered from the list available on www.valueresearchonline.com which is the sample frame in this research study.

4. Time frame of study:

The data is taken for five years i.e. 2015, 2016, 2017, 2018 & 2019.

5. Sampling Technique:

- a. Simple Random sampling which is a type of Probability Sampling is used for selection of the three mutual fund schemes
- b. It's a well-known fact that "simple random sampling removes bias from the selection process & hence results in representative samples".

6. Sources of data

Following data sources are used for collection of the required data:

1. The factsheets of the select mutual fund schemes available on official website of mutual fund houses.
2. Website www.moneycontrol.com & www.valueresearchonline.com which are very much trusted & commonly used website for gathering the data related to stock market & mutual fund.

7. Tools of Data Analysis

- Standard Deviation
- Variance
- Co – Variance
- Co – Relation
- R – Squared
- Beta of a portfolio

DATA ANALYSIS AND INTERPRETATION

Data Analysis

1) Nippon India Tax Saver (ELSS) Fund - Direct Plan – Growth Option

A. Presentation of the Fund & Benchmark Returns

Table 1: Presentation of fund and Benchmark Returns (Nippon India)

Year	Fund Returns (%)	Benchmark Returns (%)	Fund returns - Benchmark Returns
2015	-2.76	-3.22	-2.06
2016	4.49	3.6	-0.31
2017	47.64	31.08	12.51
2018	-19.69	1.12	-20.75
2019	1.84	9.36	-8.18
Average Return	6.31	8.39	

This table shows that four out of 5 times the fund has underperformed compared to the benchmark index S&P BSE 100 in terms of returns which is not a good sign. Once it outperformed. However the average return of this scheme is considerably less than the benchmark. Overall, prospective investors should not invest in this fund considering the returns provided.

Table 2: Calculation of Standard Deviation of Fund & Benchmark

Year	Fund Returns (X)	DX	DX ²	Benchmark Returns (Y)	DY (Y-Y)	DY ²
2015	-2.76	-9.06	82.16	-3.22	-11.61	134.75
2016	4.49	-1.81	3.29	3.60	-4.79	22.92
2017	47.64	41.34	1708.66	31.08	22.69	514.93
2018	-19.69	-25.99	675.69	1.12	-7.27	52.82
2019	1.84	-4.46	19.93	9.36	0.97	0.94
Total			2489.73			726.37

Calculation for Fund (X):

✓ Average Return = 6.31%

$$\checkmark \quad \text{Variance (V)} = \frac{\sum DX^2}{N-1}$$

$$= 2489.73/4$$

$$= 622.43$$

$$\checkmark \quad \text{Standard Deviation (Fund)} = \sqrt{V}$$

$$= \sqrt{622.43}$$

$$= 24.95$$

Calculation for Benchmark(Y)

$$\checkmark \quad \text{Average Return} = 8.39\%$$

$$\checkmark \quad \text{Variance (V)} = \frac{\sum DY^2}{N-1}$$

$$= 726.37/4$$

$$= 181.59$$

$$\checkmark \quad \text{Standard Deviation (Benchmark)} = \sqrt{V}$$

$$= \sqrt{181.59}$$

$$= 13.48$$

Data Interpretation:

“Standard Deviation is a measure of overall risk of the fund returns. It shows the volatility of returns. Investors ideally prefer lower volatility of returns i.e. lower standard deviation”. Standard Deviation of the Nippon India fund is 24.95 & that for benchmark is 13.48. So overall risk for Nippon India Tax saver fund is much higher compared to the benchmark index i.e. S&P BSE 100.

Calculation of the Co-variance of the fund

Table 3: Calculation of Co-variance of Nippon with Benchmark

Year	Fund (DX)	Benchmark (DY)	(DX*DY)
2015	-9.06	-11.61	105.21
2016	-1.81	-4.79	8.68
2017	41.34	22.69	938.03
2018	-25.99	-7.27	188.90
2019	-4.46	0.97	-4.34
Total			1236.48

$$\begin{aligned} \text{Co- Variance} &= \sum Dx * Dy / N-1 \\ &= 1236.48 / 4 \\ &= 309.12 \end{aligned}$$

Data Interpretation:

A positive Co- Variance means that asset returns move together, while a negative Co- Variance means returns move inversely, Co- variance of the Nippon fund is positive i.e. 309.12. This is a positive sign for the investor if the benchmark gives

positive & high returns.

Calculation of Co Relation of the Fund

Karl Pearson's Coefficient of correlation = $\frac{\sum D_x D_y}{\sqrt{\sum D_x^2 \sum D_y^2}}$

$$= 0.9194$$

Data Interpretation

“Correlation coefficient signifies the magnitude & direction of the relationship between two variables”. The value of 0.9194 indicates that there exists a very high positive correlation between the fund returns & the benchmark returns. Hence in case of positive returns from the benchmark, the fund also is likely to give positive returns & vice versa. So, it's a positive sign for Nippon India Tax saver fund.

Calculation of R – Squared of the fund

$$\begin{aligned} R\text{-Squared} &= [\text{Karl Pearson's Coefficient of Correlation}]^2 \\ &= [0.9194]^2 \\ &= 0.8454 \end{aligned}$$

Data Interpretation:

In investing, R-squared value is an indicator of how much percentage of the variation in fund's returns is explained by the variation in benchmark index return. So, in this case, 84.54% of the variation in funds returns is explained by the variation in benchmark index returns. That means, this fund closely tracks the benchmark index S&P BSE 100.

Calculation of Beta of the Fund

$$\begin{aligned} \text{Beta} &= \frac{R\text{-Squared} * \text{Std. Deviation of Fund}}{\text{Std. Deviation of Benchmark}} \\ &= \frac{0.8454 * 24.95}{13.48} \\ &= 1.57 \end{aligned}$$

Data Interpretation:

“Beta signifies the degree of systematic risk of the fund portfolio i.e. the volatility of returns of the fund returns with respect to the benchmark”. “If the Beta value is 1.2, then it is interpreted that if the benchmark gives a return of 10%, the fund portfolio will give return of 10%*Beta i.e. 10%*1.2 = 12%”. Hence from an investors' point of view, the Beta value should be higher if the market is expected to go up. So, in bullish market, the investors should prefer higher Beta funds & vice versa.

So In case of Nippon India tax saver fund, since Beta is 1.57, the investors should invest in this fund only if the market is likely to go up in near future.

2) LIC MF Tax Plan-Direct Plan Growth Option

A. Presentation of the Fund & Benchmark Returns of the Fund

Table 4: Presentation of fund and Benchmark Returns (LIC MF Tax plan)

Year	Fund Returns (%)	Benchmark Returns (%)	Fund returns - Benchmark Returns
2015	-3.37	-3.22	-0.15
2016	3.35	3.60	-0.25
2017	39.18	31.08	8.10
2018	0.49	1.12	-0.63
2019	13.13	9.36	3.77
Average Return	10.56	8.38	

This table shows that three out of 5 times the fund has underperformed compared to benchmark in terms of returns which is not a good sign. However, the fund has outperformed the benchmark index two times by considerable margin. Prospective investors should prefer investing in this fund considering the overall returns in last five years.

Table 5: Calculation of Standard Deviation of Fund & Benchmark

Year	Fund Returns (X)	DX	DX ²	Benchmark Returns (Y)	DY	DY ²
2015	-3.37	-13.93	193.93	-3.22	-11.61	134.73
2016	3.35	-7.21	51.93	3.60	-4.79	22.92
2017	39.18	28.62	819.33	31.08	22.69	514.96
2018	0.49	-10.07	101.32	1.12	-7.27	52.81
2019	13.13	2.57	6.63	9.36	0.97	0.95
Total			1173.14			726.37

Calculation for Fund (X):

✓ Average Return = 10.56%

✓ Variance (V) = $\frac{\sum DX^2}{N-1}$

N-1

= 1173.14/4

$$= 293.28$$

$$\checkmark \quad \text{Standard Deviation (Fund)} = \sqrt{V}$$

$$= \sqrt{293.28}$$

$$= 17.13$$

Calculation for Benchmark(Y)

Benchmark values as calculated above are as follows:

Average Return = 8.39%

Variance (V) = 181.59

Standard Deviation = 13.48

Data Interpretation:

Standard Deviation value for LIC MF Tax plan is 17.13 & that for benchmark is 13.48. So overall risk for LIC MF Tax plan is little higher compared to the benchmark index i.e. S&P BSE 100.

Calculation of the Co-variance of the fund

Table 6: Calculation of Co-variance of LIC MF with Benchmark

Year	Fund (DX)	Benchmark (DY)	(DX*DY)
2015	-13.93	-11.61	161.64
2016	-7.21	-4.79	34.50
2017	28.62	22.69	649.56
2018	-10.07	-7.27	73.15
2019	2.57	0.97	2.50
Total			921.35

$$\text{Co- Variance} = \sum Dx * Dy / N-1$$

$$= 921.35 / 4$$

$$= 230.34$$

Data Interpretation:

A positive Co-Variance means that fund & benchmark returns move together, while a negative Co- Variance means returns move in opposite direction. Co- variance of LIC MF Tax plan is positive i.e. 230.34. This is a positive sign for the investor if the benchmark gives positive & high returns.

Calculation of Co Relation of the Fund

$$\text{Karl Pearson's Coefficient of correlation} = \frac{\sum Dx Dy}{\sqrt{\sum Dx^2 \sum Dy^2}}$$

$$= 0.9981$$

Data Interpretation

The value of 0.9981 indicates that there exists an extremely high positive correlation between the fund returns & the benchmark returns. Hence in case of positive returns from the benchmark, the fund also is likely to give positive returns

& vice a versa. So it's a positive sign for LIC MF Tax plan.

Calculation of R – Squared of the fund

$$\begin{aligned} R\text{--}Squared &= [\text{Karl Pearson's Coefficient of Correlation}]^2 \\ &= [0.9981]^2 \\ &= 0.9962 \end{aligned}$$

Data Interpretation:

In this case, R squared value is found to be 0.9962. i.e. 99.62% of the variation in funds returns is explained by the variation in benchmark index returns. That means, this fund exactly tracks the benchmark index S&P BSE 100.

Calculation of Beta of the Fund

$$\begin{aligned} \text{Beta} &= \frac{R\text{--}Squared * \text{Std. Deviation of Fund} / 100}{\text{Std. Deviation of Benchmark} / 100} \\ &= \frac{0.9962 * 17.13 / 100}{13.48 / 100} \\ &= 1.27 \end{aligned}$$

Data Interpretation:

In this case, Beta of 1.27 suggests that if the benchmark index gives 10% return, LIC MF Tax plan will give a return of $10\% * 1.27 = 12.7\%$. From an investors' point of view, the Beta value should be higher if the market is expected to go up. So in bullish market, the investors should prefer higher Beta funds & vice a versa.

So In case of LIC MF Tax plan, since Beta is 1.27, the investors should invest in this fund only if the market is likely to go up in near future.

3) HSBC Tax Saver Equity Fund Direct Growth

A. Presentation of the Fund & Benchmark Returns of the Fund

Table 7: Presentation of fund and Benchmark Returns (HSBC Tax Saver Equity fund)

Year	Fund Returns (%)	Benchmark Returns (%)	Fund returns - Benchmark Returns
2015	0.92	-3.22	4.14
2016	6.02	3.60	2.42
2017	43.84	31.08	12.76
2018	-10.53	1.12	-11.65
2019	8.97	9.36	-0.39
Average Return	9.84	8.38	

This table shows that three out of 5 times the fund has outperformed the benchmark index in terms of returns which is a good sign. Two times it underperformed but

overall, the average return of this scheme is little higher compared to benchmark index. So prospective investors should prefer this fund considering the returns provided.

Table 8: Calculation of Standard Deviation of Fund & Benchmark

Year	Fund Returns (X)	DX	DX ²	Benchmark Returns (Y)	DY	DY ²
2015	0.92	-8.92	79.64	-3.22	-11.61	134.73
2016	6.02	-3.82	14.62	3.60	-4.79	22.92
2017	43.84	34.00	1155.73	31.08	22.69	514.96
2018	-10.53	-20.37	415.10	1.12	-7.27	52.81
2019	8.97	-0.87	0.76	9.36	0.97	0.95
Total			1665.85			726.37

Calculation for Fund (X):

✓ Average Return = 9.84%

✓ Variance (V) = $\frac{\sum DX^2}{N-1}$

N-1

= 1665.85/4

= 416.46

✓ Standard Deviation (Fund) = $\sqrt{V}$
= $\sqrt{416.46}$

= 20.41

Calculation for Benchmark(Y)

Benchmark values as calculated above are as follows:

Average Return = 8.39%

Variance (V) = 181.59

Standard Deviation = 13.48

Data Interpretation:

Standard Deviation for HSBC Tax saver equity fund is 20.41 & that for benchmark is 13.48.

So overall risk for HSBC Tax saver equity fund is much higher compared to the benchmark index i.e. S&P BSE 100.

Calculation of the Co-variance of the fund

Table 9: Calculation of Co-variance of HSBC Tax saver equity fund with Benchmark

Year	Fund (DX)	Benchmark (DY)	(DX*DY)
2015	-8.92	-11.61	103.58
2016	-3.82	-4.79	18.31
2017	34.00	22.69	771.46
2018	-20.37	-7.27	148.06
2019	-0.87	0.97	-0.85
Total			1040.57

$$\begin{aligned}
 \text{Co- Variance} &= \sum Dx * Dy / N-1 \\
 &= 1040.57 / 4 \\
 &= 260.14
 \end{aligned}$$

Data Interpretation:

A positive Co-Variance means that fund & benchmark returns move together, while a negative Co- Variance means returns move in opposite direction. Co- variance of HSBC Tax saver equity fund is positive i.e. 260.14. This is a positive sign for the investor if the benchmark gives positive & high returns.

Calculation of Co Relation of the Fund

$$\begin{aligned}
 \text{Co-Relation Coefficient} &= \frac{\sum Dx Dy}{\sqrt{\sum Dx^2 \sum Dy^2}} \\
 &= 0.9459
 \end{aligned}$$

Data Interpretation

The value of 0.9459 indicates that there exists a very high positive correlation between the fund returns & the benchmark returns. Hence in case of positive returns from the benchmark, the fund also is likely to give positive returns & vice a versa. So, it's a positive sign for HSBC Tax saver equity fund.

Calculation of R – Squared of the fund

$$\begin{aligned}
 \text{R –Squared} &= [\text{Karl Pearson's Coefficient of Correlation}]^2 \\
 &= [0.9459]^2 \\
 &= 0.8948
 \end{aligned}$$

Data Interpretation:

In this case, 89.48% of the variation in funds returns is explained by the variation in benchmark index returns. That means, this fund very closely tracks the benchmark index S&P BSE 100.

Calculation of Beta of the Fund

$$\begin{aligned}
 \text{Beta} &= \frac{\text{R-Squared} * \text{Std. Deviation of Fund} / 100}{\text{Std. Deviation of Benchmark} / 100} \\
 &= \frac{0.8948 * 20.41 / 100}{13.48 / 100} \\
 &= 1.36
 \end{aligned}$$

Data Interpretation:

In this case, Beta of 1.36 suggests that if the benchmark index gives 10% return, HSBC Tax saver equity fund will give a return of $10\% * 1.36 = 13.6\%$. From an investors' point of view, the Beta value should be higher if the market is expected to go up. So in bullish market, the investors should prefer higher Beta funds & vice versa.

So In case of HSBC Tax saver equity fund, since Beta is 1.36, the investors should invest in this fund only if the market is likely to go up in near future.

FINDINGS AND CONCLUSION

Findings

Table 10: Summary of data analysis & findings

Statistical Tools	Nippon India Tax saver fund	LIC MF Tax saver fund	HSBC Tax saver Equity fund
Average Return	6.31%	10.56%	9.84%
Standard Deviation	24.95	17.13	20.41
Co – Variance	309.12	230.34	260.14
Co – Relation	0.9194	0.9981	0.9459
R – Squared	0.8454	0.9962	0.8948
Beta	1.57	1.27	1.36

The above table represents the summary of this research. The major findings of this research study are as follows:

1. Maximum return is given by LIC MF Tax saver fund while minimum return is for Nippon India Tax saver fund. Hence considering the returns provided, the investors should give prefer LIC MF Tax saver fund the most.
2. The Standard Deviation is least for LIC MF Tax saver fund & highest for Nippon India. Hence, LIC MF is least risky / volatile & Nippon India is highly risky/volatile.
3. Co-variance is highest for Nippon India & least for LIC MF.
4. Coefficient of correlation is highest for LIC MF & its least for Nippon India.

5. R-squared value is highest for LIC MF & its least for Nippon India
6. Beta is positive for all the select mutual fund schemes. It's highest for Nippon India & least for LIC MF.

Conclusion

From table no. 10 & the findings, we can conclude that, LIC MF has given highest average returns amongst three funds. It has least standard deviation i.e., overall risk which is a good sign for investors, highest value of coefficient of correlation & R-squared signifying its close tracking of the benchmark index which again is a good sign. Also, it has least value of Beta i.e. systematic risk which is again a good sign. It signifies that this fund is least volatile with respect to fluctuations in major parameters of the economy i.e., interest rates, unemployment level, inflation etc. Hence, from the investors' point of view, LIC MF Tax saver plan is the **best bet** amongst the select mutual fund schemes in tax saver category.

HSBC Tax saver equity fund has second best value of average return, std. deviation, co-variance, Karl Pearson's coefficient of correlation, R-squared & Beta value. Hence after LIC MF Tax saver fund, the investors should prefer investing in HSBC Tax saver equity fund.

Nippon India tax saver fund has lot of scope for improvement. It has given least average return & highest value for standard deviation i.e. overall risk for investors. Which is worst case. Coefficient of correlation is least amongst select three funds so also R-squared value. Beta value for this fund is maximum amongst select funds i.e. 1.57 which signifies maximum systematic risk. This is again a bad sign from investors' point of view. So the investors **should avoid investing in this fund**.

Suggestions & Recommendations

From the findings & conclusion the researcher is willing to give following suggestions to the investors:

1. The best fund for investment is definitely LIC MF Tax saver fund as it has maximum average returns & minimum value of overall as well as systematic risk
2. Second best fund for investment is HSBC Tax saver Equity fund as it has given second best average return & its overall as well as systematic risk is second best amongst the select tax saver funds.
3. The investors should avoid investing in Nippon India tax saver fund due to its least average return & maximum overall as well as systematic risk.

From the findings & conclusion the researcher is willing to give following suggestions to

the fund manager / asset management companies of the select mutual fund schemes:

1. The LIC MF tax saver fund has done really well in terms of managing its risk & return. It should continue to do well so as to attract more & more investors in its scheme.
2. HSBC Tax saver equity fund has some scope of improvement in terms of giving higher returns to investors & managing its overall as well as systematic risk.
3. Nippon India Tax saver fund has very high scope of improvement as it has given least average return & maximum volatility in terms of overall as well as

systematic risk. If this performance continues in future as well, the investors will be disappointed & may switch their investment into other tax saver funds.

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