

## A COMPARATIVE STUDY OF PERFORMANCES OF SELECTED MUTUAL FUND

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### **Abstract**

This study has been undertaken to evaluate the performance of the Indian Mutual Funds vis-à-vis the Indian stock market. For the purpose of this study, 21 open ended equity based growth mutual funds were selected as the sample. The data, which is the weekly NAV's of the funds and the closing of the BSE Sensex, were collected for a period of 4 years starting 2017 to 2020. Different statistical tools were used on the data obtained to get the average returns, absolute returns, standard deviation, Fund Beta, R-squared value, residual value, Relative Performance Index were calculated. These variables of the funds were compared with the same variables of the market to assess how the different funds have performed against the market. A Statistical test, Mann Whitney U-Test, was done on the returns of the fund with respect to the Sensex returns. Another U-Test was done taking absolute return as the variable. These U- Test were done to test the hypothesis which was that the fund returns over the period of time are similar to the market returns over the period of time.

### **Introduction**

The mutual fund industry has been in India for a long time. This came into existence in 1963 with the establishment of Unit Trust of India, a joint effort by the Government of India and the Reserve Bank of India. The next two decades from 1986 to 1993 can be termed as the period of public sector funds with entry of new public sector players into the mutual fund industry namely, Life Insurance Corporation of India and General Insurance Corporation of India. The year of 1993 marked the beginning of a new era in the Indian mutual fund industry with the entry of private players like Morgan Stanley, J.P Morgan, and Capital International. This was the first time when the mutual fund regulations came into existence. SEBI (Security Exchange Board of India) was established under which all the mutual funds in India were required to be registered. SEBI was set up as a governing body to protect the interest of investor. By the end of 2008, the number of players in the industry grew enormously with 46 fund houses functioning in the country. With the rise of the mutual fund industry, establishing a mutual fund association became a prerequisite. This is when AMFI (Association of Mutual Funds India) was set up in 1995 as a nonprofit organization. Today AMFI ensures mutual funds function in a professional and healthy manner thereby protecting the interest of the mutual funds as well as its investors. The mutual fund industry is considered as one of the most dominant players in the world economy and is an important constituent of the financial sector and India is no exception. The industry has witnessed startling growth in terms of the products and services offered, returns churned, volumes generated and the

international players who have contributed to this growth. Today the industry offers different schemes ranging from equity and debt to fixed income and money market. Mutual funds are considered as one of the best available investment options as compare to others alternatives. They are very cost efficient and also easy to invest in. The biggest advantage of mutual funds is they provide diversification, by reducing risk & maximizing returns. India is ranked one of the fastest growing economies in the world. Despite this huge progression in the industry, there still lies huge potential and room for growth. India has a saving rate of more than 35% of GDP, with 80% of the population who save. These savings could be channelized in the mutual funds sector as it offers a wide investment option. In addition, focusing on the rapidly growing tier II and tier III cities within India will provide a huge scope for this sector. Further tapping rural markets in India will benefit mutual fund companies from the growth in agriculture and allied sectors.

### **Literature Review:**

Performance evaluation of mutual funds is one of the preferred areas of research where a good amount of study has been carried out. The area of research provides diverse views of the same.

For instance one paper evaluated the performance of Indian Mutual Fund Schemes in a bear market using relative performance index, risk-return analysis, Treynor's ratio, Sharpe's ratio, Jensen's measure, Fama's measure. The study finds that Medium Term Debt Funds were the best performing funds during the bear period of September 98-April 2002 and 58 of 269 open ended mutual funds provided better returns than the overall market returns.

Another paper<sup>1</sup> used Return Based Style Analysis (RBSA) to evaluate equity mutual funds in India using quadratic optimization of an asset class factor model proposed by William Sharpe and analysis of the relative performance of the funds with respect to their style benchmarks. Their study found that the mutual funds generated positive monthly returns on the average, during the study period of January 2000 through June 2005. The ELSS funds lagged the Growth funds or all funds taken together, with respect to returns generated. The mean returns of the growth funds or all funds were not only positive but also significant. The ELSS funds also demonstrated marginally higher volatility (standard deviation) than the Growth funds.

One study<sup>2</sup> identified differences in characteristics of public-sector sponsored & private-sector sponsored mutual funds find the extent of diversification in the portfolio of securities of public-sector sponsored and private-sector sponsored mutual funds and compare the performance of public-sector sponsored and private-sector sponsored mutual funds using traditional investment measures. They primarily use Jensen's alpha, Sharpe information ratio, excess standard deviation adjusted return (eSDAR) and find out that portfolio risk characteristics measured through private-sector Indian sponsored mutual funds seems to have outperformed both Public- sector sponsored and Private-sector foreign sponsored mutual funds and the general linear model of analysis of covariance establishes differences in performance among the three classes of mutual funds in terms of portfolio diversification.

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<sup>1</sup> Prof. Banerjee, Ashok et. Al (2007), "Performance Evaluation of Indian Mutual Funds vis-à-vis their style benchmarks", [www.ssrn.com](http://www.ssrn.com), paper no.962827 and PP.1-18

<sup>2</sup> Panwar, Sharad and Dr. Madhumathi (2006), "Characteristics and performance evaluation of selected mutual funds in India", [www.ssrn.com](http://www.ssrn.com), paper no.876402 and PP. 1-19

Another study<sup>3</sup> examined the risk-adjusted performance of open-end mutual funds which invest mainly in German stocks using Jensen's measure and Sharpe's measure. The study finds out that the rates of return of the mutual funds and the rates of return of the chosen benchmark both must include identical return components. Either both must include dividends or exclude them. The performance estimates are not very sensitive with respect to the benchmark choice. When we look at an investment strategy in which the investment in a specific fund has the same risk as the chosen benchmark, the average underperformance is small when we weight the individual fund returns equally. The average performance is neutral, when we weight the individual fund returns according to fund size, measured by assets under management.

One more paper<sup>4</sup> analyzed whether it was more appropriate to apply a factor-based or a characteristic-based model - both known as benchmarks in portfolio performance measurement using the linear model, asset pricing model and Fama and French factors. The study showed that if information on returns was used and a linear model was proposed that adjusted return to a set of exogenous variables, then the right side of the equation reported the achieved performance and the passive benchmark that replicated the style or risk of the assessed portfolio. While, a factor model utilizes a replicate benchmark with short positions implicitly symmetrical to the long positions. Performance of Russell indexes was analyzed by applying various factor models, constructed from the indexes themselves, and other models that use the indexes directly as benchmarks; the presence of biases was detected. Therefore, according to the empirical findings, selection of exogenous variables that define the replicate benchmark would appear to be more relevant than the type of model applied.

Another study<sup>5</sup> aimed at analyzing performance of select open-ended equity mutual fund using Sharpe Ratio, Hypothesis testing and return based on yield. The most important finding of the study had been that only four Growth plans and one Dividend plan (5 out of the 42 plans studied) could generate higher returns than that of the market which is contrary to the general opinion prevailing in the Indian mutual fund market. Even the Sharpe ratios of Growth plans and the corresponding Dividend plans stand testimony to the relatively better performance of Growth plans. The statistical tests in terms of F-test and t-Test further corroborate the significant performance differences between the Growth plans and Dividend plans.

Another study<sup>6</sup> investigated mutual fund performance using a survivorship bias controlled sample of 506 funds from the 5 most important mutual fund countries using Carhart (1997) 4-factor asset-pricing model. The study revealed a preference of European funds for small and high book-to-market stocks (value). Secondly, it showed that small cap mutual funds as an investment style outperformed their benchmark, even after control for common factors in stock returns. Finally 4 out

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<sup>3</sup> Stehle, Richard and Grewe, Olaf (2001), "Long-Run Performance of German Stock Mutual Funds", [www.ssrn.com](http://www.ssrn.com), paper no.271452 and PP. 1-32

<sup>4</sup> Carlos, Juan (2015), "Portfolio Performance: Factors or Benchmarks?", [www.ssrn.com](http://www.ssrn.com), paper no.760204 and PP. 1-26

<sup>5</sup> Rao, D.N (2016), "Investment styles and Performance of Equity Mutual Funds in India", [www.ssrn.com](http://www.ssrn.com), paper no. 922595 and PP. 1-30

<sup>6</sup> Otten, Rogér and Bams, Dennis, "European Mutual Fund Performance", [www.ssrn.com](http://www.ssrn.com), paper no.213808 and PP. 1-42

of 5 countries delivered positive aggregate alphas, where only UK funds out-performed significantly.

One more study<sup>7</sup> looked at some measures of composite performance that combine risk and return levels into a single value using Treynor's ratio, Sharpe's ratio, Jensen's measure. The study analyzed the performance of 80 mutual funds and based on the analysis of these 80 funds, it was found that none of the mutual funds were fully diversified. This implied there is still some degree of unsystematic risk that one cannot get rid of through diversification. This also led to another conclusion that none of those funds would land on Markowitz's efficient portfolio curve.

Another paper<sup>8</sup> aimed to evaluate if mutual fund managers exhibit persistently superior stock selection skills over a short-horizon of one year using risk-adjusted abnormal returns (RAR), One-factor capital asset pricing model or CAPM three-factor, Fama-French model, Four-factor Carhart model. Their study demonstrated that short-term persistence in equity mutual funds performance does not necessarily imply superior stock selection skills. Common factors in stock returns explained some of the abnormal returns in top ranking mutual fund schemes. Only the winner portfolios sorted on four-factor alphas' provided an annual abnormal return of about 10% on post-formation basis using daily data. The short-term persistence results were much better when daily data was used rather than monthly observations, thus implying that data frequency does affect inferences about fund performance.

### **Research Methodology:**

The study aims at:

1. Comparing the performance of the selected funds vis-a-vis the benchmark index, BSE (Bombay Stock Exchange) Sensex
2. Capturing differences in the performance levels, if any.
3. Ascertaining whether the returns generated by the funds are purely attributable to market movement or individual fund performance.

For the purpose of this study, 21 Funds across 5 fund houses have been selected. On the basis of the highest AUM (assets under management); these 5 fund houses were selected. All the funds were selected by simple random sampling. First the sample size was 30, but because of the non availability of data for 9 funds, only 21 funds were considered for the study. All the funds selected for the study are open-ended equity funds under the growth option. The Net Asset Values (NAV) for all the 21 funds are from 2017 to 2020, which is the period of this study.

Since, all these are equity funds, the BSE Sensex (Bombay Stock Exchange Sensitive Index); which is the oldest, most widely and commonly used benchmark index in India; has been considered as the benchmark index.

The funds which have been evaluated for this study have been randomly selected from the Indian fund houses like Reliance, Birla, UTI, HDFC, and ICICI. The data, which is the weekly NAV's (Net Asset Value), of the selected fund was collected from Reuters.

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<sup>7</sup> Wolasmal, Hewad, "Performance evaluation of mutual funds", published by Econ WPA, paper no. 0509023 and PP. 1-20

<sup>8</sup> Prof. Sehgal, Sanjay and Jhanwar, Manoj (2020), "Short-Term Persistence In Mutual Funds Performance: Evidence From India", [www.ssrn.com](http://www.ssrn.com), paper no.962829 and PP. 1-23

To compare the funds with a market index the BSE Sensex was selected for the only reason that it is India's most widely and commonly used Benchmark index. The weekly NAV's and the Sensex closing were collected over a period of 4 years. The NAV's and the Sensex closing were then divided into 32 periods with 8 weekly NAV's (on an average) in each group.

After this the returns were calculated for both the funds and the BSE Sensex. Once the grouping of weekly NAV's of the funds and the BSE Sensex were done the average return, standard deviation, and absolute returns were calculated both for Fund NAV's and the Sensex closing. These calculations were done for each group for all the 21 funds.

### Data analysis and Interpretation:

#### Returns:

Returns are the yield that an asset generates over a period of time. It is the percentage increase or decrease in the value of the investment over a period of time. In this study the fund returns and the Sensex returns have been calculated for each of the period.

There are 21 funds with a 4 year weekly data, which is divided into 32 periods which effectively gives us 32 betas and 32 average returns for the period. The main purpose of this exercise is to obtain significantly large sample size in order to conduct a non-parametric Mann-Whitney U-Test. The *fund returns* for each of the period were calculated as follows:

$$\frac{\text{Current NAV} - \text{Previous NAV}}{\text{Previous NAV}} \times 100$$

The *BSE Sensex returns* were calculated as follows:

$$\frac{\text{Current Closing} - \text{Previous Closing}}{\text{Previous Closing}} \times 100$$

#### Average Returns:

Average return is the simple average of the returns generated by an asset. In this study daily average return of both the Sensex and the funds were calculated for each of the 32 periods.

*Average returns* of the BSE Sensex returns and the fund's returns have been calculated with this formula:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i = \frac{1}{n} (x_1 + \dots + x_n).$$

Where,  $\bar{x}$  = average return,  $n$  = number of weeks in the period,  $x_1 - x_n$  = return of the corresponding week

In the data collected for the study, the selected mutual funds have given average returns in varying degrees. During late 2017, funds posted average returns in the range of 0.60% - 3.75% while markets in the same period gave average returns of 0.89%. Similar average returns were seen in late 2018 and early 2020 when markets went up significantly. Average returns posted by these funds were in the range of -1.74% to -4.75% while markets had returns of roughly -3%. Beginning of 2021 and onwards faced worse returns to the extent of -7% by funds and similar returns by markets. The average returns of the funds are not significantly different over the period, this has been proved by conducting a Mann Whitney U-test on the average returns of the 21 funds and with

95% confidence we can conclude that the average returns of the funds were not significantly different from the average returns of the BSE Sensex index.

### **Absolute Returns:**

After analyzing the average returns a clear no conclusion could be drawn hence absolute return were calculated to give a clearer indication of the returns generated. Absolute Returns refers to the returns that an asset achieves over a period of time. It measures the percentage appreciation or depreciation in the value of an asset over a certain time frame.

The *absolute returns* of the BSE Sensex returns and the fund returns were calculated as follows:

$$\frac{\text{Return of the last week} - \text{Return of the first week}}{\text{Return of the first week}} \times 100$$

From the analysis, it can be noted that mutual funds have delivered varying returns over different time periods. During the last quarter of 2017, mutual funds delivered impressive returns. On an average the selected mutual funds had returns of approximately 10% whilst markets gave returns of around 6% during the same period. A similar phase was witnessed in mid-2018 where on an average funds gave returns of 13% and markets posted returns on the same lines. During 2019 and 2020 funds gave comparable returns to the previous years but this time around the index outperformed the funds significantly.

The absolute returns of the funds till the end of 2020 was in the range of 10% to 13% and the absolute returns of the BSE Sensex in the same period ranged from 6% to 17%, in the period between 2017 to end of 2020 the funds have managed to outperform the BSE Sensex, however, we observe that in the period between 2017 to end of 2019 the funds have significantly underperformed compared to the BSE Sensex. This study shows the correlation in the absolute returns of the funds and the BSE Sensex and shows us that in the long-run the absolute returns of the fund and index are quite similar.

Hence it can be seen, that on the whole, it can be concluded that in terms of absolute returns, funds have been performing in line with markets. However, the extent of the impact and movement has been lesser or more in relation to markets in certain periods.

### **Standard Deviation:**

Standard Deviation is a tool which measures the variability of the data set. It is the square root of the square of the mean deviations from the arithmetic mean of a data series. It is calculated to measure the riskiness of a fund, stock or portfolio. Higher the standard deviation means higher the risk and higher the returns of the asset and a low standard deviation means that the asset is less risky and will generate less returns. Standard deviation which measures variability and extent of dispersion from data, expresses the volatility of the fund. It mainly indicates the risk associated with the given fund.

From the analysis, it was observed that mutual funds have witnessed high standard deviation in booming markets. During mid 2018 and mid 2019 Standard deviation is in the range of 3% - 9%; which is fairly high compared to the market. The markets in the same period had an average volatility of approximately 2%. This shows that during these periods, funds were more volatile compared to the other time periods. This shows that the risk associated with these funds were much

higher during these periods compared to the market. This also meant that since the mutual funds were having much higher risks and volatility; they were susceptible to high returns also. During this period, standard deviation in the range of 1% - 14 % was seen. The standard deviation of the fund returns were significantly high during the 2017 to 2019 period.

### **Regression:**

The study takes into consideration each beta of the 32 periods of 21 funds, here the average betas of 20 funds is in the range of 0.6 to 0.9 and for one fund the average beta exceeds 1. This shows that there is a significant level of correlation in the returns of the funds as compared to BSE Sensex index and that most the funds have performed as much or near the market performance. Overall it can be concluded that from the data collected for the study, most of the funds are sensitive to the market and have given returns as much as the market has or near the market returns.

### **Relative Performance Index:**

The Relative Performance Index for the sample size has been computed. This is calculated to show how each fund has performed in relation to the market. Here, we take the market index as the BSE Sensex Index.

On the basis of the RPI analysis, we graded the funds as:

Under-performers ( $X \leq 0.7$ ), Par-performers ( $0.8 \leq X \leq 1.1$ ) and Over-performers ( $X > 1.2$ )

Relative Performance Index has been calculated for all the funds. It has been calculated with the following formula: 
$$\frac{(\text{Current NAV} - \text{Beginning Period NAV}) / \text{Beginning Period NAV}}{(\text{Current BSE} - \text{BSE at Beginning Period}) / \text{BSE at Beginning Period}}$$

This is calculated to show how each fund has performed in relation to the market. BSE Sensex has been taken as the market index.

There were a total of 7 funds that gave a return that was lower than the market return over the 4 year period and hence had a RPI of less than 0.7

- There were a total of 3 funds that gave approximately the same return as the market return over the 4 year period.
- The remaining 11 funds gave a return in excess of the market return over the 4 year period and hence they all have a RPI of over 1.

### **Mann-Whitney U-Test for Average Returns:**

To measure the performance of the mutual fund a U-test has been conducted on the average returns of the mutual funds and the BSE Sensex index. For the purpose of this study, hypothesis is used to test the changes in the average returns of the fund and the BSE Sensex Index over the given 32 periods, to conclude whether the average returns of the fund and the BSE Sensex Index are the same. The null hypothesis is accepted if the average returns of the two are same. If not then the null hypothesis is rejected.

$H_0: x_1 = x_2$     $H_a: x_1 \neq x_2$

At 95% confidence interval, the significance level for 20 funds is more than 0.05, which helps us accept the null hypothesis, which says that the average returns of the funds over the tested two periods are similar. One fund in particular, UTI CCP growth fund, has a significant value of 0.003 which is less than 0.05. This shows that for UTI CCP growth fund the null hypothesis is rejected;

that the fund returns are similar to the market returns. UTI CCP growth fund has given returns which are not similar to the market returns given over the period of 4 years which have been considered for this study. UTI CCP growth fund has given an average return of 0.0058% where as the BSE Sensex during the same 4 year period has given an average return of 0.2919%, which is significantly higher than the return given UTI CCP growth fund.

#### **Mann-Whitney U-Test for Absolute Returns:**

For the purpose of this study, hypothesis is used to test the changes in the absolute returns of the fund and the BSE Sensex Index over the given 32 periods, to conclude whether the absolute returns of the fund and the BSE Sensex Index are the same. The null hypothesis is accepted if the absolute returns of the two are same. If not then the null hypothesis is rejected. On conducting the U-Test for the 32 average returns for each fund the following was observed:-

At 95% confidence interval, the significance level for 20 funds is more than 0.05, which helps us accept the null hypothesis, which says that the average returns of the funds over the tested two periods are similar. One fund in particular, UTI CCP growth fund, has a significant value of 0.006 which is less than 0.05. This shows that for UTI CCP growth fund the null hypothesis is rejected; that the fund returns are similar to the market returns. By running the Mann-Whitney U-test on the Average returns as well as Absolute returns of the BSE Sensex Index and the average returns confirms the hypothesis that at 95% confidence, 20 out of the 21 funds have returns quite similar to the returns of the BSE Sensex Index. Also, the UTI CCP growth is one common outlier which has generated significantly lower returns as compared to the benchmark index.

#### **Findings and Conclusions:**

The study done on the performance evaluation of Indian mutual funds was fruitful as all the objectives of the study were successfully achieved. The following are the findings from this study.

- The selected for the study gave returns in synchronization with the markets. When there was boom in the stock market the funds gave positive returns a little more than what the market had given. During the recessionary phase the markets declined steadily and so did the fund returns. Overall the fund returns and the market returns, for the period of 4 years taken into consideration for this study, was the more or less same with a very nominal difference in them.
- The performance of the funds were different from each other, though a few firm had common attributes which can be seen from the clusters that they make, a few funds didn't fall into any cluster at all. One such fund UTI CCP Advantage Fund was an outlier and gave returns very less than the market and also when compared to the other funds.
- It can be easily concluded that most of the fund returns can be attributed to the market that is they were in direct correlation with the market. But in the sample of 21 funds considered for this study one fund; UTI CCP Advantage Fund; didn't perform as the market and for this fund the returns generated cannot be attributed to the market. The performance of this fund can be attributed to both the market and as well as the fund composition and properties.

#### **Limitations of the Study:**

- Since the funds selected for this study were open ended equity based growth mutual funds the fund composition kept on changing over the time period, so it became difficult to understand the fund properties as historical data pertaining to the fund composition was not available.
- Because of unavailability of historical data and fund composition it was difficult to ascertain the performance to the fund properties and a simple evaluation was done against the market performance.

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