Comparative Analysis of Risk, Return and Diversification of Mutual Fund

R. Ahmad, A. Nomani

Rais Ahmad, Abuzar Nomani
Dept of Agricultural Economics and Business Management A.M.U
Aligarh, India

Abstract

Mutual Funds have become a widely popular and effective way for investors to participate in financial markets in an easy, low-cost fashion, while muting risk characteristics by spreading the investment across different types of securities, also known as diversification. It can play a central role in an individual's investment strategy. With the plethora of schemes available in the Indian markets, an investor needs to evaluate and consider various factors before making an investment decision. The present investigation is aimed to examine the performance of safest investment instrument in the security market in the eyes of investors. Five mutual fund large cap scheme have been selected for this purpose.

The examination is achieved by assessing various financial tests like Sharpe Ratio, Standard Deviation, Alpha, and Beta. Furthermore, in-depth analysis also has been done by considering return over the period of last five years on various basis, expenses ratio, corpus-size etc. The data has been taken from various websites of mutual fund schemes and from www.valueresearch.com.

The study will be helpful for the researchers and financial analysts to analyze various securities or funds while
Comparative analysis of risk, return and diversification of mutual fund

selecting the best investment alternative out of the galaxy of investment alternatives.

**Keywords:** Risk, Return, Diversification, Sharpe Ratio, Standard Deviation, Alpha

---

**Introduction**

Mutual Funds over the years have gained immensely in their popularity. Apart from the many advantages that investing in mutual funds provide like diversification, professional management, the ease of investment process has proved to be a major enabling factor. However, with the introduction of innovative products, the world of mutual funds nowadays has a lot to offer to its investors. The industry broadly caters to all types of investors depending on their risk return preferences. A mutual fund is the ideal investment vehicle for today's complex and modern financial scenario. Mutual funds offer several advantages over investing in individual stocks, including diversification and professional management. A mutual fund may hold investments in dozens of stocks, thus reducing the risk associated with owning any particular stock. A Mutual Fund is a pure intermediary that performs a basic function of buying and selling securities on behalf of its unit holders. Mutual Fund is a body corporate which pools up the money from different types of investors and invests those funds on behalf of the investors in diversified securities. In other words, a mutual fund allows an investor to take a position indirectly in a basket of assets. A majority of investors are quite content in simply analysing the appreciation in the net asset value (NAV) of their investment. They are not much more concerned about the risk associated with the investment alternative. Risk measure mostly deal with the character of a fund’s returns and the manner in which these returns have been achieved.

**Equity funds**

Equity funds have the objective to provide capital appreciation over a long term. A major portion of their investments is in equities which provide potentially superior returns than other avenues of investment. Equity schemes offer potentially the best possible returns among all mutual fund schemes, but carry the highest risk as well. The equity funds are high on the risk scale as the share prices are volatile. These funds try to reduce the risk by diversifying the investments in
different types of shares. Also, it is usually easier and less expensive to invest in equity funds, than to buy each and every stock in a fund’s portfolio. Equity funds are also cheaper; they're a way to avoid the often higher transaction costs and lower liquidity associated with trading individual stocks. The present research will explore the measures of risk and return for the selected mutual fund schemes.

**Literature review**

Harry Markowitz (1952) provides a theory about how investors should select securities for their investment portfolio given beliefs about future performance. He claims that rational investors consider higher expected return as good and high variability of those returns as bad. From this simple construct, he says that the decision rule should be to diversify among all securities, securities which give the maximum expected returns. His rule recommends that the portfolio with the highest return is not the one with the lowest variance of returns and that there is a rate at which an investor can increase return by increasing variance. This is the cornerstone of portfolio theory as we know it.

William Sharpe (1964) and John Lintner (1965) separately extend the work of Markowitz. They show that the theory implies that the rates of return from efficient combinations of risky assets move together perfectly (will be perfectly correlated). This could result from their common dependence on general economic activity. If this is so, diversification among risky assets enables investors to escape from all risks, except the risk resulting from changes in economic activity. Therefore, only the responsiveness of an asset return to changes in economic activity is relevant in assessing its risk. Investors only need to be concerned with systematic risk \([\text{beta}]\), not the total risk proposed by Markowitz.

Veit and Cheney (1982) investigated the ability of mutual funds managers to adjust the risk level of funds to leverage the ability to time the market. They test the null hypothesis that alphas and betas are the same in bull and bear market using annual data for 74 funds over the 1944-78 periods. The sample was sub-divided into balanced funds, income and growth to examine differential effects by investment objective.

The Financial Express Investment Magazine (1997) conducted a study jointly with Value Research, a pioneer in tracking mutual funds in
Comparative analysis of risk, return and diversification of mutual fund

India, which shows that the bond funds have emerged as winners, while equity funds plunged deeper into red.

The Intelligent Investor (2000), a leading business magazine conducted a Comprehensive survey of mutual fund performance 1999 to help the investors to choose the funds that best suits their needs. The survey is based on data source from credence, the Mumbai - based monitor of mutual fund performance, with a cut off date for the survey of December 31, 1999. The methodology and the performance parameters they used are; the three months return and one-year return calculated by taking the percentage change in net asset values, adjusted for rights, bonuses and dividends, if any in the interim; the three-year and five-year returns are likewise adjusted and annualized.

Blake David and Timmermann Allan (2003) in their assessment “Performance Persistence in Mutual Funds: An Independent Assessment of the Studies prepared by Charles River Associates for the Investment Management Association” believed that there is a reasonable case for arguing that risk-adjusted past performance data should be included in the FSA’s Comparative Tables. They argued that this is not because of the traditional argument over whether superior performance might or might not persist, which we regard as inconclusive, but rather because of the evidence that inferior performance seems to persist. They considered that it is important for investors to have easy access to reliable information on underperforming funds so they can modify their investment strategies accordingly.

Shanmugham (2000) conducted a survey of 201 individual investors to study the information sourcing by investors, their perceptions of various investment strategy dimensions and the factors motivating share investment decisions, and reports that among the various factors - psychological and sociological - dominated the economic factors in share investment decisions.

Objectives of the study
The present study aims to achieve the following objectives by considering the main objective as to select the best Mutual fund among selected eight schemes during the period of study:

I. To compare and analyse the best Mutual Fund schemes of the selected mutual fund players.

II. To compare the growth in Mutual Fund schemes with Industry average.
III. To find out the best Mutual Fund scheme in terms of return over the selected period of study.
IV. To suggest the means to improve return by investment in mutual funds.
V. To compare the risk associated with the mutual fund schemes.

**Research methodology**

The present investigation is aimed to examine the performance of the safest investment instrument in the security market in the eyes of investors i.e., mutual funds by specially focusing on equity schemes. Five mutual fund schemes have been selected for this purpose. The examination is achieved by assessing various financial tests. To carry out the research, the following methodology is adopted:

**Data collection**

The present research is a study of examining and analysing selected mutual fund schemes by using different financial and statistical tools. The Large cap schemes taken for this purpose are:

- HDFC Top 200 Fund (G)
- DSP-BR Top 100 Equity - RP (G)
- ICICI Pru Top 100 Fund -Inst –I
- Franklin India Bluechip (G)
- Birla SL Frontline Equity -A (G)

This study compares five funds launched by public/private sector, and foreign mutual fund players in India. The schemes have been selected using deliberate sampling method subject to the criteria mentioned:

A. All the funds are taken as per the ranking done by CRICL
B. Considering corpus size of AMC 25 crore to 1000 crore
C. The funds that have been consider as the minimum investment 500 and maximum 100000 Rs
D. The performances of funds are calculated on the bases of their risk and return
E. Closing Net Asset Values (NAV) of the selected funds are taken on monthly basis.

The study is exclusively based on secondary data, which has been collected from various websites, journals and fact sheets of various mutual fund schemes published by them time to time.
Comparative analysis of risk, return and diversification of mutual fund

**Tools and techniques**

The collected data have been analysed on basis of returns of last one month, six months, one year, three years and five years. Various statistical and financial techniques namely, Standard Deviation and Sharpe ratio has been used to measure volatility of returns and returns per unit of risk. Furthermore, Coefficient of determination (R2), Expenses ratio and Corpus size of funds have also been evaluated. In addition to these tools, various tables and graphs has also been used to make the data presentable and easy to understand.

**(I) Sharpe's Ratio**

Sharpe ratio reflects the additional return over the Risk-Free return per unit of its variability. It is basically return per unit of risk. The rule states that the higher the Sharpe ratio, the better the fund's performance is in relation to the amount of fluctuation. It can be explained through the formula:

\[
S = \frac{RP - Rf}{sp}
\]

where:
- \( S \) = Sharpe's Index;
- \( rp \) = average monthly return of fund;
- \( rf \) = risk free return Risk free return (rf) is taken as 3.40% per annum

**(II) Standard Deviation**

It is possibly one of the most common risk measure used in assessment of portfolios - be it of mutual funds or any other investment product. It is used to measure the variation in the individual return from the average expected return, over a certain period. Standard deviation is used in the concept of risk of a portfolio of investment. Higher Standard Deviation means a greater fluctuation in expected return.

\[
\sigma = \sqrt{\frac{(Y - Y)/N}{}}
\]

where: \( Y \) = fund return

**(III) Beta (β)**

Beta Measure reflects the systematic risk assigned to each of the schemes, Beta of the Index is always being 1 (with itself). Beta of a risk-
free investment is zero. The higher the Beta value, the higher the degree of Correlation with the market index and the fund will be.

\[
\beta = \frac{n\Sigma XY - (\Sigma x \Sigma y)}{n \Sigma x^2 - (\Sigma x)^2}
\]

where: X = Index return
Y = fund return

(IV) Jensen's Alpha (Differential Return)

Jensen's Alpha reflects the return that is expected for the scheme given the risk exposure of the scheme and compares that with the return actually realized over the period under study. If the actual return of the fund is more than the return as predicted by its Beta, then it has a positive alpha, and if it returns less than the amount predicted by Beta, the fund has a negative alpha. A fund's return and its risk both contribute to its Alpha value. The higher a funds' risk level, the greater the returns. It must generate in order to produce a high Alpha which becomes more volatile. Systematic risk can be reduced through proper diversification of the portfolio of the fund.

\[
\alpha = Y - \beta X
\]

where: X = Index return;
Y = fund return

(V) R-Squared

R-Squared measures the co-relation between returns generated by a fund and its benchmark index. This is indispensable in ascertaining the reliability of the beta of a fund. It is a statistical measure that represents the percentage of a fund or security's movements that can be explained by movements in a benchmark index. R-squared values range from 0 to 100. An R-squared of 100 means, that all the movements of a fund are completely explained by movements in the index. A high R-squared (between 85 and 100) indicates the fund's performance patterns have been in line with the index. A fund with a low R-squared (70 or less) doesn't act much like the index.
Analysis and interpretation
The data collected of selected mutual fund schemes have been analysed into two parts:

A) Analysis on the basis of returns over the period of time
Returns are calculated periodically on the basis of various time periods after that rankings have also been provided to the selected equity schemes. Returns of Last:
I. One Month
II. Six Months
III. One Year
IV. Three Years
V. Five Years

B) Performance evaluation of Selected Funds
Performance Evaluation has been done on the basis of risk and return evaluation.
I. Corpus Size
II. Beta
III. Alpha
IV. Standard Deviation
V. R-Squared
VI. Expenses Ratio

C) Analysis on the basis of diversification
One of the main advantages of investing in mutual funds is risk diversification. Thus, fund managers have different risk levels to achieve financial schemes objectives. A diversified fund contrasts with specialized or focused funds, such as sector funds, which focus on stocks in specific sectors such as biotechnology, pharmaceuticals or utilities, or in particular regions such as Asia or Europe.

Analysis of large cap scheme
Large cap funds are those mutual funds, which seek capital appreciation by investing primarily in stocks of large blue chip companies with above-average prospects for earnings growth. Generally, companies with a market capitalization in excess of Rs 1000 crore are known large cap companies. Investing in large caps is a lower risk-lower return proposition (vis-à-vis mid cap stocks), because such companies are
usually widely researched and information is widely available. The selected large cap funds are:

- HDFC Top 200 Fund (G)
- DSP-BR Top 100 Equity - RP (G)
- ICICI Pru Top 100 Fund -Inst –I
- Franklin India Bluechip (G)
- Birla SL Frontline Equity -A (G)

A) Analysis on the basis of returns over the period of time

Returns are calculated periodically on the basis of various time periods like monthly, six months, one year, three years and five years. After that rankings have also been Provided to these selected equity-diversified mutual fund schemes. These are stated below:

- HDFC Top 200 Fund (G)
- DSP-BR Top 100 Equity - RP (G)
- ICICI Pru Top 100 Fund -Inst –I
- Franklin India Bluechip (G)
- Birla SL Frontline Equity -A (G)

Table no. 1. Returns of Equity Mutual Fund schemes as on July 2012

<table>
<thead>
<tr>
<th>Scheme</th>
<th>HDFC Top 200 Fund (G)</th>
<th>DSP-BR Top 100 Equity - RP (G)</th>
<th>ICICI Pru Top 100 Fund -Inst –I</th>
<th>Franklin India Bluechip (G)</th>
<th>Birla SL Frontline Equity -A (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fund Class</td>
<td>Large Cap</td>
<td>Large Cap</td>
<td>Large Cap</td>
<td>Large Cap</td>
<td>Large Cap</td>
</tr>
<tr>
<td>Ranking</td>
<td>Rank 2</td>
<td>Rank 2</td>
<td>Not Ranked</td>
<td>Rank 2</td>
<td>Rank 2</td>
</tr>
<tr>
<td>Scheme Asset</td>
<td>11381.1</td>
<td>3109.35</td>
<td>20.13</td>
<td>4516.35</td>
<td>2900.75</td>
</tr>
<tr>
<td>Minimum Investment</td>
<td>Rs.5000</td>
<td>Rs.5000</td>
<td>Rs.10000</td>
<td>Rs.5000</td>
<td>Rs.5000</td>
</tr>
</tbody>
</table>
Comparative analysis of risk, return and diversification of mutual fund

<table>
<thead>
<tr>
<th>AMC/Fund</th>
<th>HDFC Asset Mgmt., Co. Ltd.</th>
<th>DSP BlackRock Investment Managers Limited</th>
<th>ICICI Prudential Asset Mgmt. Co. Ltd</th>
<th>Franklin Templeton Asset Mgmt. (India) Pvt. Ltd.</th>
<th>Birla Sun Life Asset Mgmt. Co. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latest NAV</td>
<td>201.863</td>
<td>98.444</td>
<td>19.99</td>
<td>212.827</td>
<td>84.53</td>
</tr>
<tr>
<td>3 Months</td>
<td>1.30%</td>
<td>0.20%</td>
<td>2.70%</td>
<td>0.60%</td>
<td>2.30%</td>
</tr>
<tr>
<td>6 Months</td>
<td>14.60%</td>
<td>12.10%</td>
<td>15.60%</td>
<td>12.00%</td>
<td>13.60%</td>
</tr>
<tr>
<td>1 Year</td>
<td>-5.20%</td>
<td>-3.20%</td>
<td>3.60%</td>
<td>-2.00%</td>
<td>-4.50%</td>
</tr>
<tr>
<td>2 Years</td>
<td>2.40%</td>
<td>2.70%</td>
<td>7.60%</td>
<td>4.60%</td>
<td>1.60%</td>
</tr>
<tr>
<td>3 Years</td>
<td>12.70%</td>
<td>11.40%</td>
<td>14.70%</td>
<td>13.00%</td>
<td>11.80%</td>
</tr>
<tr>
<td>5 Years</td>
<td>10.60%</td>
<td>8.30%</td>
<td>8.20%</td>
<td>8.10%</td>
<td>8.00%</td>
</tr>
</tbody>
</table>

**Source:** Calculated data

Table no. 1 explores the returns of selected funds over a period of time for different periods. In terms of last one year returns i.e. from August 11 to July 12; ICICI Pru Top 100 stood at number one with the maximum returns of 3.60% during the selected period. It is followed by Franklin India and DSP-BR Top 100 fund with the returns of -2.00% and -3.20% respectively. Birla SL Frontline Selected has given returns -4.50% over that period. HDFC Top 200 Fund has given the least return -5.20%. But in long run i.e. for the period of five years HDFC Top 200 Fund (G) has performed well among the selected scheme. During the period of study Franklin India Bluechip (G) has the highest NAV value 212.827.

**B) Performance evaluation of Selected Funds**

Performance Evaluation has been done on the basis of risk and return evaluation. For this purpose Standard Deviation, Beta Alpha, Sharpe-Ratio and R-Squared are calculated, which are tabulated below after the detailed calculations:
### Table no. 2. Analysis of volatility and return per unit of risk

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>Fund Risk Grade</th>
<th>Standard Deviation</th>
<th>Sharpe Ratio</th>
<th>Beta</th>
<th>Alpha</th>
<th>R-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFC Top 200</td>
<td>Avg.</td>
<td>19.34</td>
<td>0.4</td>
<td>0.91</td>
<td>4.14</td>
<td>0.95</td>
</tr>
<tr>
<td>DSPBR Top 100 Equity Reg</td>
<td>Low</td>
<td>17.9</td>
<td>0.36</td>
<td>0.84</td>
<td>3.11</td>
<td>0.95</td>
</tr>
<tr>
<td>ICICI Prudential Top 100 Inst I</td>
<td>Below Avg.</td>
<td>19.13</td>
<td>0.48</td>
<td>0.91</td>
<td>5.57</td>
<td>0.97</td>
</tr>
<tr>
<td>Franklin India Bluechip</td>
<td>Low</td>
<td>16.39</td>
<td>0.43</td>
<td>0.78</td>
<td>4.04</td>
<td>0.96</td>
</tr>
<tr>
<td>Birla Sun Life Frontline Equity</td>
<td>Avg.</td>
<td>18.06</td>
<td>0.35</td>
<td>0.86</td>
<td>3.02</td>
<td>0.97</td>
</tr>
</tbody>
</table>

**Source:** Calculated data

**Fig. no. 1** Graph showing the status of Std.Deviation

![Graph showing the status of Std.Deviation](image)

Higher standard Deviation means a greater fluctuation in expected return. The most volatile fund is HDFC Top 200 as it is having the standard deviation of 19.34, which is followed by ICICI Prudential Top 100 Inst19.13 and Birla Sun Life Frontline Equity18.06. It indicates...
that out of the selected schemes the most risky fund is of HDFC Top 200. As the standard deviation is an unsystematic risk which is not going to minimize through diversification. It is beyond the control of investors.

**Fig. no. 2.** Graph showing the status of Sharpe Ratio

Sharpe ratio reflects the additional return over the Risk-Free return per unit of its variability. In terms of returns, the scheme i.e. ICICI Prudential Top 100 Inst I is having maximum returns per unit of risk (0.48). Followed by Franklin India Blue-chip (0.43) and HDFC Top 200 (0.40). Least return provider is the fund which is having the maximum risk in terms of std. deviation and beta, i.e. Birla Sun Life Frontline Equity (0.35).
Beta of the Index is always being 1 (with itself). Beta of a risk-free investment is zero. More the Beta value, the higher the degree of correlation with the market index. The statement regarding risk is supported by the calculation of beta. Again HDFC, ICICI prudential, and Equity proved the most risky schemes as they are having maximum of beta (0.91, 0.91, and 0.86 respectively). Least risky scheme Franklin India Blue-chip in terms of Standard Deviation and Beta. Beta is a systematic risk that can be minimized through diversification.

C) Analysis on the bases of diversification

Diversification is a technique that reduces risk by allocating investments among various financial instruments, industries and other categories. It aims to maximize return by investing in different areas that would each react differently to the same event. The table shows the allocation of fund in different sector of the selected large cap equity schemes.
Comparative analysis of risk, return and diversification of mutual fund

**Table no. 3. Allocation of funds in different sectors**

<table>
<thead>
<tr>
<th>Scheme</th>
<th>HDFC Top 200 Fund (G)</th>
<th>DSP-BR Top 100 Equity - RP (G)</th>
<th>ICICI Pru Top 100 Fund -Inst –I</th>
<th>Franklin India Bluechip (G)</th>
<th>Birla SL Frontline Equity -A (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top 5 holdings</strong></td>
<td>SBI, Infosys, ITC, ICICI Bank, Tata</td>
<td>TCS, Reliance, Wipro, Kotak</td>
<td>Infosys, Reliance, Bharti</td>
<td>Infosys, ICICI Bank, Bharti</td>
<td>ICICI Bank, ITC, Infosys, Reliance, Larsen</td>
</tr>
<tr>
<td></td>
<td>Motors (D)</td>
<td>Mahindra, BPCL</td>
<td>Airtel, ICICI Bank, Sun Pharma</td>
<td>Airtel, HDFC Bank, Reliance</td>
<td></td>
</tr>
<tr>
<td><strong>Weight age to top 5 holdings</strong></td>
<td>30.43%</td>
<td>29.30%</td>
<td>42.74%</td>
<td>30.93%</td>
<td>23.07%</td>
</tr>
<tr>
<td><strong>Top 3 Sectors</strong></td>
<td>Banking/Finance, Technology, Oil &amp; Gas</td>
<td>Banking/Finance, Technology,</td>
<td>Technology, Pharmaceuticals,</td>
<td>Banking/Finance, Oil &amp; Gas</td>
<td>Banking/Finance, Technology,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oil &amp; Gas</td>
<td>Oil &amp; Gas</td>
<td>Gas, Technology</td>
<td>Automotive</td>
</tr>
<tr>
<td><strong>Weight age to Top 3 Sectors</strong></td>
<td>44.96%</td>
<td>46.72%</td>
<td>48.83%</td>
<td>42.67%</td>
<td>43.88%</td>
</tr>
</tbody>
</table>

Large cape mutual funds are expected to offer the advantages of Diversification, Market timing and Selectivity. In the sample, ICICI Pru Top 100 Fund -Inst –I is found to be highly diversified fund and because of high diversification it has reduced total risk of the portfolio. Whereas, Birla SL Frontline Equity -A (G) is low diversified and because of low diversification its total risk is found to be very high.

**Conclusions**

Observation of the results found on the basis of several calculations indicates that out of the five selected Large cap mutual fund schemes, in short-run ICICI Pru Top 100 Fund -Inst –I manages to be at number one in terms of returns over the period of last one month and six months as well as in long run at number one position in terms of the returns of last five years. As far as the financial risk parameters are concerned Franklin India Blue-chip was found least risky in terms of the results of Beta (0.78) & Standard Deviation (16.39) and in terms of returns ICICI Pru Top 100 Fund -Inst –I manage to earn the maximum...
returns per unit of risk, i.e., Sharpe ratio (0.48). Further research could aim to extend the data set to include more equity diversified mutual funds, and also to enlarge the time scope to investigate whether the market has changed (improved) over time.

**Suggestions**

The main objective of the investment is to get return from investment from the mutual funds. An investor should take following points into consideration to earn good returns:

- An investor should assess his risk profile before investing in any fund.
- To select a fund with good past records of returns. Usually, an investor should select a fund, which is less volatile.
- An investor should select a portfolio of three to five funds which are less volatile in nature, and a good track record of consistent returns.
- For selection of a good fund, investor can compare the return of the fund with the industry average and benchmark indices. The fund which outperforms the both can be selected for investment.
- Investors should review their portfolio of mutual funds from time to time. Investors should try to keep their investment for a longer period of time so as to ensure that they can beat market volatility. Last but not the least; investor can withdraw funds according to his needs and purpose.

**Bibliography**


Comparative analysis of risk, return and diversification of mutual fund


http://crisil.com/capital-markets/mutual-fund-rankings.html

http://crisil.com/ratings/crisil-pioneers.html


https://www.sbi.co.in/user.htm?action=viewsection&id=0,16,384,38