

A study on volatility and Performance of selected diversified mutual fund

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Structured Abstract:

Purpose: The general people can invest in different ways. Considering risk and return parameter people may invest through Post Office, Banks, Mutual funds, Stock Market etc. In present day mutual fund investment is attracting the eyes of general investor. The present paper tries to investigate the volatility and performance of eight open ended growth oriented Diversified Equity mutual fund schemes in India for the period from January 2011 to December 2016 (six years).

Design / Methodology / Approach: The volatility and performance of the selected mutual funds are evaluated on the basis of Standard deviation, Tracking Error, Sharpe ratio, Information ratio. Different Books, Journals and websites are used for the study.

Findings: The study indicates all the selected schemes outperform the considered benchmark index i.e. CNX-Nifty. Out of all selected fund ICIC Pru value discovery Fund (G) was extremely good performer in term of fund's return and volatility.

Originality / Value: The mutual fund investment always have market risk but investing in good performer mutual fund for long term may grew far better return than other asset class of the investment.

Keywords: Mutual fund, Sharpe ratio, Standard deviation, Tracking Error Sharpe ratio, Information ratio.

Paper Type: Research paper.

Introduction

Mutual fund is an institutional arrangement that pools the savings of millions of investors in a diversified portfolio of securities such as stocks, bonds, money market instruments. During last

two decade in India mutual fund industry has gone through rapid changes. In mutual fund's performance mainly depends on the portfolio. Different type of portfolio strategies are applied by the fund managers for their funds and success of the fund depends on the performance of the portfolio. In our country equity market is not very much popular investment avenue as stock price is very fluctuating. The price of stock is also depends on prospect of balance sheet. The stock price is very fluctuating on the expectation of future prospect of the business. Investing in Stock market may be done for long term as well as for short term. An investor must consider fundamental and technical analysis for a particular stock before investing but this job is very difficult in the part of general retail investor. In our country people with less knowledge of fundamental and technical analysis are very much interested to invest in stock market. That is why investor consider mutual fund which are professionally managed by fund managers to invest in stock market as criteria for investment. During last two decade in India mutual fund industry has gone through rapid changes. In mutual fund performance of the fund mainly depends on the portfolio of the fund. The success of any fund greatly depends upon the competence of fund manager. Different type of portfolio strategies are applied by the fund managers for their fund and success of the fund depends on the performance of the portfolio. So, one important type of portfolio is diversified equity mutual fund. A diversified equity fund is a fund which comprises of large cap equity, Mid-cap equity and small cap equity in a single portfolio. These funds are moderately high risky as the money invested in stock market portfolio. The performances of the various mutual funds are measured in term of risk return trade off and to the volatility of their investment to minimize the risk and to earn good amount of return. Performance of mutual fund cannot be judged only on the basis of absolute return. It should be based on different ratios and volatility also.

Literature Review

Bahl, Sarita and Rani, Meenakshi. (2012) evaluated the performance of 29 open ended growth oriented mutual fund schemes by using monthly return, Sharpe ratio and Treynor ratio and Jensen measure and pointed out that 14 funds had out performed benchmark index, Sharpe ratio was positive for all fund, 19 fund showed positive Jensen alpha indicating superior performance of the fund for the study period April 2005- March2011.

Annapurna and Gupta, Pradeep K. (2013) investigated in their study of mutual fund schemes ranked 1 by CRISIL for the period 2008-13 and compare the mean returns with the SBI domestic

term deposit rates. The result of the paper expressed that most of mutual fund schemes have failed even to provide the return of SBI domestic term deposits.

Keswani, Sarika. (2011) evaluated the effect of fund size on 30 balanced mutual fund classifying according to size using correlation matrix. This paper concluded that there was no significance evidence that the fund size affect the performance of selected balanced mutual fund.

Vasanthal, S. Maheswari, Uma and Subashini , K. (2013) examined the Performance of some selected open ended equity diversified Mutual fund in Indian mutual fund Industry for 5 years from January 2008 using rate of return, Sharpe ratio and Treynor ratio and Jensen measure and pointed out that HDFC Top 200 and Birla sun life from line equity fund was good performer with low beta value.

Ramanujam, V. and Bhuvanewari, A. (2015) evaluated growth and performance of Indian Mutual fund industry for the period of April 2004 to March 2014 from the view point of different parameters like asset under management, sector wise mutual fund sale, Scheme wise resource mobilization, total number of schemes. They pointed out that the investor preference towards financial assets is increasing as all the parameters had shown a tremendous increasing growth rate.

Kadambat, Krishna Kumar Raghavendra, T. and Singh, B. M. (2015) studied the various ELSS in Indian mutual fund for 2001-2013 comparing with 12 top Diversified Equity Funds and 7 Benchmark Indexes. They pointed out that ELSS funds, overall has underperformed both against sample Diversified Equity Funds and Benchmark Indexes on a risk adjusted basis.

Narayanasamy, R. and Rathnamani, V. (2013) evaluated Performance of Equity Mutual Funds on selected Equity Large Cap Funds through the statistical parameters such as alpha ,beta, standard deviation, r-squared, Sharpe ratio and concluded that all the funds have performed well in the high volatile market movement expect Reliance vision.

Shukla, Suchita (2015) depicted a comparative performance of selected mutual fund with the statistical parameters such as alpha, beta, standard deviation, r-squared, Sharpe ratio and pointed

out that Infrastructure and Mid & Small Cap funds have performed better than the benchmark, large cap and hybrid funds on return parameters.

Lohana, Sarika.R. (2014) expressed Impact of Stock volatility on Mutual Fund Investment with the help of Total Error, Information Ratio and Sharpe Ratio. He concluded that on the basis of primary survey the effect of volatility of share market on mutual fund investment is exist

Lohana, Poonam. M. (2013) studied selected Mutual Funds and found that Average monthly returns of public and private funds are equal, in randomly selected funds.

Many researchers measured the performance of various fund on the basis of Trynor ratio, Sharpe ratio and Jensen alpha. Performance of the funds may be measured on the basis of absolute return and using these ratios. But the measurement of performance of the fund cannot be judged on the basis of only these ratios and absolute return. Volatility should also be considered to judge the performance of mutual fund schemes.

Objectives of the study:

1. To study the Volatility of selected diversified equity mutual fund on the basis of risk and return with benchmark index.
2. To study the performance of selected diversified equity mutual fund on the basis of Sharpe Ration, Treynor Ratio and Jenson measure.

Research Methodology

In this paper growth oriented diversified equity mutual fund scheme were selected on basis of ascending order of Asset Under Management (AUM) on 31.12.2016 and the average ages of the fund is more than ten years. Monthly average NAV of the schemes have been used for the period January 2011 to December 2016. CNX-Nifty and 91 day Treasury bill average monthly rate have been considered for market portfolio and Risk free return respectively. Monthly averages of daily NAV are taken into consideration for calculation of return and others parameter. Monthly averages are taken assuming an investor can enter and exit any time from the portfolio. So, Monthly return is taken into consideration keeping in mind that investor is free to enter and exit from the funds. The study is totally based on secondary data. Various books, research paper, web sites are used to prepare the paper.

Return: the monthly return of the scheme is calculated by using the following formula.

$$R_{pi} = (NAV_i - NAV_{i-1}) / NAV_{i-1}$$

Where R_{pi} is monthly return of the selected scheme of i^{th} month, NAV_i is the net asset value of the selected scheme at beginning of the i^{th} month and NAV_{i-1} is the net asset value of the selected scheme at beginning of the $i-1^{th}$ month. The average return is calculated by mean of R_{pi} .

Similarly market return is calculated as follows

$$R_{mi} = (\text{Market Index } i - \text{Market Index } i-1) / \text{Market Index } i-1$$

Where R_{mi} is monthly return of the CNX-Nifty of i^{th} month, $CNX-Nifty_i$ is the nifty at beginning of the i^{th} month and $CNX-Nifty_{i-1}$ is the nifty beginning of the $i-1^{th}$ month. The average market return is calculated by mean of R_{mi} .

Risk: Risk of selected mutual fund schemes and market are measured with the help of standard deviation of return of selected mutual fund schemes and market index respectively.

Beta(β): Beta is indication of systematic risk of the portfolio. It is calculated as follows-

$$\text{Beta} = \frac{\text{Cov}(R_p, R_m)}{\text{VAR}(R_m)}$$

Sharpe ratio: William F. Sharpe (1966) invented a measure to judge the performance of mutual fund scheme. It is a risk adjusted return over the risk free return. Higher the Sharpe ratio is better the fund.

$$\text{Sharpe Ratio} = (R_p - R_f) / \sigma_p$$

Where R_p is the return of the mutual fund scheme, R_f is the risk free return and σ_p is the standard deviation of the portfolio return.

Treynor Ratio: This ratio is developed by Jack Treynor (1965) that measures returns earned in excess of that which could have been earned on a risk free investment per each unit of market risk.

$$\text{Treynor Ratio} = (R_p - R_f) / \beta_p$$

Jenson Measure: This measure uses α_p to indicate the performance of the mutual fund portfolio. The formula is as follows-

$$(R_p - R_f) = \alpha_p + \beta_p (R_m - R_f) + \epsilon_p$$

Tracking Error(T.E): It is the divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark. It is calculated as a Standard Deviation percentage difference between the return an investor receives and that of the return of benchmark which he was attempting to imitate. . If it is found low return and a large tracking error in a portfolio, it is a sign that there is something significantly wrong with that investment.

$$T.E.= SD(R_p - R_m)$$

Information Ratio (IR): It is a ratio of mutual fund portfolio return above the benchmark returns to the volatility of those returns. The IR measures a portfolio manager's ability to generate extra return in relation to a benchmark return and also attempts to identify the consistency of the performance of the fund. The higher IR signifies more consistent fund, with consistency being an ideal trait. Contrary lower IR means the less consistency

$$\text{Information Ratio (IR): } (R_p - R_m) / T.E.$$

R-Squared: It is the value range from 0 to 100 indicates movement of the selected fund is completely explained by the movement of the benchmark index. A high R-Squared between 85 to 100 signifies funds performance has been in line with performance of the index.

General range for R-Squared signifies

70-100 - Good correlation between fund return and index return

40-70 - Average correlation between fund return and index return

1- 40 - Low correlation between fund return and index return

Limitation of the study:

This study is only based on Indian growth oriented diversified open end fund. perspective. Time period of data related to study is limited for the year 2011-16.

Findings and Analysis:

In this paper summary of Fund Return, fund Risk, Beta R Square and absolute Return, Tracking Error of selected Diversified Equity funds are shown in table-1. From this table it is clear that the entire fund outperform the benchmark index in terms of average monthly return as well as absolute return. The maximum return was from ICICI Pru Value Discovery Fund (G) from both view point of monthly return and absolute return. Four funds had beta more than one that is these fund had more risk than the market risk. From table-1 it is also found that R squared value for all selected funds are nearer to 0.9 which indicate good level of diversification and fund's performance almost in line with the market. Tracking Error for all the fund nearer to same except Franklin India Prima Plus Fund (G) which is very less volatile. UTI Dividend Yield fund(G) faced problem of diversification as in spite of good R squared value and low tracking error its

monthly average return and absolute return both were very low in comparative to other fund even fund's risk was in line with other fund.

Table-2 shows the result of Sharpe ratio, Treynor ratio and Jensen measure with their rank. All the selected fund outperformed benchmark index in the study period in term of Sharpe, Treynor and Jensen alpha measure except Reliance Vision fund RP (G) and UTI Dividend Yield fund (G). It is also found that Franklin India Prima Plus Fund (G) had highest Sharpe ratio preceded by ICICI Pru Value Discovery Fund (G). As per Treynor ratio ICICI Pru Value Discovery Fund (G) had first position just before Franklin India High growth Company (G). All the selected fund had positive Jensen alpha for the study period. ICICI Pru Value Discovery Fund (G) had highest Jensen alpha as its return over risk free return was high as well as its beta was not very high for the study period.

Considering Information ratio Franklin India Prima Plus Fund (G) had highest information ratio which revealed the fund was more consistent with good performance in terms of Sharpe ratio. This means the fund had good return over risk free return with less volatility. Franklin India High growth Company (G) mutual fund was also less volatile with good return because Information ratio showed consistency of the return. Reliance Vision fund RP (G) and UTI Dividend Yield fund (G) both mutual fund were worst performer in terms of return and both the fund were less consistent in their performance.

Sign Rank test is conducted to test significance level of Sharpe ratio and Information ratio.

Calculation

Positive sign count = 0

Negative sign count = 8

Total count = 8

Z-score Calculation

$$z = (X - pn) / \sqrt{npq}$$

$$z = (8 - 4) / \sqrt{2}$$

$$z = 2.828427$$

The z -value is 2.828427. The p -value is .004678. The result is significant at $p < 0.05$.

Conclusion

The present paper analyses the volatility and performance of selected growth oriented open-end diversified equity mutual fund for the period January 2011 to December 2016. The volatility of the funds over benchmarks was calculated with the help of Information ratio and the past performances are analyzed with the help of the Sharpe ratio, Treynor ratio and Jensen measure. The study indicates all the selected schemes outperform the considered benchmark index i.e. CNX-Nifty. Out of all selected fund ICIC Pru value discovery Fund (G) was extremely good performer in term of fund monthly return and absolute return which were highest among all the funds with beta value almost equal to one followed by the next performer of Franklin India Prima Plus Fund (G) and Franklin India High growth Company . These two funds were less volatile in the study period. Jensen measure expressed that all the funds had positive alpha which indicate good performance of the scheme except UTI Dividend Yield fund (G) and Reliance Vision fund RP (G) as its monthly average return, sharpen ratio, Treynor ratio, Jensen alpha all parameter was low with high beta that was more market risk and these two funds were less consistent in the study period. Two funds were taken from Franklin India Templeton for the study. Franklin India Prima Plus Fund (G) and Franklin India High growth Company (G) both were good performer and less volatile in the study period from the view point of risk return and other measures. From Reliance mutual fund house Reliance Equity Opportunity RP (G)'s and Reliance Vision fund RP (G) were bad performer as well as more volatile.

Recommendations

1. The fund with low Tracking Error and High Information Ratio, High Sharpe and Treynor ratio will be the best fund for investment purpose.
2. The investor must consider return parameter as well as volatility parameter before investing in mutual fund schemes.
3. The investor who are interested in good and consistent return can invest in ICICI Pru Value Discovery Fund (G), Franklin India Prima Plus Fund (G), Franklin India High growth Company (G) as these fund are good performer and less volatile.
4. Investment in mutual fund for long time horizon in forms of lump sum or SIP creates good assets for the investor.

References

Vasanthan, S. & Maheswari, Uma. & Subashini, K. (2013). Evaluating the Performance of some selected open ended equity diversified Mutual fund in Indian mutual fund Industry. *International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET)*, Vol. 2, Issue 9, 4735 - 4744. Retrieved from https://www.ijirset.com/upload/2017/august/162_Final%20Paper.pdf

Keswani, Sarika. (2011). Effect of Fund Size on the Performance of Balanced mutual fund - An Empirical Study in Indian Context. *International Journal of Multidisciplinary Research Vol.1 Issue 4, 19-37*. Retrieved from www.zenithresearch.org.in/images/stories/.../2011/.../2%20vol-1_issue-4_02_SARIK.

Annapurna and Gupta K, Pradeep. (2013). A Comparative Analysis of Returns of Mutual Fund Schemes Ranked 1 by CRISIL. *Tactful Management Research Journal, Vol. 2, Issue. 1*. Retrieved from <http://www.tmgtsrj.in/>

Bahl, Sarita and Rani, Meenakshi. (2012). A Comparative Analysis of Mutual Fund Schemes in India. *International Journal of Marketing, Financial Services & Management Research, Vol.1 Issue 7, 2012, 67-79*. Retrieved from indianresearchjournals.com/pdf/IJMFSMR/2012/July/6.pdf

Ramanujam, V. and Bhuvaneshwari, A. (2015). Growth and Performance of Indian Mutual fund Industry during Past Decades. *International Journal of Advance Research in Computer Science and Management Studies(IJARCSMS), Volume 3, Issue 2, 283-290*. Retrieved from www.ijarcsms.com/docs/paper/volume3/issue2/V3I2-0059.pdf

Kumar, Kadambat Krishna, T, Raghavendra and Singh, B. M. (2015). Investment performance of ELSS of Indian Mutual Fund. *International journal of recent scientific research, Vol-6 Issue-5, 4076-4083*. Retrieved from <http://www.recentscientific.com/past-issue/201505>

Lohana, Poonam M.(2013). Performance Evaluation of Selected Mutual Funds. *Pacific Business Review International, Volume 5 Issue 7, 60-66*. Retrieved from pbr.co.in/Vol%205%20Iss%207/9.pdf

Lohana, Sarika.R. (2014). Impact of Stock volatility on Mutual Fund Investment. An Empirical analysis, *International Journal of Scientific & Engineering Research (IJSER), Volume 5, Issue 5, 1-11*. Retrieved from <https://www.ijser.org/.../Impact-of-Stock-volatility-on-Mutual-Fund-Investment.pdf>

Narayanasamy, R. and Rathnamani, V. (2013). Performance Evaluation of Equity Mutual Funds (On Selected Equity Large Cap Funds). *International Journal of Business and Management Invention(IJBMI)*, Volume 2 Issue 4, 18-24. Retrieved from [http://www.ijbmi.org/v2i4\(version2\).html](http://www.ijbmi.org/v2i4(version2).html)

Shukla, Suchita. (2015). A comparative performance evaluation of selected mutual funds. *International Journal of Services Technology and Management (IJSTM)*, Volume No.04, Special Issue No.02,140-149. Retrieved from www.ijstm.com/images/short_pdf/M026.pdf.

www.moneycontrol.com

www.amfiindia.com

www.nseindia.com

www.investopedia.com

Table 1

**Summary of Fund Return, fund Risk, Beta R Square and absolute Return
(January2011-December2016)**

<i>Name of Fund</i>	<i>Fund Return</i>	<i>Fund Risk(SD)</i>	<i>Beta</i>	<i>R Squared</i>	<i>Absolute return %</i>	<i>Tracking Error</i>
<i>HDFC Equity Fund (G)</i>	0.00841	0.04673	1.13 57	0.98083	69.33%	0.01774
<i>ICICI Pru Value Discovery Fund(G)</i>	0.01329	0.04318	1.00 20	0.95686	141.56%	0.01960
<i>Franklin India Prima Plus Fund(G)</i>	0.01075	0.03566	0.88 41	0.94372	106.50%	0.01159
<i>Reliance Equity Opportunity RP (G)</i>	0.01005	0.04243	0.99 36	0.97045	92.97%	0.01856
<i>ICIC Pru Dynamic Fund(G)</i>	0.00953	0.03387	0.81 41	0.97777	90.20%	0.01461
<i>Franklin India High growth Company</i>	0.01302	0.04418	1.06 59	0.95693	137.05%	0.01691
<i>Reliance Vision fund RP(G)</i>	0.00763	0.04566	1.10 00	0.95160	60.67%	0.01790
<i>UTI Dividend Yield fund(G)</i>	0.00627	0.03672	0.91 08	0.98005	49.54%	0.01154
<i>Average</i>	0.00986	0.04105	0.98 82	0.96478	93.48%	
<i>CNX Nifty Index</i>	0.00574	0.03787	1	-	40.27%	

Source: Author's Compiled

Table – 2

**Ranking of selected scheme on the basis of the Sharpe ratio, Treynor ratio and Jensen alpha
(January 2011-December 2016)**

<i>Fund Name</i>	<i>Sharpe</i>	<i>Rank</i>	<i>Treynor</i>	<i>Rank</i>	<i>Jen son</i>	<i>R a n k</i>	<i>IR</i>	<i>R a n k</i>
<i>HDFC Equity Fund(G)</i>	0.0631 0	6	0.002597	6	0.0 026 3	6	0.1 50 4	6
<i>ICICI Pru Value Discovery Fund(G)</i>	0.1797 9	2	0.007747	1	0.0 074 8	1	0.3 81 9	3
<i>Franklin India Prima Plus Fund(G)</i>	0.3013 2	1	0.005974	3	0.0 050 3	3	0.4 31 4	1
<i>Reliance Equity Opportunity RP (G)</i>	0.1081 6	5	0.004619	5	0.0 043 1	4	0.2 32 2	5
<i>ICICI Pru Dynamic Fund(G)</i>	0.1200 9	4	0.004996	4	0.0 038 4	5	0.2 59 2	4
<i>Franklin India High growth Company(G)</i>	0.1709 7	3	0.007086	2	0.0 072 6	2	0.4 30 3	2
<i>Reliance Vision fund RP(G)</i>	0.0474 2	7	0.001969	7	0.0 018 6	7	0.1 05 3	7
<i>UTI Dividend Yield fund(G)</i>	0.0218 6	8	0.000881	8	0.0 005 5	8	0.0 45 3	8

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<i>Average</i>	0.1265 8		0.004484		0.0 041 2		0.2 54 5	
<i>CNX-Nifty</i>	0.1949 4		0.00001					

Source: Author's Compiled