ANALYSIS OF RISK ADJUSTED MEASURES OF SELECTED LARGE-CAP EQUITY MUTUAL FUNDS IN INDIA

S. Sivaprakkash,

Ph.D. Research Scholar,
PG & Research Department of Commerce,
Loyola College, Chennai, India.

Dr. T. Joseph,

Associate Professor and Head,
PG & Research Department of Commerce,
Loyola College, Chennai, India.

ABSTRACT

A mutual fund is an investment programme which are funded by unit holders and professionally managed for trading in diversified holdings. They pools money from many investors to purchase securities. Large-cap equity mutual fund invests more than 75% in large-cap stocks mentioned by CRISIL. Risk-adjusted return is the amount of risk involved in getting an acceptable level of return. In this research article, the researcher has analyzed the risk-adjusted returns of ten large-cap equity mutual funds. The performance of the selected mutual funds were analyzed from January 2012 to December 2016. The risk-adjusted return of the mutual funds were manually calculated and measured with the help of Sharpe Ratio, Treynor Ratio, Jensen Ratio and Information Ratio. These ratios can be applied to individual securities and portfolios. The greater the value of the ratios, the more attractive and better are the risk-adjusted returns of the mutual fund schemes. All the funds generated positive returns for the risk taken according to Sharpe, Treynor and Jensen Ratios for the years 2012, 2014 and 2016 and generated negative returns for the years 2013 and 2015. Spearman's Rank Correlation was used to identify the relationship between the ranks of the mutual funds as per each risk-adjusted measures. When comparing two or more investments avenues, an investor must always compare them using same level of risk to get a relative performance perspective.

Keywords: Equity Mutual Fund, Large-cap, Information Ratio, Sharpe Ratio, Treynor Ratio

INTRODUCTION:

A mutual fund is an indirect way of investment in the capital markets. They are professionally managed asset management companies. They mobilize the savings from the investors and invest in portfolio of securities that would meet the risk-return level of expectation of the investors. Mutual funds pool the savings of the investors who share common financial goals. It is a trust which combines the savings of the investors with a mutual financial target. Each fund caters to different risk-return profile of the investors. Mutual fund investments are beneficial to small investors who may not be able to individually own certain securities since these securities have high market prices and cannot be held in large quantities. Mutual funds invest in capital market securities like shares, debentures and even in commodities. The mutual fund companies issue units to the investors representing a share in the asset value of the portfolio. The number of units represents value of the portfolio of the fund. All the investors who have invested in the mutual fund schemes are called as unit holders. Income earned through the investments and capital appreciation or depreciation after meeting the asset management companies expenses are distributed to the unit holders. Mutual funds also provide an option to unit holders to reinvest the income earned in the same fund or different fund. Large-Cap Equity Mutual Fund is defined as "Equity mutual funds that invest more than 75% in large-cap stocks mentioned by CRISIL for a minimum of six out of nine months in each period over the past three years."

The fund manager identifies the securities that have to be included in the portfolio. They are responsible for the performance of the mutual funds. They also monitor the movement of values of these portfolios and change the funds' components whenever the situation warrants. The performance of the mutual funds depends on the ability of the fund managers to choose the right kind of securities with their superior knowledge of the market. They bring value addition to the portfolios through their investment skills.

Risk Adjusted Performance Measures of Mutual Funds:

Risk-adjusted return is the amount return investment has made relative to the amount of risk investment has taken over a given period of time.

Sharpe Ratio:

The Sharpe Ratio measures the risk premium of a portfolio relative to the total amount of risk in the portfolio. The total risk is measured in terms of standard deviation. The larger the ratio value, the better the performance of the portfolio.

$$\textbf{Sharpe Ratio} = \frac{\mathbf{R_p - R_f}}{\mathbf{\sigma_p}}$$

where, R_p = Return of portfolio
R_f = Risk-free rate of return
σ_p = Standard Deviation (Total Risk) of portfolio

Treynor Ratio:

The Treynor Ratio measures the risk premium of a portfolio relative to the total amount of systematic risk in the portfolio. The systematic risk is measured in terms of beta co-efficient.

$$\textbf{Treynor Ratio} = \frac{\mathbf{R_p - R_f}}{\mathbf{\beta_p}}$$

where, R_p = Return of portfolio
R_f = Risk-free rate of return
β_p = Beta Co-efficient (Systematic Risk) of portfolio

Jensen Ratio:

The Jensen Ratio is based on the differential return. The differential return is the return earned by the portfolio over and above the return calculated according Capital Asset Pricing Model.

$$\textbf{Jensen Ratio } (\alpha) = \mathbf{R_p} - \textbf{Expected Retrun of the portfolio as per CAPM}$$
$$\textbf{Expected Retrun as per CAPM} = \mathbf{I_{RF} + [(R_M - I_{RF}) * \beta]}$$

where, I_{RF} = Risk-free interest rate
R_p = Actual return of portfolio
R_m = Expected return of benchmark index
β_p = Beta Co-efficient (Systematic Risk) of portfolio

Information Ratio:

The Information Ratio measures the portfolio returns above the returns of a benchmark indices. It also measures the ability of portfolio manager in generating excess returns than the benchmark returns.

$$\textbf{Information Ratio} = \frac{\textbf{R}_\textbf{p} - \textbf{R}_\textbf{m}}{\sigma_\textbf{p-m}}$$

where, R_p = Expected return of portfolio
R_m = Expected return of benchmark index
σ_{p-m} = Standard deviation of the difference between portfolio returns and index returns)

REVIEW OF LITERATURE:

Sandeep Bansal, Sanjeev Kumar and Surender Kumar Gupta (2012, September) in their article "Test of Sharpe ratio on selected mutual fund schemes" evaluated the performance of twelve selected mutual fund schemes with the application of Sharpe mode. The result shows that only three out of twelve selected mutual fund schemes were more risky as their standard deviation was more than market index and only three out of twelve selected mutual fund schemes had positive value of Sharpe index. So the remaining nine funds did not forecast the future prices.

Kuberudu Burlakanti and Ravi Varma Chiruvoori (2013, May) in their article "Performance evaluation of select equity funds in India" has identified that there exist a correlation relationship between annual returns of funds and NIFTY returns. Due to the crash in 2008, the benchmark index yielded negative return so that the individual funds. In term of annual growth rate Tata Dividend yield and ING Dividend Yield funds offered better returns to investors. In terms of annual returns and CAGR all funds yields better returns than their benchmark NIFTY returns. The performance of mutual funds can be accessed taking together annual growth rate, standard deviation and performance ratio as they give valuable inputs to investors to take investment decisions in mutual fund investment.

Sumana, B.K. and Shivaraj, B. (2014) in their article "Performance evaluation of active mutual funds in India" revealed that the type of performance measure selected has an impact on the performance of asset managers. No funds had a common stand with respect to different performance measures used. Many of the actively managed funds were not able to outperform their respective benchmark indices during the study period. The frequency of measurement also plays an important role in performance analysis.

Goyal, M.M. (2015, January) in his article "Performance evaluation of top ten mutual funds in India" revealed that all schemes provided higher average return than the market return though standard deviation was little higher. Franklin India Opportunities Fund was the best performer with higher average return, lower risk.

Bhagyasree, N. and Kishori, B. (2016, April) in their article "A study on performance evaluation of mutual funds schemes in India" revealed that 14 out of 30 mutual fund schemes had outperformed the benchmark index return. The schemes facing diversification problem underperformed the benchmark index return. Sharpe ratio was positive for all schemes as funds were providing returns greater than risk free rate.

OBJECTIVES OF THE STUDY:

1) To analyze the return per unit of risk of selected large-cap equity mutual funds.
2) To identify the differential return of selected large-cap equity mutual funds.
3) To determine the active returns of selected large-cap equity mutual funds.

IMPORTANCE OF THE STUDY:

The performance of mutual funds is represented through their net asset values. Though they are professionally managed, there is certain degree of risk. The returns of the mutual funds are always risk adjusted. Therefore, the present study would throw light on the returns of the mutual funds based upon well-established risk-adjusted ratios.

RESEARCH METHODOLOGY:

The research work is analytical in nature dealing with the risk adjusted performance of ten large-cap equity mutual funds. The required secondary data were collected from the websites of AMFI, Value Research and the concerned websites of mutual fund companies. The data were collected for a period of 60 months (i.e.) from January 2012 to December 2016.

LIMITATIONS OF THE STUDY:

The research is restricted only to eleven large-cap equity mutual funds which may not represent the performance of all the other schemes as each fund varies in their performance and investment strategy.

RESULTS:

Analysis of Objective 1: Return per unit of risk of selected large-cap equity mutual funds

Table 1: Sharpe Ratio of selected large-cap equity mutual funds

Mutual Funds Schemes	2012	Ranks	2013	Ranks	2014	Ranks	2015	Ranks	2016	Ranks
Birla Sun Life Frontline Equity Fund	2.05	3	-0.08	2	3.11	2	-0.5	5	0.18	3
DSP BlackRock Top 100 Equity Fund	1.51	6	-0.5	10	2.11	9	-0.63	7	0.01	7
Franklin India Bluechip Fund	1.46	8	-0.37	9	2.66	5	-0.46	3	0.14	4
HDFC Top 200 Fund	1.47	7	-0.37	8	2.64	6	-0.8	8	0.23	1
ICICI Prudential Focused Bluechip Equity Fund	1.45	9	-0.01	1	2.74	4	-0.54	6	0.22	2
IDFC Equity Fund	1.28	10	-0.13	4	1.9	10	-0.9	10	0.06	5
Reliance Focused Large-Cap Fund	2.08	2	-0.09	3	2.14	8	-0.35	2	-0.15	9
SBI Blue Chip Fund	2.54	1	-0.18	6	3.59	1	-0.02	1	0.01	6
Tata Large-Cap Fund	1.66	4	-0.15	5	2.58	7	-0.46	4	-0.15	10
UTI Opportunities Fund	1.56	5	-0.27	7	2.86	3	-0.9	9	-0.14	8

INTERPRETATION:

From the above Table - 1, it was found that in the years 2012, 2014 and 2016 all the selected large-cap equity mutual funds were able to generate positive returns for per unit of total risk taken since the Sharpe Ratio for all the funds in those years were found to be positive. Funds like SBI Blue Chip Fund and Birla Sun Life Frontline Equity Fund were the top performance as they have taken moderate to high risk in their portfolios. On the other hand, funds like Franklin India Bluechip Fund and IDFC Equity Fund generated less returns for the risk taken as they had less Sharpe Ratio.

From the above Table - 1, it was found that in the years 2013 and 2015 all the selected large-cap equity mutual funds were not able to generate required amount of returns for the total risk taken since the Sharpe Ratio for all the funds in those years were found to be negative.

Therefore Sharp ratio is an appropriate method to study the risk-relationship of the mutual fund as they depicts that riskier funds pay back with high returns than less risky funds.

Table 2: Treynor Ratio of selected large-cap equity mutual funds

Mutual Funds Schemes	2012	Ranks	2013	Ranks	2014	Ranks	2015	Ranks	2016	Ranks
Birla Sun Life Frontline Equity Fund	1.66	5	-0.05	2	1.15	4	-0.3	6	0.09	2
DSP BlackRock Top 100 Equity Fund	1.4	6	-0.33	10	0.81	10	-0.4	8	0.01	6
Franklin India Bluechip Fund	1.03	10	-0.25	9	0.94	7	-0.25	4	0.07	3
HDFC Top 200 Fund	1.12	9	-0.24	8	1.06	5	-0.51	10	0.11	1
ICICI Prudential Focused Bluechip Equity Fund	1.21	8	0.01	1	1.16	3	-0.34	7	0.01	4
IDFC Equity Fund	2.25	1	-0.24	7	1.8	1	-0.01	1	-0.31	10
Reliance Focused Large-Cap Fund	1.74	3	-0.06	4	0.83	9	-0.21	3	-0.07	7
SBI Blue Chip Fund	2.08	2	-0.06	3	1.36	2	-0.01	2	0.01	5
Tata Large-Cap Fund	1.72	4	-0.1	5	0.91	8	-0.28	5	-0.08	9
UTI Opportunities Fund	1.23	7	-0.17	6	1.02	6	-0.48	9	-0.07	8

INTERPRETATION:

From the above Table - 2, it was found that in the years 2012, 2014 and 2016 all the selected large-cap equity mutual funds were able to generate positive returns for per unit of systematic risk since the Treynor Ratio for all the funds in those years were found to be positive. SBI Blue Chip Fund showed a consistent performance while funds like UTI Opportunities Fund and DSP Black Rock Top 100 Fund generated less returns for the systematic risk taken as they had less Treynor Ratio.

From the above Table - 2, it was found that in the years 2013 and 2015 all the selected large-cap equity mutual funds were not able to generate positive returns for the systematic risk taken since the Treynor Ratio for all the funds in those years were found to be negative.

Well established mutual funds were able to generate positive returns because Treynor Ratio concentrates on the contribution of systematic risk on the performance of mutual funds rather than the simple returns generated by the mutual funds.

Analysis of Objective 2: Differential return of selected large-cap equity mutual funds

Table 3: Jensen Ratio of selected large-cap equity mutual funds

Mutual Funds Schemes	2012	Ranks	2013	Ranks	2014	Ranks	2015	Ranks	2016	Ranks
Birla Sun Life Frontline Equity Fund	0.25	4	-0.01	4	0.3	4	-0.05	6	0.04	2
DSP BlackRock Top 100 Equity Fund	0.19	5	-0.08	10	0.22	10	-0.07	8	0.01	6
Franklin India Bluechip Fund	0.15	9	-0.05	8	0.23	7	-0.04	4	0.03	4
HDFC Top 200 Fund	0.12	10	-0.06	9	0.32	3	-0.11	9	0.06	1

Mutual Funds Schemes	2012	Ranks	2013	Ranks	2014	Ranks	2015	Ranks	2016	Ranks
ICICI Prudential Focused Bluechip Equity Fund	0.16	7	0.01	1	0.27	5	-0.06	7	0.04	3
IDFC Equity Fund	0.31	1	-0.04	7	0.46	1	0.04	1	-0.07	10
Reliance Focused Large-Cap Fund	0.29	2	-0.01	2	0.22	8	-0.03	3	-0.01	7
SBI Blue Chip Fund	0.27	3	-0.01	3	0.34	2	0.03	2	0.01	5
Tata Large-Cap Fund	0.18	6	-0.02	5	0.22	9	-0.04	5	-0.01	8
UTI Opportunities Fund	0.16	8	-0.03	6	0.27	6	-0.11	10	-0.01	9

INTERPRETATION:

From the above Table - 3, it is evident that in the years 2012 and 2014 all the selected large-cap equity mutual funds showed positive alpha values which means that these mutual funds showed superior performance over the performance risk-free investments in delivering high returns. But in the year 2016, only six large-cap equity mutual funds were able to generate higher returns that the returns of risk-free instruments.

From the above Table - 3, it is evident that in the years 2013 and 2015 all the selected large-cap equity mutual funds showed negative alpha values which means that these mutual funds were not able to generate superior returns than the returns of risk-free investments.

Analysis of Objective 3: Active returns of selected large-cap equity mutual funds

Table 4: Information Ratio of selected large-cap equity mutual funds

Mutual Funds Schemes	2012	Ranks	2013	Ranks	2014	Ranks	2015	Ranks	2016	Ranks
Birla Sun Life Frontline Equity Fund	0.48	4	0.1	2	1.05	3	0.23	6	0.36	3
DSP BlackRock Top 100 Equity Fund	0.15	6	-0.25	10	0.51	8	0.07	8	0.21	6
Franklin India Bluechip Fund	-0.02	10	-0.12	8	0.58	7	0.29	3	0.33	4
HDFC Top 200 Fund	0.24	5	-0.16	9	1.05	4	-0.12	9	0.4	2
ICICI Prudential Focused Bluechip Equity Fund	0.01	8	0.16	1	0.79	6	0.18	7	0.4	1
IDFC Equity Fund	0.81	1	-0.05	7	1.98	1	0.65	1	-0.25	10
Reliance Focused Large-Cap Fund	0.67	2	0.08	3	0.45	10	0.29	4	0.08	9
SBI Blue Chip Fund	0.62	3	0.03	5	1.31	2	0.64	2	0.22	5
Tata Large-Cap Fund	0.08	7	0.05	4	0.48	9	0.26	5	0.1	7
UTI Opportunities Fund	0.01	9	-0.04	6	0.87	5	-0.12	10	0.09	8

INTERPRETATION:

From the above Table - 4, it is evident that in the years 2012, 2013, 2014, 2015 and 2016 five large-cap equity mutual funds namely Birla Sun Life Frontline Equity Fund, ICICI Prudential Focused Bluechip Equity Fund, Reliance Focused Large-Cap Fund, SBI Blue Chip Fund and Tata Large-Cap Fund were able to generate more returns than the returns of benchmark index (i.e.) NIFTY.

From the above Table - 4, it is evident that the remaining five funds namely DSP BlackRock Top 100 Equity Fund, Franklin India Bluechip Fund, HDFC Top 200 Fund, IDFC Equity Fund and UTI Opportunities Fund generated more returns than the returns of benchmark index (i.e.) NIFTY only in the years 2012, 2014 and 2016. In the years 2013 and 2016, these funds generated less returns than the returns of benchmark index (i.e.) NIFTY.

Hypotheses Statement - Relationship between mutual fund schemes ranks for each ratio.
H_{01}: There is no significant relationship between Sharpe Ratio ranks of mutual funds.
H_{a1}: There is significant relationship between Sharpe Ratio ranks of mutual funds.

Table 5: Rank Correlation for Sharpe Ratio

	2012	2013	2014	2015	2016
Correlation Coefficient	1.000	0.091	0.430	0.661[*]	-0.491
Significant (2-tailed)	.	0.803	0.214	0.038	0.150
N	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

INTERPRETATION:

From the above Table - 5, it was found that ρ-value = 0.661 and p-value = 0.038 which are statistically significant at 5% level of significance. Therefore, it can be concluded that in the span of five years, for the years 2012 and 2015, there was significant positive relationship in the ranks of mutual funds according to Sharpe Ratio.
H_{02}: There is no significant relationship between Treynor Ratio ranks of mutual funds.
H_{a2}: There is significant relationship between Treynor Ratio ranks of mutual funds.

Table 6: Rank Correlation for Treynor Ratio

	2012	2013	2014	2015	2016
Correlation Coefficient	1.000	0.297	0.273	0.709[*]	-0.636[*]
Sig. (2-tailed)	.	0.405	0.446	0.022	0.048
N	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

INTERPRETATION:

From the above Table - 6, it was found that ρ-value = 0.709 and p-value = 0.022 which are statistically significant at 5% level of significance. Therefore, it can be concluded that in the span of five years, for the years 2012 and 2015, there was significant positive relationship in the ranks of mutual funds according to Treynor Ratio.
From the above Table - 6, it was found that ρ-value = -0.636 and p-value = 0.048 which are statistically significant at 5% level of significance. Therefore, it can be concluded that in the span of five years, for the years 2012 and 2016, there was significant negative relationship in the ranks of mutual funds according to Treynor Ratio.
H_{03}: There is no significant relationship between Jensen Ratio ranks of mutual funds.
H_{a3}: There is significant relationship between Jensen Ratio ranks of mutual funds.

Table 7: Rank Correlation for Jensen Ratio

	2012	**2013**	**2014**	**2015**	**2016**
Correlation Coefficient	1.000	0.370	0.200	0.721[*]	-0.467
Sig. (2-tailed)	.	0.293	0.580	0.019	0.174
N	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

INTERPRETATION:

From the above Table - 7, it was found that ρ-value = 0.721 and p-value = 0.019 which are statistically significant at 5% level of significance. Therefore, it can be concluded that in the span of five years, for the years 2012 and 2015, there was significant positive relationship in the ranks of mutual funds according to Jensen Ratio.

H_{04}: There is no significant relationship between Information Ratio ranks of mutual funds.
H_{a4}: There is significant relationship between Information Ratio ranks of mutual funds.

Table 8: Rank Correlation for Information Ratio

	2012	**2013**	**2014**	**2015**	**2016**
Correlation Coefficient	1.000	0.103	0.370	0.491	-0.394
Sig. (2-tailed)	.	0.777	0.293	0.150	0.260
N	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

INTERPRETATION:

From the above Table - 8, it was found that in the span of five years, there was no significant relationship in the ranks of mutual funds according to Information Ratio.

CONCLUSION:

Mutual funds are financial instruments which are managed by professionals and provide investment services to the investors. The main activity of mutual fund is to collects the savings of investors by selling units of variety of schemes. The money pooled are in turn invested in different types of securities in order to get adequate returns to the investments. Mutual fund investments also provides regular income, capital appreciation and tax shield. Mutual fund schemes have different set of objectives. Based on the objectives of each mutual fund, the fund manager design the structure and composition of investments. The performances of mutual fund schemes are reflected through its net asset values. Though the mutual funds are professionally managed, they are also prone to risk level. So in this paper, the researcher analyzed the risk measures of ten large-cap equity mutual funds. Some common risk-adjusted return measured were Sharpe Ratio, Treynor Ratio, Jensen Ratio and Information Ratio. SBI Blue Chip Fund showed a consistent performance in case of Sharpe and Treynor Ratio. It also provided excess returns as compared to the benchmark returns. There was also similarities in the ranks given by Sharpe, Treynor and Jensen Ratio to the selected large-cap equity mutual funds for the years 2012 and 2015. Making investments in mutual funds would reduce the risk of the investors.

REFERENCES:

Bansal Sandeep, Kumar Sanjeev and Kumar Surender. (2012). Test of Sharpe ratio on selected mutual fund schemes. *International Journal of Marketing, Financial Services & Management Research*, 1(9), 60-69.

Bhagyasree, N. and Kishori, B. (2016). A study on performance evaluation of mutual funds schemes in India. *International Journal for Innovative Research in Science & Technology,* 2(11), 812-816.

Burlakanti Kuberudu and Varma Ravi. (2013). Performance evaluation of select equity funds in India. *International Journal of Social Science & Interdisciplinary Research,* 2(5), 69-78.

Goyal, M.M. (2015). Performance evaluation of top ten mutual funds in India. *Indian Journal of Commerce & Management Studies,* 6(1), 51-55.

Ranganatham, M. & Madhumathi, R. (2006). *Security Analysis and Portfolio Management.* New Delhi: Pearson Publication.

Sumana, B.K. and Shivaraj, B. (2014). Performance evaluation of active mutual funds in India. Elk Asia *Pacific Journal of Finance and Risk Management,* 5(4), 60-84.

*****