



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2021; 7(1): 71-77
www.allresearchjournal.com
Received: 01-11-2020
Accepted: 03-12-2020

Akhila Raju
College of Co-Operation,
Banking and Management,
Kerala Agricultural
University, Vellanikkara
Thrissur, Kerala, India

Risk – return analysis of selected open-ended equity mutual fund schemes in India

Akhila Raju

Abstract

The present paper attempted to examine the risk-return characteristics of selected open-ended equity mutual fund schemes in India. Ten open-ended equity mutual funds (Direct plan-Growth schemes), five each from large-cap and mid-cap category formed the sample for the study. The period of study was from April 2013 to March 2019. The study was exclusively based on secondary data and used monthly closing Net Asset Value (NAV) of selected schemes from the website of Association of Mutual Funds in India (AMFI), return of various market indices from the websites of National Stock Exchange of India limited (NSE) and Bombay Stock Exchange (BSE) and the rate of return of 364 days Treasury bill from Handbook of Statistics on Indian Economy published by Reserve Bank of India (RBI). Average return, Standard deviation and Beta for measurement of risk, various risk adjusted performance evaluation techniques such as Sharpe Ratio, Treynor's Ratio, Sortino Ratio and Jensen's Alpha were the statistical tools used for studying the risk-return characteristics of the selected funds. Risk-return analysis of the funds using various risk adjusted performance evaluation techniques revealed that, the top performers are Mirae Asset Large-cap Fund and Invesco India Mid-cap Fund in the Large-cap and Mid-cap categories respectively. All the selected mutual fund schemes exhibited satisfactory performance during the study period and are good choice of investment for potential investors.

Keywords: Mutual funds, beta, Sharpe ratio, Treynor's ratio, Sortino ratio, Jensen's alpha

Introduction

Mutual fund industry is one of the most preferred investment avenues in India. Mutual funds act as catalytic instruments in the capital market by generating investment growth. They are becoming the most preferred investment options even for small investors by giving access to diversified portfolio of securities with a small amount of capital. Risk-return analysis is an important part of the process of investment management. Return alone should not be considered as the basis of measurement of the performance of a mutual fund scheme, it should also include the risk taken by the fund manager because different funds will have different levels of risk attached to them. Investors and organizations desirous of placing their funds with these mutual funds would like to know the comparative performance of each investment, so as to select the best mutual fund/company. Risk-return analysis of mutual funds will throw light into the performance of mutual fund schemes by assessing their ability to generate returns for the risk assumed. So, in this context, the present paper investigated into the risk-return characteristics of selected open-ended equity mutual fund schemes in India.

Literature review

Sathish and Srinivasan (2016) ^[3] attempted to evaluate the performance of selected mutual fund schemes in India. A sample of 20 open ended mutual fund schemes from top 10 Asset Management Companies were selected and data was collected for over a period of five years spanning from January 2010 to December 2014. NSE Nifty was used as a surrogate for market portfolio. Commercial bank's savings bank deposit rate of 4% was used as proxy for risk free rate of return. Average return, Beta, Standard deviation, correlation, regression analysis and risk adjusted performance measures such as Sharpe ratio, Treynor ratio and Jensen's Alpha were used for analysis. The study found out that ICICI Prudential Mid-cap fund (Growth) has yielded highest average returns (0.07%) for the study period. All the

Corresponding Author:
Akhila Raju
College of Co-Operation,
Banking and Management,
Kerala Agricultural
University, Vellanikkara
Thrissur, Kerala, India

Selected funds were less volatile than the market with a Beta value less than one. ICICI Prudential Mid-cap fund, HDFC Capital Builder fund, UTI Equity fund, UTI opportunities fund and SBI Blue chip fund were the best performing funds in the sampled schemes.

Solanki (2016) ^[1] undertook a study to evaluate the performance of ten Reliance open ended equity schemes with growth option and to compare the risk- return characteristics of the sample schemes with benchmarks – BSE 100 and SENSEX. The period of study was from 1st April 2007 to 31st March 2016 (based on monthly NAV). Rate of Public Provident Fund (PPF) was taken as proxy for risk-free rate of return. Average return and Standard deviation were the main tools used for analysis. The study concluded that all the schemes except Reliance Focused Large-cap fund showed an average return higher than BSE 100 and SENSEX.

Parameshwar *et al.* (2018) ^[2] undertook a comparative absolute return analysis of two sample of Diversified Equity Mutual Fund schemes, namely, Large-cap funds and Mid-cap funds. The study analyzed data collected on 59 Large-cap and 40 Mid-cap funds of different financial institutions for different time period such as one day, one week, two week, one month, three months and six months. F- test and t- test were used to test the significant difference between the two sample fund returns. The study found out that returns from the Mid-cap funds are greater than the returns from Large-cap funds when the time period is less than a year but as far as returns in the long run are considered Large-cap funds are better for investment purposes.

Statement of the problem

Small investors invest in avenues like bank deposits, gold, share, debentures and real estate. Lower per-capita income, apprehensions on loss of capital and economic insecurity significantly influence investment decision of investors, especially small investors and investment in financial assets demands more time, knowledge and risk taking attitude from the part of investors. As most of the investors are not experts in choosing the right scrip sometimes they get their finger burnt due to financial decision, developing a state of loss of interest in direct equity investment. Mutual fund, a financial innovation provides a novel way of mobilizing savings from small investors thus permitting them to enjoy the participation in the equity & other securities of leading companies with less amount of risk involvement, which otherwise would have been impossible for them. Even though, in India the popularity of investing in mutual funds is growing rapidly, most of the common people are less aware about evaluating the performance of mutual fund schemes and selecting the right fund based on their risk appetite and investment objectives. The present study will throw some light to solve the problem of choosing the right mutual fund scheme for making investment. The analysis will generate and provide information that will help the investor / fund manager to assess any need for rebalancing of the investments.

Significance of the study

Evaluating historical performance of mutual funds is important both for portfolio managers and investors. It enables an investor to assess as to how much return has been generated by the portfolio manager and what risk level has been assumed in generating such returns. The present

research work is supposed to be useful especially to present and potential investors, managers of mutual funds, agents of mutual funds, academicians, present and future research scholars and also government and regulated bodies. This study will guide the investors in planning and effecting their investments in mutual funds. It will also act as a guide for beginning investors for choosing better investment avenues.

Objective of the Study

To examine the risk-return characteristics of selected open-ended equity mutual fund schemes in India.

Research methodology

A total of 10 open ended equity schemes (Direct Plan – Growth), five (top performing based on CRISIL ranking) each from Multi-cap and Large-cap category formed the sample for the study. The period of study was from April 2013 to March 2019. Rate of 364 days Treasury bill was used as risk-free rate of return. The study was exclusively based on secondary data and used monthly closing Net Asset Value (NAV) of selected schemes from the website of Association of Mutual Funds in India (AMFI), return of various indices from the websites of National Stock Exchange of India limited (NSE) and Bombay Stock Exchange (BSE) and the rate of return of 364 days Treasury bill from Handbook of Statistics on Indian Economy published by Reserve Bank of India (RBI).

Research tools

Average return

Return of the fund is measured in terms on NAV and is known as the intrinsic value of each unit of mutual fund. Higher the average return, better is the performance of the fund.

$$R_p = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}}$$

Where R_p represents return on fund, NAV_t is the Net Asset Value of the fund at end of the month “t” and NAV_{t-1} is the Net Asset Value of the fund at beginning of the month “t”
Average return = $1/n \sum_{t=1}^n R_p$, where “n” is the time period.

Standard deviation

Standard deviation is a measure of the total risk of the portfolio and is used to measure the variation in individual returns from the average expected return over the period. A fund with higher standard deviation is more volatile than a fund with lower standard deviation.

$$SD = \sqrt{1/n[(\sum y_i^2) - (\sum y_i)^2 / n]}$$

Where SD is the standard deviation, “n” is the time period and “y” is the return on the fund or index.

Beta

Beta indicates the sensitivity of fund returns to the movements of the underlying benchmark. A portfolio with $Beta > 1$ is an aggressive portfolio and $Beta < 1$ is defensive portfolio. Beta value of market index is 1.

$$\beta = Cov(x, y) / V(x) * V(y)$$

Where, $V(x)$ is the Variance of “x”, $V(y)$ is the Variance of “y”, $Cov(x, y)$ is the Covariance of x and y, “x” represents return on market index and “y” represents return on fund.

Sharpe ratio

Sharpe Ratio was devised by William. F. Sharpe in 1996. This ratio measures the performance of an investment (security/portfolio) compared to a risk free asset, after adjusting for its total risk. Higher the Sharpe ratio, better is its risk adjusted performance. By comparing Sharpe ratio of the fund and benchmark, one can get to know whether the fund is outperforming or underperforming the benchmark.

$$SR_p = \frac{R_p - R_f}{\sigma_p}$$

Where SR_p is the Sharpe ratio of portfolio, R_p is the average return on portfolio, R_f is the average risk free rate of return and σ_p is the standard deviation of returns of portfolio.

$$SR_m = \frac{R_m - R_f}{\sigma_m}$$

Where, SR_m is the Sharpe ratio of market index, R_m is the average return on market index and σ_m is the standard deviation of returns of index.

Treynor's ratio

Treynor's ratio is a risk-adjusted measurement of return based on systematic risk (β). This ratio determines how much excess return was generated for each unit of systematic risk taken on by a portfolio/market risk assumed. The higher the Treynor's ratio, the better the performance of the portfolio. If the Treynor's ratio is greater than benchmark comparison, the portfolio is supposed to have outperformed the market.

$$TR_p = \frac{R_p - R_f}{\beta}$$

Where TR_p is the Treynor's ratio of portfolio, R_p is the average return on portfolio, R_f is the average risk free rate of return and β is the systematic risk

$$TR_m = \frac{R_m - R_f}{\beta}$$

Where TR_m is the Treynor's ratio of market index and R_m is the average return on market index

Sortino ratio

Sortino ratio is a modification of Sharpe ratio that differentiates harmful volatility from total overall volatility by using the asset's standard deviation of negative portfolio returns, called downside deviation, instead of total standard deviation of portfolio returns. A higher Sortino ratio indicates superior performance.

$$SO_p = \frac{R_p - R_f}{\sigma_p(\text{negative})}$$

Where SO_p is the Sortino ratio of portfolio, R_p is the average return of the portfolio, R_f is the risk free rate of return and σ_p (negative) is the standard deviation of the negative portfolio return

$$SO_m = \frac{R_m - R_f}{\sigma_m(\text{negative})}$$

Where SO_m is the Sortino ratio of portfolio, R_m is the average return of the market index R_f is the risk free rate of return and σ_m (negative) is the standard deviation of the negative market return

Jensen's alpha

Jensen's Performance Index is a risk adjusted performance measure that represents the average return on a portfolio/investment above or below that predicted by the CAPM. A portfolio with consistently excess return (adjusted for risk) will have positive Alpha and a portfolio with consistently negative excess return (adjusted for risk) will have negative Alpha.

$$R_p - (R_f + \beta * (R_m - R_f))$$

Where R_p is the average return on portfolio, R_f is the average risk free rate of return, β is the systematic risk and R_m is the average return on market index.

Results and Discussions

Table 1: List of mutual fund schemes selected for the study and their respective market indices

S. No.	Scheme	Index
	LARGE-CAP	
1	Axis Bluechip Fund	NIFTY 50 TRI
2	Canara Robeco Bluechip Equity Fund	S&P BSE 100 TRI
3	BNP Paribas Large-cap Fund	NIFTY 50 TRI
4	Edelweiss Large-cap Fund	NIFTY 50 TRI
5	Mirae Asset Large-cap Fund	NIFTY 100 TRI
	MID-CAP	
6	Axis Mid-cap Fund	S&P BSE MID-CAP TRI
7	Invesco India Mid-cap Fund	NIFTY MID-CAP 100 TRI
8	Kotak Emerging Equity Fund	NIFTY MID-CAP 100 TRI
9	Tata Mid-cap Growth Fund	NIFTY MID-CAP 100 TRI
10	DSP Mid-cap Fund	NIFTY MID-CAP 100 TRI

Average return

The return provided on investment by a fund is a criteria for appraising the performance of a fund. Average returns

generated by the mutual fund schemes are calculated using the monthly closing NAV's of the selected schemes for the study period.

Table 2: Average return of the selected schemes for the period 2013-2019

S. No.	Scheme	Average return (%)	Rank
	LARGE-CAP		
1	Axis Bluechip Fund	1.062	3
2	Canara Robecco Bluechip Equity Fund	0.940	5
3	BNP Paribas Large-cap Fund	1.135	2
4	Edelweiss Large-cap Fund	1.037	4
5	Mirae Asset Large-cap Fund	1.327	1
	MID-CAP		
6	Axis Mid-cap Fund	1.374	4
7	Invesco India Mid-cap Fund	1.526	1
8	Kotak Emerging Equity Fund	1.457	2
9	Tata Mid-cap Growth Fund	1.435	3
10	DSP Mid-cap Fund	1.205	5

Table. 2. Depicts the performance of selected open-ended equity mutual fund schemes in terms of average returns for the study period. The table reveals that all the funds selected have positive average return for the study period. In the Large-cap category, Mirae Asset Large-cap Fund is the top performer with an average return of 1.327% followed by BNP Paribas Large-cap Fund (1.135%) and Axis Bluechip Fund (1.062%). Canara Robecco Bluechip Equity Fund is the poor performer among the five funds in the large-cap category with an average return of 0.94%. In the Mid-cap category, Invesco India Mid-cap Fund, Kotak Emerging Equity Fund and Tata Mid-cap Growth Fund holds the first three positions with an average return of 1.526%, 1.457% and 1.435% respectively. DSP Mid-cap Fund is comparatively the poor performer in terms of average returns in the mid-cap category with an average return of 1.205%.

Standard deviation

Standard deviation is a measure of the total risk of the portfolio and is used to measure the variation in individual returns from the average expected return over the period. Standard deviation considers both upward and downward volatility in returns, and a fund with higher standard deviation is more volatile than a fund with lower standard deviation.

Table 3: Standard deviation of the selected schemes for the period 2013-2019

S. No.	Scheme	Standard Deviation (%)
	LARGE-CAP	
1	Axis Bluechip Fund	3.833
2	Canara Robecco Bluechip Equity Fund	3.837
3	BNP Paribas Large-cap Fund	4.018
4	Edelweiss Large-cap Fund	3.877
5	Mirae Asset Large-cap Fund	3.899
	MID-CAP	
6	Axis Mid-cap Fund	4.781
7	Invesco India Mid-cap Fund	4.894
8	Kotak Emerging Equity Fund	4.842
9	Tata Mid-cap Growth Fund	5.054
10	DSP Mid-cap Fund	5.143

Table.3. represents the risk in terms of standard deviation of the return of selected 10 mutual fund schemes. In the Large-cap category, almost all the five funds have similar standard deviation. BNP Paribas Large-cap Fund (4.018 percent) and Mirae Asset Large-cap Fund (3.90 percent) are the ones with higher standard deviation which means its returns are more volatile and are riskier than other funds in the same category. Comparing with the average returns it can also be concluded that these two funds have generated better returns for the total risk assumed. Axis Bluechip Fund has comparatively lowest standard deviation which means that it is less risky compared to other funds and its returns are less volatile. In the Mid-cap category, DSP Mid-cap Fund (5.14 percent) and Tata Mid-cap Growth Fund (5.05 percent) has the highest Standard deviation indicating they are comparatively riskier to other funds. Comparing with average returns, it can be concluded that DSP Mid-cap Fund failed to generate enough returns for the total risk assumed since it has low average returns comparing to other funds in the same category. Axis Mid-cap Fund is the one with lowest SD followed by Kotak Emerging Equity Fund (4.84 percent) and Invesco India Mid-cap Fund (4.89 percent).

Beta

Beta / Systematic risk is the risk inherent to the entire market segment that cannot be diversified away by the fund manager. It measures the tendency of a portfolio's return to change in response to changes in return for the overall market.

Table 4: Beta values of the selected schemes for the period 2013-2019

S. No.	Scheme	Beta (%)
	LARGE-CAP	
1	Axis Bluechip Fund	0.062
2	Canara Robecco Bluechip Equity Fund	0.064
3	BNP Paribas Large-cap Fund	0.057
4	Edelweiss Large-cap Fund	0.062
5	Mirae Asset Large-cap Fund	0.063
	MID-CAP	
6	Axis Mid-cap Fund	0.04
7	Invesco India Mid-cap Fund	0.027
8	Kotak Emerging Equity Fund	0.027
9	Tata Mid-cap Growth Fund	0.024
10	DSP Mid-cap Fund	0.025

Table.4. represents the Beta values of sampled schemes. The table reveals that all the selected 10 schemes have positive Beta value in the range of 0.02 to 0.065. All the selected funds have been defensive since their beta values are less than 1. This indicates that they are less risky than the market portfolio. Beta value is highest for Canara Robecco Bluechip Equity Fund (0.064%) in the large-cap category and this value implies that its returns fluctuate by 0.064 times the market fluctuation.

Sharpe Ratio

Sharpe ratio is a risk-adjusted measurement of risk based on total risk (σ). This ratio measures the performance of an investment (security/portfolio) compared to a risk free asset, after adjusting for its total risk.

Table 5: Sharpe ratio of the selected schemes for the period 2013-2019

S. No.	Scheme	Sharpe Ratio (%)	Rank	Index	Sharpe Ratio (%)
	LARGE-CAP				
1	Axis Bluechip Fund	0.239	3	NIFTY 50 TRI	0.167
2	Canara Robecco Bluechip Equity Fund	0.207	4	S&P BSE 100 TRI	0.180
3	BNP Paribas Large-cap Fund	0.246	2	NIFTY 50 TRI	0.167
4	Edelweiss Large-cap Fund	0.23	5	NIFTY 50 TRI	0.167
5	Mirae Asset Large-cap Fund	0.303	1	NIFTY 100 TRI	0.182
	MID-CAP				
6	Axis Mid-cap Fund	0.257	3	S&P BSE MID-CAP TRI	0.168
7	Invesco India Mid-cap Fund	0.282	1	NIFTY MID-CAP 100 TRI	0.195
8	Kotak Emerging Equity Fund	0.271	2	NIFTY MID-CAP 100 TRI	0.195
9	Tata Mid-cap Growth Fund	0.255	4	NIFTY MID-CAP 100 TRI	0.195
10	DSP Mid-cap Fund	0.206	5	NIFTY MID-CAP 100 TRI	0.195

Table.5. reflects Sharpe ratio of selected schemes and their respective indices for the study period. A positive Sharpe ratio for all the schemes indicate that the funds provided average return greater than the risk free rate for the study period. Similarly, all the funds in the two categories have Sharpe ratio greater than the Sharpe ratio of their respective benchmark indices, indicating that they have outperformed their respective indices and generated higher risk adjusted return than the market return. In the Large-cap category, Mirae Asset Large-cap Fund have the highest Sharpe ratio followed by BNP Paribas Large-cap Fund and Axis Bluechip Fund. Higher Sharpe ratio indicates superior

performance and hence, these funds exhibited comparatively better performance among the sampled schemes in the large-cap category. In the mid-cap category, almost all the funds have similar Sharpe ratio. Under this ratio, Invesco India Mid-cap Fund is the top performer followed by Kotak Emerging Equity Fund and Axis Mid-cap Fund.

Treynor's Ratio

Treynor's ratio is a risk- adjusted measurement of return based on systematic risk (β). This is a measure of the returns earned by a mutual fund more than the risk-free return at a given level of market risk.

Table 6: Treynor's ratio of the selected schemes for the period 2013-2019

S. No.	Scheme	Treynor's Ratio (%)	Rank	Index	Treynor's Ratio (%)
	LARGE-CAP				
1	Axis Bluechip Fund	14.843	3	NIFTY 50 TRI	0.645
2	Canara Robecco Bluechip Equity Fund	12.429	5	S&P BSE 100 TRI	0.706
3	BNP Paribas Large-cap Fund	17.451	2	NIFTY 50 TRI	0.645
4	Edelweiss Large-cap Fund	14.384	4	NIFTY 50 TRI	0.645
5	Mirae Asset Large-cap Fund	18.736	1	NIFTY 100 TRI	0.7116
	MID-CAP				
6	Axis Mid-cap Fund	30.831	5	S&P BSE MID-CAP TRI	0.811
7	Invesco India Mid-cap Fund	50.984	2	NIFTY MID-CAP 100 TRI	1.147
8	Kotak Emerging Equity Fund	48.282	3	NIFTY MID-CAP 100 TRI	1.147
9	Tata Mid-cap Growth Fund	52.779	1	NIFTY MID-CAP 100 TRI	1.147
10	DSP Mid-cap Fund	41.733	4	NIFTY MID-CAP 100 TRI	1.147

Table.6. depicts the Treynor's ratio of selected schemes and their benchmark indices for the study period. Positive value of Treynor's ratio indicate that all the selected funds provided return higher than the risk free rate for the study period. All the funds have outperformed their respective market indices by having comparatively higher Treynor's ratio. This is because the funds ($\beta < 1$) are less volatile than the market indices ($\beta = 1$). In the large-cap category, Mirae Asset Large-cap Fund is the top performer followed by BNP Paribas Large-cap Fund and Axis Bluechip fund. In the mid-cap category, Tata Mid-cap Growth Fund, Invesco India Mid-cap Fund and Kotak Emerging Equity Fund holds the

first three positions as per performance under Treynor's ratio.

Sortino Ratio

Sortino ratio is another measure of risk-adjusted return that measures the performance of the investment relative to downside deviation. It is a modification of Sharpe ratio that differentiates harmful volatility from total overall volatility by using the asset's standard deviation of negative portfolio returns, instead of total standard deviation of portfolio returns.

Table 7: Sortino Ratio of the selected schemes for the period 2013-2019

S. No.	Scheme	Sortino Ratio (%)	Rank	Index	Sortino Ratio (%)
	LARGE-CAP				
1	Axis Bluechip Fund	0.403	2	NIFTY 50 TRI	0.303
2	Canara Robecco Bluechip Equity Fund	0.35	5	S&P BSE 100 TRI	0.331
3	BNP Paribas Large-cap Fund	0.398	4	NIFTY 50 TRI	0.303
4	Edelweiss Large-cap Fund	0.402	3	NIFTY 50 TRI	0.303
5	Mirae Asset Large-cap Fund	0.509	1	NIFTY 100 TRI	0.331
	MID-CAP				
6	Axis Mid-cap Fund	0.396	3	S&P BSE MID-CAP TRI	0.264
7	Invesco India Mid-cap Fund	0.482	1	NIFTY MID-CAP 100 TRI	0.311

8	Kotak Emerging Equity Fund	0.425	2	NIFTY MID-CAP 100 TRI	0.311
9	Tata Mid-cap Growth Fund	0.387	4	NIFTY MID-CAP 100 TRI	0.311
10	DSP Mid-cap Fund	0.370	5	NIFTY MID-CAP 100 TRI	0.311

Table.7. indicates the Sortino ratio for the selected schemes and their respective indices for the study period. All the selected schemes have positive value for the ratio and have outperformed their respective indices as they have higher Sortino ratio than their benchmark indices. In the Large-cap category, Mirae Asset Large-cap Fund, Axis Bluechip Fund and Edelweiss Large-cap Fund are the top three performers with Sortino ratio 0.509%, 0.403% and 0.402% respectively. Higher Sortino ratio indicates superior performance. In the Mid-cap category, Invesco India Mid-cap Fund, Kotak Emerging Equity Fund and Axis Mid-cap Fund are included

in the bracket of top three schemes with Sortino ratio 0.482%, 0.425% and 0.396% respectively.

Jensen's Alpha

Jensen's Alpha is used to determine the abnormal return of a security or portfolio of securities over the theoretical expected return that is predicted by Capital Asset Pricing Model (CAPM). This measure is used to evaluate a fund manager's ability to reward the investors with returns higher than benchmark to justify the risk taken in the underlying portfolio.

Table 8: Jensen's Alpha of the selected schemes for the period 2013-2019

S. No.	Scheme	Jensen's Alpha (%)	Rank
LARGE-CAP			
1	Axis Bluechip Fund	0.876	3
2	Canara Robecco Bluechip Equity Fund	0.749	5
3	BNP Paribas Large-cap Fund	0.953	2
4	Edelweiss Large-cap Fund	0.852	4
5	Mirae Asset Large-cap Fund	1.136	1
MID-CAP			
6	Axis Mid-cap Fund	1.196	4
7	Invesco India Mid-cap Fund	1.350	1
8	Kotak Emerging Equity Fund	1.28	2
9	Tata Mid-cap Growth Fund	1.262	3
10	DSP Mid-cap Fund	1.031	5

Table.8. indicates the Jensen's measure of sampled schemes for the study period. The analysis reveals that all the schemes have positive value for Alpha indicating better performance of the scheme with respect to its benchmark. The fund manager has been handsomely rewarding the investors in the scheme with excessive returns over the benchmark with respect to underlying risk associated with portfolio selection. The good performers on this parameter

in the large-cap category are Mirae Asset Large-cap Fund, BNP Paribas Large-cap Fund and Axis Bluechip Fund. The funds forming bracket of top three schemes in the mid-cap category are Invesco India Mid-cap Fund, Kotak Emerging Equity Fund and Tata Mid-cap Growth Fund.

Ranking of schemes based on risk adjusted techniques of performance evaluation

Table 9: Ranks of selected schemes based on various risk-adjusted performance measures

S. No.	Scheme	Sharpe ratio	Treynor's ratio	Jensen's Alpha	Sortino Ratio
LARGE-CAP					
1	Axis Bluechip Fund	3	3	3	2
2	Canara Robecco Bluechip Equity Fund	4	5	5	5
3	BNP Paribas Large-cap Fund	2	2	2	4
4	Edelweiss Large-cap Fund	5	4	4	3
5	Mirae Asset Large-cap Fund	1	1	1	1
MID-CAP					
6	Axis Mid-cap Fund	3	5	4	3
7	Invesco India Mid-cap Fund	1	2	1	1
8	Kotak Emerging Equity Fund	2	3	2	2
9	Tata Mid-cap Growth Fund	4	1	3	4
10	DSP Mid-cap Fund	5	4	5	5

Table.9. reveals that based on all five risk-adjusted performance measures, Mirae Asset Large-cap Fund is the top performer in Large-cap category and Invesco India Mid-cap Fund in the mid-cap category.

Summary of Findings

- Based on average returns earned for the study period, Mirae Asset Large-cap Fund and Invesco India Mid-cap Fund were the top performers in the large-cap and mid-cap categories respectively.

- Analysis of the volatility of the schemes based on Standard deviation indicated that BNP Paribas Large-cap Fund and DSP Mid-cap Fund were comparatively more risky and volatile with highest Standard deviation.
- Beta value measures the systematic risk, and all the selected funds have been defensive, since their Beta values are less than one and are less risky than market portfolio.
- The Sharpe ratios of all the schemes were positive. Mirae Asset Large-cap Fund and Invesco India Mid-cap

Fund were the best performers in the Large-cap and Mid-cap categories respectively.

- All the funds have outperformed their respective indices with higher Treynor's ratio. Mirae Asset Large-cap Fund and Tata Mid-cap Growth Fund have the highest Treynor's ratio in the Large-cap and Mid-cap categories respectively for the study period.
- Jensen's Alpha for all the schemes were positive indicating superior performance of the schemes with respect to its benchmark which can be attributed to fund manager's efficient stock picking skills.
- With respect to Sortino ratio, Mirae Asset Large-cap Fund and Invesco India Mid-cap Fund have the highest Sortino ratio in the Large-cap and Mid-cap categories respectively.
- Analysis based on all five risk-adjusted performance measures revealed that Mirae Asset Large-cap Fund is the top performer in Large-cap category and Invesco India Mid-cap Fund in the mid-cap category.

Conclusion

Mutual funds are versatile financial vehicles which extends various schemes that suits to the investment objectives of different investors. They work on the principle of collective investment and is expected to provide the benefits of diversification and professional management. From the present study it can be concluded that all the sampled schemes have generated positive average returns for the study period and all the funds have been defensive and are less risky than market portfolio. Risk-return analysis of the funds using various risk adjusted performance evaluation techniques revealed that, the top performers are Mirae Asset Large-cap Fund and Invesco India Mid-cap Fund in the Large-cap, Mid-cap categories respectively. Therefore, it can be concluded that all the 10 selected funds exhibited satisfactory performance and are good choice of investment for potential investors.

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