International Journal of Financial Management
10 (4) 2020, 26-34
http://publishingindia.com/ijfm/

Performance Evaluation of Sectoral Mutual Fund Schemes: Evidence from India

Animesh Bhattacharjee*

Abstract

The study measures the performance of mutual fund (MF) schemes in India with special reference to sector-specific schemes. For the purpose, 21 open-ended equity schemes are considered and analysed by employing Sharpe ratio, Treynor ratio, Jensen alpha, M-squared measure, R-squared measure, and Information ratio. Among the measures selected, the Treynor ratio, Sharpe ratio, Jensen alpha, and M-squared measure are applied as absolute measures and these measures do not compare the returns of the schemes with the returns of their benchmarks. Correlation analysis has also been applied to the ranks assigned by the measures. The study found that majority of the schemes are efficiently and consistently providing more returns than their respective benchmarks. Also, the study found the ranks assigned by absolute measures to be highly associated with each other and the paired correlation between absolute measures and the information ratio is found to be insignificant. The article will help the investors in selecting the consistent sectoral MF schemes operating in India. The originality of the article lies in the fact that only a handful of studies have measured the performance of sectoral MF schemes in India. In addition, majority of the studies use traditional ratios to measure the performance of MF schemes. Thus, the present article is a significant addition to the existing literature.

Keywords: Mutual Funds, Sectoral Funds, Sharpe Ratio, Treynor Ratio, Jensen Alpha, M-Squared Measure, Information Ratio

Introduction

Growth process of an economy is facilitated by financial system of that economy (Height, 2005). The financial system helps in accumulating, channelizing and allocating funds by encouraging savings from different groups (Babu, 2018). A financial institution channelizes the unutilized money from unproductive sectors to the productive sectors. MF is no different and performs the same function in the economy (Subrahmanyam, 2008-2009).

MF as a financial institution collects savings from small investors and invests them in well-diversified financial instruments to provide maximum possible return with minimum possible risk. With MFs, retail investors get better opportunity to invest in better and less-risky investments. So, for them, the MF is a preferred way of investing in capital market (Kaur, 2013). MFs facilitate the investors with various risk-return preferences by providing them the facility of various categories of funds to invest in and are able to satisfy a diverse range of investors. Among the various categories of funds provided by the MFs, sectoral MFs are the funds, which consider the portfolio of a specific sector of the economy. Because of their focused exposure, these funds are considered risky and do not find a place in most financial plans. The reason behind this is as more people invest in a particular fund, the less diversified their portfolio becomes (Dhanorkar, 2016). Further, due to less diversification, the risk of the portfolio increases and to make up for the increased risk, a higher return must be offered (Hymer, 1976). Thus, if the sectoral funds are capable of offering higher risk-adjusted returns, the investors may consider it while constructing the portfolio or if their risk preferences allow them, they may consider these funds as a plan for core investment.

The aforementioned discussion motivates us to know whether the sectoral funds provide better returns than other traditional MF schemes and which sectoral funds are better to invest in, the performance evaluation of sectoral funds is required. To our knowledge, no other study investigated the performance of Indian sectoral MF schemes. Thus, the present study will be a relevant addition to the empirical literature of performance evaluation of MF schemes. In addition, the study will apply performance measurement tools suggested by Treynor (1965), Sharpe (1966) and Jenson (1968) to provide in-depth analyses of the performance of the schemes under study.

* Research Scholar, Department of Commerce, Tripura University, Tripura, India. Email: bhatt.ani725@gmail.com

Review of Literature

There is a plethora of articles that measured the performance of various types of MFs. Some of the important articles are discussed in this section.

Using monthly returns, Jayadev (1996) analysed the performance of capital growth unit scheme of UTI and Magnum Express scheme of SBI mutual fund. With the objective to find out diversification, market timing and stock-selection abilities of managers, returns were calculated and compared using Jensen's measure, Treynor's measure, Sharpe's measure and Fama's measure. Magnum express was found to be diversified. However, the managers of both the schemes were ranked poor for their selectivity and timing ability. Choi and Murthi (1997) examined the efficiency of MFs and measured portfolio performance with non-parametric approach. The study used DEA analysis and considered returns of schemes as benefit variable and expense ratio, turnover, risk and loads as cost variables. It was concluded in the study that all schemes were efficient according to mean-variance efficiency rules. Samashekar (2008) measured the performance of 58 open-ended equity-diversified growth funds by employing Hausman test and regression analysis. The author concluded that the larger firms underperform in a bearish market. Puri (2010) evaluated the performance of 30 open-ended balanced funds using daily data. The study employed Sharpe, Treynor and Jensen measures, and found that balanced growth schemes provided better returns as compared to balanced dividend schemes. Zaheeruddin (2013) investigated the performance of all schemes offered by HDFC, Birla Sun Life and ICICI mutual funds by using traditional measures like Sharpe ratio, Treynor ratio and Jensen's alpha. The results suggested that ICICI mutual fund schemes performed better. Rekha and Rajender (2014) analysed the returns of Hybrid growth MFs over a period of 5 years and applied Sharpe ratio, Treynor's ratio and Sortino ratio. The findings revealed that the schemes have low unique risk. Arora (2015) evaluated the risk-adjusted performance of MF schemes for a period of 8 years starting from 2000-01 to 2007-08. Analysing the Treynor and Sharpe's ratio, calculated with Net asset values and benchmark returns, the study concluded that during bull phase, the equity-oriented schemes did well but most of them did not perform better than Benchmark and also suggested that the past performances are not the indicator of future performance. Prasad and Durga (2017) evaluated the performance of mid cap MFs for financial year 2016-17. Nine such schemes with minimum survival period of ten years were selected and the study considered minimum investment, Beta, Expense ratio and total assets of the schemes as input variable for Data Envelopment analysis. The output variables were the return of the schemes, Sharpe ratio, alpha value and turnover of the funds. Out of the nine schemes selected, seven were found be efficient as per the analysis. Chowdhary and Chawla (2014) evaluated the performance of diversified Indian equity MFs. The study selected eight open-ended schemes and analysed through Sharpe's ratio, Treynor's ratio and R-squared. The study concluded that majority of the funds recorded superior performance as those were providing returns more than that of the benchmark. Narayanaswamy and Ratnamani (2013) evaluated the performance of equity MFs in India with special reference to equity large-cap funds. The study extends over a period of three years and considered five MF schemes by the different private sector MFs. Net asset values and total return of the schemes were analysed through the values of Alpha, Beta, Standard deviation, R-squared and Sharpe ratio. The study concluded that the selected funds, except one, performed very well in high-volatile market and suggested that while evaluating the funds' performance Alpha, Beta, Standard deviation should also be seen apart from Net assets value and total return. Busse et al. (2010) evaluated the performance of investment fund managers in generating returns and examined persistence in that performance. A number of 4617 domestic equity schemes were studied for a period of 17 years starting from 1991 to 2008. The study used conditional 4-factor, Fama-French 3-factor model, Carhart 4-factor model and 7-factor models, and found that the managers were not having the ability of superior performance, which leads lower actual performance against the expected standards. Bhagyashree (2016) investigated the performance of MFs with a special reference to open-ended, growth-oriented equity MFs. The study employed the Sharpe ratio, Treynor ratio, Jensen measure and found that almost all the schemes were providing more returns than the risk-free rate of return. However, the study also found that the schemes were not well-diversified and according the two ratios. Dhanda and Choudhary (2016) analysed the performance of five sector-specific growth schemes for a period from April, 2003, to March, 2016. The study considered daily data of returns realised, BSE Sensex as benchmark and assumed risk free rate of 8% for the analysis and employed Sharpe ratio, Treynor ratio and Jensen measure. The study concluded that all the selected schemes performed better than the market for all the years except in the year 2008-09.

Data and Techniques

Data and its Sources

The study measured the performance of 21 sectoral MF schemes. The study included four Pharma and Healthcare Funds, four FMCG Funds, seven Banking and Financial Services Funds and six Infrastructure Funds. The study covered a period of 3 years (2017:1 to 2019:12) and considered only open-ended equity schemes. The Net Asset Value of the MF schemes is obtained from the AMFI website while the benchmark index is obtained from the official websites of Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). For the present study, the risk-free rate is the rate of return of the 365 days Treasury Bills. The data on risk-free rate is collected from the RBI website.

Table 1: Selected Sectoral Mutual Fund Schemes

Sr. No	*Name of the Scheme*	*Benchmark Index*	*Launch Date*
1.	UTI Healthcare Fund-Dir-(G)	S&P BSE Healthcare	02-Jan-2013
2.	Nippon India Pharma Fund-Dir-(G)	S&P BSE Healthcare	02-Jan-2013
3.	SBI Healthcare Opportuinities Fund-Dir-(G)	S&P BSE Healthcare	02-Jan-2013
4.	TATA India Pharma and Healthcare Fund-Dir-(G)	Nifty 50	28-Dec-2015
5.	ICICI Prudential FMCG-Dir-(G)	Nifty 50	01-Jan-2013
6.	TATA India Consumer Fund-Dir-(G)	Nifty 50	28-Dec-2015
7.	Mirae Asset Great Consumer Fund-Dir-(G)	Nifty 50	02-Jan-2013
8.	CanaraRobeco Consumer Trends Fund-Dir-(G)	S&P BSE 100	02-Jan-2013
9.	Aditya Birla Sun Life Banking and Financial Services Fund-Dir-(G)	Nifty Financial Services	14-Dec-2013
10.	Baroda Pioneer Banking and Financial Services Fund-Dir-(G)	Nifty 50	02-Jan-2013
11.	ICICI Prudential Banking and Financial Services Fund-Dir-(G)	Nifty Financial Services	01-Jan-2013
12.	Tata Banking and Financial Services Fund-Dir-(G)	Nifty Financial Services	28-Dec-2015
13.	SBI Banking and Financial Services Fund-Dir-(G)	Nifty Financial Services	26-Feb-2015
14.	UTI Banking and Financial Services Fund-Dir-(G)	Nifty Financial Services	02-Jan-2013
15.	Taurus Banking and Financial Services Fund-Dir-(G)	Nifty 50	02-Jan-2013
16.	Aditya Birla Sun Life Infrastructure Fund-Dir-(G)	Nifty Infrastructure	02-Jan-2013
17.	BOI AXA Manufacturing and Infrastructure Fund-Dir-(G)	Nifty 50	02-Jan-2013
18.	CanaraRobeco Infrastructure Fund-Dir-(G)	S&P BSE Infrastructure	02-Jan-2013
19.	ICICI Prudential Infrastructure Fund-Dir-(G)	Nifty Infrastructure	01-Jan-2013
20.	IDFC Infrastructure Fund-Dir-(G)	S&P BSE Infrastructure	02-Jan-2013
21.	L&T Infrastructure Fund-Dir-(G)	Nifty Infrastructure	01-Jan-2013

Source: Compiled by Author

Methodology

The present study measured the performance of 21 sectoral funds by employing measures suggested by Treynor (1965), Sharpe (1966) and Jenson (1968) in addition Modigliani risk-adjusted performance measure and information ratio is used.

Daily MF return: It is computed using equation (1)-

$$DR_i = [(NAV_t - NAV_{t-1})/ NAV_{t-1}]*100 \qquad (1)$$

Where, DR_i is daily scheme return, NAV_t is the Net Asset Value at time t, NAV_{t-1} is the Net Asset Value at time $t-1$.

Daily Benchmark/Market return: It is computed using the equation below-

$$DR_m = [(MAR_t - MAR_{t-1})/ MAR_{t-1}]*100 \qquad (2)$$

Where, DR_m is daily benchmark return, MAR_t is the Benchmark Index at time t, MAR_{t-1} is the Benchmark Index at time $t-1$.

Standard Deviation: It measures the dispersion in returns and a higher value of standard deviation suggests higher risk.

Beta (β_i): It is a measure of systematic risk and reflects the sensitivity of the scheme's returns to fluctuation in the benchmark return. A scheme with a beta value of greater than 1 suggests that the scheme is more volatile than the benchmark return while a beta value of less than 1 indicates that the fund's returns is less volatile than the benchmark returns.

R-Squared: The coefficient of determination or the R-Squared is a measure of a fund's diversification in relation to the benchmark index. A value of 0 indicates that a fund's return have no correlation with the benchmark returns while a value of 100 suggests that the fund's returns are completely in sync with the benchmark returns. A low R-Squared value also suggests that the MF scheme is not properly diversified.

Sharpe Ratio: Sharpe ratio was developed by William F. Sharpe and characterises how well the return of a MF scheme compensates the investors for the risk taken. The ratio can be defined as the difference between the scheme return and the risk-free rate of return, divided by the standard deviation of the scheme. This ratio assigns high values to MF schemes that best support the risk-adjusted average rate of return.

It can be expressed as:

$$S_i = (R_i - R_f)/\sigma_i \quad (3)$$

Where, S_i is the Sharpe ratio of scheme i, R_i is the average return of the scheme i, R_f is the risk-free rate of return and σ_i is the standard deviation of the scheme.

While comparing two MF schemes, the scheme with a higher Sharpe ratio is a better performer.

Treynor Measure: Treynor measure is also known as reward to volatility ratio and can be defined as the difference between the scheme return and the risk-free rate of return, divided by the beta of the portfolio. The difference between the Sharpe ratio and Treynor measure is that the former considers the total risk while the latter considers the systematic risk.

Treynor measure is given as:

$$T_i = (R_i - R_f)/\beta_i \quad (4)$$

Where, T_i is the Treynor measure of the scheme i, R_i is the average return of the scheme i, R_f is the risk-free rate of return and β_i is the Beta of the scheme i.

Jensen's Alpha: It determines abnormal return of a MF scheme over the expected market return predicted by the Capital Asset Pricing Model (CAPM). A positive value of Jensen's alpha suggests that the MF scheme has provided a higher return over the CAPM return and, therefore, lies above the Security Market Line.

Jensen's alpha can be calculated using the equation (5):

$$\alpha = R_i - [R_f + \beta_i(R_m - R_f)] \quad (5)$$

Equation (3) can be rewritten as:

$$\alpha = (R_i - R_f) - \beta_i(R_m - R_f) \quad (6)$$

Where, R_i is the average return of the scheme, R_f is the risk-free rate of return, β_i is the Beta of the scheme i and R_m is the average benchmark return.

M-Square Measure: M-Square measure is also known as Modigliani risk-adjusted performance or simply RAP. It is an extended version of Sharpe ratio and is more useful when compared with the Sharpe ratio. It is easy to interpret since it is in units of percent return. A scheme with a higher value of M-Square measure is a better performer as compared to a scheme with a lower value.

RAP can be calculated using equation (5):

$$RAP_i = (\sigma_M / \sigma_i)\,(r_i - R_f) + R_f \quad (7)$$

Where, RAP_i is risk-adjusted return of the scheme i, σ_M is the standard deviation of the benchmark, σ_i is the standard deviation of the scheme and R_f is the risk-free rate.

Information Ratio: It measures the risk-adjusted returns of a MF scheme relative to its benchmark. The ratio shows not only the excess returns of the scheme relative to its benchmark but also the consistency with which the scheme generates the excess return.

$$IR_i = (R_i - R_m)/TE \quad (8)$$

Where, IR_i is the information ratio of scheme i, R_i is the average return of the scheme, R_m is the average benchmark return and TE is the tracking error. Tracking error is the standard deviation of a scheme returns from the returns of a benchmark.

Higher the information ratio better is the performance and consistency of the MF scheme. However, if the information ratio is negative, it shows the failure of the scheme manager to achieve even the benchmark return.

Results and Discussions

Table 2: Analysis of Pharma and Healthcare Funds

Scheme	*Std. Deviation (Scheme)*	β_i	*R-Squared*	*Sharpe Measure*	*Treynor Ratio*	*Jensen's Alpha*	*M-Squared Measure*	*Information Ratio*
UTI Healthcare Fund-Dir-(G)	0.868	0.303	0.126	-3.807	-10.892	-1.138	0.994	-10.945
Nippon India Pharma Fund-Dir-(G)	0.907	0.252	0.085	1.165	4.189	3.625	6.093	28.808
SBI Healthcare Opportunities Fund-Dir-(G)	0.937	0.281	0.098	-6.200	-20.658	-3.163	-1.625	3.092
TATA India Pharma and Healthcare Fund-Dir-(G)	0.883	0.296	0.116	-0.008	-0.024	2.113	4.861	6.512

Source: Computation of Author

Table 3: Analysis of FMCG Funds

Scheme	*Std. Deviation (Scheme)*	β_i	*R-Squared*	*Sharpe Measure*	*Treynor Measure*	*Jensen's Alpha*	*M-Squared Measure*	*Information Ratio*
ICICI Prudential FMCG-Dir-(G)	0.734	0.378	0.154	14.210	27.557	6.904	15.719	1.350
TATA India Consumer Fund-Dir-(G)	0.830	0.482	0.195	17.400	29.939	10.236	18.118	10.664
Mirae Asset Great Consumer Fund-Dir-(G)	0.789	0.429	0.171	18.023	33.107	10.469	18.592	10.685
CanaraRobeco Consumer Trends Fund-Dir-(G)	0.801	0.166	0.025	16.579	80.003	11.915	17.659	4.918

Source: Computation of Author

Table 4: Analysis of Banking and Financial Services Funds

Scheme	*Std. Deviation (Scheme)*	β_i	*R-Squared*	*Sharpe Measure*	*Treynor Measure*	*Jensen's Alpha*	*M-Squared Measure*	*Information Ratio*
Aditya Birla Sun Life Banking and Financial Services Fund-Dir-(G)	1.060	0.188	0.030	13.633	76.490	10.750	18.330	-3.911
Baroda Pioneer Banking and Financial Services Fund-Dir-(G)	0.974	0.156	0.015	14.367	89.198	12.589	15.797	4.339
ICICI Prudential Banking and Financial Services Fund-Dir-(G)	1.048	0.178	0.028	13.867	81.474	11.043	18.562	-3.849
Tata Banking and Financial Services Fund-Dir-(G)	0.961	0.115	0.014	18.514	153.611	15.569	23.149	-1.113
SBI Banking and Financial Services Fund-Dir-(G)	0.961	0.170	0.030	19.127	107.999	15.055	23.754	-0.961
UTI Banking and Financial Services Fund-Dir-(G)	1.054	0.144	0.018	10.415	75.738	8.192	15.154	-6.151
Taurus Banking and Financial Services Fund-Dir-(G)	0.972	0.243	-0.036	17.612	70.359	14.871	18.269	7.037

Source: Computation of Author

Table 5: Analysis of Infrastructure Funds

Scheme	*Std. Deviation (Scheme)*	β_i	*R-Squared*	*Sharpe Measure*	*Treynor Measure*	*Jensen's Alpha*	*M-Squared Measure*	*Information Ratio*
Aditya Birla Sun Life Infrastructure Fund-Dir-(G)	0.988	0.242	0.059	1.311	5.340	0.766	6.169	-0.728
BOI AXA Manufacturing and Infrastructure Fund-Dir-(G)	0.948	0.308	0.061	4.476	13.774	1.381	8.275	-4.767
CanaraRobeco Infrastructure Fund-Dir-(G)	0.925	0.176	0.041	1.791	9.405	2.784	6.791	6.367
ICICI Prudential Infrastructure Fund-Dir-(G)	0.916	0.188	0.041	4.175	20.302	3.417	9.008	1.367
IDFC Infrastructure Fund-Dir-(G)	0.997	0.232	0.062	0.746	3.195	2.167	5.670	5.407
L&T Infrastructure Fund-Dir-(G)	0.943	0.210	0.048	5.670	25.483	4.894	10.490	2.625

Source: Computation of Author

Beta indicates the sensitivity of a fund returns against the benchmark return and R-Square (Coefficient of Determination) measures the relationship between the MF return and the benchmark return. From Table 2, it can be observed that beta of all the pharma and healthcare funds is less than 1, indicating that the schemes are less volatile than the market. From the values of R-Square, it can be said that movements in the benchmark indices explain a small percentage of variations in the returns of the schemes. Among the selected pharma and healthcare funds, Nippon India Pharma Fund-Dir-(G) outperformed all other funds in every measure while SBI Healthcare Opportunities Fund-Dir-(G) is the worst performer. Further, Nippon India Pharma Fund-Dir-(G) is the only scheme with a positive Sharpe, Treynor and Jensen's alpha. Since the Sharpe measure is negative for most of the schemes, M-Squared Measure is a better indicator of the risk-adjusted performance because M-Squared Measure is expressed in terms of percentage while Sharpe measure is dimensionless and hence hard to interpret. The information ratio of UTI Healthcare Fund-Dir-(G) is negative which shows the failure of the fund manager to achieve the benchmark return

From Table 3, it can be seen that the beta of the FMCG funds is less than 1, indicating that the returns of the schemes are less volatile than the market return. The observation of the R-square indicates that the movement in the benchmark returns explains only a small percentage of the variation in the schemes' returns. Mirae Asset Great Consumer Fund-Dir-(G) is the best performer among the FMCG funds in every measure. All the schemes have a positive value of Jensen's alpha, which indicates that all the schemes have provided higher returns over the CAPM return and thus, lie above the security market line. The values of information ratio are positive for all the schemes indicating that the fund manager was able to beat the market and achieved higher return than the benchmark return.

Table 4 shows the performance analysis of Banking and Financial Services Funds. The analysis of the beta revealed that all the returns of the schemes are less volatile than the benchmark return. From the observation of the R-Square values, it can be said that since the values are very low, there is a large scope for diversification. The diversification can reduce the unsystematic risk or diversifiable risk and improve the fund's performance. The values of Sharpe measure suggest that SBI Banking and Financial Services Fund-Dir-(G) is the best performer while Tata Banking and Financial Services Fund-Dir-(G) has the highest Treynor ratio and Jensen's alpha. The information ratio indicates that the Fund Managers of Aditya Birla Sun Life Banking and Financial Services Fund-Dir-(G), ICICI Prudential Banking and Financial Services Fund-Dir-(G), Tata Banking and Financial Services Fund-Dir-(G), SBI Banking and Financial Services Fund-Dir-(G), and UTI Banking and Financial Services Fund-Dir-(G) failed to achieve the benchmark return.

The analysis of the infrastructure funds reveals that the returns of the funds are less volatile than the benchmark returns. The results of R-Square suggest that there is a large scope of diversification. L&T Infrastructure Fund- Dir-(G) is the best performer in all measure. All the infrastructure funds have positive values of Jensen's alpha suggesting that all the infrastructure funds have provided higher return over the CAPM return. The Aditya Birla Sun Life Infrastructure Fund- Dir-(G) and BOI AXA Manufacturing and Infrastructure Fund- Dir-(G) have negative information ratio suggesting the failure of the fund managers in achieving returns higher than the benchmark returns.

Table 6: Rankings of the Sectoral Schemes

Scheme	Sharpe Measure	Treynor Ratio	Jensen's Alpha	M-Squared Measure	Information Ratio
UTI Healthcare Fund-Dir-(G)	20	20	20	20	21
Nippon India Pharma Fund-Dir-(G)	17	17	13	17	1
SBI Healthcare Opportuinities Fund-Dir-(G)	21	21	21	21	10
TATA India Pharma and Healthcare Fund-Dir-(G)	19	19	17	19	5
ICICI Prudential FMCG-Dir-(G)	8	11	11	10	13
TATA India Consumer Fund-Dir-(G)	5	10	9	7	3
Mirae Asset Great Consumer Fund-Dir-(G)	3	9	8	3	2
CanaraRobeco Consumer Trends Fund-Dir-(G)	6	5	5	8	8
Aditya Birla Sun Life Banking and Financial Services Fund-Dir-(G)	10	6	7	5	18
Baroda Pioneer Banking and Financial Services Fund-Dir-(G)	7	3	4	9	9
ICICI Prudential Banking and Financial Services Fund-Dir-(G)	9	4	6	4	17
Tata Banking and Financial Services Fund-Dir-(G)	2	1	1	2	16
SBI Banking and Financial Services Fund-Dir-(G)	1	2	2	1	15
UTI Banking and Financial Services Fund-Dir-(G)	11	7	10	11	20
Taurus Banking and Financial Services Fund-Dir-(G)	4	8	3	6	4
Aditya Birla Sun Life Infrastructure Fund-Dir-(G)	16	16	19	16	14
BOI AXA Manufacturing and Infrastructure Fund-Dir-(G)	13	14	18	14	19
CanaraRobeco Infrastructure Fund-Dir-(G)	15	15	15	15	6
ICICI Prudential Infrastructure Fund-Dir-(G)	14	13	14	13	12
IDFC Infrastructure Fund-Dir-(G)	18	18	16	18	7
L&T Infrastructure Fund-Dir-(G)	12	12	12	12	11

Source: Computation of Author

After measuring the performance of the MF schemes, the correlation between the rankings based on different performance measures using Spearman's rank correlation coefficient is computed. The summary of the correlation analysis is summarised in Table 7.

Table 7: Rank Correlation of Rankings based on Various Performance Measures

			Sharpe Ratio	Treynor Measure	Jensen's Alpha	M-Squared Measure	Information Ratio
Spearman's rho	Sharpe Ratio	Correlation Coefficient	1.000	.894**	.909**	.953**	.052
		Sig. (2-tailed)	.	.000	.000	.000	.823
		N	21	21	21	21	21
	Treynor Measure	Correlation Coefficient	.894**	1.000	.940**	.926**	-.199
		Sig. (2-tailed)	.000	.	.000	.000	.388
		N	21	21	21	21	21
	Jensen's Alpha	Correlation Coefficient	.909**	.940**	1.000	.913**	.058
		Sig. (2-tailed)	.000	.000	.	.000	.801
		N	21	21	21	21	21
	M-Squared Measure	Correlation Coefficient	.953**	.926**	.913**	1.000	-.070
		Sig. (2-tailed)	.000	.000	.000	.	.763
		N	21	21	21	21	21
	Information Ratio	Correlation Coefficient	.052	-.199	.058	-.070	1.000
		Sig. (2-tailed)	.823	.388	.801	.763	.
		N	21	21	21	21	21

Source: Computation of Author

**. Correlation is significant at the 0.01 level (2-tailed).

It is evident from the high correlation values that Sharpe measure, Treynor ratio, Jenson alpha and M-Squared measure deliver nearly the same rankings. However, the ranking based on information ratio is not significantly correlated to any other performance measures.

Conclusion

The study investigated the performance of sector-specific MFs in terms of their risk-adjusted returns as well as the consistency of that funds in providing the returns higher than their reputed benchmarks. The R-squared measure has been found to be very low in all the schemes. It shows that the funds have not been diversified in accordance with their benchmarks. But, on the other hand, if funds are able to beat the benchmark returns without following or replicating their benchmarks, then it shows their active management in managing the portfolio. The efficiency of funds in providing more returns than the benchmark has been judged by the information ratio, which found that out of 21 funds studied, 13 funds show positive values of the information ratio. It shows the consistency of the funds in providing higher risk-adjusted returns than their respective benchmarks. Apart from the information ratio, the study has analysed the schemes with the help of Sharpe ratio, Treynor ratio, Jensen measure and M-squared measure and ranks has been assigned to the funds according to each measure. According to the Sharpe and Treynor ratio, 18 funds have provided more returns than the risk free rate of return while three funds were not able to provide the returns even at par with the risk-free rate of returns. The Jensen measure found that the 19 funds have provided more returns than that was expected from the benchmark. While according to the M-squared measure, 20 funds were qualified for providing good returns. The study also used Correlation analysis to find the association between the ranks given by these measures. The high and significant value of paired correlation confirmed the high association between ranks assigned by these measures. It means these four measures have ranked the schemes in near about the same ranks. But the paired correlation of all the four measures with the information ratio shows no significant correlation between them, because these four measures are absolute measures and count the returns only above the risk-free rate of return while the Information ratio is relative measure and considers both variables i.e. the risk adjusted rate of returns and returns of their respective benchmarks. Overall, the study concludes that majority of the sector-specific funds are able to provide higher risk-adjusted returns as confirmed by all the measures. In addition, the information ratio confirms the ability of the funds to consistently provide better returns than the market with their active management of portfolio. Hence, it is advisable to the investors to consider sector-specific funds to invest in while making the investment decisions and adjust the proportion of these funds according to their risk-return preferences.

References

Arora, K. (2015). Risk adjusted performnace evaluation of Indian mutual fund schemes. *Paradigm, 19*(1), 79-94.

Babu, G. S. (2018). Role of financial system in economic development of a country. *International Journal of Multidisciplinary Research and Development, 5*(8), 100-107.

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

Busse, J. A., Goyal, A., & Wahal, S. (2010). Performance and persistence in institutional investment management. *The Journal of Finance, 65*(2), 765-790.

Choi, Y. K., & Murthi, B. (2001). Relative performance evaluation of mutual funds: A non-parametric approach. *Journal of Business Finance & Accounting, 28*(7&8), 853-876.

Chowdhary, V., & Chawla, P. S. (2014). Perfromance evaluation of mutual funds: A study of selected diversified equity mutual funds in India. *International Conference on Business, Law & Corporate Social Responsibility,* 82-85.

Dhanda, N., & Chaudhary, R. (2017). Performance evaluation of selected mutual fund growth schemes in India. *EPRA International Journal of Economic and Business Review, 5*(5), 89-95.

Dhanorkar, S. (2016, September 19). Should you invest in sectoral mutual funds? Find out. Retrieved March 22, 2020, from Economic Times Website: https://economictimes.indiatimes.com/wealth/invest/should-you-invest-in-sectoral-mutual-funds-find-out/articleshow/54375247.cms?from=mdr

Height, L. (2005, January). Please explain how financial markets may affect economic performance. Retrieved from www.frbsf.org: https://www.frbsf.org/education/publications/doctor-econ/2005/january/financial-markets-economic-performance/

Hymer, S. H. (1976, June 27). *The international operations of national firms: A study of direct foreign investment.* Cambridge: MIT Press.

Jayadev, M. (1996). Mutual fund performance: An analysis of monthly returns. *Finance India, 10*(1), 73-84.

Jensen, M. (1968). The performance of mutual funds in the period 1945-1964. *The Journal of Finance, 23*(2), 389-416.

Kaur, I. (2013, October). Performance, timing and selectivity skills of indian equity mutual funds: An empirical approach. *Journal of Arts, Science and Commerce, 4*(4), 87-94.

Modigliani, F., & Modigliani, L. (1997). Risk-adjusted performance. *The Journal of Portfolio Management, 23*(2), 45-54.

Narayanasamy, R., & Ratnamani, V. (2013). Performance evaluation of equity mutual funds (on selected equity large cap funds). *International Journal of Business and Management Invention, 2*(4), 18-24.

Prasad, R. S., & Durga, H. K. (2017). A study on perfromance evaluation of select mutual fund schemes: An operational research approach. *IOSR Journal of Business and Management, 19*(12), 69-72.

Puri, H. (2010). Perfromance evaluation of balanced mutual fund schemes in Indian scenario. *Paradigm, 14*(2), 20-28.

Rekha, U., & Rajender, K. (2014). Portfolio perfromance evaluation of mutula funds in India - A study of hybrid growth funds. *Global Journal of Management and Business Research, 14*(4), 42-52.

Sharpe, W. F. (1966). Mutual fund performance. *The Journal of Business, 39*(1), 119-138.

Somashekar, T. S. (2008). Fund size and its impact on fund returns. *The Indian Economic Journal, 56*(1), 102-111.

Subrahmanyam, N. (2008-09). Mutual funds and banking: India and global experience. Retrieved from http://www.iibf.org.in/documents/reseach-report/Report-17.pdf

Treynor, J., & Mazuy, K. (1966). Can mutual funds outguess the market? *Harvard Business Review, 44*, 131-136.

Zaheeruddin, M., Sivakumar, P., & Reddy, K. S. (2013). Performance evaluation of mutual funds in India with special reference to selected financial intermediaries. *IOSR Journal of Business and Management, 7*(2), 34-40.