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Performance Analysis of Mid Cap Mutual Funds in India (2014 To 2023)

Lieutenant Colonel Apollo Ghosh*
Student : MBA 2nd Year (Batch 2021-23)
Lords Institute of Engineering and Technology,
Sy No 32, Himayat Sagar, Hyderabad-500091

Abstract:- Mutual Fund investments are becoming the most attractive and popular investment options among the investors of various class in India and abroad. There has been boom in Asset management Companies from 33 in 2000 to 44 in 2022. Asset under management in Mutual Fund industry has increased from Rs7.53 Lakhs Crores in 2012 to Rs 39.33 Lakhs Crores in 2022. The risk- return balance is much better compared to equity shares and bank fixed deposits. With the introduction of large spectrum of Mutual Funds such as Equity : Large Cap, Mid Cap, Small Cap, Multi cap, Flexi Cap, ELSS, Value and Hybrid, Debt: Long, Medium and Short Term, Dynamic Bond, Corporate Bond and Technology Funds, the investors are required to select and enter into various financial instruments as per their identified goals. The study involves Performance Analysis of Mutual Funds in category of Mid Cap fund using financial and investment techniques of daily NAVs over a period of 10 years. Statistical tools have been used for calculation of returns and risks.

Keywords:- *Mutual Fund, Mid Cap Fund, Sharpe, Treynor's & Jensen's Measure, Beta*

I. INTRODUCTION

Mutual Funds have gained a significant investment options for Indian investors as well as abroad. It is an alternative option for investing funds into companies' stocks & shares, debentures and other securities which would require regular monitoring and specialized experts advise. The fund managers of Asset Management Company (AMC) pools money from a large number of individual investors in the form of various Mutual Fund schemes and invest those in shares, debentures and other securities of private and Government sectors companies.

II. REVIEW OF LITERATURE

Dr S Anand and Dr V Murugaiah (April 1999 to March 2003)[1] has come to conclusion that it's a failure on the part of the fund managers for providing better return corresponding to the risk in investment. The overall analysis of 113 selected Mutual Fund schemes of 25 fund house indicates that though the fund was successful in in its performance as compared to the market risk, yet the expected return was quite lower than the riskfree return. Hence, it is found out that the overall market has influenced positively in the performance of funds under study.

Sharad Panwar and Dr. R. Madhumathi (May, 2002 to May,2005)[2] found that six public-sector funds, seven private sector funds and five private sector foreign sponsored mutual funds does not vary statistically in terms of net assets, common stocks, market capitalization, holdings and % of top ten investment. However, there is variations in the three different classes of public-sector, private-sector Indian and private-sector foreign mutual funds in terms of Standard Deviation, Variance and Average coefficient of variance. The Private sector sponsored Mutual Funds have outperformed the Public sector sponsored Mutual Funds and Private sector foreign sponsored mutual funds.

Dr. Ravi.B and Dr. Basavarajappa.P.T. (2015-2016)[3] found that the Indian Mutual Fund industry experienced a huge growth due to infrastructural development in India and foreign investments in terms of savings. The paper analysise the performance of mutual funds with the help of historical NAV values and returns over the study period. The analysis was done by considering 13 most preferred public and private sector equity diversified growth schemes during the financial year 2015-16 and risk-free return of government bond was taken as 7.56 % annual. It is an empirical study of Mutual Funds based on three ratios: Jenson's Alpha, Treynor's & Sharpe's ratios. In this study it was found that none of the funds can be declared as best or worst performer. The risk & return does not have a linear relationship as there are many funds where σ & β are high but they have a low corresponding return.

Debasish Biswas (2001 – 2018)[4] found that Mutual funds are one of the important investment channels to increase one's wealth. Out of 25 randomly selected schemes, most of the schemes outperformed the benchmark returns. 72 % outperformed the market where as 28% underperformed as per Treynor measure and 84 % sample schemes outperformed in the market according to Sharpe measure. The study found that stock selection skills by fund manager yield more returns rather than market timings.

- *Statement of the Problem*

It is clear from the review of literature that, plenty of research work has been done on various schemes of mutual funds at national and international level. A closure examination of review of literature has revealed that rare and scanty research work has been done on growth fund schemes in India. To say in more specific terms, there are no studies conducted on Performance Analysis of growth fund

schemes in terms of its categorization in **Mid Cap funds category**. Hence, there prevails a research gap, to fill this research gap the researcher intends to undertake the research on the topic entitled "Performance Analysis of Mid Cap Mutual Funds in India".

➢ *Objectives of the Study*

Mutual Fund Industry has emerged as a dark horse in financial market and adjusted itself according to its strength. It is growing with balance pace and will continue to grow in correlation with economic growth and thus invites researches to explore the market potential, its growth and draw backs. The core objectives to carry out this study are as

- *To Apply Sharpe's, Treynor's & Jenson's Ratios On Mutual Funds.*
- *To Understand The Relationship Of Selected Mutual Funds & Its Index.*
- *To Analysis Selected Mutual Funds In Mid Cap Fund Category.*

➢ *Period of the Study*

The present study aims to carry out an analysis of selected Mutual Fund schemes in Mid Cap during the period from 2013 to 2023 (i.e., 1st Apr 2013 to 31st Mar 2023). Hence, the analysis of Mutual Funds covers a period of 10 financial years. The rationale behind choosing 10year duration as a period of study is to cover bearish phase (2012, 2016 & 2020, bullish phase (2015, 2017 & 2021) and consolidation phase as exhibited by the values of respective benchmark indices used in the study.

➢ *Research Methodology*

An exhaustive analysis of equity Mid Cap schemes of 5 funds is studied over a period of 10 years (2013-2023). The required NAVs have been collected from AMFI website. The NAV of first day of each month have been chosen as data points. Further, Nifty Mid Cap 150 Index is considered as the benchmark index and its historical data was used for calculating of market return. 10 years govt. bond was taken as the substitute for risk free rate of return.

➢ *Funds Selected for the Purpose of the Research*

The funds for the research (Regular Plan) was selected as per CRISIL ratings which is considered as the most reliable research house in India which has provided accurate opinion and analysis of Indian economy, capital market and industry . The five different schemes in **Mid Cap** category selected for study are given below:

- Quant Mid Cap Fund
- Motilal Oswal Mid Cap Fund
- PGIM India Mid Cap Opportunities Fund
- SBI Magnum Mid Cap Fund
- Mirae Asset Mid Cap Fund

III. STATISTICAL TOOLS USED FOR CALCULATION, ANALYSIS AND INTERPRETATION

The study has been done in six steps. The analysis and interpretation of Mutual Funds under study are based on the following statistical tools :

➢ *Step I*

- Calculation of the Mean Returns of the funds & index (on Monthly basis)

$$R_p = \frac{\text{NAV at Close} - \text{NAV at Beginning}}{\text{NAV at Beginning}} \times 100$$

- Calculation of standard deviation of each fund & index;

$(\sigma) = \sqrt{(\Sigma (Dx)\ 2/n)}$;

$Dx = (Ri - R.avg.)$

- Rolling Returns (2,5 and 7 Years)
Avg of $CAGR_i = (NAV_t/NAV_{t+n})^{1/n} - 1$, i= 1 to 254 days

➢ *Step-II*

- Beta (β) is calculated as below;

$$\beta = \frac{\text{Cov (Ri,Rm)}}{\text{Var (Rm)}}$$

➢ *Step III*

- Calculation of the Sharpe Measurement;

$$S_p = \frac{(Rp - Rf)}{\sigma}$$

➢ *Step IV*

- Calculation of Treynor's reward – to - variability measure:

$$T_p = \frac{(Rp - Rf)}{\beta p}$$

➢ *Step V*

- Calculation of Jenson's Alpha Index:

$\alpha = R_i - (ERp)$

$ERp = [R_f + \beta p\ (ER_m - R_f)]$

➢ *Step VI*

- Calculation of R Squared: Comparison of the Mutual fund's performance with BSE 200 index both by taking base as 100 as well as their inter-comparison by using the aforesaid three indices & ultimately ranking of the funds will be done.

$$\mathbf{R^2} = \frac{(\textbf{Covariance between index and Portfolio})}{\textit{Standard deviation of portfolio} * \textit{standard deviation of index}}$$

All the above tools & parameters will be applied henceforth to analyze & conclude the performance of the funds in the form of tables.

➢ *Limitations of the Study*

The study carried out in the paper is restricted to 10 years (1st Mar 2013 to 01Mar 2023) due to paucity of time and resources at the disposal. There is no assurance that recommended returns of Mutual Fund schemes will also continue in future due to the fact that, investment in mutual fund subject to market risk which is basically volatile in nature. Hence, results are subjective in character. The present study predominantly based on evaluation of mutual fund performance by using popular and widely accepted measures. Hence, results may get manipulated if other parameters of evaluation such as Expense ratio, Information ratio and Portfolio turnover ratio are used.

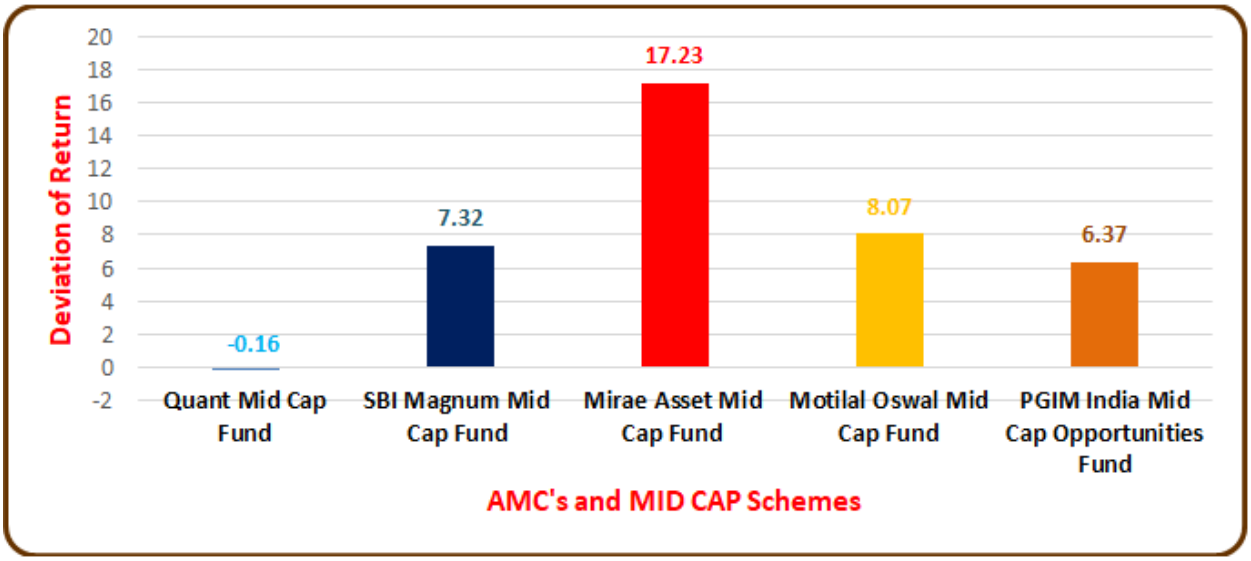
IV. DATA ANALYSIS AND INTERPRETATION

Table 1 Summary of Performance of all Funds Under Study Period (2013-2023)

Analysis Model	**Benchmark Mid cap fund**	**MID CAP FUNDs**				
	Nifty Mid Cap 150 Index (Benchmark)	**Quant Mid Cap Fund**	**SBI Magnum Mid Cap Fund**	**Mirae Asset Mid Cap Fund**	**Motilal Oswal Mid Cap Fund**	**PGIM India Mid Cap Opportunities Fund**
Avg Yearly Return	16.71	16.55	24.03	33.94	24.78	23.08
Deviation of Yearly Return	-	-0.16	7.32	17.23	8.07	6.37
3 Years Rolling return	-	15.41	16.67	28.30	13.8	16.39
5 Years Rolling return	-	13.14	12.62	-	11.16	13.01
7 Years Rolling return	-	14.18	14.78	-	14.71	16.47
Avg Yearly SD	5.33	3.71	5.17	5.56	5.08	5.23
Deviation of SD from Benchmark	-	-1.62	-0.16	0.23	-0.25	-0.1
Return Vs SD	-	$R_p < R_m$; $S_p < S_m$	$R_p > R_m$; $S_p < S_m$	$R_p > R_m$; $S_p > S_m$	$R_p > R_m$; $S_p < S_m$	$R_p > R_m$; $S_p < S_m$
Beta	-	0.05	0.31	-0.13	0.27	0.30
R^2	-	0.30	0.39	0.06	0.39	0.38
Treynor's value	2.20	-1492.34	-39.22	-176.95	-61.14	-692.09
Dev of Treynor's from Benchmark	-	-1494.54	-41.42	-179.15	-63.34	-694.29
Sharpe's value	2.16	2.81	3.21	3.34	3.10	2.31
Dev of Sharpe's from Benchmark	-	0.65	1.05	1.18	0.94	0.15
Jensen's Alpha	-	24.34	30.03	50.56	29.17	27.91
Over all Ranking	-	5	1	3	2	3

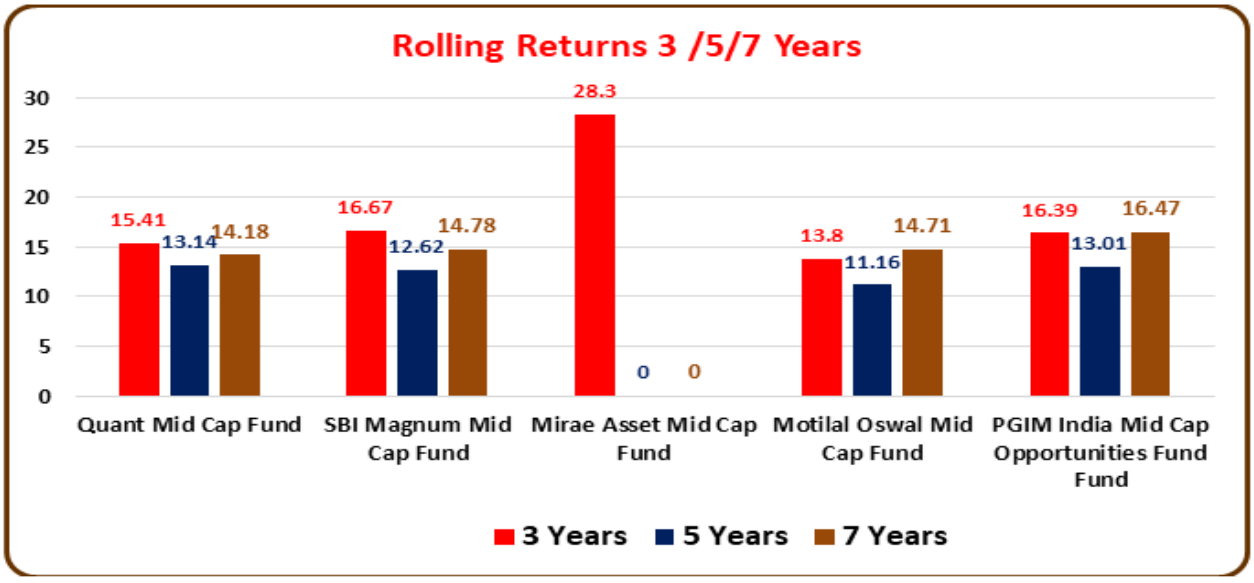
- *Avg Yearly Mutual Fund Returns – R_p*
- *Avg Yearly Benchmark Index Returns –R_m*
- *Average yearly Std Dev Mutual Fund – S_p*
- *Average Yearly Std Dev Benchmark Index- S_m*

➢ *Return Related Analysis and Interpretation*



Graph 1 Return for Select Schemes of the Mid Cap Funds and Benchmark Values

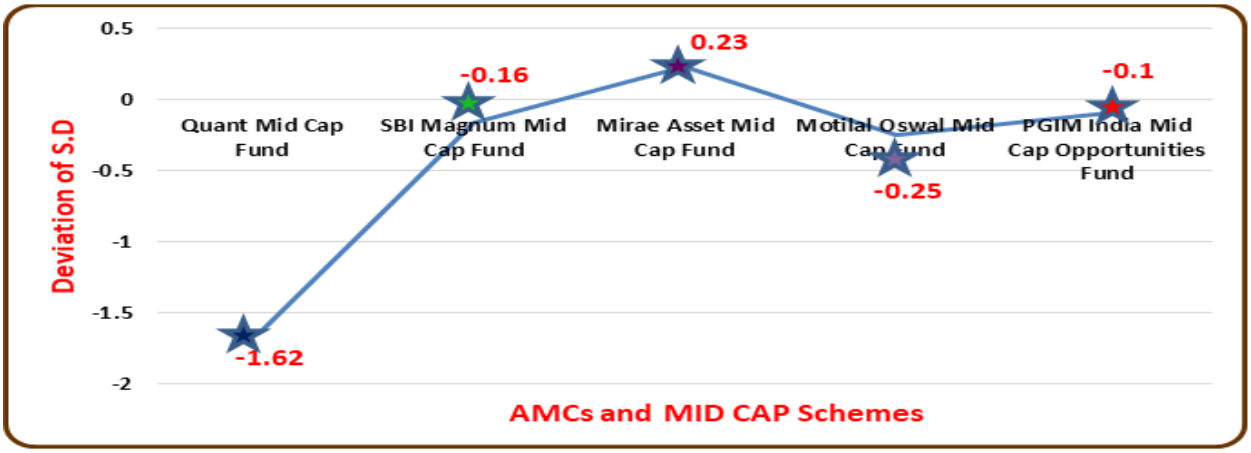
The Graph No1 reveals the deviation of average yearly returns of selected Mid Cap schemes from the benchmark index. Averages are calculated from yearly returns of 10 years which is the study period. It is confirmed from the above date in graph that, almost all the schemes have outperformed the market during the study period except one and the magnitude of outperformance differs from scheme to scheme. Mirae Asset Mid Cap Fund has outperformed the underlying benchmark index as well as other schemes of this category (Excess return of 17.23 percent greater than its counterpart schemes).



Graph 2 3/5/7 Years Rolling Return for Select Schemes of the Mid Cap Funds

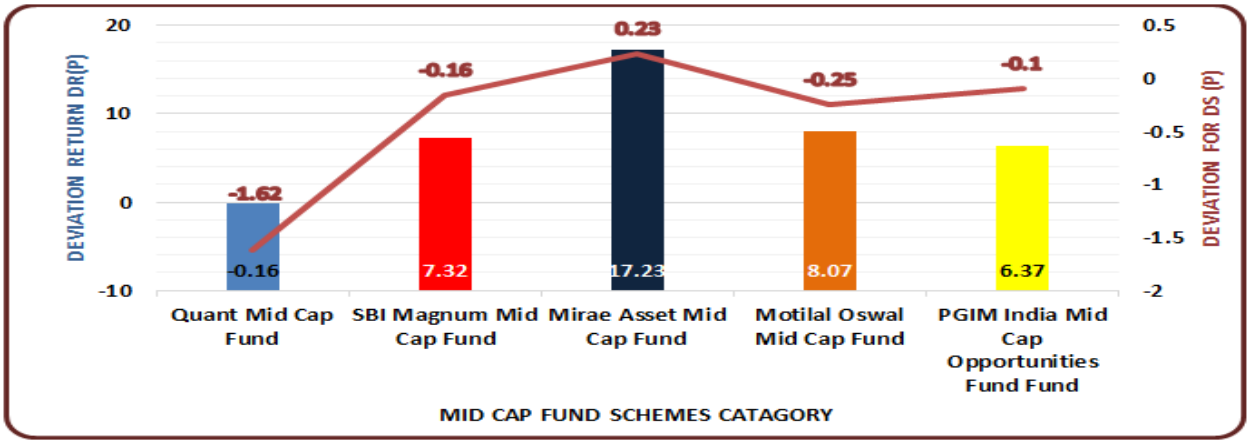
The Graph No 2 reveals the 3 years, 5 years and 7 years Rolling Returns of selected Mid Cap schemes. Rolling returns were calculated by taking averages of returns for the study period of 10 years. It is confirmed from the above graph, the Rolling returns calculated for different schemes for 3 different intervals are different. Mirae Asset Mid Cap Fund has outperformed other schemes of this category in 3 years Rolling returns with 28.3 % returns . Quant Mid Cap Fund has outperformed other schemes of this category in 5 years Rolling returns with 13.14 % returns. PGIM India Mid Cap Opportunities Fund has outperformed other schemes of this category in 7 years Rolling returns with 16.47 % returns. PGIM India Mid Cap Opportunities Fund has given most consistent returns followed by SBI Magnum Mid Cap Fund from all other funds.

➢ *Risk Related Analysis and Interpretation*



Graph 3 Standard Deviation for Select Schemes of the Mid Cap Funds and Benchmark Values

The Graph No 3 provides data regarding deviation of Standard deviation from benchmark index. Further, it also provides the information about the resultant average standard deviation of each scheme and corresponding benchmark index. A close look at the graph reveals that, Mirae Asset Mid Cap Fund is having higher total volatility whereas Quant Mid Cap Fund has least total volatility during the study period as measured by Standard Deviation.



Graph 4 Deviation of Returns from Index and Deviation of Standard Deviations from Index for select Schemes of Mid Cap Category

The Graph No 4 reveals the information about average return of the portfolio and average standard deviation of the portfolio of select schemes belonging to Mid cap category during the study period. It also provides information about the deviation between average return of the portfolio and average return on the market index as well as standard deviation of the portfolio as compared to the standard deviation of the market. The comparison between R_p and R_m, S_p and S_m taken together provides an idea about comparative performance of selected schemes.

From comparison it is clear from the above graph that, **SBI Magnum Mid Cap fund**, **Motilal Oswal Mid Cap Fund** and **PGIM Mid Cap Opportunities funds** are falling under the situation characterized as ($R_p > R_m$; $S_p < S_m$) respectively. This implies that the scheme provides higher return than the market with lower risk compared to market index. This speaks about favorable performance of the schemes both on the grounds return and risk. Hence, the schemes are said to be in glowing situation.

Quant Mid Cap fund is falling under the situation characterized as ($R_p < R_m$; $S_p < S_m$). This implies that the performance of the scheme is unfavorable on the grounds of returns and favorable on the grounds of risk. Therefore, it is inevitable for respective scheme fund managers to consider return maximization strategies.

Mirae Asset Mid Cap fund is falling under the situation characterized as ($R_p > R_m$; $S_p > S_m$). Therefore, it implies that scheme return is higher than the market and risk is also higher than the market. Hence, the scheme no doubt provides more earnings to the investors but such additional earning is at a level of risk than the underlying benchmark index. It is better for the fund managers of Mirae Asset Mid Cap fund to initiate portfolio diversification strategies to bring down its total risk without sacrificing existing return rate.

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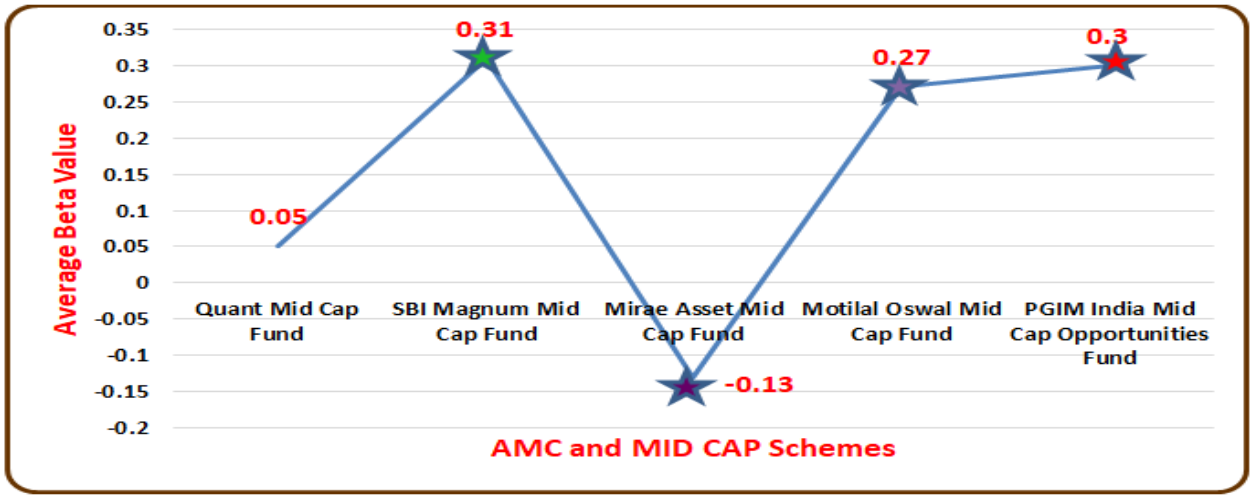
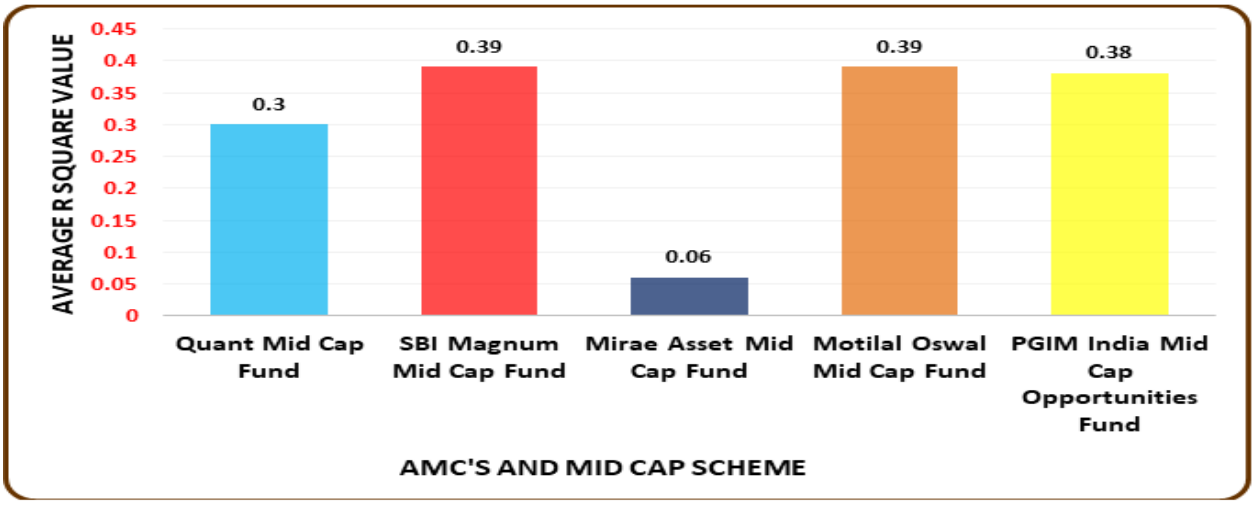


Graph 5 Systematic Risk (Beta) for Select Schemes of the Mid Cap Category

The Graph 5 shows the Beta values of select schemes belonging to Mid Cap category for the study period. We know that, higher the value of beta higher will be responsiveness of a given fund to the changes in the market index and vice-versa. A fund having higher beta may do well in a general up-trend whereas may not do so during the down-trend. Hence, a fund with lower beta may not exhibit attractive performance but it may save investors from extreme loss during the downtrend. A beta value of 1.0 of a fund implies neither over responsiveness nor under responsiveness to the changes in the market or in other words the fund with move with the market. A beta value of greater than 1.0 shows more than proportionate responsiveness to the changes in the market; a beta of less than 1.0 shows less than proportionate responsiveness.

It is clear from the graph that SBI Magnum Mid Cap fund has highest beta value of 0.31 showing moderately high responsiveness; Mirae Asset Mid Cap fund has lowest beta value of -0.31 having less responsiveness to the changes in the market; PGIM Mid Cap Opportunities has a Beta value of 0.3 ; Motilal Oswal Mid Cap fund has a Beta of 0.27 and Quant Mid Cap fund has a Beta value of 0.05. Hence, all the schemes having Beta values of less than 1.0, so it can be inferred that, all portfolios are defensive in nature to market swing.

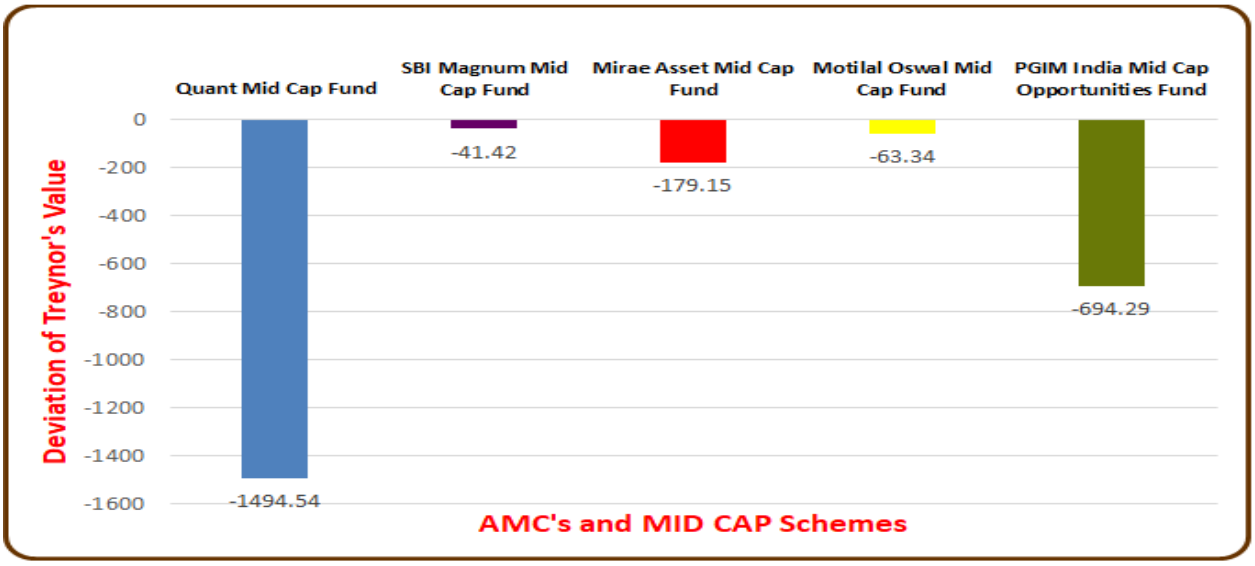


Graph 6 Co-efficient of Determination (R^2) for Select Schemes of the Mid Cap Category

The Graph No 6 gives the information about R^2 values of selected Mid Cap schemes category and the average value of R^2 of each scheme during the study period. The term R^2 value explains the percentage of returns explained by the index. Higher the value of R^2 higher will be the percentage of return explained by the index and lower will be unexplained return. Hence, higher value implies better diversified portfolio and lower value implies inadequately diversified portfolio. A high R-squared (between 0.85 and 1.0) indicates the fund's performance is in sync with the index. A fund with a low R-squared (0.70 or less) doesn't act much like the index.

Therefore, it can be concluded that, **SBI Magnum Mid Cap, Motilal Oswal Mid cap, PGIM India Mid Cap Opportunities fund and Quant Mid Cap fund** can be considered as Moderately diversified portfolios as its average value of R^2 are 0.39, 0.39,0.38 and 0.30 respectively. The performance of **Mirae Asset Mid Cap fund** can be considered as inadequately diversified portfolios as its average value of R^2 is 0.06.

➢ *Risk-Adjusted Return Analysis and Interpretation*

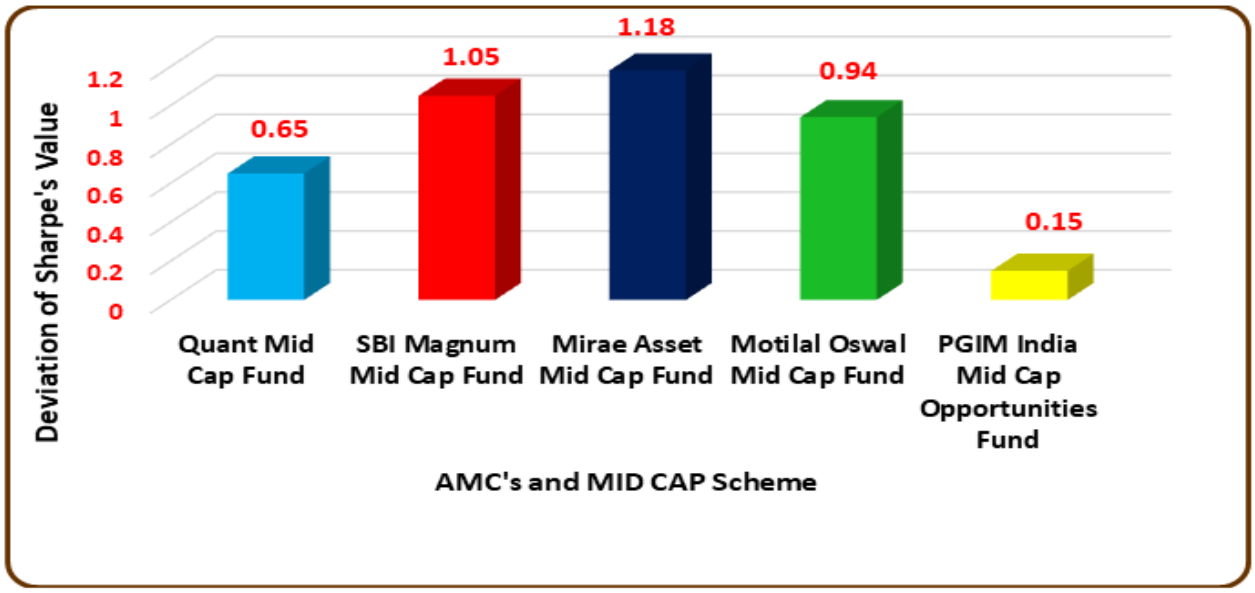


Graph 7 Treynor's Values for Select Schemes of the Mid Cap Category and Benchmark Values

The Treynor measure gives out the excess return earned per unit of risk. As systematic risk is the measure of risk. The Graph No 7 exhibit the average values of Treynor's Index both for select schemes and the underlying benchmark index over the period of the study. It is surprising to observed from the above graph that, all schemes belonging to Mid Cap category have on an average underperformed as compared to average performance of benchmark index.

However, the extent of underperformance differs from scheme to scheme, wherein, **SBI magnum Mid Cap Fund** has shown lesser extent of underperformance (-41.42 percent); followed by **Motilal Oswal Mid Cap fund** (-63.34 percent); **Mirae Asset Mid Cap fund** (-179.15 percent); **PGIM India Mid Cap Opportunities fund** (- 694.29 percent) and **Quant Mid Cap fund** (-1494.54 percent). Due to ongoing Russian – Ukraine war, the returns unusually decreased considerably during 2022 resulting in overall reduction of Treynor's index of funds especially Quant Mid Cap fund.

Hence, all schemes have failed to generate sufficient excess return in commensurate with their systematic risk (β) as compared to benchmark index. It implies to some extent; fund managers have failed to incorporate appropriate changes into the composition of their portfolio to trim well their performance to the changing conditions in the market. Hence, there is an urgent need to update and upgrade portfolio composition of different schemes to make them to fair well. This is more so, in case of Quant Mid Cap Fund and PGIM India Opportunities Mid Cap Fund as their extent of underperformance is greater as compared to other three (SBI magnum, Motilal Oswal and Mirae).



Graph 8 Sharpe's Values for Select Schemes of the Mid Cap Category and Benchmark Values

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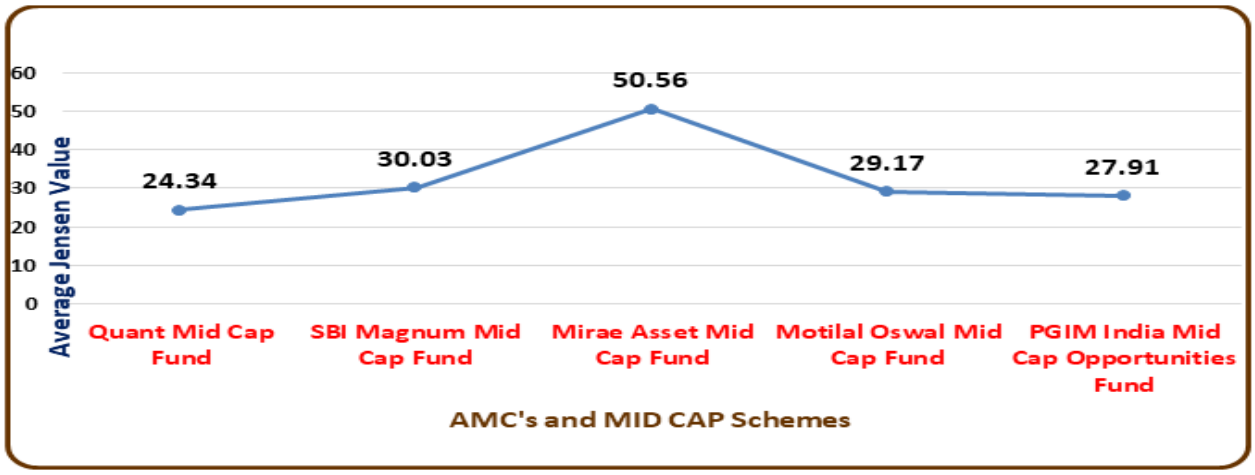
As systematic risk is the measure of risk. The Sharpe Ratio measure reflects the excess return earned on a portfolio per unit of its total risk (standard deviation). The Graph No 8 displays average values of Sharpe's Index both for select schemes and the underlying benchmark index over the period of the study. It is observed from the above table that, all schemes belonging to Mid Cap category have shown on an average over performance as compared to average performance of benchmark index. However, the extent of performance differs from scheme to scheme.

Mirae Asset Mid Cap Fund, SBI Magnum Mid Cap Fund, Motilal Oswal Mid Cap Fund and Quant Mid Cap Fund have shown over performance of 1.18, 1.05, 0.94 and 0.65 percent respectively, followed by PGIM India Opportunities Mid Cap Fund which has marginal overperformance as compared to benchmark index 0.15 percent.

Hence all four schemes have generated adequate excess return in commensurate with their total risk (σ) as compared to benchmark index. The Fund manager of four schemes have incorporated adequate changes in the portfolio to get excess return. Only PGIM India Opportunities Mid Cap Fund to initiate well informed investment decisions to improve the quality of its funds performance.



Graph 9 Jensen's Alpha Values (α) for Select Schemes of the Mid Cap category

The above Graph No 9 displays the Jensen alpha value. It brings out from the sample schemes that fund manager have stock selection ability. If the value of alpha is significantly positive then the fund manager has stock selection ability or otherwise. The above table displays the information about year wise values of alpha (α) for each selected scheme as well as their average value during the study period. It is clear from the above table that, all schemes have been successful in generating return as per CAPM model (Capital Asset Pricing Model) given their beta values. Alpha is an index of management skills of fund managers.

All select schemes fund managers have experienced positive alphas and the extent of performance differs from scheme to scheme. In case of Mirae Asset Mid Cap Fund (α=50.56 percent), followed by SBI magnum Mid Cap Fund (α=30.03 %); Motilal Oswal Mid Cap Fund (α= 29.17 %); PGIM India Opportunities Mid Cap Fund (α=27.91 %) and Quant Mid Cap Fund (α=24.34 %). A positive alpha implies superior returns due to superior management skills and negative alpha implies inferior management skills as compared to the market. From the results shown in the above table, one can infer that, on an average, all schemes have fared well.

Table 2 Overall Ranking of all Selected Mid Cap Funds

Models	RANKING					TOTAL
	Quant Mid Cap Fund	SBI Magnum Mid Cap Fund	Mirae Asset Mid Cap Fund	Motilal Oswal Mid Cap Fund	PGIM India Mid Cap Opportunities Fund	
Return	5	3	1	2	4	15
Rolling Return	3	2	4	5	1	15
Risk (σ)	1	3	5	2	4	15
Beta	4	1	5	3	2	15
R-Squared	1	1	4	1	1	8
Treynor's	5	1	3	2	4	15
Sharpe's	4	2	1	3	5	15
Jensen's	5	2	1	3	4	15
Risk vs SD	3	1	2	1	1	8
TOTAL	31	16	26	22	26	121
RANK	5	1	3	2	3	

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The table No 2 brings out the overall ranking of all selected Mid cap schemes during the study period. From the above table, it is clear that SBI magnum Mid Cap fund has placed at first position (1st Rank), followed by Motilal Oswal Mid Cap fund has placed at second position (2nd Rank); Mirae Asset Mid Cap fund and PGIM India Mid Cap Opportunities fund have been placed at third position (3rd Rank); and lastly, Quant Mid Cap fund has been placed in fifth position (5th Rank). Hence, SBI magnum Mid Cap fund has an excellent performance the market due to fund managers' performance and their superior stock selection skill when compared to its counterparts. Quant Mid Cap fund managers need to become clever and acclimatize in developing and implementing strategies to overcome from their inferior stock selection skills.

V. CONCLUSION

Mutual Funds is the best investment options nowadays as it can beat the prevailing inflation. It gives a yearly interest of mora than 14 %. All the Mid Cap Mutual fund schemes selected for the study have followed the Market Benchmark Index. All the schemes have fared well to give stable market returns over a long period as seen from rolling return analysis. Quant Mid Cap fund is less volatile and Mirae Asset Mid Cap fund is more volatile as per Std Dev analysis. SBI Magnum Mid Cap fund, Motilal Oswal Mid Cap Fund and PGIM Mid Cap Opportunities funds provides higher return than the market with lower risk compared to market index. Quant gives less return with less risk. Mirae Asset Mid Cap fund gives more return with more risk. Mirae Asset Mid Cap fund is found to be inadequately diversified as compared to other funds asp per R squared analysis. All schemes have failed to generate sufficient excess return commensurate with their systematic risk (β) as compared to benchmark index on calculation of Treynor's ratio analysis. PGIM India Mid Cap Opportunities Fund resulted in marginal overperformance as compared to benchmark index and other schemes as per Sharpe's analysis. All select schemes fund managers have experienced positive alphas but the extent of performance differs from scheme to scheme during Jensen's Alpha analysis. All four schemes have generated adequate excess return in commensurate with their total risk (σ) as compared to benchmark index in Sharpe's analysis. Only PGIM India Opportunities Mid Cap Fund needs to initiate well informed investment decisions to improve the quality of its funds' performance a it gives marginal Overperformance over other funds.

On application of Sharpe's, Treynor's & Jenson's Alpha ratios on Mutual Funds it can be concluded that SBI Magnum Mutual Fund Scheme has better Risk Adjusted Returns as compared to other funds. Therefore, **SBI magnum Mutual Fund Scheme** has outperformed all other schemes.

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