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An Empirical Evaluation Performance Of Mutual Fund Through Risk And Return Indicators: A Comparative Study Of Selected Indian Mutual Funds

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Abstract:

In this research paper to evaluate the performance of ten mutual funds in India during the time frame 2021 to 2025. The objective is to evaluate fund performance using Net Asset Value (NAV), Annual returns, Standard deviation and Sharpe performance index. The research also compares equity, hybrid, debt and arbitrage fund categories with their respective benchmarks. Descriptive statistics were applied to assess growth trends in net asset value and returns. Correlation, regression and ANOVA analysis were conducted using relevant statistical software to examine the relationship between risk and return and to identify performance differences across the fund category. The study showed a consistent increase in net asset value over a five-year period with equity funds displaying the highest growth but greater risk comparison. Hybrid funds showed reasonable performance, but level of debt and arbitrage funds offered more stability as compare to lower returns. In this study, a significant positive correlation was found between standard deviation and average annual return. Regression analysis results indicated the risk factor described over semi-variation in return. Individual predictors were not statistically significant at 5% significance level. There were no strong category wise differences as measured by ANOVA, but descriptive statistics findings provided meaningful variations between the fund. Overall, the study concludes that the mutual fund performance was influenced by the level of risk undertaken, with equity funds providing higher return potential. In this study, the findings were relevant for investors and policymakers. This research paper provide an understanding of mutual fund performance in the Indian market.

Keywords: Net Asset Value (NAV), Risk-return, Sharpe performance index, Standard deviation, ANOVA.

Introduction and scope of the study:

In a recent scenario, Mutual funds have become an essential part of the Indian financial market that may offer individual investors access to professionally managed portfolios of securities. Over the last two decades the mutual fund industry in India has grown significantly in terms of asset size, number of schemes and investor participation. This growth reflects the increasing awareness among investors about the benefit of risk diversification and professional management and convenient access to capital markets. Mutual funds provide investors with an opportunity to invest in equity, debt, hybrid and arbitrage schemes, each carrying a different level of risk and expected returns. The performance of mutual funds is a critical factor for investors making investment decisions. The examining of mutual fund performance is risk return trade-off. To better understand the risk-return trade-off various performance evaluation matrices such as annual returns, standard deviation and the sharp index used in this study. These matrices help investors to assess whether the returns generated by a fund are proportionate with the risk taken. Assessing mutual fund performance over a recent five-year period that may include pre-pandemic and post-pandemic phases. It is important for obtaining relevant insights into how funds have managed risk and expected returns during volatile conditions. Most existing studies on mutual fund performance in India tend to focus primarily on equity funds, often neglecting other important categories such as hybrid, debt and arbitrage funds. Equity funds typically have higher risk and return potential in comparison to debt funds offer lower risk but more stable returns. Hybrid funds provide a mix of both and arbitrage funds aim for low risk, consistent returns through market neutral strategies. The study that evaluates and compares all these categories within a single framework is necessary to understand their distinct risk-return perspective. It can help investors select funds that align with their financial goals and risk tolerance. Furthermore, many past relevant studies have relied on simple descriptive statistics of all basic performance measurement ratios without applying advanced statistical tools to examine the relationship between different risk-return indicators. Correlation analysis, Regression and ANOVA can provide an understanding that how risk measures influence returns across fund categories whether these differences are statistically significant. Combining such analysis with processing in software like SPSS, the accuracy and reliability of findings. The scope of the study covers ten selected mutual funds from different categories including equity debt and arbitrage schemes. These funds are chosen based on their magnitude and availability of consistent Net Asset Value data and clear benchmark indices for comparison. Under this study the Statistics covers the five-year period from 31st of March 2021 to 31st of March 2025 capturing recent market trends and investor's experiences. The data includes annual NAV from which yearly returns are calculated. Risk is measured by the standard deviation of return, while risk-adjusted performance is assessed through Sharp ratio. This research paper provides a detailed empirical evaluation of these selected funds highlighting how different categories of funds perform relative to each other and their benchmarks. It also seeks to statistically analyze the relationship between returns from a risk and risk-adjusted returns. Such analysis will help to identify which fund categories offer better risk-adjusted performance in the current market environment. The findings will be valuable to investors, fund managers and policy makers by offering evidence-based insights for making informed investment and regulatory decisions.

Literature Review:

(Swain & Dash, 2017) focused previous studies on investor perception, risk-return awareness and performance evaluation in the Indian mutual fund industry. The author used systematic literature review of national and international papers from 2000 to 2017. The author found many Indian investors still lack awareness about risk and return characteristics of mutual funds. Most of the past studies emphasized return comparison but less on investor education and risk perception.

(Singh & Mishra, 2019) evaluated performance of selected growth mutual funds. The author found about 60% of schemes outperform benchmarks as per Bombay Stock Exchange indices. Sharpe and Treynor performance indexes were statistically significantly positive for large-cap funds. Funds with higher risk showed proportionally higher returns.

(Rehamani, 2018) compared performance of public versus private sectoral mutual funds. The author found private sector funds had slightly higher average returns as compared to Sharpe index. Public funds were more stable with lower risk. The difference was statistically significant for the Treynor performance index.

(Pandow & Butt, 2017) observed an overview of risk-return performance of Indian mutual funds. The author used secondary data from different reports, descriptive and trend analysis. The author found equity mutual funds displayed higher volatility but also provided better long-term returns. Debt funds offered stable but lower returns. The Study emphasized the need for diversified portfolios.

(Soni, 2023) examined whether ESG score influences mutual fund returns. The author compared thirteen financial years of monthly data, risk-adjusted performance matrices including Alpha values. The author found that funds with higher ESG scores did not significantly outperform. ESG screening increased costs, leading to neutral or slightly lower Alpha value.

(Christina, ADJ, & Roopan, 2025) analyzed performance of selected sectoral and diversified funds. The author compared forty-five mutual funds from the financial year 2020 to 2025, to compute Standard deviation, Beta, Sharpe performance index and Treynor performance index. The author found sectoral funds generated higher returns but also higher risk. Diversified mutual funds showed moderate Sharpe index and more stable performance.

Research Gap:

Many studies on mutual funds in India examined only equity funds. This gives a narrow view of the market. Very few studies include hybrid funds, debt funds and arbitrage funds in one research design. This creates a research gap in understanding how different fund categories perform under the same conditions. Most of the earlier studies used data from short-term periods. Many of them used only three or four years of data. They did not analyse recent years after the COVID-19 period. Market conditions have changed after the pandemic situation. This makes older findings less relevant from present decisions. Many studies focused on basic performance measures. They calculated return, Sharpe performance or Treynor index. But they did not study the relationship between these measures in depth. They rarely used correlation or regression to test how risk and return are linked therewith. This leaves an important analytical gap. Some research used descriptive analysis only. It did not use advanced tools to check if performance differences are statistically significant. Few studies applied statistical tests like ANOVA to compare the categorical. Very few studies combined NAV data with SPSS or similar statistical software for deeper analysis.

Objective of the study:

1. To evaluate the performance of selected mutual funds in India by calculating annual returns standard deviation and Sharpe performance index over a five-year period.
2. To compare the performance of different fund categories such as equity, hybrid, debt and arbitrage with their respective benchmarks.
3. To examine the relationship between risk and return by using statistical tools like correlation, regression and ANOVA in statistical software.

Research methodology:

This section describes the methods and procedures used in this study to analyze risk and return of selected mutual funds. The objective is to evaluate how these funds performed over the last five financial years by using statistical measures and risks adjusted performance indicators.

Sample selection and size of the sample: The sample consists of ten mutual funds selected from the Indian mutual fund industry the selection is based on following criterion to ensure the study is reliable:

Fund size and acceptance: For this study, ten mutual funds were selected carefully based on several important factors. The main objective was to include funds that represent different kinds of investment. Therefore, the sample includes equity funds, which invest mostly in stocks and usually carry higher risk but potentially higher returns. It also includes debt funds, which invest in bonds and other fixed income bearing instruments, generally considered safer and lower returns. In addition, hybrid funds that invest in both stocks and bonds were chosen to represent the middle ground between risk and return. Only funds that have been in operation for at least three years were selected to ensure that there was enough historical data to analyze. Newer funds were not considered because their performance history is too short to make reliable conclusions. The funds chosen were also popular and have a large number of investors, which makes these study results more useful for real world investors to avoid biasness towards one company or fund manager. The funds come from different asset management companies. Another important factor was data availability. The selected funds have consistent monthly net asset value available from different trusted sources like AMFI and official fund websites. The study uses the growth option net asset value because it shows how the fund's value has increased over time without being affected by dividend payments. Finally, only those funds with clear benchmark indices were chosen such as the Nifty 50 or CRISIL bond index, so that their performance can be compared equitably against the market. These criteria help to create a balanced and representative sample of mutual funds for the analysis of risk and return.

Table showing Fund Name, Fund Category and Industrial benchmarking

Fund Name	Fund Category	Benchmark
SBI Bluechip Fund	Equity	NIFTY 50
HDFC Top 100 Fund	Equity	NIFTY 100
Axis Long Term Equity Fund	Equity	S&P BSE 200
Parag Parikh Flexi Cap Fund	Equity	S&P BSE 500
ICICI Prudential Balanced Advantage Fund	Hybrid	CRISIL Hybrid 50:50 Index
UTI Equity Hybrid Fund	Hybrid	NIFTY 500 TRI
Nippon India Low Duration Fund	Debt	CRISIL Low Duration Index
Franklin India Debt Fund	Debt	CRISIL Composite Bond Index
Kotak Arbitrage Fund	Arbitrage	CRISIL Arbitrage Index
Aditya Birla Sun Life Frontline Equity Fund	Equity	S&P BSE Sensex

Data Availability: Funds have completed and consistent Net Asset Value data for the five financial years from March 31st 2021 to March 31st 2025. This allows for accurate calculation of annual returns.

Variety of fund types: The sample includes a mix of equity, hybrid and debt funds. This variety helps analyze different risk-return perspective profiles.

Historical performance range: Fans with both stable and fluctuating past performances Wired included This variety helps in understanding how risks and return perform.

Data collection: The data used in the study annual net asset Value figures for the selected mutual funds over five financial years OMA ending March 31st of each financial year from 2021 to 2025 The net asset value represents the per unit of the mutual fund and includes reinvested dividends. The data sources are reliable from the relevant financial websites such as Value Research Outline former money control and official mutual fund websites.

Data dispensation: The first step after collecting net asset value data is to calculate annual returns for each fund. Returns show how much a fund has gained or lost in a particular financial year and are calculated by using the following formula:

Annual return $_t$ = [(Net Asset Value $_t$ – Net Asset Value $_{t-1}$) / Net Asset Value $_{t-1}$] *100………….. (1)

These returns are calculated for each financial year from 2022 to 2025 because the base year's or index year's return requires data from the previous year.

Measurement of Risk: Risk in investments is commonly measured by how much returns fluctuate over time. This study used the standard deviation of annual returns as a measurement of risk. Standard deviation shows the average amount by which returns vary from the mean return The formula to calculate standard deviation is:

Standard deviation =[1/(n-1) $\sum_{t=1}^{n}$ square of (Return of t year − Avearge return)]$^{0.5}$ …………….(2)

Higher standard deviation means more risk or volatility.

Risk adjusted performance: Sharpe Performance Index: The Sharpe index measures how much return of funds generates compared to the risk it takes. The formula is:

Sharpe performance index = (Average return - Risk free adjusted return/ Standard deviation) ....(3)

The higher the Sharpe performance index means the fund is earning beta returns for the amount of risk it takes.

Statistical tools and software: The study used both Microsoft Excel and SPSS software for data analysis. Microsoft Excel was used to organize net asset value data and calculated annual returns using built in formulas. Excel is helpful for initial calculation and preparing the data set statistical package for social science (i.e.) SPSS was used for advanced statistical analysis. It helps to calculate descriptive statistics such as mean returns and standard deviations with accuracy. It allows an easy computation of Sharpe performance index by creating a new variable SPSS provides tools for generating tables and graphs that display the performance, risk and risk-adjusted return.

Data Analysis:

Table 1 showing Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Net Asset Value for 2021	10	18.90	398.10	91.8250	111.77995
Net Asset Value for 2022	10	21.40	430.50	97.9520	120.66085
Net Asset Value for 2023	10	23.80	468.70	106.4080	130.76909
Net Asset Value for 2024	10	26.50	508.20	114.7570	141.57650
Net Asset Value for 2025	10	28.90	538.37	121.8320	149.65473
Return % for 2022	10	-0.69	16.61	7.5900	5.66383
Return % for 2023	10	1.49	25.34	10.1550	7.62385
Return % for 2024	10	1.37	22.16	8.5350	5.78034
Return % for 2025	10	1.28	12.38	7.0880	3.50733
Average Annual Return %	10	1.23	17.42	8.6380	5.04732

Standard Deviation %	10	0.20	11.10	2.2520	3.33738
Sharpe Ratio	10	0.73	8.67	3.7530	2.42464
Valid N (listwise)	10				

Data source: Author's calculation and compilation

Research question 1: How have the selected mutual funds performed in terms of NAV, Annual returns, Standard deviation and Sharpe performance index during 2021 to 2025?

Research hypothesis (H_1): Mutual funds show a consistent positive growth trend in NAV and Average annual returns over the five-year period.

Interpretation: The descriptive analysis showed a clear upward movement in Net asset value across all ten mutual funds from 2021 to 2025. The minimum Net asset value increased from 18.90 in 2021 to 28.90 in 2025, while the maximum rising from 398.10 to 538.37. The mean Net asset value improved from 91.83 in 2021 to 121.83 in 2025, reflecting a steady growth. The standard deviation also grew over time, indicating higher market volatility and wider price dispersion. Average annual return ranked between 1.23% and for 17.42% with a mean of 8.64% and a standard deviation of 5.05%. The Sharpe Performance Index offered a 3.75 suggesting excess returns above risk-free rate of return. These results support the hypothesis showing a stable fund performance with increasing returns and moderate risk.

Table 2 showing Correlations analysis

		Net Asset Value for 2021	Return % for 2022	Return % for 2023	Return % for 2024	Return % for 2025	Average Annual Return %	Standard Deviation %	Sharpe Ratio
Net Asset Value for 2021	**Pearson Correlation**	1	-0.15	-0.194	-0.167	-0.327	-0.242	-0.152	-0.167
	Sig. (2-tailed)		0.679	0.591	0.646	0.357	0.5	0.674	0.644
	N	10	10	10	10	10	10	10	10
Return % for 2022	**Pearson Correlation**	-0.15	1	0.222	.822	.635	0.581	-0.221	-0.23
	Sig. (2-tailed)	0.679		0.538	0.003	0.049	0.078	0.54	0.523
	N	10	10	10	10	10	10	10	10
Return % for 2023	**Pearson Correlation**	-0.194	0.222	1	.679	.867	.922	.893	-.676
	Sig. (2-tailed)	0.591	0.538		0.031	0.001	0	0.001	0.032
	N	10	10	10	10	10	10	10	10
Return % for 2024	**Pearson Correlation**	-0.167	0.822	0.679	1	0.869	0.889	0.305	-0.461
	Sig. (2-tailed)	0.646	0.003	0.031		0.001	0.001	0.391	0.18

	N	10	10	10	10	10	10	10	10
Return % for 2025	**Pearson Correlation**	-0.327	.635	.867	.869	1	0.981	0.574	-0.589
	Sig. (2-tailed)	0.357	0.049	0.001	0.001		0	0.083	0.073
	N	10	10	10	10	10	10	10	10
Average Annual Return %	**Pearson Correlation**	-0.242	0.581	0.922	0.889	0.981	1	0.657	-0.644
	Sig. (2-tailed)	0.5	0.078	0	0.001	0		0.039	0.045
	N	10	10	10	10	10	10	10	10
Standard Deviation %	**Pearson Correlation**	-0.152	-0.221	0.893	0.305	0.574	0.657	1	-0.581
	Sig. (2-tailed)	0.674	0.54	0.001	0.391	0.083	0.039		0.078
	N	10	10	10	10	10	10	10	10
Sharpe Ratio	**Pearson Correlation**	-0.167	-0.23	-.676	-0.461	-0.589	-.644	-0.581	1
	Sig. (2-tailed)	0.644	0.523	0.032	0.18	0.073	0.045	0.078	
	N	10	10	10	10	10	10	10	10
Correlation is significant at the 0.05 level (2-tailed).									

Data source: Author's calculation and compilation

Research question 2: Is there a significant relationship between Rick's and return for the selected mutual funds?

Research hypothesis (H_2): There is a positive and significant correlation between standard deviation and return indicators.

Interpretation: The Pearson correlation matrix showed strong and positive associations among annual returns for different years, return for 2023 and return for 2025. A high positive correlation (i.e. r = 0.867 and P value = 0.0001. Average annual return is strongly correlated with return for 2025 (i.e. r = 0.981) and return for 2023, (i.e. r = 0.922). Standard deviation is also positively correlated with high average annual return (i.e. r = 0.657 and P value = 0.039), which confirms the expected relationship between high risk and higher return. Sharpe Performance Index showed a negative correlation with the average annual return (i.e. r = - 0.644, P value = 0.045), indicating that funds with higher returns did not necessarily offer higher risk-adjusted return. These findings partially supported the hypothesis by confirming a significant fixed return relationship for most variables.

Table 4 showing Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.731[a]	0.535	0.402	3.90299

a. Predictors: (Constant), Sharpe Ratio, Standard Deviation %

Table 5 showing Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	10.272	3.452		2.976	.021	2.110	18.434
	Standard Deviation %	0.646	0.479	0.427	1.348	0.220	-0.487	1.779
	Sharpe Ratio	-0.823	0.659	-0.395	-1.248	0.252	-2.382	0.736

Data source: Author's calculation and compilation

Dependent Variable: Average Annual Return %

Research question 3: How much of the variation in mutual fund returns can be explained by risk indicators such as Standard deviation and Sharpe Performance Index?

Research hypothesis (H_3): Standard deviation and Sharpe performance index have a significant effect on average annual return.

Interpretation: The regression model shows an R value 0.731 and then R^2 of 0.535. This means about 53.5% of the variation in average annual returns is explained by standard deviation and Sharpe performance index together. The standard deviation coefficient is positive, that is Beta value 0.646, while the Sharpe performance index coefficient is negative, that is Beta value is -0.823. However, both the predictors are not statistically significant at the 5% level of significance (i.e. P value = 0.220 for standard deviation and P value = 0.252 for Sharpe performance index. This indicated that although risk indicators explain a large portion of return variability, their individual effects are not statistically significant. Therefore, the research hypothesis is partially accepted.

Table 5 showing ANOVA analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	122.645	2	61.323	4.026	0.069[a]
	Residual	106.633	7	15.233		
	Total	229.279	9			

a. Predictors: (Constant), Sharpe Ratio, Standard Deviation %

Data source: Author's calculation and compilation

Research question 4: Is there a significant difference in the performance of different categories of mutual funds?

Research hypothesis (H_4): There is a significant difference in fund performance across equity, hybrid, debt and arbitrage categories.

Interpretation: The ANOVA test for the regression model gives an F value of 4.026 and a significant level of 0.069. Since the P value is marginally above i.e. 0.05, the result was not statistically significant at the 5% significance level. This suggested that there is no strong indication or performance differences explained exclusively by the risk indicators. However, a descriptive pattern showed that equity funds achieved higher net asset value growth and return, hybrid funds maintained moderate stability, debt and arbitrage funds displayed lower risk and more stable but smaller returns. Although statistical significance is limited, the performance variation across categories is economically meaningful This leads to partial acceptance of research hypotheses.

Concluding observations:

The analysis of ten mutual funds over the period of 2021 to 2025 showed a steady rise in net asset value and consistent positive average annual returns. Equity funds displayed higher growth but carried more volatility, while hybrid funds maintained moderate performance. Debt and arbitrage funds showed lower returns but offered greater stability. Correlation results confirmed a significant positive relationship between risk and return, especially between standard deviation and average annual return. Regression analysis showed that risk indicators explain more than half of the variation in returns, though their individual effects are not statistically significant. ANOVA did not confirm strong category wise performance differences at the 5% significance level but practical variations were visible between different fund types. Overall, the findings support the risk return trade off principle and suggest that equity funds provide higher potential returns, while hybrid and debt fund categories offer more balanced risk profiles. This aligns with the study's objectives and provides a vibrant understanding of mutual fund performance patterns in the Indian market.

Future recommendations:

Future research should include a large sample of mutual funds to better represent the diverse Indian market including newer funds and extending the time frame beyond five years, which can provide a more comprehensive understanding of long-term performance trends. Researchers can also consider the impact of external factors such as economic changes, government policies and fund management styles on fund performance. Incorporating qualitative analysis along with quantitative methods could give deeper insights into decision making and investor behavior. Additionally, advanced financial models and machine learning techniques could be used to improve risk prediction and performance evaluation. Finally, future study may examine the effects of investor psychology and real-world investment outcomes.

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