



## An Investigation into the Risk-Return Profile of Mutual Funds in India

Mr. Vikram Bajaj\*

\*RNB Global University-Bikaner

<p>Received: 09<sup>th</sup> March 2022 Revised: 14<sup>th</sup> April 2022 Accepted: 25<sup>th</sup> May 2022</p> <p><b>CC License</b> CC-BY-NC-SA 4.0</p>	<p style="text-align: center;"><b>Abstract</b></p> <p><i>The objective of this paper is to assess the performance of Mutual Funds and investigate whether variations in Mutual Funds returns are attributable to their respective investment domains or other factors. The study analyzes the Net Asset Values (NAV) data of six Mutual Funds over a three-year period using statistical tools, as well as Beta, Sharpe's, and Treynor Indices. Two Mutual Funds are selected from each investment domain: all Equity Mutual Funds, Hybridequity oriented Mutual Funds, and Hybrid-debt oriented Mutual Funds. The findings indicate that Hybrid-equity oriented Mutual Funds exhibit the highest returns compared to all Equity Mutual Funds and Hybrid-debt oriented Mutual Funds. Conversely, Hybrid-debt oriented Mutual Funds demonstrate the lowest total risk relative to all Equity Mutual Funds and Hybrid-equity oriented Mutual Funds. Through the application of ANOVA, it is deduced that Mutual Funds returns significantly vary across different investment domains.</i></p> <p><b>Keywords:</b> Mutual Fund, Risk, Return, Beta, Sharpe Index, Treynor Index, ANNOVA</p>
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### Introduction

The idea of individuals pooling their money together for investment purposes is not new, but Mutual Funds gained popularity post-Second World War. Mutual Funds serve as an ideal investment vehicle in today's intricate financial landscape, catering to both small and large investors as well as institutions. It's unrealistic for an individual to possess the knowledge, skills, inclination, and time to monitor events, comprehend their implications, and act swiftly to safeguard investments while earning market returns. Mutual Funds address these challenges effectively by leveraging economies of scale in research, investments, and transaction processing.

Amidst the ongoing global turmoil, which is expected to persist for some time, particularly affecting emerging markets unfavorably, major players like ICICI, SBI, Birla, Sundaram, etc., are introducing a variety of Mutual Fund plans across different investment domains to attract investors. A Mutual Fund operates as a trust that aggregates the savings of numerous investors sharing a common financial goal. Each Mutual Fund scheme may have distinct characteristics and objectives. Investors are issued units representing proportional ownership in the Mutual Fund's assets.

Mutual Funds are categorized based on their primary investments into four main categories: money market funds, bond or fixed income funds, stock or equity funds, and hybrid funds. Within these categories, funds may be further classified based on investment objective, approach, or focus.

Bond funds primarily invest in fixed income securities and can be further categorized based on the types of bonds held (e.g., high-yield or junk bonds, investment-grade corporate bonds, government bonds, or municipal bonds) or the maturity of the bonds (short-, intermediate-, or long-term).

Stock or equity funds invest in common stocks, often focusing on specific industries or sectors. These funds can be sub-classified based on market capitalization and investment style, such as growth, blend/core, or value. Hybrid funds invest in a combination of bonds and stocks or convertible securities, including balanced funds, asset allocation funds, target date or target risk funds, and lifecycle or lifestyle funds. Some hybrid funds may operate as funds of funds, investing in shares of other Mutual Funds.

Index funds or passively-managed funds aim to replicate the performance of a market index, like the S&P Nifty 50 index, while actively managed funds seek to outperform relevant indices through superior security selection.

## Literature Review

Cummings J.R (2016) explored the correlation between fund size and performance across two major superannuation industry sectors in Australia: retail and not-for-profit, utilizing a confidential database. Results indicated that larger superannuation funds offer benefits to members through diversification across multiple asset classes, including unlisted property and private equity. They also avoid scale diseconomies in investment returns observed in equity Mutual Funds studies and enjoy cost savings by spreading fixed operating costs over a larger asset base.

Haque, Tariq H. and Ahmed, Abdullahi D (2015) found that Australian mutual fund investors should steer clear of high-fee funds, as they tend to generate relatively low after-fee risk-adjusted returns, especially in weak economic conditions. However, surviving high-fee

Australian wholesale funds exhibit relatively strong performance, both in weak economic conditions and overall. High-fee funds in other categories generally underperform, whether in weak economic conditions or overall. Low-fee funds may charge more if they perform poorly overall but well in weak economic conditions.

Alexakis, Panayotis and Tsolas, I. E (2015) applied Data Envelopment Analysis to assess the performance of Greek domestic equity Mutual Funds over four one-year periods and the entire four-year period. The study aimed to determine if fund managers efficiently utilize inputs (assets, loads, and risk) to produce returns. Results revealed that only a small portion of examined funds operated efficiently, but average efficiency improved over time, supporting the mean-variance efficiency hypothesis for inefficient funds.

Patwa, Prerna and Agarwal, Kshama (2014) conducted an evaluation of equity funds by analyzing a sample of four companies each from the private and public sectors and five schemes with similar characteristics. Using the Mann-Whitney U-test, the study found a significant performance difference between private and public sector Mutual Funds, with private sector funds outperforming public sector funds.

Stefea, Petru, Wagdi, Osama, and Abbas, Karim Mamdouh (2013) presented research offering an overview of mutual funds in Egypt. Their study revealed that Egyptian Mutual Funds impact fund return, total risk, and systemic risk. Additionally, they identified the influence of mutual fund objectives on Sharpe and Treynor ratios.

Agrawal D (2011) discussed Mutual Fund size and asset allocation in India, analyzing the industry's pricing mechanism and conducting empirical studies on valuation. The paper emphasized the impact of saving and investment habits, as well as fund manager confidence and loyalty, on Mutual Fund performance in India.

aker, Haslem, and Smith (2008) investigated the relationship between equity Mutual Fund performance and characteristics, finding that larger funds tend to perform better, indicating significant economies of scale. The study also observed a positive association between cash holdings and performance.

Rao (2006) compared the performance of Growth and Dividend plans, concluding that Growth plans yield higher returns but also involve higher risk. Furthermore, the study found that Growth plans generally offer better risk-adjusted excess returns, indicating a preference for these plans among investors.

Anand and Murugaiah (2006) analyzed the components and sources of investment performance in Indian Mutual Funds, observing that Mutual Funds fail to adequately compensate investors for the additional risk they assume. The study highlighted the influence of market factors and fund manager selectivity on fund performance.

Panwar and Madhumati (2006) investigated differences between public-sector and private-sector Mutual Funds, particularly in terms of asset characteristics, portfolio diversification, and the effects of diversification

on investment performance. While mean returns did not differ significantly between sectors, there were notable differences in standard deviation, variance, and coefficient of variation.

Geczy et al (2005) examined Mutual Fund portfolios to determine the cost of imposing socially responsible investment constraints. The study found that the cost of SRI depends on investor views about asset pricing models and fund manager stock-picking skill.

Sapar N. Rao, Madava R (2003) conducted performance evaluation of Indian Mutual Funds during a bear market, utilizing relative performance index, risk-return analysis, and various performance measures. Results indicated that most Mutual Funds in the sample exceeded investor expectations by generating excess returns over market benchmarks.

O'Neal (2001) documented typical return behavior of equity Mutual Funds around yearends, consistent with the practice of window dressing. The study suggested alterations in the return-generation process during fiscal year-ends, indicating increased trading costs.

Wermers, Russ (2000) found that Mutual Funds hold stocks outperforming the market, but net returns underperform due to expenses and transaction costs. However, high-turnover funds still outperform certain index funds on a net return basis.

Walker, David A., and Droms, William G (1996) analyzed the long-run relationship between risk-adjusted performance of equity Mutual Funds and asset size, expense ratios, portfolio turnover, and load/no-load status. The study found no significant relationship between investment performance and asset size, turnover rate, or load/no-load status, with higher expenses associated with higher returns.

Ferson, Wayne E., and Schadt, Rudi (1996) proposed conditional performance evaluation, modifying classical performance measures to account for public information variables. Results indicated the significance of predetermined variables in controlling biases and improving Mutual Fund performance assessment.

Fama (1972) developed a methodology for evaluating managed portfolio performance, breaking it down into several components.

Michael C. Jensen (1967) evidenced that Mutual Fund performance on average failed to predict security prices sufficiently to outperform a buy-the-market-and-hold strategy, indicating limited evidence of significant outperformance.

## Research Objectives

- To comprehend the varying risk-return profiles of different Mutual Funds.
- To assess and contrast the performance of Mutual Funds across various investment domains.
- To investigate whether disparities in Mutual Funds returns are attributable to their investment domains or other contributing factors. **Hypothesis**

Null Hypothesis (H<sub>0</sub>): There is a significant difference in the average returns among investment domains.

Alternate Hypothesis (H<sub>1</sub>): There is no significant difference in the average returns among investment domains.

## Research Methodology

The study adopted an experimental approach and involved secondary data analysis. It focused on the Net Asset Values (NAV) of six Mutual Funds over the past three years (from July 2010 to July 2016), representing three different investment domains: Equity, Index, and Hybrid-debt. The Mutual Funds selected were Nifty-ETF and Kotak Sensex-ETF for All Equity Mutual Funds, TATA Balanced and DSP Balanced for Hybrid-equity oriented Mutual Funds, and HDFC MIP Long Term and Reliance MIP for Hybrid-debt oriented Mutual Funds.

Tools of Analysis: The performance of the Mutual Funds was assessed using various statistical tools such as average, standard deviation, Beta, and correlation. Additionally, the funds' performances were evaluated using Sharpe's ratio and Treynor's ratio. ANOVA and F-test were employed to determine differences in the impact on Performance Indices (Total risk & Market risk) of Mutual Funds.

Sharpe's Index measures the performance of a portfolio over a specified period, considering the portfolio's risk. It requires knowledge of the portfolio return, risk-free rate of return, and Standard Deviation of the portfolio. The risk-free rate of return is typically represented by the average return of government 91-day T-bills. The Sharpe Index is calculated as follows:

$$\text{Sharpe's Index} = (\text{Portfolio Return} - \text{Risk-Free Return}) / \text{Standard Deviation}$$

Treynor's Index also measures portfolio performance over a specified period, factoring in the portfolio's risk. It necessitates information on the portfolio return, risk-free rate of return, and the portfolio's beta. Similar to

Sharpe's ratio, the risk-free rate of return is typically represented by the average return of government 91-day T-bills. The Treynor Index is calculated as follows:

$$\text{Treynor's Index} = (\text{Portfolio Return} - \text{Risk-Free Return}) / \text{Beta}$$

### Findings & Results

The NAV data of six Mutual Funds, namely Nifty-ETF, Kotak Sensex-ETF, TATA Balanced, DSP Balanced, HDFC MIP Long Term, and Reliance MIP, collected over a 3-year period, were analyzed using statistical tools calculated via an Excel spreadsheet. These Mutual Funds were categorized according to their investment domains: All Equity Mutual Funds (NiftyETF, Kotak Sensex-ETF), Hybrid-equity oriented Mutual Funds (TATA Balanced and DSP Balanced), and Hybrid-debt oriented Mutual Funds (HDFC MIP Long Term and Reliance MIP).

The descriptive results of the Mutual Funds are presented in Table (a).

Table (a)

MUTUAL FUNDS	Average Return	S.D Total risk	Correlation	Beta Market risk	Sharpe's Index	Treynor's Index
Nifty-ETF	6.607719489	5.44167	0.998987	1.399183	-0.22134	-1.24521
Kotak Sensex ETF Dividend	6.29219415	5.570102	0.999711	0.990817	-0.36944	-2.07688
TATA Balanced	8.4223361	3.52188	0.934616	0.585684	0.020539	0.123507
DSP Blackrock-Balanced	7.798591488	3.72876	0.918531	0.609416	-0.14788	-0.90481
HDFC MIP long term	5.85357921	1.378968	0.892165	0.218905	-1.81035	-11.4041
Reliance MIP	5.356464532	1.322898	0.82055	0.193147	-2.26286	-15.4988
Market-BSE Sensex	5.81201992	5.620106	1	1	---	--

From the data presented in the table above, it can be observed that the All Equity Mutual Funds Nifty-ETF and Kotak Sensex-ETF have returns of 6.61% p.a. and 6.29% respectively, with total risks of 5.44 and 5.57 respectively. Similarly, the Hybrid-equity oriented Mutual Funds TATA Balanced and DSP Balanced have returns of 8.42% p.a. and 7.79% respectively, with total risks of 3.5 and 3.7 respectively. Lastly, the Hybrid-debt oriented Mutual Funds HDFC MIP Long Term and Reliance MIP have returns of 5.85% p.a. and 5.35% respectively, with total risks of 1.37 and 1.32 respectively. It is evident that Hybrid-equity oriented Mutual Funds have the highest return compared to the All Equity Mutual Funds and the Hybrid-debt oriented Mutual Funds. Additionally, the Hybrid-debt oriented funds exhibit the lowest total risk compared to the other categories.

**Beta:** All Mutual Funds in the table have positive betas, indicating that their returns generally follow the market's returns. Nifty-ETF and Kotak Sensex ETF Dividend have betas of 1.4 and 1 respectively.

**Sharpe's Index:** The data shows that only the TATA Balanced fund aligns with the market return, with a value of 0.12. The other funds do not align with the market return.

**Treynor's Index:** The TATA Balanced fund is positioned above the SML (M) Line, indicating that it has outperformed the market. This suggests that, in the current Indian Capital Market scenario, investing solely in All Equity Mutual Funds may not be profitable for short and medium-term investors.

**Note:** Investors should exercise their own discretion when making investment decisions based on this research. We do not take responsibility for any capital losses incurred.

To verify if the difference in Mutual Funds returns is independent of the investment domain, the following research design (Table b) is constructed, and the ANOVA technique is applied.

Table (b)

Mutual Funds	Investment Domains			
	All Equity fund	Hybrid-equity	Hybrid-debt	
1	6.61	8.42	5.85	
2	6.29	7.79	5.35	
Mean Returns	<b>6.45</b>	<b>8.11</b>	<b>5.61</b>	<b>6.72</b>

The result above design can be set up ANOVA table as shown below

**Table (c)**

Source of Variation	SS	d.f	MS	F-ratio	5% Critical value	1% Critical value
Between Investment Domain	6.49	2	3.25	<b>26.49</b>	9.55	30.82
Within Investment Domain	0.37	3	0.123			

The results from the table indicate that the calculated value of F is 26.49, exceeding the critical value at a 5% level of significance with degrees of freedom (2,3). This analysis contradicts the null hypothesis (Ho) that there is no significant difference in Investment Domain average returns. Therefore, it can be concluded that the disparity in average returns of Mutual Funds is significant and attributable to their respective investment domains.

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