Risk-adjusted return, fund manager efficacy, and fund characteristics – An inquiry

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Abstract

In this study, I examine the risk-adjusted return of mutual funds in India. A data set of 4220 mutual funds is used for the analysis. Sharpe ratio, a metric of risk-adjusted return (Sharpe, 1994) and Information ratio, a metric of outperformance than a fund's benchmark (Goodwin, 1998) were analyzed. Regression analysis is used to estimate the impact of fund characteristics like fund category, fund type, fund access type, corpus size on the dependent variables i.e., Sharpe Ratio and the Information Ratio. All the funds underperformed in both the Sharpe ratio and Information ratio. Liquid funds found worst. Fund type and corpus size do not impact fund performance. Fund access type was found to be significant on fund performance. The results add to the literature by examining the post-pandemic period.

Introduction

The Indian mutual fund industry is witnessing a great demand for New Fund Offerings (NFO) particularly in the year 2021. Likewise, Initial Public Offering (IPO) received tremendous responses from investors. Post, the covid pandemic demand for market-based investments had increased in India. Indian stock markets have increased phenomenally (Alam & Chavalli, 2020). However, the primary reason for investing in mutual funds is professional management. Further, emerging economies offer a superior return for investors in mutual funds (Levine, 2005). The assets under management (AUM) in India had crossed ₹10 lakh crores in the year 2014 and touched ₹30 lakh crores during the year 2020. The data shows the growth of mutual funds as an investment product in India. However, the penetration of mutual funds is comparatively inadequate than other developed economies. Investors expect mutual funds to outperform due to professional management. One way of evaluation is the fund's risk-adjusted return. Sharpe ratio is one popular metric in estimating the risk-adjusted return (Sharpe, 1994). Likewise, a fund's ability to outperform the average return of the benchmark is considered a fund manager's competence.

Information ratio is one metric that represents the fund manager's efficacy in generating returns than the benchmark (Goodwin, 1998). The empirical evidence shows that the mutual funds' industry grew at a rate of 20% in general and 25% for equity-oriented schemes. Likewise, mutual fund folios had crossed remarkable 10 crores, during May 2021. Post pandemic, 72% of the investors prefer mutual funds and the majority are satisfied with the decision (FinDoc, 2021). The post-pandemic return was found better for certain categories of funds than their long-term returns (Appendix A). However, the crucial question is whether the mutual funds perform on a risk-adjusted basis? And were the fund managers efficient in generating outperformance? Does the fund manager's efficacy significant across all categories of funds? Indian mutual fund industry has 4305 funds across categories. In this study, I investigate the risk-adjusted returns and fund manager efficacy of all funds using the Sharpe ratio and Information ratio. Further, I examine the significance of fund category, fund type, fund access type, and corpus size in Sharpe Ratio and the Information ratios using the regression model. The remaining section of the paper is presented as follows. Section 2 discusses the literature review. Section 3 presents data and methodology. Section 4 is about analysis and results. The final section presents the conclusion.

Literature Review

The covid 19 pandemic has caused economic changes and behavioral changes in the minds of investors. The increased trading volumes and Demat accounts are evidence of high involvement in Indian stock markets. Mutual funds in countries with liquid stock markets and strong legal institutions display better performance (Ferreira et.al, 2012). Likewise, mutual funds play a significant role in enhancing liquidity and recovery of stock market crashes (Jagannathan et.al, 2021). Hence, liquidity in Indian stock markets improves mutual fund performance and vice versa. The penetration of the Indian mutual fund industry is inadequate compared to developed economies due to a lack of objective research (Kale and Panchapagasan, 2012). To improve penetration more objective research is required to examine specific

aspects of fund performances. Fund size, market risk, expenses, are persistent in determining the performance of the equity mutual funds.

Larger, older, high-expense ratio funds are persistent in performance (Deb, 2019). Likewise, Mutual funds managed by large fund houses outperform the markets (Ferriera et.al, 2012). Even though retail investors trade actively, they have poor timing and fund selection skills despite access to professional fund management (Sourirajan and Nataran, 2021). However, professional fund managers exhibit poor stock-selection skills and do not seem to exhibit any distinguishable ability in timing (Zabiulla, 2014). Ippolito (1992) concluded that the investors prefer mutual funds which have a record of positive returns than any other factors. Cognazzo (2021) examined whether investors make good timing decisions and found that the average performance gap is negative and statistically significant for all funds. Cognazzo (2021) concludes that although gaps remain negative regardless of the strategy declared by the fund manager, corporate and growth funds exhibit the worst performance.

Hence analyzing the ability of funds in showing outperformance is crucial for identifying best-performing ones. Babbar and Sehgal (2018) have investigated 237 equity growth funds for the period of April 2007 to March 2013 and found that the size of the fund negatively impacts, and the age of the fund positively impacts the net asset value (NAV). Narayan and Ravindran (2003) found that most of the mutual fund schemes overperformed the expectation of investors by giving excessive returns over expected returns. Contrastingly, Malviya and Khanna (2020) found that mutual funds have failed to generate even the returns of fixed deposits. Garg (2011), Debasish (2009), and Anitha et. al (2011) identified best-performing funds out of the sample considered. Selvam et. al. (2011) examined the risk-return relationship in mutual fund schemes and found not all schemes exhibit risk-return relationships. Guha Deb (2008) examined the efficiency of funds in generating excess return than their respective benchmarks and found that the funds haven't been able to beat their style benchmarks on average. Likewise, Prajapati and Patel (2012) found outperformance by most of the funds. There is no study available investigating the funds and fund managers' outperformance post-pandemic.

A complete inquiry of all available mutual funds will help to understand the ability of the fund's outperformance at present. This study examines mutual funds traded in India with the following objectives,

1. Examining the risk-adjusted returns and funds outperformance than the benchmark.
2. Investigating the significance of fund category, fund type, access type, and corpus size in the risk-adjusted return and outperformance.

Data

The data for the study is collected from the Association of Mutual Funds in India (AMFI) and the factsheets of Asset Management Company's (AMC) sources. A total of 4307 funds exists in the Indian mutual funds market. Excluding funds with missing values, the study used 4220 funds for analysis.

Methodology

The initial analysis focused on estimating the average group level risk-adjusted performance and benchmark outperformance. Further, regression analysis is used to estimate the significance of fund category, fund type, fund access type, and corpus size on improving the risk-adjusted return and fund outperformance i.e., Sharpe ratio and Information ratio. The multiple linear models used are.,

$$\text{Sharpe ratio} = \text{Category} + \text{Type} + \text{Access} + \text{Corpus} \quad - (1)$$

$$\text{Information ratio} = \text{Category} + \text{Type} + \text{Access} + \text{Corpus} \quad -- (2)$$

Analysis and Interpretation

The initial analysis results show that most of the funds are dividend-based bond funds. Further equity and dividend-based liquid funds are higher in numbers (Figure 1). Based on scheme type, dividend funds are higher than the growth funds (Appendix B). Most of the funds are open-ended funds (97%) in nature (Appendix C). Further, the risk-adjusted return estimated through the Sharpe ratio reveals that all fund categories underperformed. Liquid funds were found to be the worst. Likewise, the information ratio shows that no funds have outperformed its benchmark market indices, post-pandemic.

Table 1 - Sharpe ratio of mutual fund categories

Category of funds	Sharpe ratio	Information ratio
Balanced	0.1675	-0.3871
Bond Funds	-0.1099	0.3921
Equity Funds	0.3389	-0.2276
Fund Of Funds	0.1322	-0.018
Gilt Funds	-0.2155	-0.3901
Index Funds	0.2631	-0.1510
Liquid Funds	-0.585	-0.3813
Pension Funds	0.2900	-0.3671
Sectoral funds	0.1436	-0.1830
Tax planning funds	0.1977	-0.1531

Source: Author's calculation based on AMFI data.

To examine the significance of the impact of category along with other factors like fund type, access type, and corpus size, I have used regression analysis. Two models examining the impact of dependent variables Sharpe ratio and Information ratio are tested. Based on the ANOVA analysis, the best model is identified (Table 2).

The results of the ANOVA found Model 3 is better in explaining both the Sharpe ratio and the information ratio. The models are expressed as equations (3) and (4).

$$\begin{aligned} \text{Sharpe ratio} = & 0.161 - (0.161 * \text{Bond funds}) \\ & + (0.270 * \text{Fund of funds}) - (0.279 * \text{Gilt funds}) \\ & + (0.203 * \text{Index funds}) - (0.650 * \text{Liquid funds}) - (0.372 \\ & * \text{interval}) \quad \quad \quad - - (3) \end{aligned}$$

$$\begin{aligned} \text{Information ratio} \\ = & -0.181 - (0.122 * \text{Balanced funds}) - (0.128 * \text{Bond fund}) \\ & + (0.248 * \text{Fund of funds}) - (0.124 * \text{Gilt funds}) \\ & + (0.114 * \text{Index funds}) - (0.115 * \text{Liquid funds}) \\ & + (0.082 * \text{Sectoral funds}) \\ & + (0.1087 * \text{Tax planning funds}) - (0.081 * \text{Interval}) - (0.083 \\ & * \text{Open ended}) - - (4) \end{aligned}$$

Categorical independent variables, fund category, fund type, and fund access type are contrasted with a reference category (Table 2). Hence, the intercept of the Sharpe ratio (Eqn. 3) 0.161 denotes the risk-adjusted performance of 'closed-ended equity dividend' funds. Across models, there is no significant effect identified by fund type and corpus size on the Sharpe ratio. However, there is a significant impact of fund access type - interval funds on the Sharpe ratio. Interval funds underperform compared to the reference category. Fund of funds and index funds significantly outperform the reference category. Bond funds, gilt funds, liquid funds significantly underperform the reference categories in generating a risk-adjusted return.

Information ratio (equation 4) identifies how much a fund has exceeded its benchmark. The intercept value of - 0.181 indicates the underperformance of 'closed-ended equity dividend' funds than their benchmarks. The reference category did not outperform the benchmark. There is no significant effect found in fund type and corpus size on the information ratio. Fund access types, like interval and open-ended, significantly reduce the information ratio, compared with the reference category. Fund of funds, index funds, sectoral funds, tax planning funds, show better outperformance. Bond funds, gilt funds, liquid funds show lower performance than the reference category.

Table 2 – Regression results

Dep. Variables	Sharpe Ratio				Information Ratio			
Ind. Variables	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Fund category								
Equity Funds	Reference category				Reference category			
Balanced funds	0.105 (0.061)	0.103 (0.061)	0.103 (0.061)	0.105 (0.061)	-0.121*** (0.011)	-0.122*** (0.011)	-0.122*** (0.011)	-0.121*** (0.012)
Bond Funds	-0.172*** (0.043)	-0.175*** (0.043)	-0.161*** (0.044)	-0.163*** (0.044)	-0.127*** (0.007)	-0.127*** (0.007)	-0.128*** (0.008)	0.127*** (0.007)
Fund of funds	0.269*** (0.073)	0.271*** (0.073)	0.270*** (0.073)	0.287*** (0.074)	0.246*** (0.013)	0.246*** (0.013)	0.248*** (0.013)	0.2512*** (0.013)
Gilt Funds	-0.277*** (0.073)	-0.279*** (0.072)	-0.279*** (0.072)	-0.274*** (0.072)	-0.124*** (0.013)	-0.125*** (0.013)	-0.124*** (0.0132)	-0.123*** (0.013)
Index Funds	0.201* (0.079)	0.204** (0.078)	0.203** (0.078)	0.215** (0.079)	0.113*** (0.014)	0.114*** (0.014)	0.114*** (0.014)	0.117*** (0.014)
Liquid Funds	-0.647*** (0.054)	-0.650*** (0.054)	-0.650*** (0.054)	-0.665*** (0.055)	-0.116*** (0.009)	-0.116*** (0.009)	-0.115*** (0.009)	-0.119*** (0.010)
Pension Funds	0.227 (0.308)	0.231 (0.308)	0.229 (0.308)	0.225 (0.308)	-0.102 (0.055)	-0.102 (0.055)	-0.101 (0.055)	-0.102 (0.055)
Sectoral funds	0.081 (0.090)	0.081 (0.090)	0.081 (0.090)	0.077 (0.090)	0.084*** (0.016)	0.082*** (0.016)	0.082*** (0.016)	0.081*** (0.016)
Tax planning funds	0.135 (0.076)	0.136 (0.076)	0.130 (0.076)	0.125 (0.076)	0.112*** (0.014)	0.1119*** (0.013)	0.1087*** (0.013)	0.107*** (0.013)
Fund Type								
Dividend	Reference category				Reference category			
Growth		-0.017 (0.029)	-0.013 (0.029)	-0.012 (0.029)		-0.0014 (0.005)	-0.0012 (0.005)	-0.002 (0.005)
Fund Access								
Closed-end.	Reference category				Reference category			
Interval			-0.372* (0.165)	-0.344* (0.166)			-0.081** (0.030)	-0.075* (0.030)
Open-end			-0.092 (0.133)	-0.122 (0.134)			-0.083*** (0.024)	-0.089*** (0.024)
Corpus Size				0.0108 (0.007)				0.0022 (0.001)
Constant	0.062 (0.038)	0.070 (0.041)	0.161 (0.138)	0.119 (0.141)	-0.265 (0.007)	-0.264 (0.0075)	-0.181 (0.025)	-0.1892 (0.025)

Observations	4220	4220	4220	4220	4220	4220	4220	4220
Adj. R – squared	0.064	0.064	0.065	0.066	0.291	0.291	0.293	0.293
Robust standard errors in parentheses								
*** p<0.01, ** p<0.05, * p<0.1								

Source: Author's calculations

Conclusion

Investments in mutual funds significantly increased during the past few years and post covid pandemic. The primary objective of investing in mutual funds is it is professionally managed by fund managers. Investors expect mutual funds to outperform, exceeding the risk-free rate and the benchmark returns. Excess of risk-adjusted return makes a fund attractive and outperformance than the benchmark adds credit to the fund manager's efficacy.

In this study, the Sharpe ratio and information ratio of 4220 mutual funds are examined to find a significant impact of fund category, fund type, access type, and corpus size on the Sharpe ratio and Information ratio. Regardless of categories, the Sharpe ratio and Information ratio are negative across all funds. Hence, it can be inferred that the absolute returns of funds are better than post-pandemic however the risk-adjusted performance and outperformance are poor. Cagnazzo (2022) proved funds underperformance in emerging markets during the current year. The results of the multiple linear regression show that fund type and corpus size do not impact both the Sharpe ratio and Information ratio. However, interval funds negatively perform compared to the reference category (closed-ended equity dividend funds) in determining the Sharpe ratio. Likewise, open-ended funds and interval funds significantly underperform based on the Information ratio. The results are valuable for mutual fund selection in the post-pandemic market situation.

Declarations

Competing interests: The author declares no competing interests.

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Figures

Figure 1

Taxonomy of mutual funds in India

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