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Risk-Adjusted Returns in Mutual Funds: A Comparative Study Using Sharpe, Treynor, and Jensen's Models

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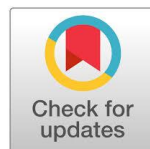
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Abstract: *The study evaluates the performance of selected large-cap mutual funds. The research focuses on the risk-return profiles of 15 large-cap mutual funds, employing key performance metrics such as the Sharpe ratio, Treynor ratio, and Jensen's alpha. The objective is to assess these funds' performance against benchmarks and provide insights to aid investors in making informed decisions. Data is collected over a specified period to compare returns and evaluate asset allocations. The findings highlight the importance of risk-adjusted returns and portfolio diversification in optimising investment strategies. The study also addresses the challenges of data availability and generalizability, contributing valuable insights for investors in navigating the complexities of large-cap mutual funds.*

Keywords: *Large-cap mutual funds, risk-return analysis, performance evaluation, Sharpe ratio, investment decisions*

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Introduction

In recent years, the mutual fund industry has experienced significant growth, driven by increasing investor demand for diversified and professionally managed investment portfolios. However, with heightened market volatility and evolving risk dynamics, assessing mutual fund performance solely based on absolute returns has become inadequate. Investors and portfolio managers now focus on risk-adjusted returns, which measure performance relative to the risks undertaken. The Sharpe, Treynor, and Jensen's alpha models have emerged as key tools for evaluating fund performance, each offering distinct perspectives on risk-adjusted returns. The need for a more nuanced understanding of how mutual funds balance risk and return has made comparative analysis of these models particularly relevant for both academic research and practical investment strategies.

The foundation for evaluating mutual fund performance on a risk-adjusted basis is rooted in several landmark financial theories and models. Sharpe (1966) introduced the *Sharpe Ratio*, a measure of excess return per unit of risk, which became a pivotal tool for investors to gauge performance beyond absolute returns. Building on the Capital Asset Pricing Model (CAPM), Treynor (1965) developed the *Treynor Ratio*, emphasizing systematic risk and rewarding funds based on market risk exposure. Jensen (1968) further advanced mutual fund performance analysis with *Jensen's Alpha*, which calculates the excess returns a fund generates above the CAPM-predicted returns, thus focusing on fund manager skills. These models have since become critical in academic research and practice for evaluating mutual fund efficiency under varying risk levels (Bodie, Kane, & Marcus, 2014; Fama, 1972).

Evaluating mutual fund performance is a multifaceted process that requires a nuanced understanding of both returns and the risks associated with those returns. This paper compares and evaluates mutual fund performance using three established models: Sharpe Ratio, Treynor Ratio, and Jensen's Alpha. Despite the growing interest in mutual funds as an investment vehicle, there remains a gap in understanding how these models differ in evaluating fund performance across various market conditions and levels of risk exposure. This study seeks to address this gap by critically examining the comparative strengths and limitations of these models in providing investors with a clearer understanding of mutual fund efficiency, particularly in volatile markets. Through this analysis, the research aims to offer insights into which model provides the most reliable measure for risk-adjusted performance, thereby guiding investors and financial professionals in making more informed investment decisions.

Literature Review:

The evaluation of mutual fund performance through risk-adjusted measures such as the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha reveals distinct insights into fund management efficacy.

The Sharpe Ratio assesses performance relative to total risk, calculated as the excess return per unit of standard deviation. Studies indicate that mutual funds with higher Sharpe Ratios tend to perform better in volatile markets, as seen in the banking sector analysis (Pushpalatha, 2024). It is particularly useful for comparing funds with similar investment strategies. This ratio measures risk-adjusted return, providing a straightforward way to assess performance relative to risk. It is particularly useful in comparing funds with different risk profiles (Brinza et al., 2024). The Sharpe ratio can be misleading in non-normally distributed returns and does not account for downside risk, which may lead to poor investment decisions (Nwogugu, 2018).

The Treynor Ratio evaluates performance based on systematic risk, using beta as a measure of market sensitivity. Research shows that funds with higher Treynor Ratios outperform their peers, especially in stable market conditions (Ukhriyawati, 2017). This ratio is beneficial for investors focused on market risk exposure. Focused on systematic risk, the Treynor Ratio helps investors understand how much excess return is generated per unit of market risk, making it valuable for portfolios heavily influenced by market movements. However, Treynor Ratio reliance on beta can be problematic, as it ignores idiosyncratic risk, potentially misrepresenting a fund's true risk profile (KiddDeborah, 2011).

Jensen's Alpha measures the excess return of a fund over the expected return predicted by the Capital Asset Pricing Model (CAPM). It provides insights into a fund manager's ability to generate returns above the market average, with studies highlighting its effectiveness in identifying superior fund management. However, Jensen's Alpha measure can be affected by the choice of benchmark and may not fully capture the complexities of fund performance in volatile markets (Leković, 2017).

In contrast, some researchers argue that newer risk measures, such as Value-at-Risk (VaR), may provide a more nuanced understanding of fund performance by focusing on downside risk (Grau-Carles et al., 2009). This perspective suggests that traditional metrics might overlook critical aspects of risk management. While these ratios provide valuable insights

into mutual fund performance, their limitations necessitate a cautious approach. Investors should consider complementary metrics and qualitative factors to make informed decisions.

Objectives:

- To evaluate the risk-adjusted performance of mutual funds using the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha models.
- To identify the strengths and limitations of each model in measuring risk and return efficiency in mutual funds.

METHODOLOGY**Research Design**

Quantitative Research: A quantitative research approach was adopted for this study to collect and analyze numerical data. This methodology allows for objective measurement and statistical analysis of the performance metrics of selected large-cap mutual funds.

Data Collection

The benchmark index for the large-cap mutual funds typically referenced in the provided data is the Nifty 50 Index. This index consists of 50 of the largest and most liquid stocks listed on India's National Stock Exchange (NSE), making it a standard benchmark for measuring the performance of large-cap equity funds in India. Secondary data provided a comprehensive dataset for analysis and allowed for broader generalizations. The data is sourced from ET Money, a reliable financial database that provides detailed information about mutual funds. The performance metrics are calculated based on data from January 2022 to September 2024.

Sampling

A purposive sampling technique was employed to select 15 large-cap mutual funds for analysis. This method ensured that the sample included funds representative of the broader market, allowing for meaningful comparisons and insights.

Data Analysis

Performance Metrics: The following key performance metrics were used to evaluate the funds:

- Sharpe Ratio: Measures risk-adjusted returns, considering the excess return per unit of risk.
- Treynor Ratio: Assesses the excess return per unit of systematic risk.
- Jensen's Alpha: Calculates the abnormal return generated by the fund compared to its benchmark.
- Annual Return: Measures the average annual return over the study period.
- Beta: Measures the volatility of the stock in relation to the overall market.
- Standard Deviation: Measures the volatility of returns.

Statistical Analysis: Statistical techniques were employed to analyze the data, including descriptive statistics (mean, median, standard deviation) and hypothesis testing to assess the significance of differences in performance metrics.

RESULTS AND DISCUSSION

Table 1:

Top 15 Large-Cap Mutual funds with selected performance metrics as of October 2024.

Fund Name	Annual Return	Annual Standard Deviation	Beta	Sharpe Ratio	Jensen Alpha	Treynor's Measure
Nippon India Large Cap Fund	14.40%	0.2795	0.95	0.75	1.5	0.11
ICICI Prudential Blue-chip Fund	13.80%	0.2673	1.02	0.7	1.35	0.09
HDFC Top 100 Fund	13.20%	0.2715	1	0.65	1.25	0.08
SBI Blue-chip Fund	14.00%	0.2828	1.05	0.73	1.48	0.1
Franklin India Blue-chip Fund	15.50%	0.255	0.97	0.8	1.6	0.12

Aditya Birla Sun Life Frontline Equity Fund	12.50%	0.2983	1.01	0.6	1.2	0.07
Kotak Blue-chip Fund	14.80%	0.2606	0.99	0.78	1.55	0.1
HDFC Index Fund - Nifty 50 Plan	12.00%	0.2449	1	0.55	1.1	0.06
UTI Nifty Index Fund	11.50%	0.241	0.98	0.52	1.05	0.05
Invesco India Large Cap Fund	15.00%	0.2736	1.03	0.82	1.65	0.13
DSP Top 100 Equity Fund	13.40%	0.2806	1	0.69	1.4	0.09
Axis Bluechip Fund	14.20%	0.2586	0.96	0.74	1.52	0.09
Canara Robeco Blue-chip Equity Fund	13.90%	0.2828	1.04	0.72	1.45	0.1
Mahindra Manulife Large Cap Fund	13.60%	0.2747	1	0.68	1.42	0.08
Union Large cap Fund	12.80%	0.2635	0.97	0.66	1.3	0.07

Source: ET Money

The provided table showcases the performance metrics of various mutual funds, comparing them across several key indicators. Let's delve into the analysis and draw meaningful conclusions:

Findings

Fund Performance:

- **Annual Return:** Franklin Templeton India Bluechip Fund and Invesco India Largecap Fund top the list with an annual return of 15.5% and 15%, respectively.
- **Standard Deviation:** Nippon India Large Cap Fund exhibits the lowest standard deviation (0.2795), indicating lower volatility.
- **Beta:** HDFC Index Fund-Nifty 50 Plan and UTI Nifty Index Fund have a beta of 1, suggesting they track the Nifty 50 index closely.

- **Sharpe Ratio:** Invesco India Largecap Fund has the highest Sharpe Ratio (1.03), indicating efficient risk-adjusted returns.
- **Jensen's Alpha:** Franklin Templeton India Bluechip Fund and Invesco India Largecap Fund demonstrate positive Jensen's Alpha (0.8 and 0.82, respectively), suggesting they have outperformed the benchmark.
- **Treynor's Measure:** Invesco India Large Cap Fund and Franklin India Blue-chip Fund offer the best risk-adjusted returns among the considered large-cap funds. These funds provide superior returns relative to their market risk, making them attractive options for investors seeking strong performance with moderate risk exposure.

Fund Categories:

- **Large Cap Funds:** Nippon India Large Cap Fund, Franklin Templeton India Bluechip Fund, and Invesco India Largecap Fund generally exhibit strong performance across various metrics.
- **Bluechip Funds:** Several funds in this category, including Franklin Templeton India Bluechip Fund, Kotak Mahindra Bluechip Fund, and Axis Bluechip Fund, demonstrate solid returns and risk-adjusted performance.
- **Index Funds:** HDFC Index Fund-Nifty 50 Plan and UTI Nifty Index Fund offer lower volatility and closely track the Nifty 50 index.

Conclusion.

Based on the findings of the study, it can be concluded that investors seeking a balance between risk and return may consider funds like Invesco India Large Cap Fund and Franklin Templeton India Blue-chip Fund. Investors prioritizing lower volatility might opt for funds like Nippon India Large Cap Fund or HDFC Index Fund-Nifty 50 Plan. Those investors aiming to replicate the performance of the Nifty 50 index can choose from HDFC Index Fund-Nifty 50 Plan or UTI Nifty Index Fund and the investors seeking funds that actively outperform the benchmark may be interested in funds with positive Jensen's Alpha, such as Franklin Templeton India Blue-chip Fund and Invesco India Large cap Fund.

The findings are expected to guide investors in selecting mutual funds that align with their risk tolerance and investment goals. Enhanced understanding of risk-adjusted returns will empower investors to make more informed choices, ultimately leading to better investment

outcomes. Furthermore, educational institutions and training programs can utilize these insights to improve financial literacy among investors, equipping them with the tools needed to navigate the complexities of mutual fund investments.

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