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PARAMETRIC ANALYSIS OF MUTUAL FUND PERFORMANCE: ASSESSING RISK-ADJUSTED RETURNS – HDFC STANDERD LIFE

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ABSTRACT

Mutual funds have emerged as one of the most preferred investment avenues for individual and institutional investors due to their diversification benefits, professional management, and accessibility. Evaluating the performance of mutual funds is essential for investors to make informed investment decisions. Traditional performance measures based solely on returns may not provide a complete picture, as they ignore the level of risk undertaken to achieve those returns. Therefore, risk-adjusted performance evaluation has become a crucial aspect of mutual fund analysis.

This study focuses on the parametric analysis of mutual fund performance by assessing risk-adjusted returns. The research employs widely accepted parametric measures such as the Sharpe Ratio, Treynor Ratio, Jensen's Alpha, and Capital Asset Pricing Model (CAPM) to evaluate the effectiveness of fund management and the ability of mutual funds to generate superior returns relative to risk. These measures help in understanding whether fund managers are capable of outperforming market benchmarks while maintaining acceptable risk levels.

The study analyzes historical data relating to mutual fund returns, market returns, and risk-free rates over a specified period. Statistical techniques are used to measure systematic and unsystematic risk and to determine the relationship between risk and return. The findings provide insights into the comparative performance of selected mutual funds and highlight the significance of risk-adjusted evaluation methods in investment decision-making.

The study concludes that parametric performance measures offer a comprehensive framework for assessing mutual fund efficiency and enable investors to identify funds that deliver superior returns for the level of risk assumed. The results are expected to assist investors, portfolio managers, and financial analysts in making more effective investment decisions and developing sound portfolio management strategies.

I. INTRODUCTION

INTRODUCTION TO THE STUDY:

Mutual funds play a significant role in modern investment management by providing investors with an opportunity to participate in diversified portfolios managed by professional fund managers. They pool funds from numerous investors and invest them in a variety of financial instruments such as equities, bonds, money market securities, and other assets. Due to their ability to offer diversification, liquidity, and professional expertise, mutual funds have become one of the most popular investment vehicles worldwide.

The evaluation of mutual fund performance is a critical aspect of investment analysis. Investors seek not only higher returns but also an understanding of the risks associated with achieving those returns. Merely comparing returns may not provide a complete picture of a fund's performance because higher returns are often accompanied by higher risks. Therefore, assessing performance on a risk-adjusted basis becomes essential for making informed investment decisions.

Parametric analysis provides a systematic and quantitative approach to evaluating mutual fund performance. It utilizes statistical and financial models to measure the relationship between risk and return. Commonly used parametric performance measures include the Sharpe Ratio, Treynor Ratio, Jensen's Alpha, and the Capital Asset Pricing Model (CAPM). These measures help determine whether a mutual fund has

generated adequate returns relative to the level of risk undertaken by the fund manager.

Risk-adjusted return analysis enables investors to compare different mutual funds on a standardized basis. It assists in identifying funds that have consistently delivered superior performance while effectively managing risk. Such analysis is particularly important in volatile market conditions where the ability to balance risk and return becomes a key determinant of investment success.

The present study, "Parametric Analysis of Mutual Fund Performance: Assessing Risk-Adjusted Returns," aims to evaluate the performance of selected mutual funds using established parametric techniques. By examining risk-adjusted measures, the study seeks to provide valuable insights into fund efficiency, managerial effectiveness, and the overall relationship between risk and return. The findings will be beneficial for investors, fund managers, financial analysts, and researchers in understanding the effectiveness of mutual fund investment strategies and making better financial decisions.

Parametric Analysis

Parametric Analysis is a statistical technique used to evaluate data by assuming that it follows a specific probability distribution, usually the normal distribution. In finance and investment management, parametric analysis is widely employed to assess the performance, risk, and return characteristics of investment instruments such as mutual funds, stocks, and portfolios.

In the context of mutual fund performance evaluation, parametric analysis helps in measuring the relationship between risk and return using mathematical and statistical models. It enables researchers and investors to analyze historical fund performance and determine whether the returns generated are adequate considering the risks undertaken. Parametric methods rely on numerical parameters such as mean return, variance, standard deviation, beta, and alpha to assess investment performance.

Some of the most commonly used parametric measures in mutual fund performance analysis include:

Sharpe Ratio – Measures excess return earned per unit of total risk.

Treynor Ratio – Evaluates returns relative to systematic risk (beta).

Jensen's Alpha – Measures a fund manager's ability to generate returns above the expected market return.

Capital Asset Pricing Model (CAPM) – Explains the relationship between risk and expected return.

Standard Deviation – Measures the volatility of fund returns.

Beta Coefficient – Indicates the sensitivity of a fund's returns to market movements.

Parametric analysis provides a scientific and objective framework for comparing different mutual funds. It helps investors identify funds that offer superior risk-adjusted performance and assists fund managers in evaluating the effectiveness of their investment strategies. The approach is particularly useful for making informed investment decisions, portfolio construction, and performance benchmarking.

NEED AND IMPORTENCE OF THE STUDY

1. Mutual funds are dynamic financial intuitions which play crucial role in an economy by mobilizing savings and investing them in the capital market.
2. The activities of mutual funds have both short and long term impact on the savings in the capital market and the national economy.
3. Mutual funds, trust, assist the process of financial deepening & intermediation.
4. To banking at the same time they also compete with banks and other financial intuitions.
5. India is one of the few countries to day maintain a study growth rate is domestic savings.

SCOPE OF THE STUDY:

1. Analysis of selected equity-oriented mutual fund schemes over a specified study period.
2. Evaluation of mutual fund performance using parametric measures such as Sharpe Ratio, Treynor Ratio, Jensen's Alpha, Standard Deviation, and Beta.
3. Assessment of risk-adjusted returns to determine the effectiveness of fund management.

4. Comparison of mutual fund schemes based on their risk and return characteristics.
5. Examination of systematic risk and market sensitivity through the Capital Asset Pricing Model (CAPM).
6. Study of historical Net Asset Value (NAV) data and returns of selected mutual funds.
7. Identification of funds that provide superior performance relative to their risk exposure.
8. Evaluation of the consistency and stability of mutual fund returns during the study period.
9. Providing useful insights and recommendations for investors, portfolio managers, and financial analysts.
10. Contributing to the understanding of mutual fund performance evaluation techniques and their practical applications in investment decision-making.

Objectives of the study:

- To evaluate the performance of selected mutual funds using parametric analysis techniques.
- To measure the risk-adjusted returns of mutual funds through performance indicators such as the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha.
- To analyze the relationship between risk and return in selected mutual fund schemes.
- To compare the performance of different mutual funds based on their risk-adjusted returns.
- To assess the effectiveness of fund managers in generating returns above market expectations.
- To examine the systematic risk (Beta) associated with selected mutual funds.
- To evaluate the consistency and efficiency of mutual fund performance over the study period.
- To identify mutual fund schemes that provide superior returns for the level of risk undertaken.
- To study the applicability of the Capital Asset Pricing Model (CAPM) in mutual fund performance evaluation.
- To provide suggestions and recommendations for investors based on the findings of risk-adjusted performance analysis.

Methodology of study:

To fulfill the objective of the study both primary and secondary data has been collected. Primary data is the data collected specifically for the study. Data is collected directly from people and organizations via questionnaires or surveys before being analyzed to reach conclusions concerning the issues covered in the questionnaire or survey.

In this study primary data was collected through interaction with staff of **HDFC Asset Management Company Ltd (AMC) .** and the applications of Reliance equity fund.

Secondary data is the data collected previously by someone else for some other purpose which can be analyzed and interpreted according to requirements. For example, sources of secondary data are government publications, newspapers, worldwide web etc.

In this study the Secondary data is mainly taken from

* The company's training material.
* Reconciliation statements.
* Other documents generated within the organization which have to Access
* www. hdfc.com, www.amfiindia.com,www.sebi.com.

Limitations of study:

* Analysis of the applications is carried out by taking the applications from Reliance equity Fund. The data available is therefore restricted by the design of the application.
* The inspection of applications is done on the basis of a sample of 120 applications. Though the sample is drawn randomly, the possibility of sampling fluctuations affecting the findings cannot be ruled out.
* Numerical data like number of applications received, total subscription amount

received, statement of accounts, investor details, etc are not available and therefore a description of these aspects is given.

* NFO process may not be same for all mutual funds that are released. It may differ from one fund to other depending upon the size like the no. of applications received, subscription amount received, etc.

II. REVIEW OF LITERATURE

Parametric and Nonparametric Statistics

When analyzing data for research project, you're often confronted with a decision about what kind of statistical analysis to perform. There are literally hundreds of tests from which to choose and you have to careful to select the one that is the most appropriate for your data. If you select an inappropriate test then you may make an incorrect interpretation about your data and your manuscript will likely be rejected during a journal review process. Although it is impossible to give a definitive method for selecting appropriate tests in a brief article such as this, one aspect of statistical tests that is often confusing will be discussed – the difference between parametric and nonparametric statistical tests.

When you gather scientific data, one of the first statistics you'll typically calculate is the mean. This statistic is used to indicate average value of a population or sample. If the mean is combined with another common statistic called the standard deviation, then the pair of number tells the research both the central tendency of the group of number and their spread. A large standard deviation reflects a large spread in the data – the numbers are diverse and far apart. A small standard deviation reflects a tightness of the data – the numbers are close together. However, before you can really depend on these statistics to give you accurate information about the data, you're required to make the assumption that the data are normally distributed – that is, if you were to plot the data in a histogram, it would create a graph that looks like the well-known bell-shaped curve. When data behave in this way you can make some simple assumptions about the data. For example, the mean plus or minus one standard deviation contains about 65% of the data, and the mean plus or minus two standard deviations contains about 95% of the data. This information is often used to create a range of values in which you might expect future sampled data to appear.

When statistics are calculated under the assumption that the data follow some common distribution such as the normal distribution we call these parametric statistics. It follows that statistical tests based on these parametric statistics are called parametric statistical tests. Thus, when the data are normal, we can then use a host of well-known parametric statistical tests to analyze our data -- such as t-tests, analysis of variance, linear regression, and others.

However, what happens when your data are not normally distributed? Suppose you create a histogram of your data and it doesn't look like the bell-shaped curve. Suppose it has two humps or it has most of its data at one end of the distribution with some of the data trailing off into a long tail. Now what can you do? There are several ways to approach non-normal data, but we'll only discuss one in this article – using a non-parametric test in lieu of a standard parametric test. Non-parametric tests are also called distribution-free tests since they do not make the assumption that the data follows some distribution.

For example, suppose you have two independent groups (corresponding to two drugs) on which some measurement has been made – for example, the length of time until relief of pain. You want to determine if one drug has a better overall (shorter) time to relief than the other drug. However, when you examine the data it's obvious that the distribution of the data is not normal (You can test for normality of data using a statistical test.) If the data had been normally distributed, you would have performed a standard independent group t-test on this data. But since the assumption of normality cannot be made, what can you do? Fortunately for almost every parametric test in the statistical toolbox, there is a corresponding non-parametric test. In this case a corresponding nonparametric test is the Mann-Whitney test. Using the Mann-Whitney test you can calculate a significance

level to help you determine the answer to your research question – are the values of the observations from one group significantly lower than the observations from the other group? (Notice that we're not comparing means.)

Other standard parametric tests also have corresponding non-parametric counterparts. The Wilcoxon Signed Rank test can be used for the paired t-test. The Kruskal-Wallis test can be used for a one-way independent group analysis of variance, and so on.

Why not just always use non-parametric tests? Since non-parametric tests do not make an assumption about a distribution of the data, they have less information to use to determine significance. Thus, they are less powerful than the parametric tests. That is, they have a more difficult time finding statistical significance.

Therefore, if a parametric test is appropriate it should be used because it gives you a better chance of finding significances when they exist. If the parametric test is not appropriate, then a non-parametric test is a reasonable substitute.

When using WINKS, you may refer to the diagrams in Appendix B (in the printed manual) to help you determine which parametric or nonparametric test is appropriate for your data

New fund offer (NFO):

When a mutual fund asset management company announces Public issue of units of a new fund/scheme it is called a New Fund Offer (**NFO**).

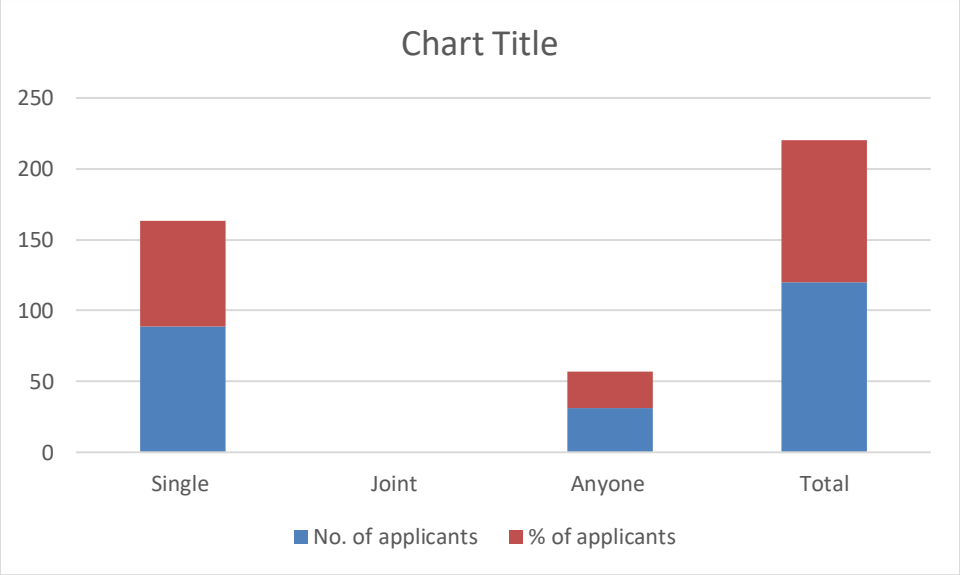
When a mutual fund company plans for a new fund offer it first informs to the registrar or the back office functions provider like HDFC through email. This is called as "NFO Launching Information Mail" send by the fund manager of the asset management company to the NFO coordinator of the HDFC. In this Mail the fund manager will ask the NFO coordinator to get ready for the new fund with the required man power and software.

Later they send the sample application form, the key information memorandum (**KIM**) and offer document to **HDFC**. This offer document sets forth concisely, necessary information about the scheme for a prospective investor to make an informed investment decision on the scheme described. The offer document contains the salient features of the scheme like NFO opening date, NFO closing date, Scheme name, Scheme class, reopening date, plans available banks involved, number of bank branches involved, minimum amount – fresh purchase, maximum amount – fresh purchase, expected number of applications, entry load and exit load. The unit manager or the NFO coordinator will arrange a meeting where the AMC team, NFO expert's team, Data entry team, Reconciliation team and the dispatch team will discuss and fix the target dates by which the work has to be completed accordingly.

III. DATA ANALYSIS AND INTERPRETATION

Holding profile of applicant:

Particulars	Single	Joint	Anyone	Total
No. of applicants	89	0	31	120
% of applicants	74	0	26	100

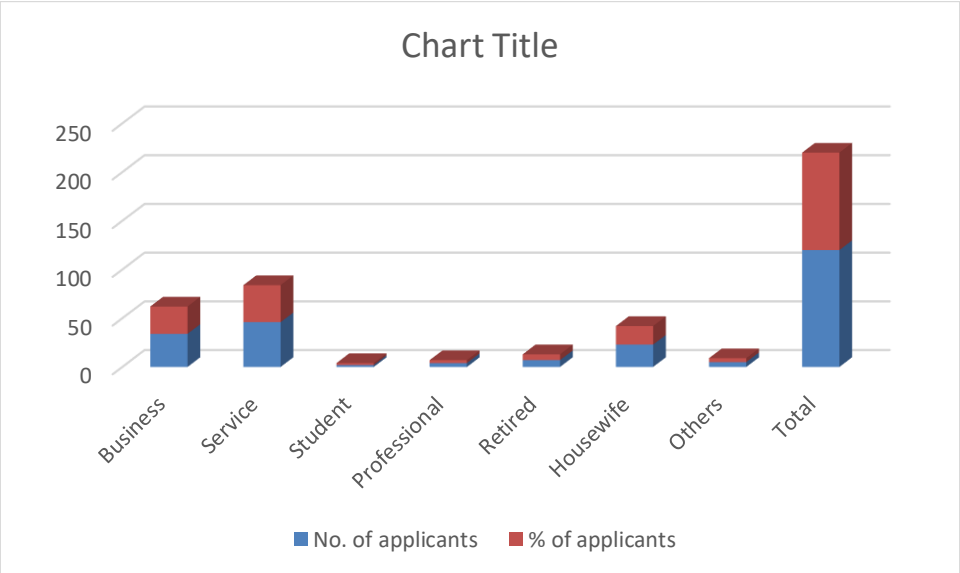


Interpretation:

It can be seen that majority of the applicants prefer to hold the allotted units individually and 26% prefer to hold anyone/survivors. This corroborates with the age profile of the applicants.

Occupation profile of applicants:

Particular	Business	Service	Student	Professional	Retired	Housewife	Others	Total
No. of applicants	34	46	2	4	7	23	5	120
% of applicants	28	38	2	3	6	19	4	100



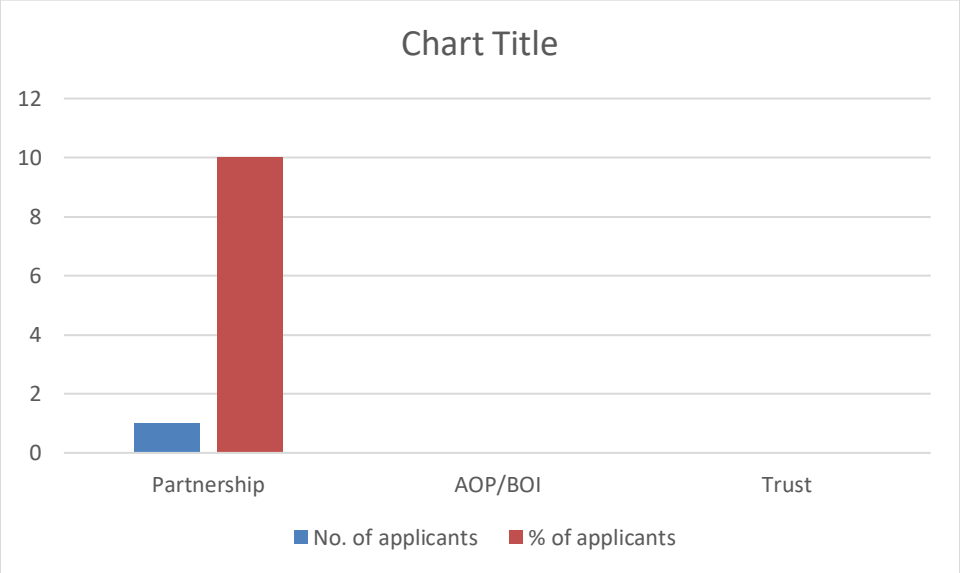
Interpretation:

Majority of the applicants are from services personnel at 38%, next comes business People are 28%. The housewife occupy 3rd highest at 19%. It is found that professionals and retired are at the lowest.

STATUS:

a) Residential status of individual applicants:

Particulars	Resident	NRI	Total
No. of applicants	104	4	108
% of applicants	96	4	100

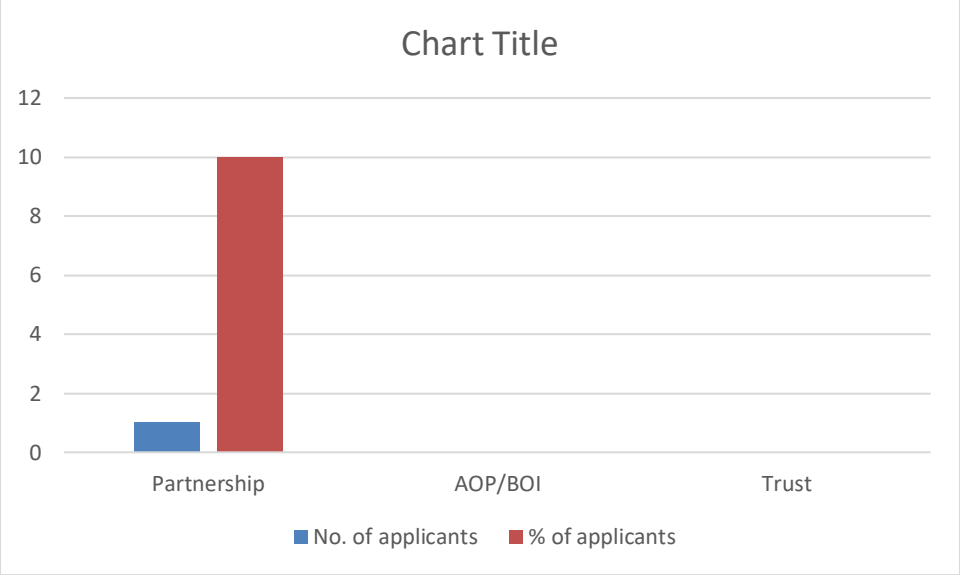


Interpretation:

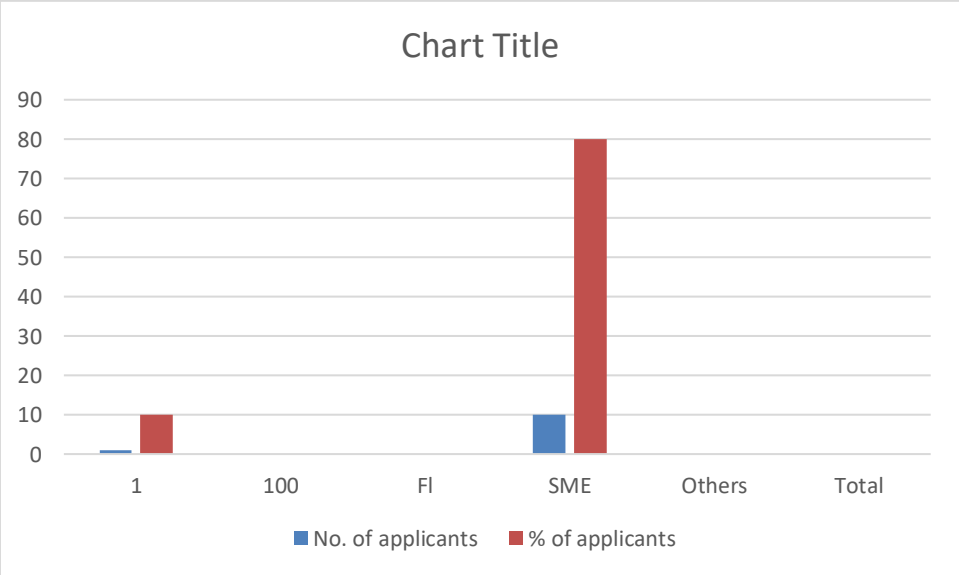
It can be observed from the table and the chart that the majority of applicants are resident individuals constituting 96% the applicants and remaining 4% are the Non-resident Indians.

b) Status of non-individuals:

Particulars	Partnership	AOP/BOI	Trust	HUF	FII	Banks
No. of applicants	1	0	0	10	0	0
% of applicants	10	0	0	80	0	0



Particulars	Company	Society	FI	SME	Others	Total
No. of applicants	1	0	0	10	0	0
% of applicants	10	0	0	80	0	0



Interpretation:

In the non-individuals category HUF occupied the highest at 80% and next 10% is for partnerships. In others category 10% is found and all other non-individual entities have recorded zero applications.

IV. FINDINGS:

1. The majority of applicants (74%) preferred to hold mutual fund units in a **single name**, while 26% opted for the **anyone/survivor** holding pattern.
2. Service employees constituted the largest occupational group among investors at

38%, followed by business persons at **28%** and housewives at **19%**.

3. Resident Indians dominated the investor base, accounting for **96%** of total applicants, whereas NRIs represented only **4%**.
4. Among non-individual investors, **Hindu Undivided Families (HUFs)** formed the largest category with **80%** of applications.
5. The majority of investors (60%) belonged to the **31–60 years age group**, indicating strong participation from middle-aged individuals.
6. Most investors (65%) invested amounts ranging from **₹5,000 to ₹25,000**, reflecting a strong retail investor presence.
7. Nearly **49%** of investors selected the **Growth Option**, while 31% preferred **Dividend Reinvestment**, showing a preference for long-term wealth creation.
8. A significant **99%** of investments were made through **cheques**, indicating formal banking participation.
9. Most payments (99%) were made through **Savings Bank accounts**, while transactions through NRO, NRE, and FCNR accounts were negligible.
10. Male investors accounted for **74%** of total applicants, while female participation was relatively low at **26%**.
11. Among the selected HDFC Mutual Fund schemes, **HDFC Small Cap Fund** generated the highest average return of **24.80%**.
12. **HDFC Balanced Advantage Fund** recorded the highest **Sharpe Ratio (0.96)**, indicating the best risk-adjusted performance.
13. **HDFC Small Cap Fund** achieved the highest **Treynor Ratio (16.64)** and **Jensen's Alpha (3.75%)**, reflecting superior market-risk-adjusted returns.
14. All selected HDFC schemes reported positive Jensen's Alpha values, indicating effective fund management and market outperformance.
15. **HDFC Equity Savings Fund** exhibited the lowest risk with a beta of **0.52** and standard deviation of **7.50%**, making it suitable for conservative investors.

V. SUGGESTIONS

1. Mutual fund companies should undertake awareness campaigns to increase participation among women investors.
2. Asset Management Companies (AMCs) should focus on attracting younger investors below 30 years through digital investment platforms and financial literacy programs.
3. Investor education initiatives should emphasize the benefits of long-term investing and risk-adjusted performance evaluation.
4. More customized investment products can be designed to cater to different occupational groups and income categories.
5. AMCs should encourage greater participation from NRIs through targeted marketing and simplified investment procedures.
6. Investors seeking higher returns may consider HDFC Small Cap Fund and HDFC Mid-Cap Opportunities Fund after evaluating their risk tolerance.
7. Conservative investors may prefer HDFC Balanced Advantage Fund and HDFC Equity Savings Fund due to their lower risk profiles.
8. Fund managers should continue focusing on generating positive alpha through effective stock selection and portfolio management strategies.
9. Investors should not rely solely on returns while selecting mutual funds but should also consider risk measures such as Sharpe Ratio, Treynor Ratio, Beta, and Jensen's Alpha.
10. Regular monitoring and portfolio review should be encouraged to ensure investments remain aligned with financial goals and market conditions.

VI. CONCLUSIONS

The study on **Parametric Analysis of Mutual Fund Performance: Assessing Risk-Adjusted Returns of HDFC Mutual Fund Schemes**

reveals that mutual funds continue to be an attractive investment avenue for retail investors. The investor profile analysis indicates that middle-aged, salaried, and resident individuals form the major investor base, with a strong preference for growth-oriented investment options. Most investments are made in moderate amounts, highlighting the growing participation of retail investors in mutual fund schemes.

The parametric analysis demonstrates that the selected HDFC Mutual Fund schemes have delivered satisfactory returns while maintaining appropriate levels of risk. HDFC Small Cap Fund emerged as the highest-return-generating scheme, whereas HDFC Balanced Advantage Fund provided the best overall risk-adjusted performance based on the Sharpe Ratio. The positive Jensen's Alpha values across all schemes indicate effective fund management and the ability to outperform benchmark expectations.

Overall, the study confirms that risk-adjusted performance measures such as Sharpe Ratio, Treynor Ratio, Beta, Standard Deviation, and Jensen's Alpha are valuable tools for evaluating mutual fund performance. Investors should consider both risk and return while making investment decisions to achieve long-term financial objectives and optimize portfolio performance.

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