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An Empirical Investigation into the Risk-Return Profile of selected mutual Fund in Comparison to the Nifty Index: A Comparative Analysis of Performance Metrics

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ABSTRACT:

This study compares the risk-return profile of a chosen mutual fund with the Nifty Index empirically using covariance, correlation, and performance indicators in a thorough comparative analysis. The selected mutual funds are the main focus for analyzing their behavior and financial performance relative to the larger market as represented by the Nifty Index. First, the study compares the mutual funds and the Nifty Index using important performance indicators like mean returns, standard deviation, skewness, kurtosis, and range. For every investment, these measures offer information on the range of observed returns, volatility, average returns, and distribution characteristics. The study then explores statistical measures of covariance and correlation to clarify the strength of the relationship and the direction of movement between the Funds and the Nifty Index. The abstract highlights the significance of this research in aiding investors, financial analysts, and fund managers in making informed decisions about portfolio diversification, risk management, and potential returns. By comprehensively comparing the performance of a selected mutual fund with a widely tracked market index, the study contributes valuable insights into the dynamics of risk and return in the context of mutual fund investments.

Keywords: Mutual Fund, Risk-Return Profile, Comparative Analysis, Performance Metrics, Portfolio Diversification, Investment Decision-making.

Introduction

Indian mutual funds have been a pillar of the financial system's stability. Mutual funds have given investors new opportunities and brought much-needed liquidity into the system. Mutual funds are vibrant financial companies that contribute significantly to the economy by enabling people to save money and then invest it in the capital markets(Kohli et al., 2018). An investment vehicle known as a mutual fund pools the capital of several investors who share a same financial goal. Following this method of collection, the funds are invested in stocks, debentures, and other capital market products. The capital gained and realised, as well as the income received through these funds, are distributed among the unit holders in proportion to the number of units they own(Agarwal, 2018). The net asset value per share (NAV), which represents the value of a mutual fund share, is determined every day by dividing the fund's entire value by the total number of shares that are currently issued and outstanding**(Shukla, 2015)**. A major factor in most individual investors' decision-making processes is risk and return. The goal of each investor is to minimize risk and increase reward. Risk and reward typically go hand in hand. In order to attain greater profits, investors need to recognize that doing so will require them to assume a corresponding rise in risk. Since risk and return are positively connected, rising risk is always accompanied by rising returns. As a result, choosing an investment involves making a trade-off between risk and return, which is thought to be crucial. In the current climate, a sane investor would be wise to investigate the true return on an investment given that inflation is starting to slow down**(Karthika, 2010)**. A proper evaluation measure will eliminate confusion and help small investors to decide about the level of investment in various mutual fund schemes, to maximize the returns(Rekha & Ramanathan, 2023).

This study Investigation into the Risk-Return Profile of Flexi Cap Mutual Fund schemes. Flexi Cap funds invest in companies of all sizes and across sectors. This flexibility allows them to make changes in the portfolio as market conditions change.

Objectives of the study

1. To assess the historical performance of selected mutual funds and the Nifty Index
2. To compare the risk-return profiles of selected mutual funds with the Nifty
3. To assess covariance and correlation between selected mutual funds and the Nifty Index

4. To provide insights into investment strategies based on findings.

Significance of the study

This research can help investors make better investing decisions by giving them a better knowledge of the risk-return characteristics of particular mutual funds. For investors looking to match their portfolios to their desired returns and risk tolerance, this is especially crucial. Through a performance comparison between mutual funds and the Nifty Index, this study provides investors with a benchmark to assess the relative performance of their investments. Investors can use this benchmarking to determine if actively managed mutual funds perform better or worse than the overall market index. The study's conclusions can be helpful to people and organizations creating portfolio diversification plans. Comprehending the correlation between particular mutual funds and the Nifty Index, as well as evaluating their covariance, can aid investors in building portfolios that efficiently manage risk and return.

Limitations of the study

The five years of carefully selected Flexi cap funds are all that is available for modern study. These plans are chosen in an ad hoc manner. There aren't any more schemes under Flexi cap funds. While the mutual fund is exposed to market risk, such as Beta, Covariance and Correlation measures are used to assess the risk and performance of certain funds. As a result, using the average return alone to compare the performance of particular funds is difficult.

RESEARCH METHODOLOGY

The goal of the current study was to examine how the chosen mutual fund schemes performed against the market over the course of the investigation. The various mutual funds have been divided into five schemes under the Flexi cap category in order to accomplish the goals, and a comparison of these schemes with the market is done based on risk and return. The performance of these mutual fund schemes is assessed using a variety of statistical and financial methods in the current study. Standard deviation, beta, correlation, and covariance are some of these methods and instruments. The secondary data included in this study came from a variety of sources, including the sponsoring agencies' published annual reports, online bulletins, journals, books, magazines, brochures, newspapers, and other printed and digital materials. This research project will run from November 2018 to October 2023. Five years of the chosen scheme's NAV have been compared to an annual return. The performance of these schemes has then been assessed by comparing them to the benchmark return(Shukla, 2015).

Tools used for analysis

Standard deviation

A statistical metric or instrument known as the standard deviation is used to quantify the risk or volatility of a market instrument, such as stocks, mutual funds, etc. The standard deviation provides a precise indication of the degree of departure from the historical mean. The degree of variation increases with increasing standard deviation.

Beta (β)

A securities or portfolio's volatility, or systematic risk, is measured by its beta (β) in relation to the market as a whole. It is possible to perceive stocks having betas greater than 1.0 as being more volatile than the S&P 500.

Variance

An investment's level of risk is gauged by its variance. Risk is the possibility that an investment will perform better or worse than anticipated, either in terms of gain or loss over a given time frame. There's a chance that the investment will lose all of it.

Covariance

The directional link between the returns of two assets is measured by covariance. Asset returns move together when there is a positive covariance and inversely when there is a negative covariance.

Correlation coefficient

It is employed to gauge the degree of correlation between two variables. The strength of the association is indicated by the correlation coefficient's absolute value.

Literature Review

Investing in mutual fund schemes carries a great deal of risk because they are very volatile and unpredictable, particularly over short time horizons(Goyal & Madan, n.d.).

The beta ratio is most useful to investors when making short-term decisions where price volatility is significant. Beta is a useful indicator of risk if you intend to buy and sell quickly. But the beta has too many shortcomings to be a reliable indicator of risk for a long-term investor. Examining a company's fundamentals closely will help you get a far better idea of the possible long-term risk. The stocks might not be safe, but for investors who are risk averse or who take risks, the short-term gains could be greater than the long-term gains(Karthika, 2010).

Keeping in mind the varying risk and return appetites of various investor classes, different scheme types have varied investment objectives. The trust that investors have placed in fund managers is violated if investments are not made in accordance with the investment objectives. Because they are exposed to considerably more danger than they are comfortable with, the investors' savings could be at stake(Arora, 2016).

Investors will be better equipped to make decisions and have a deeper understanding of mutual fund dynamics across various market capitalization categories with the assistance of the performance and risk parameters evaluation(Sharma, 2023).

With over 90% of the style exposure in these funds explained by the large-cap value index, large-cap growth index, and Nifty midcap index, the returns-based style analysis shows that the investment style of large-cap equity funds in India is well in line with their stated investment objectives(Mohanti & Priyan, 2018).

The best chance of doing that is with a well-managed balanced fund because bonds tend to keep their value better during stock market declines and lower during stock market gains(Pal & Chandani, 2014).

Regardless of the model being employed, owning a well-diversified portfolio is preferable to owning a single asset, as suggested by Modern Portfolio Theory. Thus, when applying both the single index model and the MVO model, the individual risks exceed the portfolio risk (Nyokangi, C. O, 2016).

Mutual Fund Schemes Selected for analysis:

HDFC Flexi Cap Direct Plan-Growth

One of Hdfc Mutual Fund's Flexi Cap mutual fund schemes is HDFC Flexi Cap Direct Plan-Growth with an expense ratio of 0.94%, the fund is more expensive than the majority of comparable Flexi Cap funds. The bulk of the fund's capital is allocated to the financial, healthcare, energy, technology, and construction industries. Compared to other funds in the category, it has less exposure to the financial and healthcare sectors. HDFC Bank Ltd., ICICI Bank Ltd., National Thermal Power Corp. Ltd., HCL Technologies Ltd., and Cipla Ltd. are the fund's top 5 holdings.

Union Flexi Cap Fund Direct-Growth

Union Mutual Fund offers a Flexi Cap mutual fund scheme called Union Flexi Cap Fund Direct-Growth with an expense ratio of 0.91%, the fund is more expensive than the majority of comparable Flexi Cap funds. The bulk of the fund's capital is allocated to the financial, automotive, energy, technology, and services industries. In comparison to other funds in the category, it has taken less of a risk in the financial and automotive sectors. ICICI Bank Ltd., HDFC Bank Ltd., Reliance Industries Ltd., Larsen & Toubro Ltd., and Infosys Ltd. are the fund's top 5 holdings.

Franklin India Flexi Cap Fund Direct-Growth

Franklin, India Franklin Templeton Mutual Fund offers a Flexi Cap mutual fund strategy called Flexi Cap Fund Direct-Growth. With an expense ratio of 1.08%, the fund is more expensive than the majority of comparable Flexi Cap funds. The bulk of the fund's capital is allocated to the financial, technology, consumer staples, energy, and services industries. In comparison to other funds in the category, it has taken less of a risk in the Financial and Technology industries. ICICI Bank Ltd., HDFC Bank Ltd., Larsen & Toubro Ltd., Infosys Ltd., and Axis Bank Ltd. are the fund's top 5 holdings.

Axis Flexi Cap Fund Direct - Growt

Axis Mutual Fund offers a Flexi Cap mutual fund scheme called Axis Flexi Cap Fund Direct - Growth. The fund's 0.73% expense ratio is comparable to that of the majority of other Flexi Cap funds. The bulk of the fund's assets are allocated to the financial, services, automotive, healthcare, and technology industries. Compared to other funds in the category, it has assumed less exposure to the Financial and Services sectors. The top 5 holdings of the fund are Tata Consultancy Services Ltd., Bajaj Finance Ltd., Avenue Supermarts Ltd., ICICI Bank Ltd., and HDFC Bank Ltd.

Aditya Birla Sun Life Flexi Cap Fund Direct-Growth

Birla Aditya Sun Life Aditya Birla Sun Life Mutual Fund offers a Flexi Cap mutual fund plan called Flexi Cap Fund Direct-Growth. With an expense ratio of 0.9%, the fund is more expensive than the majority of comparable Flexi Cap funds. The bulk of the fund's capital is allocated to the financial, technology, healthcare, consumer staples, and communication industries. In comparison to other funds in the category, it has taken less of a risk in the Financial and Technology industries. ICICI Bank Ltd., HDFC Bank Ltd., Infosys Ltd., Bharti Airtel Ltd., and HCL Technologies Ltd. are the fund's top 5 holdings.

Data Analysis:

Table 1: Descriptive Statistics:

Measurements of central tendency and measurements of variability (spread) are the two categories into which descriptive statistics fall. The standard deviation, variance, minimum and maximum variables, kurtosis, and skewness are measurements of variability, whereas the mean, median, and mode are measures of central tendency.

HDFC Flexi Cap Dir Gr Returns		**Franklin Flexi Cap Dir Gr Returns**		**Axis Flexi Cap Dir Gr Returns**		**Union Flexi Cap Dir Gr Returns**		**ABSL Flexi Cap Gr Dir Returns**	
Mean	7%	Mean	7%	Mean	6%	Mean	8%	Mean	6%
Standard Error	0.03459536	Standard Error	0.033158	Standard Error	0.02975	Standard Error	0.030863912	Standard Error	0.033336
Median	14%	Median	15%	Median	10%	Median	13%	Median	16%
Mode	#N/A	Mode	0	Mode	0	Mode	0	Mode	#N/A
Standard Deviation	1.21871957	Standard Deviation	1.16809	Standard Deviation	1.048046	Standard Deviation	1.087268635	Standard Deviation	1.17435
Sample Variance	1.48527738	Sample Variance	1.364437	Sample Variance	1.098399	Sample Variance	1.182153084	Sample Variance	1.379098
Kurtosis	14.6446781	Kurtosis	15.77791	Kurtosis	14.05489	Kurtosis	20.83365852	Kurtosis	22.82756
Skewness	-1.46885471	Skewness	-1.32871	Skewness	-0.97705	Skewness	-1.54762783	Skewness	-1.77527
Range	18.6580297	Range	20.26547	Range	17.54475	Range	20.18867039	Range	22.19505
Minimum	-12.083127	Minimum	-12.2758	Minimum	-10.6618	Minimum	-12.387252	Minimum	-14.0798
Maximum	6.57490265	Maximum	7.989658	Maximum	6.882989	Maximum	7.80141844	Maximum	8.115284
Sum	92.4819099	Sum	90.89103	Sum	79.00194	Sum	93.17333537	Sum	79.16076

Source: Authors Own

Interpretation

HDFC Flexi Cap Direct Growth fund has a mean return of 7.45%, indicating a positive average performance. The relatively high standard deviation of 1.22 suggests moderate volatility. The negative skewness (-1.47) indicates a slight skew towards lower returns. The fund has a wide range of returns, with a maximum of 6.57% and a minimum of -12.08%. Franklin fund shows a comparable mean return of 7.32%, with a similar standard deviation of 1.17. The median return of 15% suggests a consistent performance. The fund has a wider range of returns compared to HDFC, with a maximum of 7.99%. The negative skewness and high kurtosis indicate a distribution with a tail towards lower returns. Axis fund has a slightly lower mean return of 6.37%, but with a lower standard deviation of 1.05, indicating relatively lower volatility. The median return of 10% suggests a good midpoint performance. The fund has a narrower range of returns compared to HDFC and Franklin, with a maximum of 6.88%. Union fund shows a mean return of 7.51%, slightly higher than HDFC and Franklin. The standard deviation is moderate at 1.09, and the skewness is negative, indicating a distribution skewed towards lower returns. The wide range of returns, with a maximum of 7.80%, suggests the potential for both high and low-performance periods. ABSL fund has a mean return of 6.38%, similar to Axis. The high kurtosis and negative skewness indicate a distribution with heavier tails and a skew towards lower returns. The fund has the widest range of returns among the analyzed funds, with a maximum of 8.12% and a minimum of -14.08%.

Table 2: Correlation Coefficient

Correlation	ABSL Flexi Cap Gr Dir Returns	Union Flexi Cap Dir Gr Returns	Axis Flexi Cap Dir Gr Returns	Franklin Returns	Scheme:- HDFC Flexi Cap Dir Gr Returns
ABSL Flexi Cap Gr Dir Returns	1.00				
Union Flexi Cap Dir Gr Returns	0.02	1.00			
Axis Flexi Cap Dir Gr Returns	0.94	0.02	1.00		
Franklin Returns	0.14	-0.05	0.13	1.00	-
scheme:- HDFC Flexi Cap Dir Gr Returns	0.01	0.93	0.00	-0.03	1.00

Source: Authors Own

The above table represents the correlation coefficients between the returns of different mutual funds, indicating the strength and direction of their linear relationships.

ABSL Flexi Cap Gr Dir Returns has strong positive correlation with Axis Flexi Cap (0.94), indicating that these two funds tend to move in the same direction and negligible correlation with Union Flexi Cap (0.02) and HDFC Flexi Cap (0.01), suggesting a weak or no linear relationship.

Union Flexi Cap Dir Gr Returns has strong positive correlation with HDFC Flexi Cap (0.93), indicating a significant tendency to move together and negligible correlation with ABSL Flexi Cap (0.02) and Axis Flexi Cap (-0.05), suggesting a weak or no linear relationship.

Axis Flexi Cap Dir Gr Returns has strong positive correlation with ABSL Flexi Cap (0.94), indicating a strong tendency to move together and negligible correlation with Union Flexi Cap (0.02) and HDFC Flexi Cap (0.00), suggesting a weak or no linear relationship.

Franklin Flexi Cap Dir Gr Returns has weak positive correlation with ABSL Flexi Cap (0.14) and Axis Flexi Cap (0.13), suggesting a slight tendency to move together and weak negative correlation with Union Flexi Cap (-0.05), indicating a mild inverse relationship.Negligible correlation with HDFC Flexi Cap (-0.03).

HDFC Flexi Cap Dir Gr Returns has negligible correlation with ABSL Flexi Cap (0.01) and Axis Flexi Cap (0.00), indicating a weak or no linear relationship and strong positive correlation with Union Flexi Cap (0.93), suggesting a significant tendency to move together. Weak negative correlation with Franklin Returns (-0.03).

Nifty Index

Nifty Index has considered as benchmark return and compared with selected Mutual fund returns:

Table 3: Descriptive Statistics of Nifty Return

Nifty Index	
Mean	0.059473423
Standard Error	0.0344795
Median	0.098839046
Mode	#N/A
Standard Deviation	1.214637977
Sample Variance	1.475345416
Kurtosis	18.23794336
Skewness	-1.140536746
Range	0
Minimum	-12.98046413
Maximum	8.763205423
Sum	73.80651831

Source: Authors Own

Table 4: Correlation coefficient of selected Mutual fund schemes with Nifty Index

MF Schemes with Nifty index					
MF Schemes with Nifty index	ABSL Flexi Cap Gr Dir Returns	Union Flexi Cap Dir Gr Returns	Axis Flexi Cap Dir Gr Returns	FranklinFlexi cap	HDFC Flexi Cap Dir Gr Returns
Covariance	0.174220933	-0.101430598	0.14233823	1.339165165	-0.096922499
Correlation	0.122336168	-0.076839592	0.111971828	0.944627576	-0.065527569
Beta	0.126570199	-0.085850774	0.129798808	0.982269617	-0.065308112

Source: Authors Own

Interpretation:

1. Covariance:

Covariance measures the degree to which two variables (in this case, the mutual fund returns and Nifty index returns) move together. Positive values indicate a positive relationship, while negative values indicate a negative relationship. Highest covariance is observed for Franklin Flexi Cap (1.3392), suggesting a strong positive relationship with Nifty index.

2. Correlation:

Correlation is a standardized measure of the strength and direction of the linear relationship between two variables. It ranges from -1 to 1. The highest correlation is observed for Franklin Flexi Cap (0.9446), indicating a very strong positive linear relationship with Nifty index.

3. Beta:

Beta measures the sensitivity of a stock or fund's returns to market movements. A beta of 1 indicates the fund moves in line with the market, while a beta greater than 1 suggests higher volatility. Franklin Flexi Cap has the highest beta (0.9823), indicating higher volatility compared to the market.

Findings:

By considering Descriptive statistics:

- "Union Flexi Cap Direct Growth" and "HDFC Flexi Cap Direct Growth" have relatively higher mean returns.
- Assess your risk tolerance. Funds with lower standard deviation and narrower ranges of returns may be suitable for investors with lower risk tolerance. In this context, "Axis Flexi Cap Direct Growth" has a relatively lower standard deviation.
- "Franklin " has lower correlations with other funds, potentially providing some diversification benefits.

By considering Correlation coefficient of selected Mutual fund schemes:

- In terms of diversification, it's generally beneficial to invest in assets that are not highly correlated, as this can help mitigate risk. Based on the correlation coefficients, Axis Flexi Cap and HDFC Flexi Cap appear to have a lower correlation, indicating that investing in both may provide some diversification benefits.

By considering Correlation coefficient of selected Mutual fund schemes with Nifty Index:

- Consider a diversified approach by investing in a mix of mutual funds that have shown varied relationships with the Nifty index. This can help spread risk and potentially improve overall portfolio stability.
- Funds like Aditya Birla Sun Life (ABSL) Flexi Cap and Axis Flexi Cap, with moderate covariance, correlation, and beta values, may be suitable. They have shown a balanced relationship with the Nifty index.
- Union Flexi Cap, with negative covariance and correlation values, may be considered if you are looking for a counter-cyclical option. This fund has shown a potential to behave differently from the overall market.
- Franklin Flexi Cap has demonstrated a strong positive relationship and higher volatility (high beta) with the Nifty index. If you are comfortable with higher volatility and are seeking potentially higher returns, this fund may be an option.
- HDFC Flexi Cap, with moderate values across covariance, correlation, and beta, represents a balanced approach. This fund may be suitable for investors seeking a middle-ground strategy.

Suggestions:

Based on the different factors the following are the some suggestions for the investors:

1. Higher Average Returns:

- Consider allocating a portion of your portfolio to "Union Flexi Cap Direct Growth" and "HDFC Flexi Cap Direct Growth" as they have relatively higher mean returns.

2. Risk Tolerance:

- If you have a lower risk tolerance, "Axis Flexi Cap Direct Growth" is a suitable option, given its relatively lower standard deviation. This can help in managing risk for investors who are more risk-averse.

3. Diversification:

- To achieve portfolio diversification, consider adding "Franklin" to your portfolio as it has lower correlations with other funds, potentially providing diversification benefits.

4. Diversification Benefits between Funds:

- For further diversification benefits, consider investing in both "Axis Flexi Cap" and "HDFC Flexi Cap," as they appear to have a lower correlation, potentially reducing overall portfolio risk.

5.Diversification Benefits with Nifty Index:

- For a balanced relationship, consider funds like "Aditya Birla Sun Life (ABSL) Flexi Cap" and "Axis Flexi Cap."
- If you are looking for a counter-cyclical option, "Union Flexi Cap" with negative covariance and correlation values may be considered.
- For potentially higher returns and higher volatility, "Franklin Flexi Cap" is an option.
- "HDFC Flexi Cap" represents a balanced approach with moderate values across covariance, correlation, and beta.

6. Moderate Risk:

- If you have a moderate risk appetite, consider a mix of funds such as "Aditya Birla Sun Life (ABSL) Flexi Cap" and "Axis Flexi Cap," which have moderate covariance, correlation, and beta values.

Conclusion:

To sum up, investors should evaluate the average performance and risk of each mutual fund by combining metrics such as skewness, standard deviations, and mean returns. While a larger mean return could seem alluring, it's important to consider the returns' consistency and volatility as well as the possibility of extreme outcomes suggested by skewness and kurtosis. Furthermore, the range of returns sheds light on how the fund performed differently throughout the course of the analysis. The correlation matrix sheds light on the relationship between these mutual funds' returns. Negative correlations imply some divergence, whereas strong positive correlations indicate similar movements. By adding funds with lower correlations to their portfolios, investors can utilize this knowledge to diversify their holdings and possibly minimize the risk of their entire portfolio.

Franklin Flexi Cap seems to have a strong positive relationship and high sensitivity to Nifty index movements, as indicated by the highest covariance, correlation, and beta values. Union Flexi Cap shows a negative relationship with the Nifty index, which may suggest a counter-cyclical behavior. Other funds (ABSL, Axis, HDFC) show moderate relationships with the Nifty index.

In summary, HDFC Flexi Cap has, on average, higher returns than Nifty, but it also exhibits higher volatility. The negative correlation and beta suggest that HDFC Flexi Cap may be less sensitive to market movements compared to Nifty. Additionally, both distributions show negative skewness, indicating a tendency towards lower returns, and they are leptokurtic, implying a higher risk of extreme values. Investors should consider these factors when making investment decisions.