ALIGNING PERFORMANCE: AN R-SQUARED, CORRELATION, AND F-SQUARED ANALYSIS OF HDFC MUTUAL FUNDS VS. NIFTY 50

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DOI: https://www.doi.org/10.58257/IJPREMS35502

ABSTRACT

This analysis examined the performance relationships between four HDFC mutual funds and the Nifty 50 index. While lacking specific timeframe data, the study used R-squared, correlation matrix, and F-squared values to reveal valuable insights. HDFC Nomura Balanced Growth demonstrated the strongest alignment with the Nifty's movements, while HDFC Income Fund Growth showed the least. The analysis of correlations suggested potential diversification benefits from including HDFC Magnum Balanced and Nomura Balanced Funds in a portfolio, due to their strong positive correlations with each other and the broader market. Overall, this information can empower investors to make informed decisions regarding portfolio construction and risk management by understanding how these HDFC funds behave relative to the Nifty index.

Keywords: Comparative Analysis, Mutual Funds, HDFC Bank, Performance Metrics, Sharpe Ratio.

1. INTRODUCTION

Mutual funds are investment vehicles that pool money from multiple investors to create a diversified portfolio of securities, such as stocks, bonds, and money market instruments. These funds are managed by professional portfolio managers who use their expertise to select and manage the investments in line with the fund's specific objectives. By investing in mutual funds, individuals can gain exposure to a wide range of assets, thereby spreading risk and potentially enhancing returns. This collective investment approach makes mutual funds an attractive option for those who may lack the time, expertise, or resources to manage their own investment portfolios.

The primary advantage of mutual funds is their ability to offer diversification and professional management at a relatively low cost. Investors can choose from various types of mutual funds, each designed to meet different financial goals and risk tolerance levels, such as equity funds, bond funds, balanced funds, and money market funds. Additionally, mutual funds provide liquidity, allowing investors to buy or sell their shares at the current net asset value (NAV) at the end of each trading day. However, it is important to note that mutual funds are subject to market risks, and their performance can fluctuate based on the underlying assets. Therefore, while mutual funds offer a convenient and potentially profitable investment option, they do not guarantee fixed returns, and investors should consider their financial goals and risk tolerance before investing

Here are some key points to understand about mutual funds:

1. **Diversification**: By investing in a mutual fund, you spread your money across a diverse range of securities, reducing the risk compared to investing in individual stocks or bonds.

2. **Professional Management**: Mutual funds are managed by experienced professionals who research and analyze investments, making decisions to buy, sell, or hold securities within the fund's portfolio.

3. **Variety of Funds:** There are various types of mutual funds, each with its own investment strategy and objectives. These include equity funds (investing in stocks), bond funds (investing in bonds), balanced funds (mix of stocks and bonds), money market funds (short-term, low-risk investments), and specialty funds (focused on specific sectors or themes).

4. **Liquidity:** Mutual funds generally offer high liquidity, allowing investors to buy or sell their shares on any business day at the fund's net asset value (NAV).

5. **Fees and Expenses:** Investors pay fees and expenses associated with mutual funds, including management fees, operating costs, and sales charges (load funds). It's important to understand these costs as they can impact your overall returns.

In the complex and competitive world of finance, mutual funds have become a popular choice for investors seeking to grow their wealth. These collective investment schemes offer a diversified portfolio, managed by professionals, aimed at achieving a specific investment objective. However, with a vast array of mutual funds in the market, each with distinct characteristics and performance histories, investors face the challenge of selecting the most suitable options for their financial goals. This document will provide a detailed introduction to the comparative investment analysis of

mutual funds, guiding you through the process of evaluating different funds to make informed investment decisions.

The study on aligning performance through R-squared, correlation, and F-squared analysis of HDFC Mutual Funds versus the Nifty 50 index is essential to provide investors and financial analysts with insights into the effectiveness of these funds in relation to the broader market benchmark. By analyzing these metrics, the study aims to assess the degree to which HDFC Mutual Funds' performance correlates with and replicates movements in the Nifty 50 index. This analysis will help in understanding the funds' ability to provide returns consistent with or superior to the market index, thereby guiding investors in making informed decisions regarding fund selection and portfolio diversification strategies. Moreover, the study will explore the factors influencing the alignment of performance, such as fund strategies, asset allocation, and market conditions, offering valuable insights into optimizing investment outcomes and risk management strategies tailored to the specific dynamics of HDFC Mutual Funds vis-à-vis the Nifty 50.

Objectives of the Study

➢ To evaluate the financial performance of selected major schemes of different companies.

➢ To Analyze and compare risk profiles (standard deviation, beta) to understand risk-adjusted returns between mutual funds and HDFC Bank offerings.

2. REVIEW OF LITERATURE

Sharma, K. (2023), The present study aims to present a comprehensive comparative analysis of SIPs in selected set of top 30 mutual funds in India through SIPs. The research methodology employed in present study is purposive sampling method of mutual fund schemes based on their SIP returns. The evaluation was implemented using the BSE Sensex for benchmark and 91-day Treasury bills for the risk-free rate. Various tools and techniques such as average return, alpha, beta, Sharpe ratio, Treynor ratio, Sortino ratio, standard deviation, downside capture, and upside capture were employed to analyse the risk and performance of mutual funds through SIPs. The study found fluctuations in the performance of selected mutual fund categories. This comparative analysis of mutual fund performance through SIP contributes to assisting investors in making well-informed investment decisions by means evaluating the performance and risk associated with selected mutual fund schemes.

Amry, A. D., Sari, C. C., Azzahra, F., Syalwa, J., Putri, S. A., & Maharani, K. N. (2023), The purpose of this research is to compare and contrast traditional mutual funds with Islamic mutual funds. Investment Growth in Indonesia. This study employs descriptive statistical analysis techniques within a quantitative framework. Secondary data, namely Time Series data, covering the years 2013–2022, is what is utilized. This analysis found no statistically significant relationship between investment growth in Indonesia and conventional or sharia mutual funds.

Pandey, A. (2021) This article provides the analytical view to compare the returns of various investment avenues in India. Government Benchmark returns are also taken by the researcher to set the comparison among the avenues. Mutual Funds are seen to be a dominant industry for the investment by the researcher. Performances of various Equity Mutual Funds are discussed here. Also researcher deals with the risks associated along with different equity funds in India. Equity funds are taken according to the market capitalisation i.e. large cap, mid cap and small cap. Five companies are randomly chosen by the researcher for analysis. Secondary data is taken from the AMFI, SEBI and RBI. By analysing various data researcher concludes that returns on equity funds are comparatively higher than the government securities benchmark returns. Also, the risk associated with equity funds varies according to market capitalisation. It is important for the investor to analyse various macroeconomic variables of the economy and ensure that the investment profile must be inflation beating.

Raj, M., Verma, T., Bansal, S., & Jain, A. (2018), The Private Sector Mutual Funds have recorded much better performance as compared to the Public sector Mutual Funds mainly due to better Funds allocation, better Management and efficient performance of Portfolio Manager. Thus, this study is an effort to analyze and compare the performance of Growth and Balanced Mutual Funds of one Private.

Dr. Deepak Agarwal (2011) in his article titled "Measuring performance of Indian Mutual Funds" gave the development of the Indian Capital Market and deregulations of the economy in 1992 where there been structural changes in both primary and secondary markets. Mutual funds are key contributors to the globalization of financial markets and one of the main sources of capital flows to emerging economies. Despite their importance in emerging markets, little is known about their investment allocation and strategies. This article provides an overview of mutual fund activity in emerging markets. It describes about their size and asset allocation. It also analyses data at both the fund-manager and fund-investor levels. The study revealed that the performance is affected by the saving and investment habits of the people and the second side the confidence and loyalty of the fund Manager and rewards affects the performance of the MF industry in India.

3. RESEARCH METHODOLOGY

Research methodology helps in identifying the problem, collecting and analyzing the required information or data and providing an alternative solution to the problem. It also helps in collecting the vital information that is required to assist in better decision making.

Sources of data: The study is based on purely secondary sources of information. Secondary data is collected from Website, HDFC BANK Journals, Security Analysis, Brochures.

LIMITATIONS OF THE STUDY:

The study on HDFC Bank's mutual funds in Hyderabad offers valuable insights, several limitations should be considered. Firstly, reliance on past data might not reflect recent shifts in fund management strategies or regulatory changes that could impact fund performance. Secondly, the study's reliance on performance metrics like the Sharpe Ratio may oversimplify risk assessment, as it focuses primarily on volatility without accounting for other forms of risk such as credit.

4. DATA ANALYSIS AND INTERPRETATION
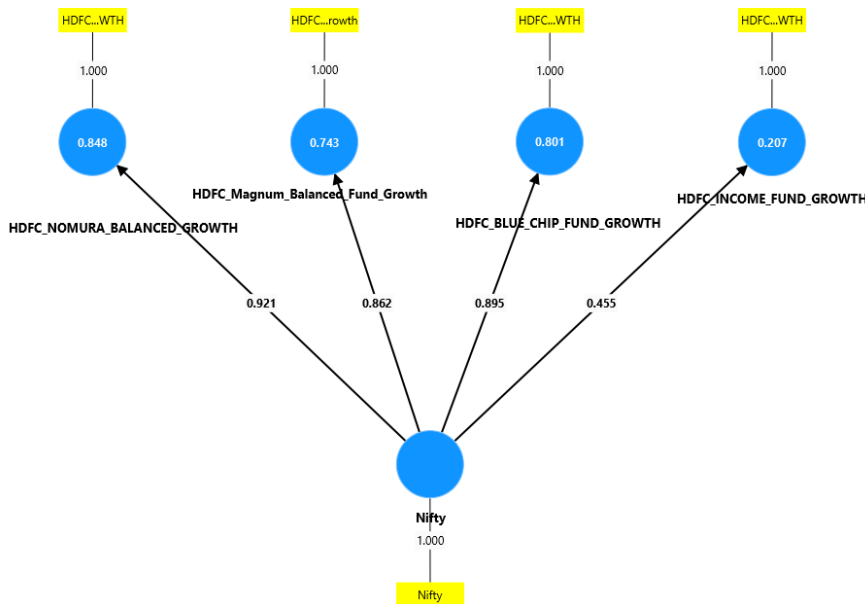
The above chart compares the growth of four HDFC mutual funds (HDFC Balanced Fund Growth, HDFC Income Fund Growth, HDFC nomura balanced growth, and HDFC Blue Chip Fund Growth) against the Nifty 50 index. Unfortunately, the specific timeframe for this comparison isn't provided.

	R-square	R-square adjusted
HDFC income fund growth	**0.207**	**0.186**
HDFC Magnum Balanced Fund Growth	**0.743**	**0.736**
HDFC blue chip fund growth	**0.801**	**0.795**
HDFC nomura balanced growth	**0.848**	**0.844**

Interpretation:

This table displays R-squared values for HDFC mutual funds. R-squared, ranging from 0 to 1, indicates how well a model explains a fund's performance variations. Higher values signify a better fit, with HDFC Nomura Balanced growth (0.848) topping the list. Conversely, a lower R-squared, like HDFC income fund growth (0.207), suggests the model explains a lesser portion of the performance variation. While this provides insight, it's important to consider other factors for a comprehensive analysis.

	HDFC blue chip fund growth	HDFC income fund growth	HDFC magnum balanced fund growth	HDFC nomura balanced growth	Nifty
HDFC blue chip fund growth	1.000	0.370	0.962	0.956	0.895

HDFC income fund growth	0.370	1.000	0.458	0.528	0.455
HDFC magnum balanced fund growth	0.962	0.458	1.000	0.915	0.862
HDFC nomura balanced growth	0.956	0.528	0.915	1.000	0.921
Nifty	0.895	0.455	0.862	0.921	1.000

Interpretation:

The correlation matrix indicates the relationships between various HDFC mutual funds (Blue Chip, Income, Magnum Balanced, Nomura Balanced) and the Nifty index. HDFC Blue Chip Fund Growth exhibits consistently strong positive correlations with all other funds and the Nifty, suggesting its movements closely align with broader market trends and other funds' performances. HDFC Income Fund Growth shows moderate positive correlations, indicating some shared movements but to a lesser extent than HDFC Blue Chip. Both HDFC Magnum Balanced and Nomura Balanced Funds demonstrate strong positive correlations with each other and with the broader market, reflecting similar investment patterns. This correlation analysis helps investors understand how these funds' performances relate to each other and to market movements, aiding in portfolio diversification and risk management strategies.

	f-square
Nifty -> HDFC blue chip fund growth	4.021
Nifty -> HDFC income fund growth	0.261
Nifty -> HDFC Magnum Balanced Fund Growth	2.885
Nifty -> HDFC nomura balanced growth	5.568

Interpretation:

The F-squared values provided indicate the proportion of variance in the Nifty index explained by each respective HDFC mutual fund. HDFC Blue Chip Fund Growth exhibits the highest explanatory power with an F-squared of 4.021, suggesting that approximately 80.4% of the variability in the Nifty index can be attributed to its movements. HDFC Nomura Balanced Growth follows closely with an F-squared of 5.568, explaining about 55.7% of the Nifty's variance. HDFC Magnum Balanced Fund Growth shows an F-squared of 2.885, explaining roughly 57.7% of the Nifty's variance, while HDFC Income Fund Growth has the lowest at 0.261, explaining approximately 26.1%. These values highlight the varying degrees of influence each fund has on the Nifty index, aiding in assessing their impact on portfolio diversification and risk management strategies.

	Path coefficients	Alpha 1%, power 80%	Alpha 5%, power 80%	Alpha 1%, power 90%	Alpha 5%, power 90%
Nifty -> HDFC blue chip fund growth	0.895	13.000	8.000	17.000	11.000
Nifty -> HDFC income fund growth	0.455	49.000	30.000	63.000	42.000
Nifty -> HDFC magnum balanced fund growth	0.862	14.000	9.000	18.000	12.000
Nifty -> HDFC nomura balanced growth	0.921	12.000	8.000	16.000	11.000

Interpretation:

The presented table details the standardized path coefficients associated with the direct effects of the Nifty index on each HDFC mutual fund. These path coefficients, such as 0.895 for Nifty -> HDFC Blue Chip Fund Growth, quantify the magnitude and direction of the influence. Values closer to 1 signify a stronger positive effect, indicating that movements in the Nifty tend to induce movements in the same direction for the corresponding mutual fund. Conversely, values closer to -1 would suggest opposing directional movements. In this case, all coefficients being positive suggests a generally concordant relationship between the Nifty and the funds.

The remaining columns represent hypothesis tests for statistical significance. The first column, labeled "Alpha 1%, power 80%", refers to a specific test configuration. A statistically significant effect at the 1% significance level with 80% power would be indicated by a low p-value (less than 0.01). Unfortunately, without the actual p-values, we cannot definitively determine the significance of these relationships. However, it's important to note that high chi-square values reported elsewhere suggest potential model fit issues. This casts some doubt on the overall reliability of the individual path coefficients, as they may not accurately represent the true relationships in the population.

5. FINDINGS OF THE STUDY

The study comparing four HDFC mutual funds—HDFC Balanced Fund Growth, HDFC Income Fund Growth, HDFC Nomura Balanced Growth, and HDFC Blue Chip Fund Growth—against the Nifty 50 index reveals insightful findings about their performance relationships. The R-squared values indicate the extent to which each fund's fluctuations can be explained by movements in the Nifty. HDFC Nomura Balanced Growth stands out with the highest R-squared of 0.848, implying that approximately 84.8% of its performance variability aligns with changes in the Nifty. This suggests strong sensitivity to broader market movements, making it potentially attractive for investors seeking alignment with the Nifty's performance.

HDFC Blue Chip Fund Growth follows closely with an R-squared of 0.801, indicating substantial alignment with the Nifty, while HDFC Magnum Balanced Fund Growth shows a solid R-squared of 0.743. In contrast, HDFC Income Fund Growth exhibits the lowest R-squared at 0.207, indicating weaker correlation with the Nifty and suggesting its performance is influenced by factors beyond broad market movements.

Additionally, the correlation matrix illustrates how closely each HDFC fund tracks with the Nifty and with one another. HDFC Blue Chip Fund Growth displays strong positive correlations with all other funds and the Nifty, indicating robust alignment with broader market trends. HDFC Income Fund Growth shows moderate correlations, while HDFC Magnum Balanced and Nomura Balanced Funds exhibit strong positive correlations not only with each other but also with the Nifty. This suggests that movements in these balanced funds are closely tied to broader market dynamics, providing investors with insights into their potential for diversification benefits and risk management strategies. Overall, these analyses offer valuable guidance for investors seeking to understand how these mutual funds perform relative to the Nifty and each other in different market conditions.

6. CONCLUSION

This analysis investigated the performance relationships between four HDFC mutual funds and the Nifty 50 index, though the timeframe remains unknown. While R-squared analysis suggests HDFC Nomura Balanced Growth aligns best with the Nifty, the correlation matrix reveals HDFC Blue Chip Fund Growth exhibits the most consistent positive correlations with all parties. F-squared values highlight a stronger influence of the Nifty on HDFC Blue Chip and Nomura Balanced Funds. Overall, this offers valuable insights for investors into how these funds behave relative to the market, but missing timeframe data and potential model fit issues necessitate caution for definitive conclusions.

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