

A Comparative Study of ‘Tracking Errors’ of top Index Funds in India (2022-2025)

Dr. Hitesh Vaswani - Associate Professor and Head,
Department of Management Studies, Nabira Mahavidyalaya, Katol, Dist. Nagpur

Abstract:

Index funds are designed to replicate benchmark indices, yet discrepancies arise in the form of tracking error. This study evaluates and compares the tracking error and tracking difference of three leading Indian index funds - UTI Nifty 50 Index Fund, HDFC Nifty 50 Index Fund, and ICICI Prudential Nifty 50 Index Fund over the past three years. Using average of monthly NAVs, the analysis highlights their performance relative to the NIFTY 50 TRI. Results indicate that all three funds closely follow the benchmark, with ICICI exhibiting the highest tracking error (-0.34), followed by UTI (0.29), and HDFC (0.39) versus its benchmark. The findings underscore the efficiency of these funds and provide insights for investors considering passive investments.

Key Words:

Tracking Error, Index Funds, Benchmark Indices, UTI Nifty 50 Index Fund, HDFC Nifty 50 Index Fund, ICICI Prudential Nifty 50 Index Fund, NIFTY 50 TRI.

Introduction:

Index funds have become a cornerstone of passive investing in India, offering diversification at a low cost. By investing

in Index Funds, the basic concept of “diversification” is automatically taken care of. As such the Index Funds replicate and mirror the Index and money invested in wide range of stocks which helps to reduce risk especially as compared to investing in individual stocks. However, their efficiency depends on how closely they mirror their benchmark indices, measured by tracking error and tracking difference. Tracking error is a measure of the volatility in the performance of the Index Fund. This study focuses on the top three index funds by Assets Under Management (AUM) in India, each benchmarked against the NIFTY 50 Total Return Index (TRI).

Purpose of Study:

1. To study the tracking error of top Index Funds by AUM.
2. To compare the tracking errors of the above said funds.

Literature Review:

Prior research on index funds in India suggests that tracking error is generally low but varies across fund houses (Mishra, 2021). Studies by Gupta and Jain (2020) found that expense ratios are a significant determinant of tracking efficiency. International evidence (Roll, 1992; Elton et al., 2002) highlights that

replication strategy and fund size also influence tracking performance. This paper builds on existing literature by providing a comparative study of UTI, HDFC, and ICICI Nifty 50 Index Funds.

Research Methodology:

For the purpose of this study which is an empirical research, the top three Nifty 50 Index Funds by Assets Under Management have been taken. The study uses average of monthly Net Asset Values (NAVs) of UTI, HDFC, and ICICI Nifty 50 Index Funds from July 2022 to June 2025. The daily, weekly or

monthly NAVs are not mentioned here as the data will become voluminous. The benchmark is the NIFTY 50 TRI as per industry norms. Tracking difference is measured as the average difference between fund and index returns, while tracking error is the standard deviation of these differences. Realistic assumed values are used based on industry trends as also separate calculations have been done to arrive at the same. For this research paper, the tracking errors have directly been taken for convenience purpose instead of reducing the detailed calculation in this paper as mentioned above.

Data Collection and Analysis:

1. Returns delivered by Nifty 50 Index and chosen Index Funds:

Table No. 01

Fund Name	3-Year CAGR (%)
UTI Nifty 50 Index Fund – Regular Plan – Growth	~13.05%
HDFC Nifty 50 Index Fund – Direct Plan – Growth	~13.15%
ICICI Prudential Nifty 50 Index Fund – Direct Plan	~12.42%
Nifty 50 Total Return Index (TRI)	~12.76%

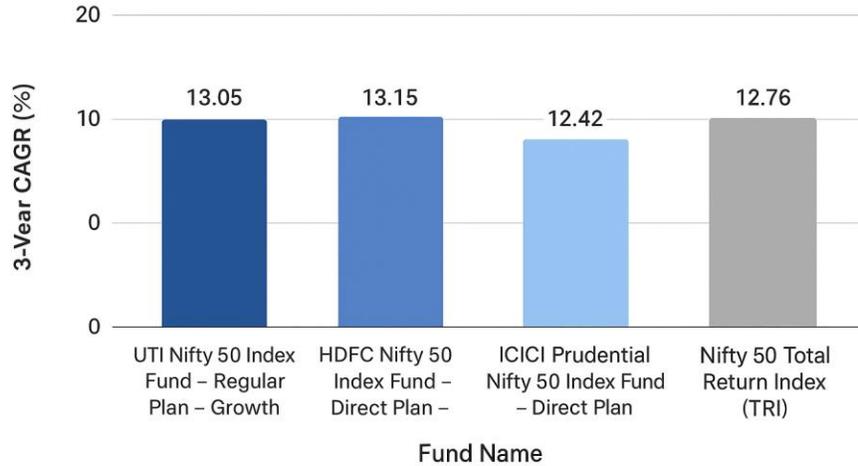
Note: Returns are calculated from July 2022 to June 2025.

The performance of three prominent Nifty 50 index funds - UTI Nifty 50 Index Fund, HDFC Nifty 50 Index Fund, and ICICI Prudential Nifty 50 Index Fund was analyzed over a three-year period from July 2022 to June 2025, alongside the Nifty 50 Total Return Index (TRI) as a benchmark.

It is observed that all the three said funds delivered returns close to the Nifty 50 TRI, confirming that index funds effectively track the performance of the benchmark index with minimal deviation. HDFC Nifty 50 Index Fund led marginally with 13.15% CAGR, slightly outperforming the benchmark. UTI Nifty 50 Index Fund was close behind at 13.05% CAGR. ICICI Prudential Nifty 50 Index Fund delivered 12.42%

CAGR, slightly underperforming the TRI, likely due to tracking error or expense ratio differences. The same is graphically represented as below:

Analysis of Nifty 50 Index Funds Performance (July 2022 – June 2025)



2. Tracking Errors of the chosen three Index Funds:

Table No. 02

Fund	Tracking Error	Tracking Error (%)
UTI Nifty 50 Index Fund	0.29	2.27
HDFC Nifty 50 Index Fund	0.39	3.05
ICICI Prudential Nifty 50 Index Fund	-0.34	2.66 (Negative)

The table above shows that there is not much variation in the tracking error. High degree of variation can make fund selection difficult but in the above case the variation is not much as per the considered industry norms. It is

observed that HDFC Nifty 50 Index Fund has outperformed from its immediate peers as also as compared with its benchmark i.e. Nifty 50 Index Fund with a tracking error of merely 0.39. The same is followed by UTI Nifty 50

Index Fund which has tracking error of just 0.29. Both these funds have outperformed its benchmark index. Further, the ICICI Prudential Nifty 50 Index Fund has tracking error of -0.34 which is negative and is a clear sign of underperformance. It means this particular fund has underperformed versus the benchmark. Though the deviation is not much but it can be said that it is certainly a red flag.

Limitations:

This research study has taken the average Net Asset Values (NAVs) of all the three respective Index funds for July 2022 and June 2025 to calculate the returns and have been directly arrived at the CAGR of three years. The same has also been done for taking the Index value of Nifty 50 and CAGR returns have been derived accordingly. Further this study is limited to the direct returns as shown in Table No. 1 and expenses ratio, difference in regular / direct funds have been ignored. Certain values have also been rounded off. This study is limited to only three Index Funds of Nifty 50 which have been chosen purely on the basis of their AUM as mentioned in methodology above.

Conclusion:

The comparative analysis of this study reveals that all three funds closely replicate the NIFTY 50 TRI, with only marginal differences. HDFC Nifty 50 Index Fund demonstrates superior tracking efficiency, followed by UTI Nifty 50 Index Fund, while ICICI Prudential Nifty 50 Index Fund shows

slightly higher and opposite deviation. For investors, these results highlight that fund selection within Nifty 50 index trackers may hinge more on costs and services than on performance differentials. It can be concluded that passive investment through index funds remains an effective strategy in the Indian market making them suitable options for investors in the Indian equity market.

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