Performance Evaluation of Some Index Funds-Indian Perspective

Pranav Mishra[1], Gulab Singh[2]

Abstract: The popularity of the index funds as an investment option has increased manifolds ever since they were introduced. This is primarily because of the merits that the investor enjoys through passive style of funds management. This includes the low cost involved in managing such funds and the significant tax savings. Most of the researchers have compared the performance of the actively managed funds with that of index funds. However the index funds of US and for that reason other parts of the world are different from that of India. Unlike other countries in India the benchmark indices comprise of very less number of securities and thus are unable to represent the entire economy. So in Indian context comparison of performance of actively managed funds with index funds is not logical. Therefore this paper attempts to make an intra-class performance evaluation of some Indian index funds based on some statistics. The study includes the use of graphical interpretations coupled with statistical tools like R-square and tracking error values. Two models of tracking error have been employed to test empirically the performance of the selected index funds. The study is useful for those interested in mutual funds, which includes researchers, academicians, and financial advisors. The paper suits the requirement and the situations prevalent in Indian economy during the period under study.

Keywords: Index funds; Passive fund management; Benchmark indices; Investment option; Performance evaluation.

JEL Classification: G11; G23

1 Introduction

The common investors in India prefer to invest in the capital market through a Mutual fund rather than direct investments. This has given impetus to the growth of the Mutual fund industry. The primary reason behind such a behavior is the risk avoiding nature of the investor coupled with the lack of sound knowledge of the intricacies with which the capital market operates. So they believe that the fund manager with his expertise would be the best person to handle their hard earned money.

[1] Assistant Professor, Institute of Business Management, GLA University, India, Address: Mathura-281406 U.P., India, Tel.: +918449153544, Corresponding author: contactpranavca@gmail.com.
[2] Professor, PhD, Institute of Business Management, GLA University, India, Address: Mathura-281406 U.P., India, Tel.: +918601785459, E-mail: gulab.singh@gla.ac.in.

Mutual fund is a Trust where money is pooled from a group of investors who happen to share common financial objectives. The funds thus collected are invested into asset classes that closely match the stated investment goals of the scheme. A fund manager manages the Mutual fund and uses his portfolio management skills and ensures a better return than what an investor is expected to manage on his own. The manager also utilizes the research going on in the industry to arrive at a decision.

The concept of Mutual Fund first came from a Dutch Merchant Ling in the year 1774. In 1822, that idea was further developed. In India this concept was introduced in 1963. From an historical point of view, Mutual Funds have been around four hundred years, but they are a relatively new investment phenomenon to novice investors. Mutual Funds are a conglomeration of stocks, bonds, securities and even real estate, put together by a smart Fund Manager who hand-picks winners for a winning combination. (Athma & Mamatha, 2013).

Fund Managers use different investment styles in consonance with the investment objectives of the concerned scheme. Some funds are actively managed while others are not. The passively managed funds are commonly termed as the index fund. The popularity of the index funds as an investment option has increased manifolds ever since they were introduced. This is primarily because of the merits that the investor enjoys through passive style of funds management. This includes the low cost involved in managing such funds and the significant tax savings (Fortin & Michelson, 2002).

Index Funds replicate the portfolio of a particular index such as the BSE Sensitive index, S&P NSE 50 index (Nifty), etc. These schemes invest in the securities in the same proportion comprising of an index (www.utimf.com/). Theoretically NAVs of such schemes would rise or fall in accordance with the rise or fall in the index, though not exactly by the same percentage due to some factors known as "tracking error" in technical terms. There are various reasons for occurrence of such tracking errors which eventually have become the yardstick for measuring the performance of such index funds (Frino & Gallagher, 2001)

Some of the factors that cause tracking error in index funds are enumerated here. One of the prime reasons being, that, the benchmark index is maintained more like a paper portfolio than reality (Perold, 1988). Any change in the composition of the benchmark index requires some time for the fund manager of the index fund to replicate the new composition. Further this also entails some buying and selling on the part of the index fund which raises its cost where on the other hand returns from the benchmark index are assumed to be received without incurring any cost. Secondly the way the benchmark index is calculated also has a bearing on the possibility and quantum of the tracking error. Thirdly if the index fund does not exactly mirror its benchmark there will be some tracking error. Some stocks may be liquid enough to be included in the benchmark index, but not quite liquid enough to

be bought by the index fund and if included affect the stock's price (Keim, 1999). Another notable point is the treatment of dividend in the benchmark index.

Warren Buffett and Benjamin Graham have recommended index funds as one of the best investment tool for small investors who don't have the capacity to select their own quality stocks or Mutual funds. This is exactly what asset management companies of index funds have been using as their justification to sell such funds in India for long. However this logic holds good for a market like America where the index funds are true indicators of the market at large owing to the fact that they track indices containing 500 to 5000 stocks (www.safalniveshak.com/). That is probably the most significant reason for research gap in this area specifically in Indian context.

In India, we have just two important indices available – the 30 stock BSE-Sensex and the 50 stock NSE-Nifty. Such a small number of companies are anyways not indicative of the broader Indian market. What is more concerning is, the way the Sensex (or the Nifty) are constructed makes them just a shabby collection of big companies/expensive stocks. In such a situation, performance evaluation of the index funds becomes significant, that too intra-class comparison (www.safalniveshak.com/). These traits of the Indian index funds make them appropriate for the novice investor who is content with just moderate return above the usual fixed deposits in any bank or the retired investors who cannot afford to take risk involved in actively managed funds. According to Jaya Prakash, Head, Products, Franklin Templeton Investments, India, index funds are ideal for investors who prefer to take only market risk and not a fund manager risk (www.businesstoday.in). Whether actively managed funds have an edge over the passively managed index funds remain a debatable issue and we feel that this varies from economy to economy.

2 Literature Review

Athma and Mamatha (2013) studied the growth and progress of ETFs (Exchange Traded Funds) and Index funds in India starting from 1998. Narend (2014) empirically studied the performance of some index funds and ETFs based on tracking error, active returns and Jensen's alfa. Similar works are also reported from other parts of the world. Philips *et al*(2014) compared the performance of the actively managed funds vis-à-vis the index funds and found that index funds displayed a greater probability of outperforming the actively managed funds even though index funds generally underperform their benchmarks. These findings support the conclusions drawn by Benke & Ferri (2013)earlier. Other notable works which need a mention are- Rhompotis (2005) comparing ETFs with index funds, Oh *et al* (2005) proposing a model to optimize investments in index funds. Elton *et al* (2004) evaluated the performance of a few mutual funds. Tracking error of some S&P 500 index funds was reported by Frino & Gallagher (2001).

The first attempt to quantify the difference in portfolio performance between the two strategies was made by Larry Martin (1993). Many authors in succession have worked on similar lines and more or less confirmed the same findings that in general low expensed index funds outperform the high expensed actively managed Mutual funds.

However in the Indian scenario a comparison between the index funds and actively managed funds is not warranted. This is because in India the usual benchmarks namely Sensex and Nifty comprises of only thirty and fifty stocks respectively and is thus not representative of the entire market. In US and abroad the benchmark indices comprise of much larger number of stocks and hence very well represent the market as a whole. In a country like India an intra-class comparison of index funds seems more justifiable in our opinion.

Keeping this research gap in mind this study has been taken up to evaluate the performance of seven selected index funds and undertake a comparison among them.

3 Research Methodology

3.1 Objective

This paper attempts to evaluate some of the index funds from the Indian Mutual fund industry.

3.2 Hypothesis

H_0: Passively managed Mutual funds reap returns equal to that of the benchmark index.

H_1: Passively managed Mutual funds do deviate from the benchmark index with respect to returns and thus give rise to tracking error.

3.3 Scope

The study covers a period of five years and nine months starting from April 2010 to December 2015. Such short duration study is warranted as the economic scenario in a fast developing economy like India is prone to changes. The paper takes into account the performance of seven index funds operative in India whose benchmark index is the Nifty index of the NSE (National Stock Exchange). The names of index funds under study are mentioned in Table 1.

Table 1. List of Index Funds Under Study

S.No.	Name of the Index fund	Investment Option
1.	UTI-Nifty Index	Growth Option
2.	HDFC Index fund-Nifty plan	Growth Option
3.	ICICI Pru Index Fund	Growth Option
4.	Birla Sun Life Index Fund	Growth Option
5.	SBI Nifty Index Fund	Growth Option
6.	Franklin Templeton India Index-Nifty plan	Growth Option
7.	Tata Index Fund-Plan A (Nifty)	Growth Option

3.4 Research Design

The study is empirical in nature and purely based on secondary data. Quarterly NAV of the selected index funds are taken from their respective websites of the Asset Management Company (AMC) starting from 01st April 2010. From these NAVs quarterly returns are calculated for all the seven index funds.

At the same time CNX Nifty index values are obtained for the period under study from www.nseindia.com. All the seven selected index funds have their benchmark as the CNX Nifty. Hence quarterly returns of Nifty are calculated next. In theory an index fund is expected to mimic its benchmark so the graph showing the returns from an index fund can be superimposed on the graph showing returns from the benchmark that is CNX Nifty. That would be an indicator of how closely the index fund is able to represent its benchmark and provide its investors the benefits of passive management.

Next tracking error is calculated for the index fund using the following two methods and represented as tracking error 1(TE_1) and tracking error 2 (TE_2). Tracking error measures the deviation of the Mutual fund's return from that of its benchmark. Every index fund aims at minimizing the tracking error as much as possible but the same cannot be eliminated altogether.

TE_1 in quarter t is calculated as the absolute difference in returns of the index portfolio and benchmark index ($e_{pt} = R_{pt}-R_{bt}$),

Where, R_{pt} is the return from the index fund under consideration and

R_{bt} is the return from the benchmark index.

The quarterly average absolute tracking error over n quarters (TE_1) is defined as follows:

$$TE_1 = \sum |e_{pt}|/n$$

An alternative measure i.e. TE_2 which is mostly used in industry, measures the quarter-to-quarter variability (standard deviation) of the difference in returns between the index fund and the benchmark index return.

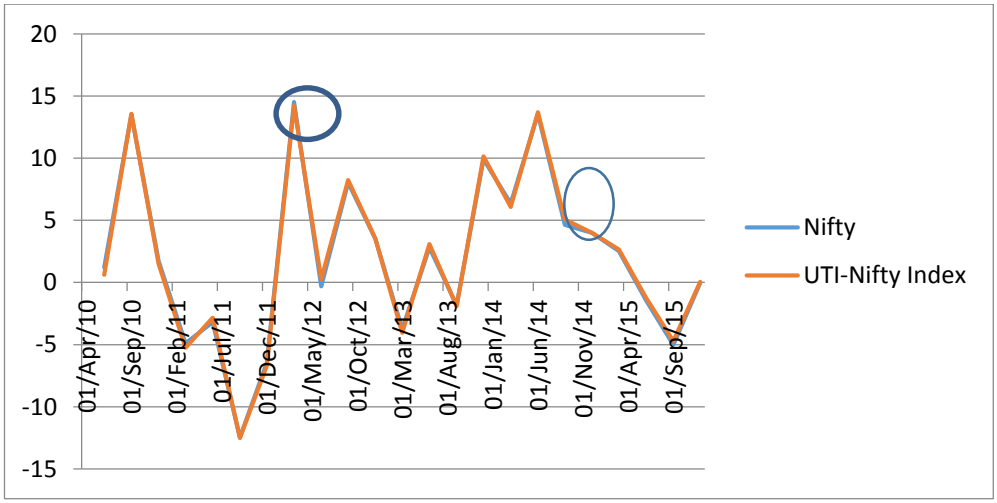
$$TE_2 = \sqrt{1/(n-1)\sum(e_{pt}-e_{pt}')^2}$$

The index fund with the least tracking error is the best among the seven funds selected.

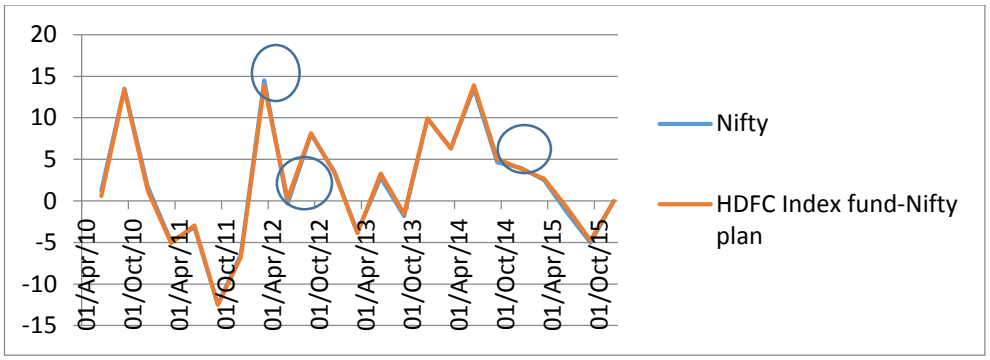
Next R-square values are calculated for the index funds with respect to the CNX Nifty to determine how closely the fund is able to replicate its benchmark. The value of R-square varies between 0 to 1. A high R-square value indicates near perfect replication.

4 Empirical Findings

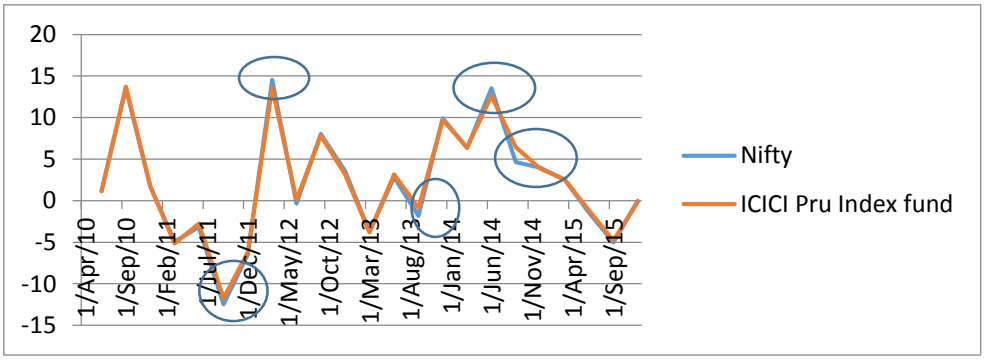
In order to work on the above mentioned methodology graphs showing the time period on X-axis and quarterly returns from the selected index funds on Y-axis are drawn. Similar graph is drawn for the quarterly returns from the benchmark index i.e. Nifty. These were then superimposed. The graphs so plotted are depicted below (Graph 1-7).



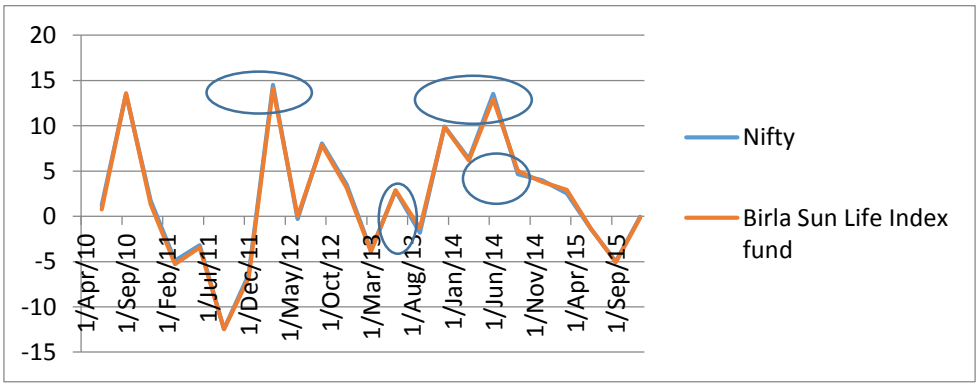
Graph 1. Quarterly Returns from UTI Nifty fund vs. Nifty



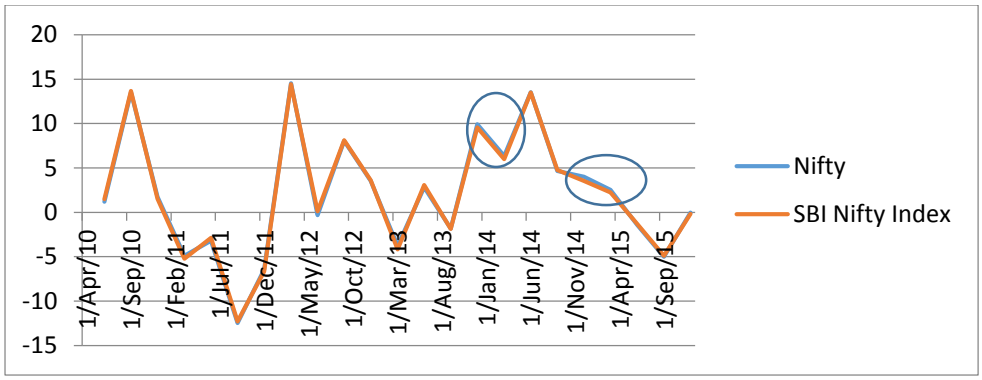
Graph 2. Quarterly Returns from HDFC Index fund-Nifty plan vs. Nifty



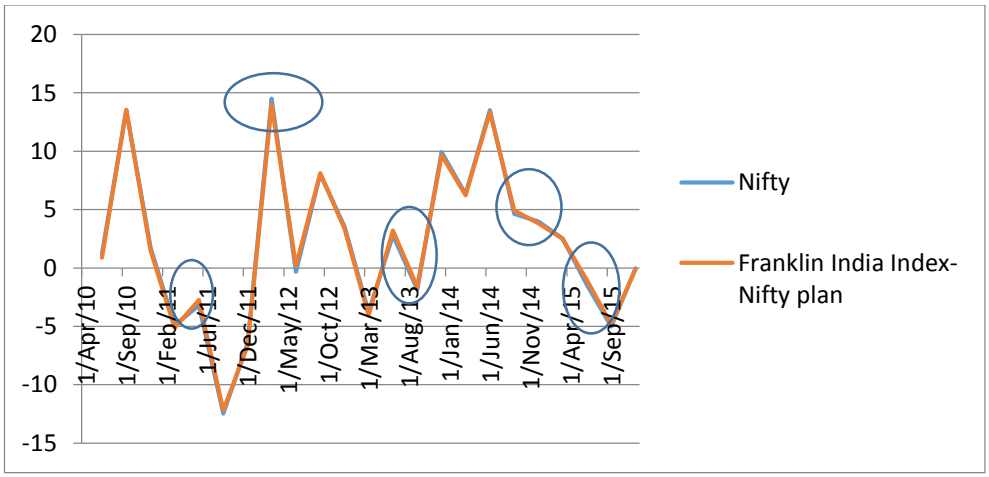
Graph 3. Quarterly Returns from ICICI Pru Index fund vs. Nifty



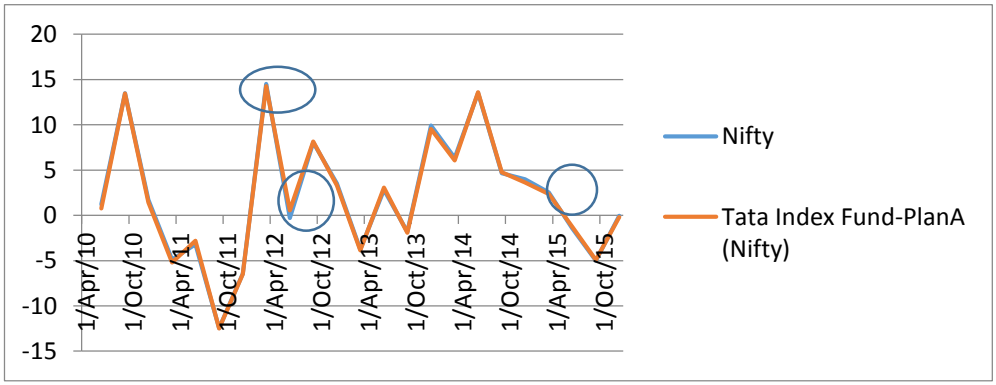
Graph 4. Quarterly Returns from Birla Sun Life Index fund vs. Nifty



Graph 5. Quarterly Returns from SBI Nifty Index fund vs. Nifty



Graph 6. Quarterly Returns from Franklin India Index-Nifty plan vs. Nifty



Graph 7. Quarterly Returns from Tata Index fund-Nifty plan vs. Nifty

A perusal of the graphs so drawn showed there are some deviations at some points highlighted by encircling. These observations necessitate the calculation of tracking error to quantify the deviations.

The tracking errors, and the charts made thereon are shown below in Table 2& 3 and Charts 1&2 respectively.

Table 2. Tracking Error-1 Values

Funds	TE_1
UTI-Nifty Index	0.24
HDFC Index fund-Nifty	0.28
ICICI Pru Index fund	0.40
Birla Sun Life Index fund	0.25
SBI Nifty Index fund	0.22
Franklin India Index fund	0.25
Tata Index fund-Nifty plan	0.23

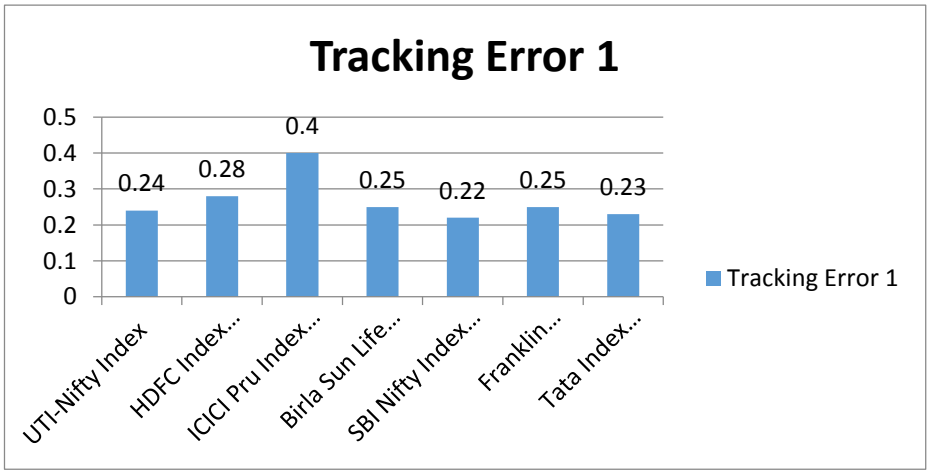


Chart 1. Tracking Error-1

Table 3 Tracking Error-2 Values

Funds	**TE_2**
UTI-Nifty Index	0.29
HDFC Index fund-Nifty	0.35
ICICI Pru Index fund	0.57
Birla Sun Life Index fund	0.29
SBI Nifty Index fund	0.25
Franklin India Index fund	0.29
Tata Index fund-Nifty plan	0.29

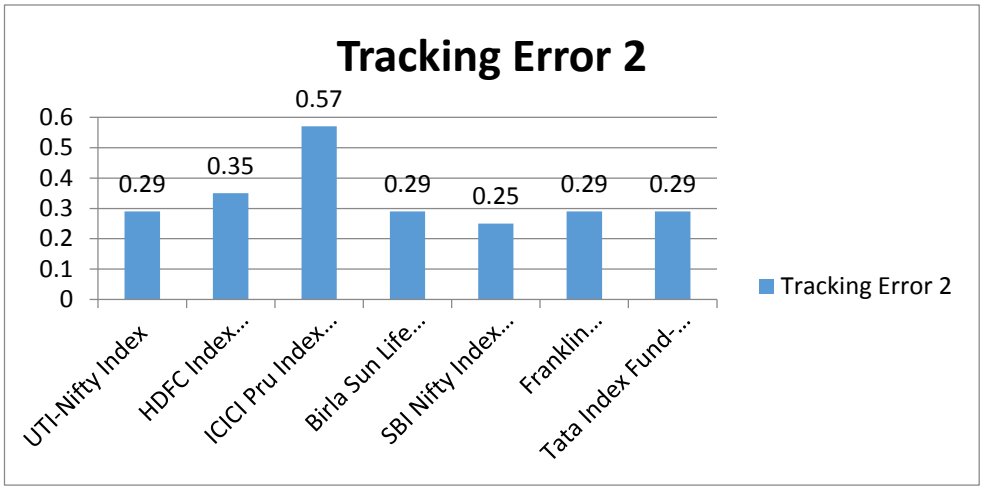


Chart 2. Tracking Error-2

Study of the Table 2 reveals that Tracking error TE_1 in absolute terms averaged out to be 0.27% with the maximum of 0.4 % in case of ICICI Pru Index fund and the least being 0.22 % for SBI Nifty Index fund.

Table 3 made for tracking error 2 shows that on an average TE_2 value is found to be around 0.33 %. The lowest value is 0.25 % for SBI Nifty Index fund and the highest being 0.57 % pertaining to ICICI Pru Index fund.

Next the value of coefficient of determination or R-square, is determined for each of the seven index funds with respect to the benchmark index as shown in the Table 4 and Chart 3 below.

Table 4. R-square Values

Funds	**R^2**
UTI-Nifty Index	0.998
HDFC Index fund-Nifty	0.997
ICICI Pru Index fund	0.994
Birla Sun Life Index fund	0.998
SBI Nifty Index fund	0.999
Franklin India Index fund	0.998
Tata Index fund-Nifty plan	0.998

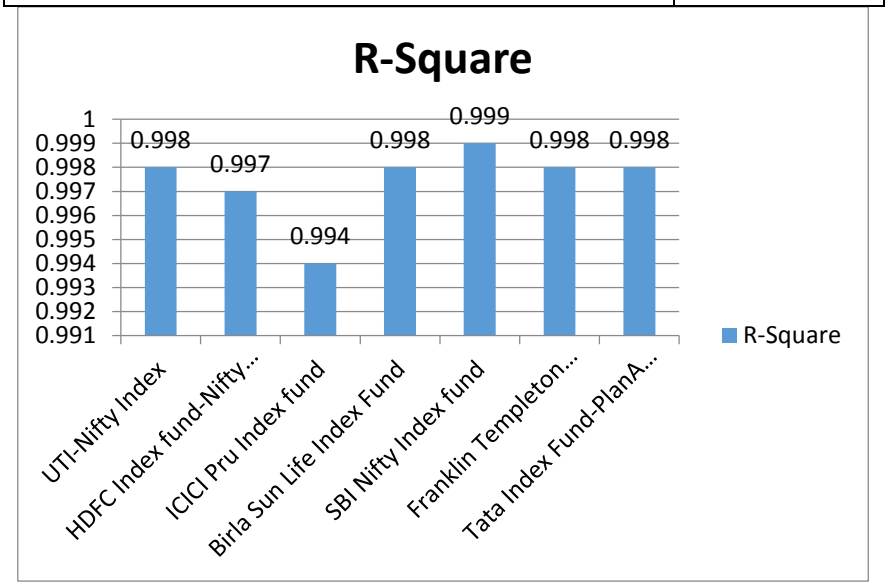


Chart 3. R-square

R-square value indicates how well the data fits a line or a curve. An r^2 of 1.00 indicates that the regression line perfectly fits the data while an r^2 of 0.00 shows that the line does not fit the data at all.

he values of R-square indicate that all the funds under study are able to replicate the returns of the benchmark index with minor deviations. The below table and graph clarifies this point.

5. Conclusion

The empirical results in this paper shows that with all the three measures used to evaluate the performance of the selected index funds, SBI Nifty Index fund has outperformed the other six index fund during the period under study. The fund manager managing SBI Nifty Index fund is able to limit the tracking error to an acceptable limit. The findings clearly indicate that the null hypothesis has been rejected by all the three statistics used namely tracking error-1, tracking error-2 and R-square value. These results should be analyzed with some caveats. This paper does not take into account for the expenses involved in restructuring the portfolio of the fund with each change in the composition of the benchmark index. These issues are left open for further research.

6. Acknowledgements

The authors wish to acknowledge their sincere gratitude to the Director, Institute of Business Management and the Management of GLA University, Mathura, U.P. for their unstinted support and encouragement.

7. References

Athma, P., & Mamatha, B. (2013). Performance of index funds in India. *Asian Journal of Research in Business Economics and Management*, *3*(6), 21.

Benke, A., & Ferri, R. (2013). *A Case for Index Fund Portfolios*. (Available at http://www.rickferri.com/WhitePaper.pdf)

Elton, E. J., Gruber, M. J., & Busse, J.A. (2004). Are investors rational? Choices among index funds. *The Journal of Finance*, *59*(1), 261-288.

Fortin, R., & Michelson, S. (2002). Indexing versus active mutual fund management. *Journal of Financial Planning-denver-*, *15*(9), 82-95.

Frino A & Gallagher D. R. (2001). Tracking S&P 500 Index Funds. *Journal of Portfolio Management*, 28(1), 44-55.

Keim, D. B. (1999). An analysis of mutual fund design: the case of investing in small-cap stocks. *Journal of Financial Economics*, *51*(2), 173-194.

Martin, L. L. (1993). The evolution of passive versus active equity management. *The Journal of Investing*, *2*(1), 17-20.

Narend, S. (2014). *Performance of ETFs and Index Funds: a comparative analysis* (Doctoral dissertation, Indian Institute of Technology, Madras).

Oh, K. J., Kim, T. Y., & Min, S. (2005). Using genetic algorithm to support portfolio optimization for index fund management. *Expert Systems with Applications*, *28*(2), 371-379.

Perold, A. F. (1988). The implementation shortfall: Paper versus reality. *The Journal of Portfolio Management*, *14*(3), 4-9.

Philips, C. B., Kinniry Jr, F. M., Todd Schlanger, C. F. A., & Hirt, J. M.(2014). *The buck stops here: Vanguard money market funds.* Retrieved from http://www.coatesville.org/website/wp-content/uploads/2014/12/7-InR-Response-to-RFP-Section-7-A.pdf date: 01-16-2016

Rompotis, G. G. (2005). An empirical comparing investigation on exchange traded funds and index funds performance. *Available at SSRN 903110, 2005 - papers.ssrn.com.*

Online Sources

http://www.amfiindia.com

http://www.franklintempletonindia.com

http://www.hdfcfund.com

http://www.icicipruamc.com

http://www.nseindia.com

http://www.safalniveshak.com

http://www.sbimf.com

http://www.tataMutualfund.com

http://www.utimf.com