POST-GRADUATE STUDENT RESEARCH PROJECT

Performance of ETFs and Index Funds: a comparative analysis

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Abstract

This paper is an empirical study of the performance of exchange traded funds and index funds since the period of their respective inception till July 2013 in terms of three parameters: a) tracking error b) active returns and c) Jensen's alpha. The analysis shows that tracking error is higher for ETFs compared to index mutual funds. The active returns (returns of the funds minus the returns of underlying index) analysis reveals that ETFs always outperformed their underlying index while the index funds have both underperformed and outperformed. The study also reveals that Jensen's alpha is negative for both types of funds, which means that both ETFs as well as index funds have not been able to provide excess returns over the market; however, the Jensen's alpha is better for index funds than ETFs. Overall, the study reveals that, in India, index funds have done better than ETFs in terms of a lower tracking error and a higher Jensen's alpha while ETFs have performed better in terms of active returns.

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Tracking Error and Performance of Exchange-Traded Funds and Index Funds

1. Introduction

Exchange-traded funds (ETFs) are increasingly finding favour in the global financial markets; foreign institutional investors (FIIs) in particular are using ETFs to gain exposure to emerging markets. In India, ETFs are making their presence felt gradually. In fact, ETFs are one of the disinvestment modes proposed by the Indian government for public sector undertakings (PSUs). After liberalisation in 1991, FIIs have played a significant role in the Indian stock market. It has been estimated that a sizable chunk of FII flows comes through offshore and India-focused equity funds and ETFs.[1] Notably, several India-specific ETFs that exist in the U.S. such as WisdomTree India Earnings Funds, iShares MSCI India ETF, and PowerShares India Portfolio concentrate exclusively on Indian stocks. The assets of offshore equity funds and India-focused ETFs were USD 55.84 billion in 2010 and USD 37 billion in 2012.[2]

Exchange-traded funds are one of the best known innovations in financial markets. ETFs hold assets such as stocks, commodities, or bonds, and trade close to their net asset value (NAV) throughout the day. ETFs can track a specific index, a particular sector of an industry, or even the stock markets of a foreign country. ETFs that are passively managed and track their benchmark indices are known as classical ETFs. ETFs combine the positive aspects of closed-ended and open-ended mutual funds. ETFs have several advantages over traditional mutual funds, such as lower expense ratios, trading flexibility, tax efficiency, transparency, and exposure to diverse asset classes. Mutual funds have higher expense ratios than ETFs because of entry and exit loads. It is pertinent to note that in India, entry loads for mutual funds have been banned while exit loads do exist. ETFs can be traded like stocks throughout the day while open-ended mutual funds can be accessed only at the end of the day. ETFs are

[1] Source: http://www.morningstar.in/posts/17907/emerging-market-and-asia-ex-japan-funds-etfs-continue-to-be-big-contributors-of-foreign-inflows.aspx (Morningstar).

[2] Source: http://www.morningstar.in/posts/18766/morningstar-offshore-india-fund-spy-quarter-ended-june-2013.aspx (Morningstar).

more tax efficient because of their in-kind creation and redemption process, which allows for arbitrage and pricing efficiency. In the case of ETFs, only the transacting shareholder is taxed, while the gains are distributed to the other shareholders. On the other hand, the transactions of mutual funds generate tax consequences for all the unit holders. ETFs are more transparent than mutual funds as they declare their daily holdings, unlike mutual funds, which declare their holdings at the end of the quarter. In addition to the numerous advantages of ETFs, investors can have exposure to various asset classes, from commodities to livestock. The phenomenal growth of ETFs globally has attracted the attention of researchers and investors, and extensive studies have been done on ETFs in the context of the developed markets of the U.S. and Europe.

Globally, most of the ETFs were passive in nature, at least to begin with. Currently however, there are many ETFs that are actively managed. ETFs were introduced in the U.S. in 1993 and the first ETF to be listed was Standard & Poor's Depository Receipts (SPDRs). Although the growth of ETFs was sedate initially, the subsequent growth of ETFs has been phenomenal. At the end of 2013, there were around 5090 ETFs and exchange-traded products (ETPs) in the U.S., with 10,172 listings and assets worth USD 2.4 trillion.[3] In India, the Nifty Benchmark Exchange Traded Scheme (Nifty BeES), was the first ETF to be introduced in 2001. Nifty BeES was subsequently taken over by Goldman Sachs Asset Management Company. At present, there are over 40 ETFs listed in India and a majority of the ETFs are still passively managed, meaning that the ETFs track their underlying benchmark indices.

Globally, the total assets under management (AUM) of mutual funds equalled USD 28.87 trillion at the end of the third quarter of 2013.[4] The first mutual fund in India was set up by the Government of India when the Unit Trust of India (UTI) was created in 1963. UTI had a monopoly in the mutual fund business and the next mutual fund—the SBI Mutual Fund—was established only in 1987. From the late 90s onwards, there was a proliferation of mutual funds in India. At the end of December 2013, there were 1430 mutual fund schemes managing around INR 8,50,000 crore.[5] Several prominent fund houses such as SBI Mutual Fund, ICICI Mutual Fund, Reliance Mutual Fund, and so on have schemes that invest predominantly in the benchmark indices. The AUM for ETFs stood at INR 10,273 crore as on December 2013—the AUM for gold ETFs stood at INR 8784 crore and that for other ETFs

[3] Source: http://www.etfgi.com/index/home (ETFGI).
[4] Source: http://www.ici.org/research/stats/worldwide/ww_12_13 (Investment Company Institute).
[5] Source: http://portal.amfiindia.com/spages/amdec2013repo.pdf (Association of Mutual Funds in India).

was INR 1489 crore.[6] These figures are very low compared to those of mutual funds and it is obvious that ETFs have a long way to go in India. In India, only three classifications of ETFs exist, namely, index ETFs, commodity ETFs, and money market ETFs. Classical ETFs are those that invest in the benchmark indices, which is a passive investing technique. Passively managed ETFs, at first glance, appear to be a simple exercise; in reality however, this is not the case. Similar to mutual funds that have exposure to the benchmark indices (i.e., the S&P BSE SENSEX index and the CNX Nifty index), passively managed ETFs also have exposure to these benchmark indices. The most popular classical ETFs include the GS Nifty BeES, the Kotak Nifty ETF, the MOST Shares M50 ETF, and the Birla Sun Life Nifty ETF. As on December 2013, the AUM for the GS Nifty BeES was INR 382.62 crore, the AUM for the MOST Shares M50 was INR 43.19 crore, and the AUM for the Kotak Nifty ETF was around INR 38.3 crore.[7] Some of the most popular index funds are the ICICI Prudential Index Fund–Nifty Plan, the Franklin Index Fund, the UTI Nifty Index Fund, and the Reliance Index Fund–Nifty Plan. As on December 2013, the AUM for the ICICI Prudential Index Fund–Nifty Plan was INR 62.48 crore, the AUM for the UTI Nifty Index Fund was INR 126.83 crore, and the AUM for the Franklin Index Fund was INR 111.6 crore.[8] It is pertinent to note that both classical ETFs as well as index funds track the benchmark indices. Given that ETFs and index funds track similar indices, it would be interesting to investigate which fund is actually performing better—index funds or passively managed ETFs. Hence, in this study, we examine the performance of ETFs compared to that of index funds in the Indian context.

Many prior studies examined the pricing efficiency of ETFs, wherein the difference between ETF prices and NAVs was investigated. Ackert and Tian (2000) found that the U.S. ETFs are priced closer to their NAVs than the country ETFs are. Examining the tracking error and performance of ETFs, Elton et al. (2002) found that SPDR ETFs underperformed the S&P 500 index by an average of 28 basis points per annum; they also found the tracking errors to be very small. While Elton et al. (2002) reported that the premiums or discounts are economically not significant, Engle and Sarkar (2006) found that the premiums or discounts are lower for domestic ETFs. Poterba and Shoven (2002) examined the performance of SPDRs and highlighted the tax advantages of ETFs due to their unique in-kind creation and redemption. Rompotis (2005) compared the performance of ETFs and index funds that track

[6] Source: http://portal.amfiindia.com/spages/amdec2013repo.pdf (Association of Mutual Funds in India).
[7] Source: http://portal.amfiindia.com/spages/amdec2013repo.pdf (Association of Mutual Funds in India).
[8] Source: http://portal.amfiindia.com/spages/amdec2013repo.pdf (Association of Mutual Funds in India).

the same indices and showed that the returns produced by them are almost similar and that they do not provide any excess returns over their underlying indices. Rompotis (2005) also demonstrated that tracking error is strongly dependent on the expense ratio and risk of ETFs. Gallagher and Seagara (2006) investigated the performance of classical ETFs in Australia and reported that the variation between the NAV and the traded price is small. Svetina (2010) found that although ETFs underperform their benchmark indices, they actually outperform the index funds. In the Indian context, Prasanna (2012) examined the performance of Indian ETFs and found that gold ETFs provide returns in excess of 13% compared to the returns offered by the equity market. However, the performance of ETFs was not compared to that of index funds.

Thus, in the extant literature, the performance of ETFs has been compared with other ETFs or has been evaluated in relation to spot. However, the performance of ETFs vis-à-vis index funds has not been explored. This study aims to fill this void using publicly available data and examines the tracking error and performance of ETFs and index funds with respect to their underlying indices.

2. Data and Methodology

In this study, we examine ETFs and index funds that track either the S&P BSE SENSEX index or the CNX NIFTY index. In India, although ETFs were introduced in 2001, there are only around 40 ETFs at present. Gold ETFs are more popular in India than ETFs that track indices. We propose to evaluate funds that have a minimum AUM of INR 5 crore, which leaves us with three ETFs that track indices. The three ETFs examined in this study are the Goldman Sachs Nifty BeES, the Kotak Sensex ETF, and the Kotak Nifty ETF. The index funds that are considered in this study are growth funds that track either the S&P BSE SENSEX or the CNX Nifty index. The data was collected from the ICRA, the National Stock Exchange, and the respective fund houses. The daily closing prices and NAV of the funds were considered from the inception of the funds up to July 31, 2013; this data was taken from the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE). Due to the unavailability of AUM data of some of the index funds, the data was restricted to the following funds: Franklin Index Fund, HDFC Index Fund, LIC Nomura Index Fund, Birla Sun Life Index Fund, SBI Index Fund, Principal Index Fund, UTI Index Fund, and IDBI Index Fund. Hence, based on the criteria outlined earlier, our study was restricted to three ETFs and 12 index funds.

The performance of ETFs and index funds was measured by comparing their daily returns with the returns of the underlying indices. The tracking error of ETFs and index funds was analysed to examine how closely the ETFs and mutual funds track their underlying indices. Tracking error was measured as the standard deviation of the difference between the returns of the underlying index and the returns of ETFs or index funds; this is similar to the approach adopted by Frino and Gallagher (2001). For reasons of brevity, a graphical representation of the returns and tracking error of GS Nifty BeES and UTI Index Fund alone are provided in the Appendix.

Traditionally, the performance of mutual funds was examined using Jensen's alpha. Hence, further analysis was done to check whether ETFs and index funds were able to generate better alphas. Jensen's alpha was used to measure the excess returns of a fund over that of its underlying index. The excess returns of a fund were regressed against the excess returns of its underlying index as shown below:

$$R_p - R_f = \alpha_i + \beta (R_m - R_f) + e_t \longrightarrow (1)$$

where R_p is the return of an ETF or an index fund; R_f is the risk-free return; α_i is the Jensen's alpha; β is the beta of the fund; and e_t is the error term. Jensen's alpha was calculated for those ETFs and index funds tracking either the S&P BSE SENSEX or the CNX Nifty index.

3. Results

3.1 Characteristics of ETFs and Index funds

The Goldman Sachs Nifty Exchange-Traded Scheme, also known as GS Nifty BeES, was the first ETF introduced in India in 2001. Subsequently, many ETFs were introduced. At present, there are around 40 ETFs in India. ETFs tracking indices used to be popular in India; of late however, ETFs tracking gold are more popular with the investing fraternity. The characteristics of the ETFs examined in this study are given in Table 1.

The GS Nifty BeES is the most popular ETF and has the highest AUM, followed by the Kotak Nifty ETF. The expense ratio of the Kotak Nifty ETF as well as the Kotak Sensex ETF is 0.5% and that of the GS Nifty BeES is 0.8%. The minimum investment required for the Kotak Nifty ETF as well as the GS Nifty BeES is INR 10,000 while it is INR 5000 for the Kotak Sensex ETF.

Table 1: Characteristics of Exchange-Traded Funds

Sl. No.	ETFs	Underlying Index	Listed on	Launch date	AUM as on June 2013 (INR crore)	Expense Ratio (%)	Minimum Investment (in INR)
1	Kotak Nifty ETF	Nifty	NSE	19 Jan 2010	47.07	0	10000
2	Goldman Sachs Nifty Exchange-Traded Scheme	Nifty	NSE	28 Dec 2001	451.49	0.8	10000
3	Kotak Sensex ETF	SENSEX	BSE	16 May 2008	5.98	0	5000

Index funds are passively managed and are designed to replicate the underlying index that they track. Index funds hold their stocks in the same proportion as that of the underlying index. Index funds are very popular worldwide and even in India, index funds have found favour with the investing fraternity. The characteristics of the index funds examined in this study are given in Table 2.

Table 2: Characteristics of Index funds

S. No.	Index funds	Underlying Index	Launch Date	AUM As on June 2013 (INR crore)	Loads (%)	Min. Invest. (INR)	Fund Type
1	ICICI Prudential Index Fund (G)-Nifty Plan (G)	Nifty	15 Feb 2002	145.98	0.25	5000	Open
2	UTI Nifty Index Fund (G)	Nifty	26 Feb 2000	133.24	1	5000	Open
3	Franklin India Index Fund-NSE Nifty Plan (G)	Nifty	4 Aug 2000	104.86	1	5000	Open
4	IDBI Nifty Index Fund (G)	Nifty	31 May 2010	88.47	1	5000	Open
5	HDFC Index Fund-Nifty Plan (G)	Nifty	10 Jul 2002	56.70	1	5000	Open
6	LIC NOMURA MF Index Fund-Nifty Plan (G)	Nifty	28 Nov 2002	26.86	1	2000	Open
7	Birla Sun Life Index Fund(G)	Nifty	17 Sep 2002	20.05	0.5	5000	Open
8	Principal Index Fund (G)	Nifty	27 Jul 1999	15.71	0	5000	Open
9	SBI Magnum Index Fund(G)	Nifty	4 Feb 2002	33.64	1	5000	Open
10	Franklin India Index Fund-BSE SENSEX (G)	SENSEX	27 Aug 2001	42.68	1	5000	Open

S. No.	Index funds	Underlying Index	Launch Date	AUM As on June 2013 (INR crore)	Loads (%)	Min. Invest. (INR)	Fund Type
11	HDFC Index Fund-Sensex Plan (G)	SENSEX	10 Jul 2002	34.05	1	5000	Open
12	LIC NOMURA MF Index Fund-Sensex Plan (G)	SENSEX	28 Nov 2002	15.77	1	2000	Open

Table 2 shows that most of the index funds used in our study have an exit load of 1% for their schemes and the minimum investment required is INR 5000 (except for the LIC Nomura Index Fund scheme). The ICICI Prudential Index Fund, the UTI Index Fund, and the Franklin India Index Fund are some of the largest index funds. The ICICI Prudential Nifty Plan has the lowest exit load at 0.25%, while it is 1% for most of the other schemes.

3.2 Performance of ETFs and Index funds

The performance of ETFs and index funds was measured by analysing their active returns. The analysis showed that all the ETFs considered in this study outperformed their underlying index (Table 3). The active return for the Kotak Nifty ETF was 0.043, followed by the Kotak Sensex ETF with a return of 0.0097 and the GS Nifty BeES with a return of 0.0003.

In the case of index funds, the performance was mixed (Table 3). The analysis of active returns showed that index funds that tracked the S&P BSE SENSEX index underperformed the underlying index. However, the findings of Index funds that tracked the CNX Nifty as their underlying index are mixed. While UTI Nifty Index Fund, the Franklin Nifty Index Fund, and the ICICI Prudential Index Fund outperformed the CNX Nifty, the other index funds that tracked the CNX Nifty—the IDBI Nifty Index Fund, the HDFC Index Fund, the LIC Nomura Index Fund, the Birla Sun Life Index Fund, the Principal Nifty Index Fund, and the SBI Index Fund—underperformed the CNX Nifty index.

Thus, the analysis showed that ETFs outperformed their underlying indices while the performance of index funds was mixed.

Table 3: Active Returns of Exchange-Traded Funds and Index funds

Fund	No. of Observations	ETF Returns Annualised	Index Returns Annualised	Active Returns
Exchange-Traded Funds				
Kotak Nifty ETF	866	-0.46194	-0.50495	0.04301
GS Nifty BeES	2889	0.04337	0.043	0.00038
Kotak Sensex ETF	1260	-0.28309	-0.29284	0.00975
Index funds tracking S&P BSE SENSEX				
Franklin Index Fund (G)	2955	0.04573	0.04805	-0.00232
HDFC Index Fund (G)	2657	0.04511	0.05453	-0.00942*
LIC Nomura Index Fund (G)	2589	0.02508	0.05623	-0.03115*
Index funds tracking CNX Nifty				
UTI Nifty Index Fund (G)	3274	0.0227	0.02011	0.00259
Franklin Nifty Index Fund (G)	2955	0.04573	0.04387	0.00186
IDBI Nifty Index Fund (G)	768	-0.85184	-0.8301	-0.02174
ICICI Prudential Index Fund (G)	2810	0.04641	0.04038	0.00603
HDFC Index Fund (G)	2656	0.04227	0.05036	-0.00809**
LIC Nomura Index Fund (G)	2588	0.0148	0.05143	-0.03663*
Birla Sun Life Index Fund (G)	2578	0.05308	0.05444	-0.00135
Principal Nifty Index Fund (G)	3438	0.02319	0.02841	-0.00521
SBI Index Fund (G)	2800	0.04325	0.04599	-0.00274

* and ** indicate significance at 1% and 5% levels, respectively.

Further, we analysed the risk-adjusted returns of ETFs and index funds using Jensen's alpha. The analysis showed that the alpha was negative for all the funds examined in this study, except for the ICICI Prudential Index Fund (G), which was statistically insignificant. It is pertinent to note that the UTI Index Fund (G) had the best performance among the index funds tracking the S&P BSE SENSEX index, followed by the Principal Index Fund (G) (Table 4). Among the index funds that tracked the CNX Nifty index, the HDFC Index Fund (G) was the best performer with an alpha of -0.25%, followed by the LIC Nomura Index Fund (G) with an alpha of -0.38%. Among the ETFs, the GS Nifty BeES was the best performer with an alpha of -0.71%, followed by the Kotak Nifty ETF with an alpha of -

1.18%. The analysis also showed that the beta for all the funds was significant at 5%, which indicates that the funds were heavily correlated with their underlying index. The possible factors that could contribute to the negative alphas are the passive nature of the funds, the fees charged by the funds and the transaction costs involved in buying and selling. The results of our study are contrary to those of Redman *et al*. (2000) who report a positive alpha (0.284) for international mutual funds; however, our results conform with their result of a negative alpha (-0.056) for the U.S. equity market. Badrinath and Gubellini (2010), in their study of U.S. mutual funds, also reported alphas that are insignificant.

Apart from the alphas being significant, it is also important to note that the betas and R^2 were significant for ETFs as well as index funds, which shows that the fund's returns are closely intertwined with those of the index.

Table 4: Risk-Adjusted Returns of ETFs and Index funds

Index funds tracking CNX Nifty	**Alpha (%)**	**Beta**	R^2
ICICI Prudential Index Fund (G)	0.06%	1	0.88
	(-1.31)	(145.87)*	
UTI Nifty Index Fund (G)	-0.10%	0.98	0.99
	(-10.01)*	(708.61)*	
Principal Nifty Index Fund (G)	-0.11%	0.98	0.97
	(-5.38)*	(326.87)*	
IDBI Nifty Index Fund (G)	-0.15%	0.97	0.96
	(-3.01)*	(140.69)*	
SBI Index Fund (G)	-0.19%	0.97	0.99
	(-24.2)*	(868.72)*	
HDFC Index Fund (G)	-0.24%	0.96	0.99
	(-24.65)*	(684.75)*	
LIC Nomura Index Fund (G)	-0.51%	0.93	0.94
	(-16.8)*	(215.92)*	
Franklin Index Fund (G)	-0.56%	0.92	0.89
	(-13.49)*	(156.70)*	
Birla Sun Life Index Fund (G)	-1.91%	0.72	0.52
	(-19.92)*	(53.21)*	
Index funds tracking S&P BSE SENSEX	**Alpha (%)**	**Beta**	R^2
HDFC Index Fund (G)	-0.25%	0.96	0.99
	(-26.73)*	(709.85)*	
LIC NOMURA Index Fund (G)	-0.38%	0.95	0.94
	(-11.48)*	(202.5)*	
Franklin Index Fund (G)	-0.41%	0.94	0.92
	(-11.41)*	(185.06)*	

Exchange-Traded Funds	Alpha (%)	Beta	R^2
GS Nifty BeES ETF	-0.71%	0.89	0.82
	(13.03)*	(115.54)*	
Kotak Nifty ETF	-1.18%	0.83	0.61
	(-7.57)*	(37.17)*	
Kotak Sensex ETF	-3.16%	0.54	0.23
	(-16.29)*	(19.74)*	

Note: The values in parentheses represent the *t* statistics and * represents significance at 5% level.

3.3 Tracking Error of Funds

The tracking error of funds in relation to the underlying index was also examined for ETFs and index funds. Frino and Gallagher (2001) suggested different methods for calculating the tracking error of funds. In the extant literature, the most commonly used method to calculate tracking error is the standard deviation of the difference between the returns of the underlying index and the returns of the ETFs or index funds. This method was adopted in this study. The various factors responsible for tracking error are transaction costs, fund cash flows, benchmark volatility, and the replication strategy adopted by the funds. Table 5 shows the tracking error of the ETFs and the index funds considered in this study with respect to their underlying index.

Table 5: Tracking Error of Exchange-Traded Funds and Index funds

Fund	No. of Observations	Tracking Error
Exchange-Traded Funds		
Kotak Nifty ETF	866	0.00833
GS Nifty BeES	2889	0.0068
Kotak Sensex ETF	1260	0.01843
Index funds tracking S&P BSE SENSEX		
Franklin Index Fund (G)	2955	0.00446
HDFC Index Fund (G)	2657	0.00126*
LIC Nomura Index Fund (G)	2589	0.00393*
Index funds tracking CNX Nifty		
UTI Nifty Index Fund (G)	3274	0.00132
Franklin Nifty Index Fund (G)	2955	0.00523
IDBI Nifty Index Fund (G)	768	0.00211
ICICI Prudential Index Fund (G)	2810	0.00586
HDFC Index Fund (G)	2656	0.00131**
LIC Nomura Index Fund (G)	2588	0.00378*
Birla Sun Life Index Fund (G)	2578	0.01235
Principal Nifty Index Fund (G)	3438	0.00289

Fund	No. of Observations	Tracking Error
SBI Index Fund (G)	2800	0.00104

* and ** denote significance at 1% and 5% levels, respectively.

We found the tracking error of the GS Nifty BeES to be the lowest at 0.00680, followed by that of the Kotak Nifty ETF (0.00680) and the Kotak Sensex ETF (0.00833). Further, we conducted a *t*-test to test the significance of the tracking error. The results of the analysis revealed that the tracking error for all ETFs was not significant at 5% significance level, thus rejecting the hypothesis that there would be no difference in the tracking error of funds. Similarly, we calculated the returns and the tracking error for the index funds tracking the S&P BSE SENSEX and the CNX Nifty indices. The analysis of the index funds that tracked the S&P BSE SENSEX showed that the tracking error was minimal—the HDFC Index Fund (G) had the lowest tracking error of 0.0012, followed by the LIC Nomura Index Fund (G) with tracking error 0.0039 and the Franklin Index Fund (G) with tracking error 0.0044. The analysis revealed that the tracking error was significant for both the HDFC Index Fund (Sensex Plan) as well as the LIC Nomura Index Fund (G) at 5% significance level, while it was insignificant for the Franklin Index Fund (G).

The tracking error analysis performed for the index funds that tracked the CNX Nifty index also revealed that the tracking error was minimal. The tracking error of 0.00104 for the SBI Magnum Index Fund was the lowest in the study, followed by the HDFC Index Fund (G) and the UTI Nifty Index Fund (G) with a tracking error of 0.00131 and 0.00132, respectively. The Birla Sun Life Index Fund (G) had the maximum tracking error of 0.01235. Subsequent analysis was done to check the statistical significance of the tracking error. The analysis revealed that the tracking error was significant at the 5% level only for the HDFC Index Fund (G) and the LIC Nomura Index Fund (G) while it is insignificant for the other index funds that tracked the CNX Nifty index (Table 5).

The tracking error analysis of the ETFs and the index funds threw up some interesting facts. The analysis showed that the average tracking error of the ETFs tracking the SENSEX and the Nifty indices was 0.011%. The average tracking error of the index funds that tracked the S&P BSE SENSEX index was 0.0032% and the average tracking error of the index funds that tracked the CNX Nifty index was 0.0039%. Hence, it can be inferred that the tracking error of ETFs is actually higher than that of index funds. Moreover, the tracking errors of the index funds that tracked either the S&P BSE SENSEX index or the CNX Nifty index were almost similar in nature. One possible explanation for the tracking error of ETFs being higher is the

higher bid-ask spreads of ETFs compared to those of the index funds (Kostovetsky, 2003). The other possible factors that could lead to tracking error are transaction costs, volatility of the benchmark index, index composition changes, and corporate activity (Chiang 1998). In a way, the tracking error of ETFs is expected to be higher than that of index funds as the bid-ask spreads for ETFs are much higher. Consequently, the volume of ETFs that track indices is also much lower than that of index funds. Cash drag and the rebalancing costs involved due to the changes in the underlying index may also be responsible for tracking error (Kostovetsky, 2003). Our finding that ETFs underperform index funds is in line with Elton et al.'s (2002) finding that SPDR ETFs underperformed index funds.

4. Conclusion

This study examined the performance of ETFs and index funds that tracked their underlying index, either the S&P BSE SENSEX index or the CNX Nifty index. The study also examined the Jensen's alpha for both ETFs as well as index funds to determine whether the fund managers were able to generate excess returns. The study examined the tracking error of ETFs and index funds. This study was limited to those funds that had AUM of more than INR 5 crore and restricted to those funds for which data was available.

From the analysis of the active returns of ETFs, we found that ETFs outperformed their underlying index—the S&P BSE SENSEX or the CNX Nifty. On the other hand, the index funds showed mixed results. The analysis of the active returns revealed that the index funds that tracked the S&P BSE SENSEX underperformed. A majority of the index funds that tracked the CNX Nifty also underperformed while a few index funds outperformed the underlying CNX Nifty index. The reason why ETFs outperformed their underlying index could be their lower expense ratios. Since index funds have higher management fees and are also subject to higher capital gains tax compared to ETFs, underperformance would be seen more in the case of index funds than in the case of ETFs.

The analysis also revealed that Jensen's alpha was uniformly negative for all the funds, which could be due to the passive nature of index funds and ETFs. A plausible explanation for the alphas being negative is that the index funds and ETFs have to factor in the transaction costs involved while transacting in the stock market. Another reason could be that funds are always not fully invested—some amount of cash is generally held by the funds at any given point of

time. The negative alpha reported in our study is in line with the findings of Redman *et al*. (2000) who reported negative alphas for funds that tracked the U.S. market.

Further, the analysis revealed that the tracking error was minimal and insignificant for most of the funds. However, a couple of funds that tracked the S&P BSE SENSEX index had significant tracking error. More importantly, the tracking error was higher for the ETFs compared to the index funds. Funds do maintain some portion of their capital as cash and are not fully invested in stocks, which could be the cause of tracking error, apart from other factors such as the volatility of the benchmark, the replication strategy followed by the fund, and the transaction costs involved (Chiang, 1998). The tracking error of ETFs was found to be higher than that of index funds; this was probably due to the higher bid-ask price of ETFs.

Thus, the analysis highlighted that ETFs performed better than index funds; this finding is similar to the findings reported in Svetina (2010). In India, although ETFs have been in existence for more than a decade, they are making their presence felt slowly. The results of our study have important policy implications for asset management companies (AMCs) as they can position their products suitably in the market. The major reason why ETFs have not caught up as much in India as they have in the U.S. and in Europe is probably because of the lesser incentives to market ETFs as compared to mutual funds, which earmark higher amounts for marketing their products. Moreover, the ETFs in India are passively managed. If the ETFs were to be actively managed (thereby giving higher returns to the investors), ETFs would definitely catch the attention of the investing fraternity. Policymakers should come up with better policies to enhance the growth of ETFs. Moreover, since ETFs are one of the modes of disinvestment in the future, policymakers should actively consider promoting the growth of ETFs.

5. Limitations

The major limitation of this study is that the sample size was reduced considerably due to the non availability of data. Further, the results of this study could have been different if more number of mutual fund schemes were included for analysis. The other limitation of this study is that there may be structural breaks in the time period and this has not been considered in the study. The study also has not considered macroeconomic factors like exchange rate, inflation and political risks which could have impacted the performance of the funds.

References

Ackert, L.F., and Tian, Y.S. (2000). Arbitrage and Valuation in the Market for Standard and Poor's Depositary Receipts. *Financial Management*, 29, 71–87.

Badrinath, S.G., and Gubellini, S. (2010). Mutual Fund Performance: A synthesis of taxonomic and methodological issues. *IIMB Management Review*, 22, 147–164.

Chiang, W. (1998). Optimizing Performance. In A. Neubert (ed.), *Indexing for Maximum Investment Results*, GPCo Publishers, Chicago, Illinois.

Elton, E.J., Gruber, M.J., Comer, G., and Li, K. (2002). Spiders: Where are the bugs? *Journal of Business*, 75(3), 453–472.

Engle, R., and Sarkar, D. (2006). Premiums-Discounts and Exchange Traded Funds. *Journal of Derivatives*, 27–45.

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

Gallagher, D.R., and Seagara, R. (2006). The Performance and Trading Characteristics of Exchange Traded Funds. *Journal of Investment Strategy*, 1(2), 49–60.

Kostovetsky, L. (2003). Index funds and Exchange Traded Funds. *Journal of Portfolio Management*, 29, 80–92.

Poterba, J.M., and Shoven, J.B. (2002). Exchange Traded Funds: A new investment option for taxable investors. *American Economic Review*, 92, 422–427.

Prasanna, K.P. (2012). Performance of Exchange Traded Funds in India. *International Journal of Business and Management*, 7, 122–141.

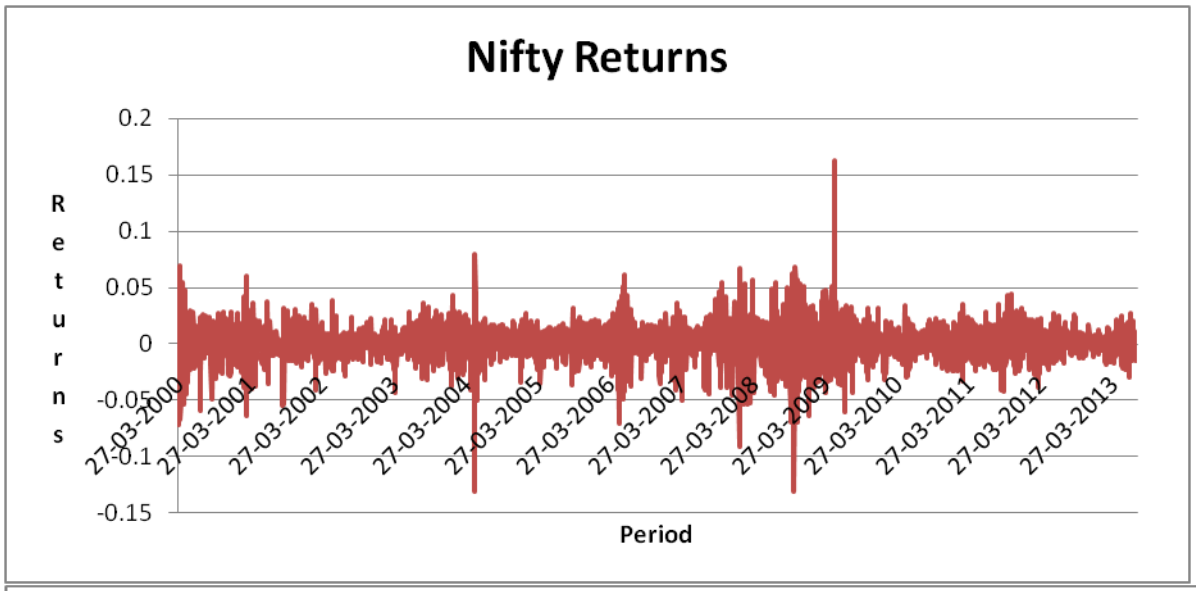
Redman, L.A., Gullett, N.S., and Manakyan, H. (2000). The Performance of Global and International Mutual Funds. *Journal of Financial and Strategic Decisions*, 13(1), 75–85.

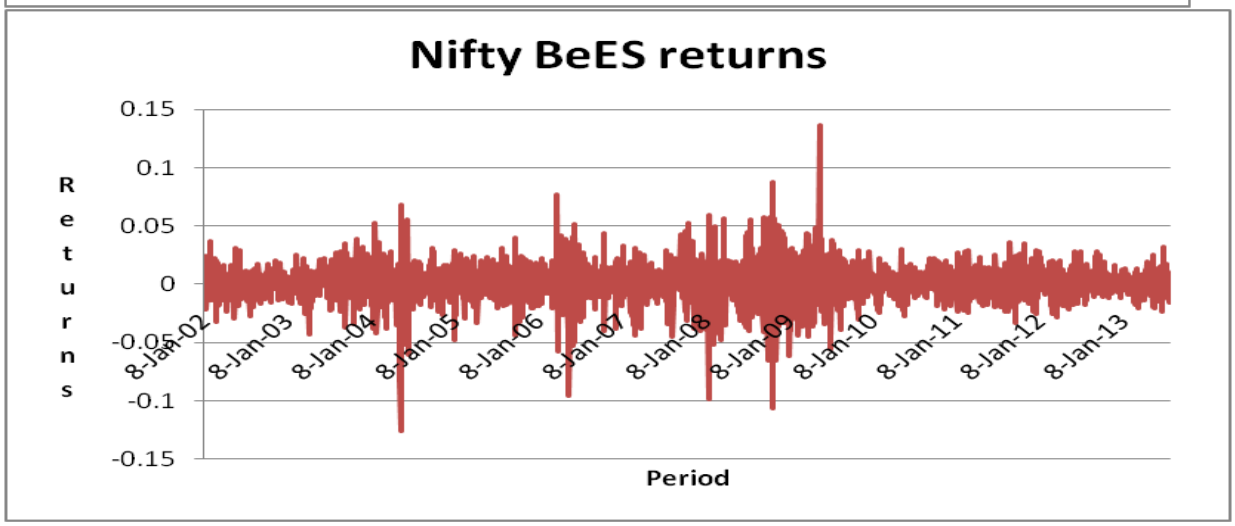
Rompotis, G.G. (2005). An Empirical Comparing Investigation on Exchange Traded Funds and Index Funds Performance. *Working Paper*.

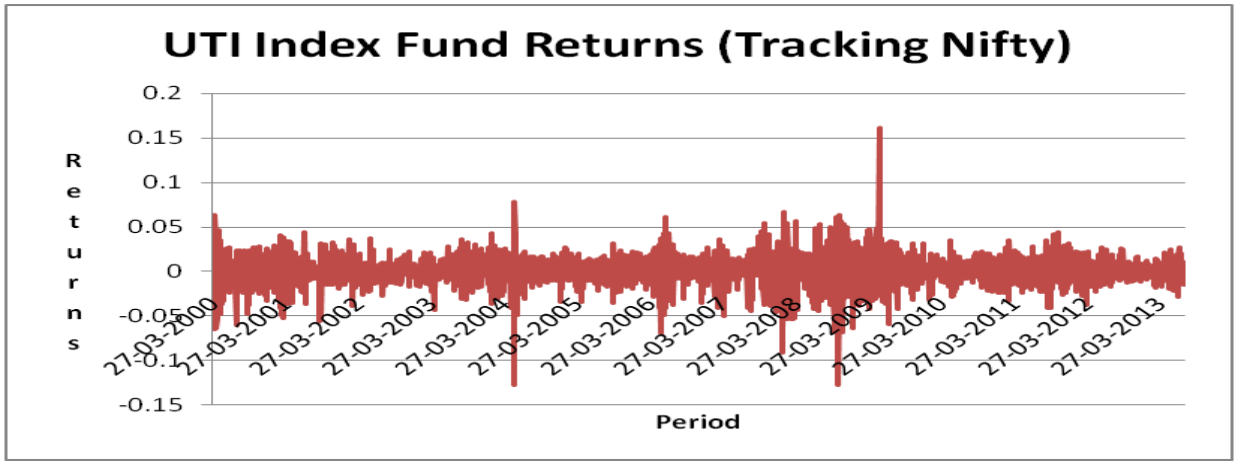
Svetina, M. (2010). Exchange Traded Funds: Performance and competition. *Journal of Applied Finance*, 20(2), 130–145.

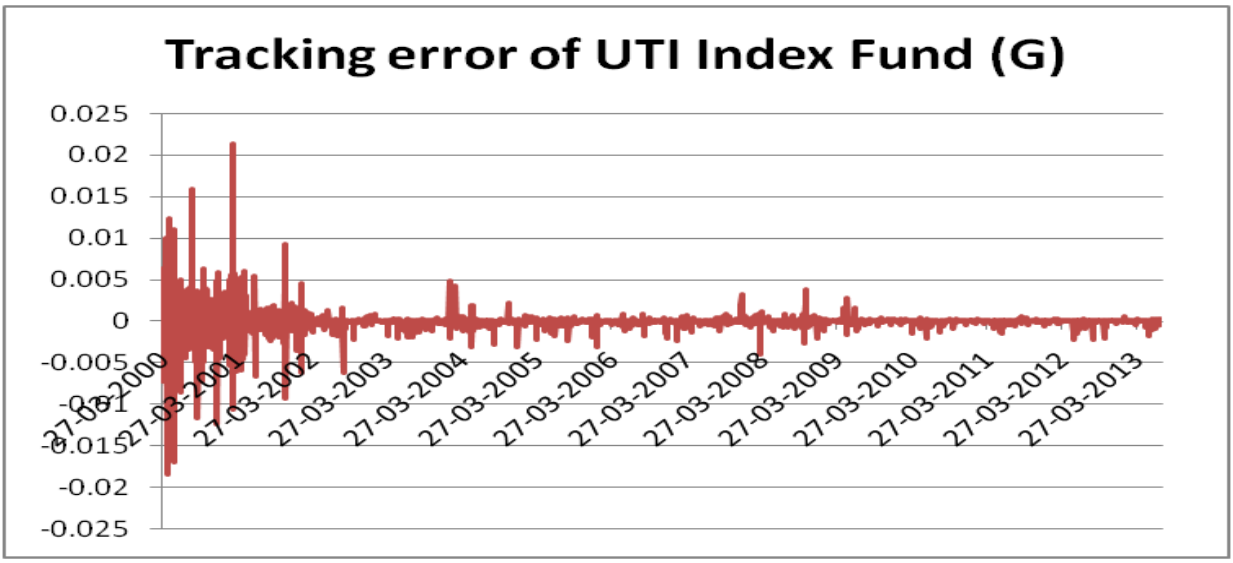
Appendix

Figure 1: Sample Performance of Exchange-Traded Funds and Index funds








Tracking error of UTI Index Fund (G)
0.025
0.02
0.015
0.01
0.005
0
-0.005
-0.01
-0.015
-0.02
-0.025
27-03-2000
27-03-2001
27-03-2002
27-03-2003
27-03-2004
27-03-2005
27-03-2006
27-03-2007
27-03-2008
27-03-2009
27-03-2010
27-03-2011
27-03-2012
27-03-2013