

Effectiveness of ETFs in Indexing: The Mean for Equity Investments by Employees' Provident Funds in India

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Abstract

Purpose: This paper aims at finding the replication quality of Indian Exchange Traded Funds (ETFs) against the benchmark index and thus finding out the prudence of the decision to choose ETFs as the mean for getting equity exposure by EPFO in India. **Methodology:** Tracking Difference [TD] and Tracking Error [TE], two mostly followed metrics have been used to measure the performance of ETFs. **Results:** Very low level of tracking difference and tracking error exhibited by the ETFs under study. **Findings:** It is found that ETFs in India have been able to closely track the underlying index and are able to offset the negative effect of factors contributing to tracking difference.

Keywords

ETF, Indexing, NAV, Passive Management, Employees' Provident Funds

1. Introduction

Few days back a good old friend of mine, who is a monthly pension holder, depicted his concern asking 'why pension funds are becoming tension funds'. This is absolutely rational thinking on the part of a person who only needs regular income with safety of principal. He is afraid of losing his money in a sudden crash in the stock market. To abate the panic of millions of people like him, it can be said that it is mere 5%-15% of the incremental inflow of the funds to be invested into equity. It means no money from the existing investment in secured instruments like Govt. bonds and treasury bills will be taken out and be put into equities. In US and UK, majority of the corpus of state run pension funds is invested in equities and equity related instruments.

Secondly, it is an observed fact that over the long run, equities outperform all the other asset classes by far. This holds well in Indian scenario as well. The returns generated by equity over longer horizon of time have substantiated the associated volatility, in spite of witnessing some of the worst possible market crashes. Finally, deployment of funds in equities will be through Exchange Traded Funds (ETFs). ETFs applies passive investment style and try to replicate the

return generated by the benchmark index (Sensex, Nifty), using indexing strategy. Passive investment is gaining popularity worldwide, as instances have shown that it is not possible for the actively managed funds to beat the benchmark index consistently over the period of time. An ETF which is traded through a recognized stock exchange brings some measurable benefits for the investors. The fund management cost of an ETF is much lower than the cost of managing an actively managed fund, apart from the benefit of closely tracking the return of a publicly observable index. ETFs are based on the underlying principle 'To be in line with the market, not to beat the market'. But at times market beats ETFs - leading to 'Tracking Error'. It is the primary factor to be considered in choosing ETFs for the implementation of indexing strategy to gain exposure of equity. Fama, (1965) set the cornerstone for passive management in 1965 with his study on market efficiency. He suggested that, since the prices of securities instantly and fully reflect all public and inside information available, price movements cannot be predicted using past prices. In consequence, investors on average can only perform the same as the market. They come off best by simply buying and holding a diversified basket of stocks, whilst minimizing fees and taxes. Kuo and Mateus (2007) investigated the

performance persistence of 20 iShares MSCI country-specific ETFs in comparison with the Standard and Poor (S&P) 500 Index, finding first, ETFs can beat the market and second, there is evidence on performance persistence based on annual returns. Over the years tracking error has emerged to be a key yard stick in judging the performance of ETFs. Larsen and Resnick (1998) demonstrated that the high-capitalization portfolios present lower tracking error and volatility than the low-capitalization portfolios. Frino and Gallagher (2001) analyzed the major factors that affect tracking error and found that expenses, dividend payments arising from stocks as the factors responsible. They also found a seasonal pattern in tracking error. Less effort has been directed to measure the performance of equity ETFs in India. P. Krishna Prasanna (2012) tried to assess the performance of different categories of ETFs floated in India during the period 2005-2011.

Basic, cross and super efficiency models were used to appraise and rank the ETFs.

Simple performance metric such as annualized tracking difference has been ignored in judging the replication quality of Indian ETFs. To the best of the author's knowledge, this the first time annualized tracking difference is being used in gauging the replication quality of ETFs floated in India.

2. Review of Literature

Existing literature on performance of ETFs provide mixed results. Many papers reported superior replication quality of ETFs, very closely tracking the returns of underlying index. Whereas others reporting negative performance of ETFs. Adjei Frederick (2009) found no significant return difference between ETFs and the underlying index S&P 500. Johnson (2009) found existence of tracking errors between foreign ETFs and the underlying index returns. Blitz David (2010) investigated the performance of index mutual funds and the ETFs that are listed in Europe. They found that European index funds and ETFs underperform their benchmarks by 50 to 150 basis points per annum. William (2009) found the existence of tracking errors between foreign ETFs and the underlying home index in US. Elton *et al.* (2002) examine Spiders which track the S&P 500 index, and show that while the ETF's NAV is close to fair market value, these investment products underperform the market by 28 basis points per year, as well as underperforming competing index funds by 18 basis points per annum. Their research shows that a large determinant of the underperformance arises from management fees and the costs associated with non-accruing earnings on dividends. The work also highlights that the relative performance difference may be tolerated by investors given the value that is provided for immediacy, together with the product's usefulness in risk control. Jares and Lavin (2004) examined the pricing efficiency of ETFs compared to the value of the underlying stocks and found that for foreign exchange-traded funds, the asynchronous nature of trading and the information flow across markets led to frequent premiums and discounts in ETF valuation. Their work documents the importance of information sourced from the

U.S., which leads to predictability in the daily return of Japanese and Hong Kong iShares ETFs. Blitz David and Huij (2011) evaluated the performance of ETFs that provide passive exposure to global emerging markets (GEM) equities and found that GEM ETFs exhibit higher tracking error. Houweling (2011) found that treasury ETFs were able to track their benchmark but investment grade corporate bond ETFs and high yield corporate bond ETFs underperform their benchmarks. Charupat & Miu (2011) analyzed the performance of leverage ETFs, and concluded that price deviations are small among leverage ETFs and that price volatility is more, as a result of rebalancing, at the end of the day. Gerasimos G. Rompotis (2015) found that majority of the selected iShares beat the S & P 500 Index, both at the annual and the aggregate levels while the return superiority of ETFs strongly persists at the short-term level. The tracking error of ETFs also persists at the short-term level. Narend (2014), made a comparative analysis of the performance ETFs and index funds. The results showed superior replication quality of ETFs as compared to index funds.

3. Data and Methodology

3.1. Selection of Exchange Traded Funds (ETFs)

For the purpose of measurement of replication quality, equity ETFs in India with underlying benchmark S&P CNX Nifty have been analyzed. The selection of ETFs emphasizes inclusion of funds across all AMCs.

3.2. Data Source & Period

The study is based on secondary data. Daily tracking error and expense ratio is based on the past one year data up to Jan 31, 2015. Annualized tracking difference has been calculated for one year and three years. Annualized tracking error of daily differential return has been calculated for one year.

3.3. Performance Metrics

In absence of standardized methodology for measuring the performance of ETFs, the most widely used measures are Tracking Difference and Tracking Error. They have been used to gauge replication quality of ETFs. Expense ratios of the ETFs have also been judged as it has direct relationship with tracking difference.

- 1) Tracking Difference (TD) - Depicts the difference in return between respective ETF and the underlying index. Tracking difference is simply the difference of annualized return of the fund and annualized return of its benchmark return over a specific period of time

$$TD = Y_t - b_t \quad 1$$

[where TD is annualized tracking difference, Y_t is annualized return of ETF and b_t is annualized return of underlying index]

- 2) Tracking Error (TE) - Denotes annualized volatility of

differential returns between the ETF and the underlying index. It is the standard deviation of return differential of daily/weekly/monthly returns between the ETFs and index. Annualized factor is used on the basis of calculation of differential returns. In this paper volatility of daily return differential has been annualized assuming 250 trading days (mostly followed).

$$TE = \sqrt{N} \times \sigma(x), \sigma(x) = \sqrt{\left[\frac{1}{N-1} \times \sum \{x_i - \text{mean}(x)\}^2 \right]}$$

[TE is annualized tracking error; $\sigma(x)$ is standard deviation of differential return and N is the number of observations]

4. Meaning of Indexing Strategy

Indexing is an investment management approach that seeks to replicate the returns generated by the underlying stock index, set as benchmark. To mimic the returns of the benchmark index, an investment manager holds all the securities constituting the index and in the same proportion. In case of an actively managed fund the investment manager tries to outpace the index by applying techniques like, specific stock picking, narrowing diversification, etc. There are no such elements of active investment management style in indexing strategy. The ultimate motto of indexing is to mirror the performance of the underlying index, hence incorporating the movement of the broad market. For these very reasons, indexing is considered as passive management. It is often found that the size of the underlying index is huge; therefore it becomes difficult for the investment manager to hold all the stocks (equity index) of the index for implementing indexing strategy. In this particular case, a sample of stocks selected to represent the underlying index, known as 'Sampled indexing'. Whereas, 'Fully replicated indexing' implies holding of all constituent stocks of underlying index, in the same proportion. Indexing is gaining popularity worldwide because over the years it is found that

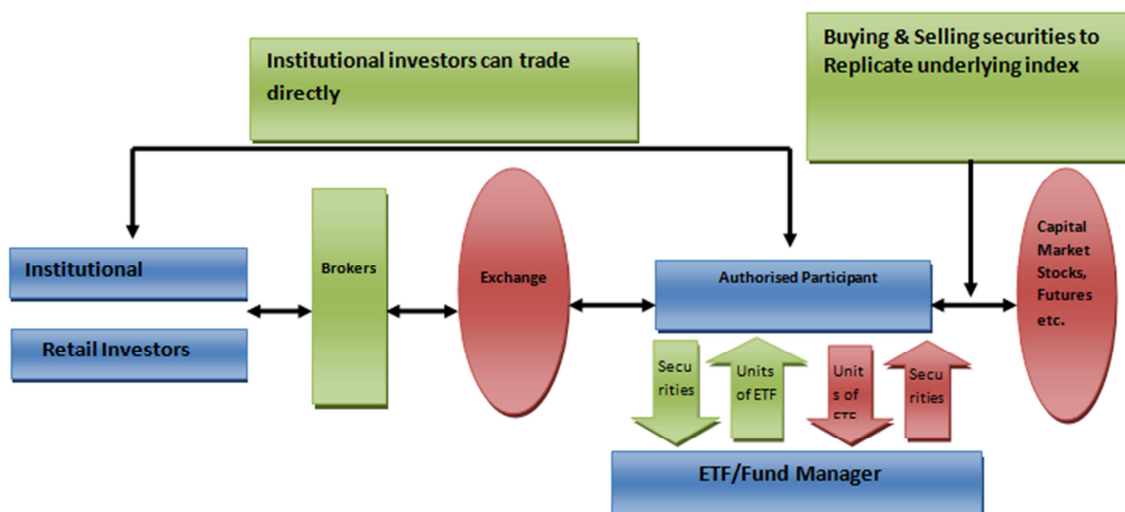
consistently outperforming the market is not possible even for highly valued investment managers. Thus it is being considered as the safer means of gaining equity exposure for the beginners, and investors who are averse to risk.

5. Overview of Exchange Traded Funds (ETFs)

From the name itself, one can gauge that ETF is a fund that is traded through stock exchanges.

These are essentially mutual fund schemes that are listed and traded on the exchange like any other security like stocks, bonds etc. It is important to note that a closed end mutual fund also keeps exchange trading as one of the options for investors to exit, but fundamentally it is different from an ETF as regards creation of units and method of operations. Investors can purchase and sell ETFs through a stock brokerage account. The benefit of placing orders like market and limit orders are there for an ETF as in the case of a common stock, making it an alluring investment vehicle for investors. ETFs are not supposed to outperform the underlying index. These are passively managed funds and hold all the stocks constituting the index in same proportion.

- *Process of unit creation and redemption:* The mechanism upon which an ETF operates is unique and different from other passively managed funds. Institutional investors or market makers sign agreement with the ETF sponsor to become authorized participants. They buy all the scrips of the market index on which equity oriented ETF is based upon and hand it over to the fund house in exchange of a certain number of units. This is the process of unit creation of an ETF. The market maker then breaks up these units enabling the investors to buy and sell these units in the stock exchange. An authorized participant can redeem ETF units and receive the portfolio of stocks.



Source: Own Illustration following Thomas Schär (2014)

Figure 1. Creation – Redemption & Trading Process of ETFs.

- **Pricing of units:** Both creation and redemption of units occur at Net Asset Value (NAV). NAV is calculated after dividing net asset of the ETF by number of outstanding ETF units. Net asset is found out after subtracting expenses of the fund from total asset of the ETF. The intra-day trading of ETF occurs at a price which is determined by the market force of demand and supply. Though the day-trading price of ETFs are fundamentally linked to NAV and are very close to NAV, yet there are times when ETFs are traded at premium (higher than) or discounts (lower than) to NAV. The ability of authorized participants to create and redeem units keeps a check on premium and discounts.
- **ETFs Vs Index Funds:** Both ETFs and Index funds are passive funds and follow publicly observable market indexes. Index funds are directly bought and sold directly from the fund. Being open end in nature, index funds need to keep buffer cash for redemption that is often more than the prescribed limit of 0-5%. It inevitably results in substantial difference in returns between the fund and underlying index. Where as in case of an ETF creation and redemption of units is done against the basket of stocks, the cash components remains static throughout, resulting in lower differential returns. In addition to this an index fund has to incur brokerages to rebalance the portfolio (Commission to brokers for buying and selling scrips). An ETF effectively does not buy and sell scrips as the market maker is responsible creating units. ETFs can better replicate the returns of underlying index than an index funds due to lower expenses and fund management

fees.

6. Replication Quality of ETFs in Light of Performance Metrics

Tracking error is often cited as the most important consideration for selecting an ETF. It measures the quality of index replication. But it fails to measure the absolute difference in returns between a fund and its underlying index as it only reflects the volatility of differential returns. So if an ETF is able to maintain uniformity throughout the period, as regards quantum of differential returns it will depict a low tracking error (the magnitude of return differential might be on the higher side). Use of tracking difference fulfils this gap in judging the replication quality of an ETF. TD tells us whether an ETF has underperformed or over performed against the benchmark index over a period of time. So use of both TE and TD serves the purpose in judging the replication quality of an ETF. This methodology is congruent with the recommendation of European Securities and Markets Authorities (ESMA) and International Organization of Securities Commissions (IOSCO), in their latest consultation paper on this subject. A secondary factor used in this paper for judging replication quality of ETFs is Total Expense Ratio (TER). It is an annual expense charged to the fund to cover costs ranging from index licensing to custodial fees. This charge is deducted from a fund's NAV on a daily basis. This important to note that TER directly induces TD but it will not have an impact on TE if this ratio remains constant over the calculation's time period.

Table 1. Tracking Difference of ETFs.

Schemes Name	Annualized Return(%) of Scheme		Annualized Return(%) of Nifty		Annualized (%) of Tracking Difference	
	1 Year	3 Years	1 Year	3 Years	1 Year	3 Years
Birla Sun Life Nifty ETF	10.38%	19.44%	8.82%	18.45%	1.56%	1.00%
IIFL Nifty ETF	10.11%	19.86%	8.82%	18.45%	1.28%	1.42%
Kotak Nifty ETF	8.85%	19.24%	8.82%	18.45%	0.02%	0.80%
Motilal Oswal MOST Shares M50 ETF	2.60%	17.62%	8.82%	18.45%	-6.23%	-0.82%
Religare Invesco Nifty ETF	9.42%	19.10%	8.82%	18.45%	0.60%	0.66%
ICICI Pru Nifty ETF	9.91%	NA	8.82%	NA	1.09%	NA
R* Shares Nifty ETF	10.26%	NA	8.82%	NA	1.44%	NA

Source: economic times & author's compilation data as of 30/06/2015

Table 2. Tracking Error & Expense Ratio of ETFs.

Schemes Name	Benchmark	Scheme's Age (Yrs)	Expense Ratio (%)	Annualized Tracking Error (Daily)%
Birla Sun Life Nifty ETF	Nifty	3.55	0.9	0.05
IIFL Nifty ETF	Nifty	3.32	0.25	0.02
Kotak Nifty ETF	Nifty	5.03	0.49	0.02
Motilal Oswal MOST Shares M50 ETF	Nifty	4.56	1.36	0.37
Religare Invesco Nifty Exchange Traded Fund	Nifty	3.67	1	0.02
ICICI Pru Nifty ETF	Nifty	1.89	0.5	0.02
R* Shares Nifty ETF	Nifty	1.2	0.22	0.02

Source: hdfcsec.com & author's compilation data as of 31 Jan 2015

7. Findings & Conclusions

From Table 1, it is found that most of the ETFs under study are able to track the underlying index efficiently by keeping the annualized TD just around one percent. Only Motilal Oswal MOST Shares M50 exhibits an unacceptable figure one year TD of -6.23% and can be treated as odd one in the category. From Table 2, it is vivid that all the ETFs under study depict a very low tracking error and are much below the internationally accepted level of 0.5% for passively managed funds. Low level of annualized volatility of daily difference [TE] justifies that, there has been no offsetting effect of daily difference in exhibiting low level of TD. As regards, expense ratio all the ETFs are well within maximum allowed expense ratio of 1.5%. Again Motilal Oswal MOST Shares M50 shows comparatively higher expense ratio of 1.36% and we can correlate this with higher one year TD exhibited. Though we cannot establish any direct relationship between expense ratio and TE, as stated earlier.

Judging the figures exhibited against the performance metrics we can conclude that equity ETFs in India are effectively managed to mimic the performance of the underlying index. Small % of Positive TD shows that even ETFs are able to beat the return of the underlying index. Though seems surprisingly for a passively managed funds with factors like expense ratio and cash drag contributing to negative TD, it is the very small portion of corpus that is actively managed offsets the negative and fetches observable small positive [subject to further research]. So it seems a prudent decision to choose ETFs as the exclusive mean for equity investment by EPFO in India.

8. Limitations

Corresponding time period as regards one year data relating to TD and TE could not be used due to data constraint. Annualized TD for three years could not be used for few ETFs due to age of the ETFs

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