

Chapter 4

Assessing Market Risk of Indian Index Funds

An index fund is a mutual fund that aims to imitate a benchmark index. In India, there has been significant growth in the number of such funds since 2002. These funds are exposed mainly to market risk. In this chapter we assess and compare the market risk and the risk-adjusted returns of these funds. VaR and ES are well known measures of the market risk. The Sharpe ratio and the Treynor ratio measure risk-adjusted return earned in excess of average market return (see [94], [102]). For each fund, we estimate these measures. Most of the index funds exhibit similar market risk as the NIFTY or the SENSEX index, which they mimic. Moreover, the market risk of these funds seems to be unaffected by multiple-fund management by the respective fund managers. Ideally, an index fund is expected to exhibit similar risk and risk-adjusted return as the benchmark index. We identify some such Indian index funds.

4.1 Introduction

An index fund is a mutual fund based on the concept of “indexing” or “passive investment”, where the aim is to create a portfolio by replicating the composition of some benchmark index. In such funds no attempt is made to outperform the market, rather the goal is to follow the composition of some broad index as closely as possible. Usually actively managed mutual funds aim to maximize investors’ gain and mitigate risk through diversification. Success of such funds depends on the skill and vision of the fund manager. However, several researchers have questioned the effectiveness of the various actively managed funds in outperforming some broad market index or in minimizing risk through diversification.

Deb [29] has suggested that several Indian equity fund managers have not been able to beat their style benchmarks on the average. These observations seem to support the efficient

market hypothesis, which suggests that one cannot consistently achieve returns in excess of average market returns on a risk-adjusted basis, given the information available at the time the investment is made (see [73]). The index funds provide the opportunity to invest in a portfolio which is a replica of some broad market index. In India there has been a significant increase in the popularity of index funds over the last ten years (see [89]). Since an index fund aims to replicate a market index, it is natural to expect the fund to have similar market risk and returns as the index that it imitates.

However, from Sarkar et al. [89] we see that not all the Indian index funds perform equally well in terms of following a benchmark index closely over a long period of time. Bryant and Liu [19] observed that different fund management structures, such as unitary (single-fund) management and multiple-fund management, have significant impact on the risk exposure of the respective funds. The authors conclude that if a single fund manager operates multiple funds, at least one of these funds can significantly deviate from its stated objective. We observed that the fund managers of several Indian index funds manage multiple funds. Therefore, we also investigate whether multiple fund management has any impact on the risk of the Indian index funds.

Athma and Mamatha [6] have observed that there has been a significant growth of the index funds, since their inception. A well known measure of the performance of an index fund is the tracking error, which is usually defined as the annualized standard deviation of the difference between the daily returns of the index funds and the target index (see [89]). Fernandes[42] has pointed out that the tracking error of an index fund can be highly sensitive to the market volatility. Sarkar et al. [89] have argued that high tracking error need not always imply poor long term performance of the fund, especially in a volatile market, and that the existence of co-integration (see [40]) between the daily NAV of the index fund and the values of the target index is a more desirable characteristic.

Testing the existence of co-integration between Indian index funds and the respective benchmark indices is a new and interesting approach towards assessment of long term performance of these funds (see [13]). But this approach does not quantify the market risk of these funds. We aim to measure the market risk and risk adjusted returns of twenty one Indian Index funds, and investigate whether all these index funds offer similar risk-return trade-off to the investors.

Bryant and Liu [19] have studied the effect of mutual fund management structure on fund risk and performance. The authors have found that when fund managers manage multiple funds simultaneously, a fund's risk can spill over to other funds managed under the same fund manager which makes a mutual fund's actual objective deviate from the stated one. Bryant and Liu [20] also find that the risk volatility of at least one fund managed by a

multiple fund manager is significantly higher than its objective and risk-adjusted peers.

The authors find that fund management companies having a multiple fund management structure (i.e. one fund manager handling funds) are more likely to adopt trading strategies that increase fund risk-taking at the expense of individual fund investors. We observe that most of the Indian index funds are being managed by fund managers who handle multiple funds (see Tables 4.11 and 4.12). In view of the findings of Bryant and Liu ([19], [20]), a natural question is that whether multiple fund management has significant impact on the market risk and risk adjusted returns of the Indian index funds? We aim to answer this question as well.

4.2 Problem description

All the equity based mutual fund investments are subjected to “market risk”, arising from the volatility in the price of the risky assets in the portfolio. In an index fund the manager’s objective is to track some index as closely as possible. Therefore index funds involve mainly market risk due to the fluctuations in the equity price. We estimate a number of well known measures of the market risk such as the VaR and ES and the risk adjusted returns such as the Sharpe and Treynor ratio of twenty one Indian index funds, based on historical data.

The comparison of the Sharpe ratio and the Treynor ratio provide insight into the performance of the index funds in terms of reaping higher returns than its peers, without too much additional risk. The estimates of the VaR and the ES of the Indian index funds are compared with the same for the benchmark indices which they mimic. This comparison enables us to understand whether the Indian index funds exhibit similar market risk as that of the SENSEX or NIFTY index. We also study whether the number of funds managed by a fund manager has any impact on the market risk and risk adjusted returns of the Indian index funds.

We compare the 95 and 99 percent daily VaR and ES values, based on the historical data on daily and monthly losses of the Indian index funds with the same for the SENSEX or the NIFTY index, which the funds imitate. The computations of the VaR and the ES depends on the knowledge of the loss distribution function F of a portfolio. The exact loss distribution is not known in practice, and it is estimated using the empirical distribution of the historical losses of that portfolio over a certain period of time in the past.

4.3 Computation

VaR estimation essentially involves estimation of the extreme quantiles of the loss distribution. There are several quantile estimators for estimating VaR. We defined a kernel estimator based on Swanepoel and Grann's distribution function estimator $S-G_p$ (see equation 2.5) in Chapter 2 of the thesis. We observed that $S-G_p$ estimator performs well under all the different time series models considered in our simulation study for sample size $n \leq 500$ and $1-p = 0.999$. Hence this estimator appears to be useful for estimation of VaR based on short term (less than one financial year) asset return data. But for large sample size n and small p we observed that none of the estimators seems to outperform the Empirical estimator (that is the sample quantile). So based on these observations we have estimated the 95 and 99 percent VaR of the daily returns of index funds by Empirical estimator and monthly returns of index funds by Swanepoel and Grann's estimator ($S-G_p$).

The ES is a function of the VaR. It is the mean of the conditional loss distribution, given the event that the loss exceeds the VaR. There are several estimators for estimating expected shortfall. In Chapter 3 of the thesis we have observed that estimator of Brazauskas et al. ($\widehat{ES}_p$) (see equation 3.2) is a preferable choice for estimating expected shortfall for large $n > 1000$ and $1-p = 0.999$, such that $np > 1$. But for $np < 1$ no such estimator seems to outperform the empirical estimator. So based on these observations we have estimated the ES of the daily returns of index funds by Brazauskas et al.'s estimator and monthly returns of index funds by Empirical Estimator.

The Sharpe ratio measures the excess return per unit of the deviation in a portfolio or an asset. Sharpe [94] defined this ratio as follows

$$S = \frac{E(R_a - R_b)}{\sqrt{\text{var}(R_a - R_b)}}$$

where R_a is the asset return, R_b is the return on a benchmark asset. The Treynor ratio relates excess return over the benchmark return to the additional risk taken (see [102]). It is defined as

$$T = \frac{E(r_a - r_b)}{\beta_a}$$

where r_a is rate of return of the asset, r_b is the rate of return of the portfolio benchmark and β_a is portfolio a 's beta.

In Tables 4.1 and 4.2, we provide the 95 and 99 percent VaR estimates for the NIFTY and the SENSEX based index funds respectively. In the Tables 4.3 and 4.4, we provide the 95 and 99 percent ES estimates for the NIFTY and the SENSEX based index funds respectively. In Tables 4.5 and 4.6, we report the estimated 'Sharpe Ratio' values for the NIFTY and SENSEX based index funds. The values of the estimated 'Treynor Ratio' for

these funds are reported in Tables 4.7-4.10. In Tables 4.11 and 4.12, we report the names of the fund managers of the NIFTY and SENSEX based index funds, and also reported the number of funds handled by each manager.

4.4 Analysis of results

Following are the main observations.

1. The Sharpe ratio measures the risk adjusted average daily and monthly return, earned in excess of the average daily and monthly return of the market index. Since an index fund aims to mimic a market index, the Sharpe ratio of such a fund is expected to be close to zero (as the average return of the fund and the index are expected to be close). However, the Sharpe ratio of some of the Indian index funds appears to be substantially different from zero. We observe that for seventeen out of the twenty one Indian index funds the values of this ratio are much closer to zero than the same for the remaining funds (see Tables 4.5 and 4.6). Among the Nifty based funds, Canara Robeco Nifty Index, UTI Nifty Index Fund, Tata Index Fund-Nifty A, Principal Index Fund-Growth, Nifty BeES, Kotak Nifty ETF, HDFC Index Fund-Nifty Plan, Franklin India Index Fund, UTI Sunder, SBI Magnum Index Fund and Franklin India Index Tax Fund are much closer to zero in case of daily returns and Canara Robeco Nifty Index, Nifty BeES and Franklin India Index Fund are much closer to zero in case of monthly returns (see Table 4.5). Among the SENSEX based funds, the Sharpe ratio of the UTI Master index Fund, Tata Index Fund-Sensex A, Kotak Sensex ETF, Sensex ICICI Prudential ETF, HDFC Index Fund Sensex Plan and Franklin India Index Fund-BSE Plan-Growth Plan are much closer to zero in case of daily returns and UTI Master Index Fund and Sensex ICICI Prudential ETF are much closer to zero in case of monthly returns (see Table 4.6).
2. The Treynor ratio measures the excess return per unit beta, and for the same reason as mentioned above, the Treynor ratio of an index fund is expected to be close to zero. From the Tables 4.7 and 4.8, we see that Canara Robeco Nifty Index, Tata Index Fund-Nifty A, Nifty BeES, Franklin India Index Fund, SBI Magnum Index Fund and Franklin India Index Tax Fund are much closer to zero in case of daily returns and Canara Robeco Nifty Index, Nifty BeES and Franklin India Index fund are much closer to zero in case of monthly returns than the same for the remaining index funds imitating Nifty. From the Tables 4.9 and 4.10, we see that UTI Master Index Fund, Tata Index Fund-Sensex A, Sensex ICICI Prudential ETF and Franklin India Index

Fund-BSE Plan-Growth Plan are much closer to zero in case of daily returns and UTI Master Index Fund and Sensex ICICI Prudential ETF are much closer to zero in case of monthly returns than the same for the remaining index funds imitating SENSEX.

3. From the Tables 4.1 and 4.2, we note that for most of the Indian index funds the 95 and 99 percent VaR closely resemble to the same for the respective benchmark indices. Only four out of twenty one index funds i.e. LIC Namura MF Index Fund, UTI Sunder, Franklin India Index Tax Fund and UTI Master Index Fund possess higher absolute values of the 95% and 99% VaR than the same for the benchmark indices for monthly returns (see Tables 4.1 and 4.2).
4. From the Tables 4.3 and 4.4, we see that for most of the Indian index funds the 95 and 99 percent ES closely resemble to the same for the respective benchmark indices. Only two out of twenty one index funds i.e. LIC Namura MF Index Fund and UTI Master Index Fund seem to possess higher absolute values of the 95 and 99 percent ES than the same for the benchmark indices (see Table 4.3 and 4.4). This suggests that the extreme monthly losses in this fund can be slightly less severe as compared to other index funds.
5. From the Tables 4.1-4.2, we see that for thirteen out of twenty one index funds the absolute values of the 95 and 99 percent VaR are less than the same for the respective market indices, which they imitate. This suggests that the extreme daily and monthly losses in these funds are expected to be less severe than the same in the respective benchmark indices. These funds are Birla Sun Life Index Fund, UTI Nifty Index Fund, Tata Index Fund-Nifty A, Principal Index Fund-Growth, Nifty BeES, HDFC Index Fund-Nifty Plan, SBI Magnum Index Fund, Tata Index Fund-Sensex A, LIC MF Index-Sensex Adv(G), LIC Namura MF Index Fund-Sensex Adv(D), Sensex ICICI Prudential ETF, HDFC Index Fund Sensex Plan and Franklin India Index Fund-BSE Plan-Growth Plan.
6. From the Tables 4.3-4.4, we see that for five out of twenty one index funds the absolute values of the 95 and 99 percent ES are less than the same for the respective market indices, which they imitate. This suggests that the extreme daily and monthly losses in these funds are expected to be less severe than the same in the respective benchmark indices. These funds are Nifty BeES, Tata Index Fund-Sensex A, Sensex ICICI Prudential ETF, HDFC Index Fund Sensex Plan and Franklin India Index Fund-BSE Plan-Growth Plan.

7. The Sharpe ratio for two funds, viz. the Nifty BeES and Sensex ICICI Prudential ETF, are substantially close to zero (see Tables 4.5 and 4.6). From the Tables 4.1-4.4, we see that the absolute values of the 95 and 99 percent VaR and ES of Kotak Nifty ETF are less than the respective benchmark index. But from Table 4.5 we see that the Sharpe ratio of Kotak Nifty ETF is substantially close to zero in case of daily returns.
8. From the Tables 4.11 and 4.12, we see that all the Indian index funds are managed by fund managers who manage more than one fund. From the above discussion we see that these index funds exhibit similar market risk as the SENSEX and the NIFTY indices. Hence multiple fund management does not seem to have any significant effect on the management of market risk of the Indian index funds.
9. From the Tables 4.7-4.10, we see that the absolute values of the beta coefficients of the entire Indian index are less than one. This indicates that these funds are low risk investments, and suitable for risk averse investors.
10. In Tables 4.13 and 4.14 we see that the ES of the Indian index funds with the number of funds handled by the respective fund managers. Most of the index funds seem to have similar ES as the corresponding benchmark index irrespective of the number of funds handled by the fund managers. In the Figures 1 and 2 we plot the number of funds handled by the fund managers against the daily ES of the index funds and also the ES of the respective benchmark indices. The red line indicates the daily ES of the benchmark index. The blue lines indicate the values 5 percent below and above the daily ES of the benchmark index. From Figures 1 and 2 we observe the daily ES of most (15 out of 21) of the Indian index funds are within the 5 percent range of the respective benchmark indices ES, irrespective of the number of funds handled by the fund manager. This indicates that the market risk of these index funds is not significantly affected by multiple fund management.

4.5 Conclusion

No one fund can be claimed to be uniformly the best in terms of all the four measures. Most of the Indian index funds seem to offer similar market risk (measured in terms of VaR and ES) as the corresponding benchmark indices. Only three out of the twenty one index funds seem to possess higher absolute values of the 99 percent ES than the same for the benchmark indices (see Tables 4.3 and 4.4). However, there seems to be significant difference among the risk adjusted excess daily and monthly returns (measured in terms of the Treynor and the Sharpe ratios) of the Indian index funds. We have identified three

funds, viz., Nifty BeES, Sensex ICICI Prudential ETF and Kotak Nifty ETF which seem to be more preferable than the other Indian index funds in terms of all the four criteria. These funds seem to exhibit slightly less extreme market risk than the respective benchmark indices and their risk adjusted daily returns are close to average daily returns in the NIFTY or the SENSEX indices, whichever they aim to imitate. It is interesting to note that Nifty BeES, Sensex ICICI Prudential ETF and Kotak Nifty ETF are found to be co-integrated with the corresponding market index (see [89]). Hence these funds are strongly recommended.

Bryant and Liu's [19] observed that when multiple funds are managed by a fund manager, the risk of one of the managed funds is significantly increased, minimizing the inherent benefits of mutual fund stock diversification. This increased risk exposure of the multiple management structure results in fund misclassification. An important feature of most of the Indian index funds seems to be that the market risk of these funds appear to be unaffected by multiple fund management.

Table 4.1: VaR of returns of the Nifty Index Funds.

Index	p	Daily	Monthly
CNX NIFTY	95%	-0.010	-0.079
	99%	-0.019	-0.116
Birla Sun Life Index Fund	95%	-0.010	-0.079
	99%	-0.020	-0.115
Canara Robeco Nifty Index	95%	-0.011	-0.083
	99%	-0.019	-0.122
UTI Nifty Index Fund	95%	-0.010	-0.079
	99%	-0.019	-0.118
Tata Index Fund-Nifty A	95%	-0.010	-0.078
	99%	-0.019	-0.118
Principal Index Fund-Growth	95%	-0.010	-0.078
	99%	-0.019	-0.115
Nifty BeES	95%	-0.010	-0.077
	99%	-0.019	-0.112
Kotak Nifty ETF	95%	-0.008	-0.046
	99%	-0.012	-0.084
HDFC Index Fund-Nifty Plan	95%	-0.010	-0.077
	99%	-0.018	-0.113
Franklin India Index Fund	95%	-0.010	-0.077
	99%	-0.019	-0.111
LIC Namura MF Index Fund	95%	-0.011	-0.088
	99%	-0.019	-0.128
UTI Sunder	95%	-0.013	-0.093
	99%	-0.023	-0.137
SBI Magnum Index Fund	95%	-0.010	-0.078
	99%	-0.019	-0.115
Franklin India Index Tax Fund	95%	-0.014	-0.094
	99%	-0.023	-0.141

Table 4.2: VaR of returns of the Sensex Index Funds.

Index	p	Daily	Monthly
Sensex	95%	-0.010	-0.080
	99%	-0.019	-0.116
UTI Master Index Fund	95%	-0.013	-0.101
	99%	-0.022	-0.141
Tata Index Fund-Sensex A	95%	-0.010	-0.081
	99%	-0.019	-0.117
LIC MF Index-Sensex Adv(G)	95%	-0.009	-0.073
	99%	-0.018	-0.115
LIC Namura MF Index Fund-Sensex Adv(D)	95%	-0.010	-0.079
	99%	-0.017	-0.117
Kotak Sensex ETF	95%	-0.010	-0.070
	99%	-0.018	-0.111
Sensex ICICI Prudential ETF	95%	-0.010	-0.081
	99%	-0.018	-0.119
HDFC Index Fund Sensex Plan	95%	-0.010	-0.081
	99%	-0.018	-0.117
Franklin India Index Fund-BSE Plan-Growth Plan	95%	-0.010	-0.081
	99%	-0.019	-0.116

Table 4.3: ES of returns of the Nifty Index Funds.

Index	p	Daily	Monthly
CNX NIFTY	95%	-0.016	-0.080
	99%	-0.026	-0.179
Birla Sun Life Index Fund	95%	-0.016	-0.080
	99%	-0.027	-0.167
Canara Robeco Nifty Index	95%	-0.017	-0.088
	99%	-0.027	-0.160
UTI Nifty Index Fund	95%	-0.016	-0.083
	99%	-0.026	-0.165
Tata Index Fund-Nifty A	95%	-0.016	-0.083
	99%	-0.026	-0.166
Principal Index Fund-Growth	95%	-0.016	-0.080
	99%	-0.026	-0.167
Nifty BeES	95%	-0.016	-0.078
	99%	-0.025	-0.176
Kotak Nifty ETF	95%	-0.010	-0.066
	99%	-0.015	-0.087
HDFC Index Fund-Nifty Plan	95%	-0.016	-0.080
	99%	-0.025	-0.157
Franklin India Index Fund	95%	-0.016	-0.078
	99%	-0.026	-0.165
LIC Namura MF Index Fund	95%	-0.017	-0.089
	99%	-0.030	-0.200
UTI Sunder	95%	-0.019	-0.100
	99%	-0.029	-0.160
SBI Magnum Index Fund	95%	-0.016	-0.080
	99%	-0.026	-0.164
Franklin India Index Tax Fund	95%	-0.020	-0.102
	99%	-0.030	-0.161

Table 4.4: ES of returns of the Sensex Index Funds.

Index	p	Daily	Monthly
Sensex	95%	-0.016	-0.081
	99%	-0.026	-0.159
UTI Master Index Fund	95%	-0.019	-0.104
	99%	-0.030	-0.163
Tata Index Fund-Sensex A	95%	-0.016	-0.082
	99%	-0.026	-0.159
LIC MF Index-Sensex Adv(G)	95%	-0.015	-0.083
	99%	-0.025	-0.151
LIC Namura MF Index Fund-Sensex Adv(D)	95%	-0.015	-0.085
	99%	-0.026	-0.177
Kotak Sensex ETF	95%	-0.016	-0.080
	99%	-0.026	-0.178
Sensex ICICI Prudential ETF	95%	-0.016	-0.084
	99%	-0.026	-0.162
HDFC Index Fund Sensex Plan	95%	-0.016	-0.083
	99%	-0.025	-0.160
Franklin India Index Fund-BSE Plan-Growth Plan	95%	-0.017	-0.087
	99%	-0.027	-0.158

Table 4.5: Sharpe Ratio of the Nifty Index Funds.

Index	Daily	Monthly
Birla Sun Life Index Fund	-0.002	-0.028
Canara Robeco Nifty Index	0.001	-0.017
UTI Nifty Index Fund	-0.001	-0.023
Tata Index Fund-Nifty A	-0.003	-0.033
Principal Index Fund-Growth	-0.002	-0.035
Nifty BeES	-0.001	-0.009
Kotak Nifty ETF	-0.003	0.046
HDFC Index Fund-Nifty Plan	-0.004	-0.086
Franklin India Index Fund	-0.002	-0.014
LIC Namura MF Index Fund	-0.006	-0.030
UTI Sunder	0.003	0.060
SBI Magnum Index Fund	-0.004	-0.062
Franklin India Index Tax Fund	0.001	-0.030

Table 4.6: Sharpe Ratio of the Sensex Index Funds.

Index	Daily	Monthly
UTI Master Index Fund	-0.001	-0.012
Tata Index Fund-Sensex A	-0.003	-0.057
LIC MF Index-Sensex Adv(G)	-0.006	-0.067
LIC Namura MF Index Fund-Sensex Adv(D)	-0.010	-0.133
Kotak Sensex ETF	0.005	0.049
Sensex ICICI Prudential ETF	-0.002	-0.013
HDFC Index Fund Sensex Plan	-0.003	-0.089
Franklin India Index Fund-BSE Plan-Growth Plan	0.001	0.025

Table 4.7: Treynor Ratio of the Nifty Index Funds for daily returns.

Index	Treynor Ratio	Beta
Birla Sun Life Index Fund	-0.022	0.069
Canara Robeco Nifty Index	0.019	0.051
UTI Nifty Index Fund	-0.022	0.057
Tata Index Fund-Nifty A	-0.007	0.401
Principal Index Fund-Growth	-0.031	0.069
Nifty BeES	-0.001	0.921
Kotak Nifty ETF	-0.383	0.008
HDFC Index Fund-Nifty Plan	-0.041	0.092
Franklin India Index Fund	-0.016	0.093
LIC Namura MF Index Fund	-0.254	0.024
UTI Sunder	0.033	0.077
SBI Magnum Index Fund	-0.009	0.396
Franklin India Index Tax Fund	0.015	0.097

Table 4.8: Treynor Ratio of the Nifty Index Funds for monthly returns.

Index	Treynor Ratio	Beta
Birla Sun Life Index Fund	-0.028	0.981
Canara Robeco Nifty Index	0.019	0.911
UTI Nifty Index Fund	-0.024	0.977
Tata Index Fund-Nifty A	-0.034	0.983
Principal Index Fund-Growth	-0.036	0.971
Nifty BeES	-0.010	0.945
Kotak Nifty ETF	3.4	-0.014
HDFC Index Fund-Nifty Plan	-0.091	0.947
Franklin India Index Fund	-0.015	0.953
LIC Namura MF Index Fund	-0.043	0.707
UTI Sunder	0.063	0.951
SBI Magnum Index Fund	-0.064	0.971
Franklin India Index Tax Fund	-0.032	0.943

Table 4.9: Treynor Ratio of the Sensex Index Funds for daily returns.

Index	Treynor Ratio	Beta
UTI Master Index Fund	-0.013	0.061
Tata Index Fund-Sensex A	-0.007	0.407
LIC MF Index-Sensex Adv(G)	2.518	-0.002
LIC Namura MF Index Fund-Sensex Adv(D)	3.293	-0.003
Kotak Sensex ETF	0.451	0.014
Sensex ICICI Prudential ETF	-0.017	0.104
HDFC Index Fund Sensex Plan	-0.036	0.091
Franklin India Index Fund-BSE Plan -Growth Plan	0.008	0.103

Table 4.10: Treynor Ratio of the Sensex Index Funds for monthly returns.

Index	Treynor Ratio	Beta
UTI Master Index Fund	-0.012	0.986
Tata Index Fund-Sensex A	-0.058	0.983
LIC MF Index-Sensex Adv(G)	-0.073	0.910
LIC Namura MF Index Fund-Sensex Adv(D)	-0.143	0.931
Kotak Sensex ETF	-0.206	-0.236
Sensex ICICI Prudential ETF	-0.014	0.951
HDFC Index Fund Sensex Plan	-0.090	0.985
Franklin India Index Fund-BSE Plan- Growth Plan	0.025	0.996

Table 4.11: List of fund managers of the Nifty Index Funds.

Index	Fund manager	No. of funds handled by fund manager
Birla Sun Life Index Fund	Ajay Garg	13
Canara Robeco Nifty Index	Krishna Sanghvi	11
UTI Nifty Index Fund	Kaushik Basu	6
Tata Index Fund-Nifty A	Pradeep Gokhale	7
Principal Index Fund-Growth	Rajat Jain	2
Nifty BeES	Vishal Jain	6
Kotak Nifty ETF	Deepak Gupta	6
HDFC Index Fund-Nifty Plan	Vinay Kulkarni	8
Franklin India Index Fund	Anil Prabhudas	9
LIC Namura MF Index Fund	Nobutaka Kitajima	13
UTI Sunder	Kaushik Basu	6
SBI Magnum Index Fund	Raviprakash Sharma	2
Franklin India Index Tax Fund	Anil Prabhudas	9

Table 4.12: List of fund managers of the Sensex Index Funds.

Index	Fund manager	No. of funds handled by fund manager
UTI Master Index Fund	Kaushik Basu	6
Tata Index Fund-Sensex A	Pradeep Gokhale	7
LIC MF Index-Sensex Adv(G)	Nobutaka Kitajima	13
LIC Namura MF Index Fund-Sensex Adv(D)	Nobutaka Kitajima	13
Kotak Sensex ETF	Deepak Gupta	6
Sensex ICICI Prudential ETF	Kayzad Eghlim	9
HDFC Index Fund Sensex Plan	Vinay Kulkarni	8
Franklin India Index Fund -BSE Plan-Growth Plan	Anil Prabhudas	9

Table 4.13: Comparing the ES of index funds handled by fund manager with CNX Nifty.

Fund Manager	No. of funds handled by fund manager	Index funds	ES	ES of CNX Nifty
Ajay Garg	13	Birla Sun Life Index Fund	-0.027	-0.026
Krishna Sanghvi	11	Canara Robeco Nifty Index	-0.027	
Kaushik Basu	6	UTI Nifty Index	-0.026	
		UTI Sunder	-0.029	
Pradeep Gokhale	7	Tata Index Fund-Nifty A	-0.026	
Rajat Jain	2	Principal Index Fund-Growth	-0.026	
Vishal Jain	6	Nifty BeES	-0.025	
Deepak Gupta	6	Kotak Nifty ETF	-0.015	
Vinay Kulkarni	8	HDFC Index Fund-Nifty Plan	-0.025	
Anil Prabhudas	9	Franklin India Index Fund	-0.026	
		Franklin India Index Tax Fund	-0.030	
Nobutaka Kitajima	13	LIC Namura MF Index Fund	-0.030	
Raviprakash Sharma	2	SBI Magnum Index Fund	-0.026	

Table 4.14: Comparing the ES of index funds handled by fund manager with Sensex.

Fund Manager	No. of funds handled by fund manager	Index funds	ES	ES of Sensex
Kaushik Basu	6	UTI Master Index Fund	-0.030	-0.026
Pradeep Gokhale	7	Tata Index Fund-Sensex A	-0.026	
Nobutaka Kitajima	13	LIC MF Index-Sensex Adv (G)	-0.025	
		LIC Nomura MF Index Fund-Sensex Adv (D)	-0.026	
Deepak Gupta	6	Kotak Sensex ETF	-0.026	
Kayzad Eghlim	9	Sensex ICICI Prudential ETF	-0.026	
Vinay Kulkarni	8	HDFC Index Fund Sensex Plan	-0.025	
Anil Prabhudas	9	Franklin India Index Fund-BSE Plan-Growth Plan	-0.027	

Figure 1

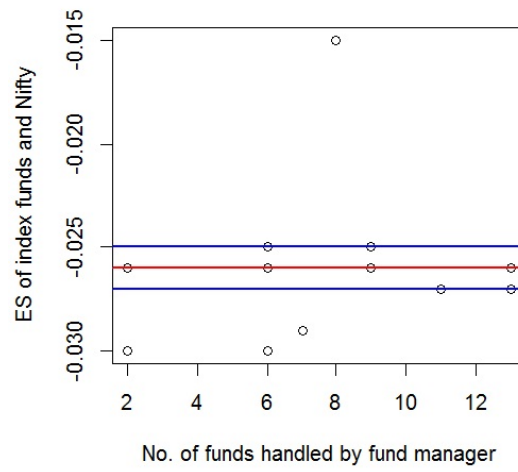


Figure 2

