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Performance Evaluation Based Rating of Indian Equity Mutual Funds - A New Approach

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Abstract

The Indian Mutual Fund Industry has experienced tremendous growth in terms of assets managed in the last five years with Assets under Management (AUM) increasing from Rs 2,318.6 billion in 2006 to Rs 5,922.5 billion[1] in 2011 representing an annual growth of 21% as against a global average of 4% and is predicted to reach Rs 16,000 – 18,000 billion by 2015[2] with more than 25% being contributed by retail investors.This suggests that number of retail investors opting for mutual funds is on the increase and to provide some benchmark for investors to assist them in selecting mutual funds *intelligently* is of immense importance. Our objective in this exercise is to provide a benchmark or guide toinvestors to select the cream layer of equity mutual funds. So, in this pursuit, we have categorized mutual funds into Large Cap, Mid Cap and Sectoral based on their AUM and sector specificity and ranked them based on their risk adjusted return values using a new index based approach.

Keywords: Mutual fund, performance evaluation, risk adjusted return
JEL Classification Codes: C02, C10, G10, G11

1. Introduction

The Mutual fund Industry in India began in 1964 with the setting up of the Unit Trust of India by the Government of India. In the last 48 years the mutual fund industry has registered a stellar growth with Assets under Management reaching close to Rs 6,000 billion by the end of March, 2011. The Assets under Management as a percentage of GDP was less than 5% in 2010[3] which represents a huge opportunity. At the end of September 2011, there were 1151 active schemes and the average assets under management for the July-September 2011 quarter was Rs 7127.42 billion[4]. The above data is evidence to the fact that a growing number of investors are interested in the Indian mutual fund industry and represents a lot of scope for future investment. Therefore, it is imperative to provide some

[1] Indian Mutual Fund Industry – Distribution Spectrum and the Changing Business Environment, 7th CII Mutual Fund Summit, June 2011
[2] Indian Mutual Fund Industry – The Future in a Dynamic Environment, Outlook for 2015, 5th CII Mutual Fund Summit, June 2009
[3] Indian Mutual Fund Industry – Towards 2015, Sustaining Inclusive Growth – Evolving Business Models, 6th CII Mutual Fund Summit, June 2010
[4] Database of the Association of Mutual Funds in India (AMFI)

benchmark to the investors which they can understand *intuitively* and apply comfortably so as to make intelligent decisions while selecting mutual funds for their investment purposes.

At present, a number of standard performance evaluation measures such as Treynor'sRatio, Sharpe's Ratio, Jensen's Measure, and Fama's Measure (For more details,see Bodie,Kane and Marcus(2010))are in use and the investors are selecting mutual funds based on these measures. All these measures are based on one common principle - a proper measure for evaluating performance of mutual funds must consider risk and return and come out with a proper risk adjusted return measure. But they all differ with respect to the way return and risk are defined and measured. Most of these measures are focusing on '*evaluating the past performance*' rather than providing some benchmark for decision making. Therefore, there is a need to develop a measure that not only helps in evaluating performance but also provides some benchmark for future decision making. And, this exercise is an attempt towards this.

The objective of this exercise is to generate a ranking system that facilitates the selection of the cream layer funds (top 10%) based on simple and intuitive understanding about risk and return so that even a naïve investor can easily understand and appreciate the same. The whole exercise is *not* aimed at designing a complex fund rating model which caters to all complications and sophistications of the market but serve only sophisticated investors. To make the whole exercise more *investor friendly*,the suggested ranking system allows an investor to enter necessary input as per his/her appetite for risk and return which means that the intuition of the user will play an important role in reaching a consensus on the selection of the funds.

What follows is Section 2 providing a very brief account of the relevant literature. Section 3 introduces the concept of composite return and risk and scope to incorporate user intuitiveness along with a detailed methodology of calculating the Rating Index. Section 4 discusses the results while also scrutinizing them and noting the limitations of the exercise. Section 5 provides the summary and concluding remarks.

2. Literature Review

Performance evaluation of mutual funds is a highly researched area. A few research studies that substantially influenced this exercise are mentioned below.

William F. Sharpe (1966) suggested a risk adjusted measure for the evaluation of portfolio performance in which return over risk free is adjusted for risk measured through standard deviation of returns. The economist Jack L. Treynor (1965) suggested a new evaluator of mutual fund performance, based on the modern portfolio theory, one that incorporated systematic risk rather than standard deviation based risk.

Michael C. Jensen (1967) defined a new risk-adjusted measure of portfolio performance that considers the contribution of a fund manager's forecasting ability in fund returns. Jensen's measure calculated the excess returns over expected returns based on a premium for systematic risk. Eugene F. Fama (1972) suggested a fund performance measure considering the excess returns over expected returns based on a premium for total risk and decomposed it into various components to know how much risk premium is earned due to each competition.

S Narayan Rao (2002) performed an extensive study to evaluate the performance of Indian Mutual Fund Schemes in a bear market using Relative Performance Index, Risk-Return Analysis, Treynor's Ratio, Sharpe's Ratio, Jensen's Measure, and Fama's Measure. The study concludes that Medium Term Debt Funds were the best performing funds during the bear period of September 98-April 2002 and 58 of 269 open ended mutual funds provided better returns than the overall market returns.

Morningstar (2007) defined the methodology for the calculation of the Morningstar Risk-Adjusted Return based on expected utility theory, a framework that recognizes that investors are risk-averse and willing to give up some portion of expected return in exchange for greater certainty of

return. Morningstar calculates risk-adjusted return by adjusting total return for sales loads, the risk-free rate, and risk.

If we observe the emerging trends in the area of performance evaluation, we notice that the tools and the methods are becoming more and more refined, sophisticated and demand more information. In such a case, it would be difficult for an ordinary investor to understand the same and use them for investment decision. Therefore, there is a need to develop a simple but intuitively appealing measure for ordinary investors so that they can use them comfortably for their investment decisions.

3. Data and Research Methodology

Only equity funds are considered for this exercise. The selected equity funds are categorized under Large Cap, Mid Cap and Sectoral categories based on CRISIL definitions. The Large Cap category has 37 funds, Mid Cap category has 24 funds and Sectoral category has 56 funds.The weekly rolling return for 6 month and 1 year periods for the selected funds was also obtained from the CRISIL Database.Data collected is from July 2008 to July 2010. For ranking purposes, return and risk for each fund are calculated as discussed below.

3.1. Return Statistic

Normally, return is calculated as simple average of the return-series of a fund. In this case, every past is *given equal weight* but many times, recent past is more important for decision making as compared to distant past. Hence, there is a need to introduce some *weighting* system for estimating return that is more suitable for taking investment decisions. Further, we advocate the use of rolling returns instead of simple average over a period as it is believed that it would provide a more realistic picture of the investment landscape over a period of time rather than the simple average annual returns. For Example, if a fund states that it had an 8% annualized return over last ten years it means if you invested on January 1, and sold your investment on December 31 exactly ten years later, you earned the equivalent of 8% a year. However, during those ten years, one year the investment may have gone up 20% and another year it may have gone down 10%. When we average together ten years, we earned the 'average annualized' return of 8%.But, when we take, say, monthly rolling average returns, they might show the best and the worst of ten years a fund might have experienced.Thus, rolling average returns are expected to capture the best times and the worst times impact in a better way than that of simple average of the entire period and therefore, we prefer to use rolling averages as an estimate of returns for a fund.

So, in conclusion, we believe that the rolling average returns provide a much more realistic perspective to the investors than the simple average return of the entire period and therefore, we take rolling average returns of the funds. Rolling average returns are calculated for 6 month and 1 year for the present exercise.Hereafter the above periods are referred to as *Period 1 and Period 2*. We were limited by the availability of data to consider a longer period.

As argued earlier that every past is not of same importance, there is a need to assign weightage. Here, one can provide flexibility to the investor to make a suitable choice of his/her own weighting system. The weightages used in this exercise are calculated using sensitivity analysis. This helps us capture the cream layer funds in each category. The calculated weights are mentioned below:

Weightages

Period 1 Rolling Return – 70%

Period 2 Rolling Return – 30%

Composite Return – 100%

The choice of the weightage is dependent on the investment objective of the user and his/her preferred period of investment. We experimented with different weightages within the limits of reasonable logicto test the robustness of the model but found *not* much change in the rankings of funds when compared with the original rankings. Therefore, an indicative choice of weightages is quite robust.

The return statistic for a fund is calculated by using the following formula:

$$return_{comp} = \sum ((W_j * \mu)_j) \; ; \; j = 1,2$$

Where, $return_{comp}$ = return statistic of a fund, μ_j = average return for period j and w_j = weightage for period j.

The descriptive statistics pertaining to the return statistic measure of top 10 funds from the three categories can be found in Table 1, 2 and 3 in Appendix I.

3.2. Risk Statistic

We define and measure risk for this exercise as the volatility of the return of a fund, *plus* its performance over different phases of the market. There is a strong motivation for us to consider the performance of a fund over different phases of the market. Volatility takes into account variation *both* above the average performance as well as below it. But, for an investor what is more important for investment decision is 'downward risk' and therefore, it should be a part of our risk definition and measurement. Also, for identifying cream layer funds (Top 10% Funds), one can not ignore the 'downside' of returns and hence, 'downside risk' becomes important. For this, we incorporate downside Standard Deviation of returns below Zero Return as an integral part of the risk measurement. Further, we also understand the role of Information Ratios in performance evaluation. Therefore, we take the Category Average as a benchmark and then, calculate downside Standard Deviation of returns below the Category Average. Thus, we take three components of the risk of a fund for this exercise – Standard Deviation of Returns, Standard Deviation of returns below Category Average and Standard Deviation of returns below Zero Return of a fund.

Further, there is a need to assign weightages to these components depending on the *risk appetite/attitude* of the investor. We provide flexibility to the investor to make a suitable choice of his/her weighting system. The weightages used in this exercise are calculated using sensitivity analysis. This helps us capture the cream layer funds in each category. The calculated weights are mentioned below:

Weightages

Standard Deviation of Returns – 40%

Downside Standard Deviation of returns below Category Average – 40%

Downside Standard Deviation of returns below Zero Return– 20%

Composite Risk – 100%

The choice of weightage is dependent on the risk appetite of the investor for each of the risk components and the type of funds which he/she prefers to select. The objective of our exercise was to select cream layer funds with minimal downside and therefore we have decided on the above weighting system. We experimented with different weightages within the limits of our objective to test the robustness of the model butfound *not* much change in the rankings of funds when compared with the original rankings. Therefore, an indicative choice of weightages is quite robust.

3.2.1. Standard Deviation of Returns

The standard deviation of returns for a fund represents the variability of the returns with respect to the average return for a specified period. The larger the deviation of the actual data points from the average return, the greater is the standard deviation and the risk taken up by the investor. The standard deviation of a fund for period 1 and period 2 is calculated by using the following formula:

$$\sigma_j = \sqrt{\frac{\sum_{i=1}^{n}(r_i - r)^2}{n-1}} \; ; \; j = 1,2$$

Where,σ_j = standard deviation of fund for period *j*,*n* = number of actual data points in a period,r_i = rolling return of fund for ^{i} *th*week, r_m = average return of fund for period *j*

The composite standard deviation of a fund is calculated by using the following formula:

$$\sigma^2 comp = \sum((w))_j * \sigma^2{}_j) \; ; \quad j = 1,2$$

Where, σ^2 *comp* = composite variance of a fund, w_j = weightage for period *j*, $\sigma^2 j$ = variance of fund for period *j* and σ_{comp} = composite standard deviation of a fund

$$\sigma_{comp} = \sqrt{\sigma \; comp}$$

The weightage for period *j* (w_j) should be equal to the value chosen by the investor while calculating the return statistic.For this exercise, we have taken same weights for calculating standard deviation as those of return above.

3.2.2. Category Average and Downside Standard Deviation below Category Average

The category average for a period is calculated by using the following methodology. First, the averageof rolling return of a fund for the period is calculated and ranked in descending order. Then, the bottom quartile is removed. It is done to avoid pulling down effect on the category average by the bottom quartile funds and thereby impacting our search for cream layer funds (Top 10% in the category).After removing the bottom quartile, simple average of the remaining 75%of funds is taken as Category Average.

The downside standard deviation of the weekly rolling returnsof Period 1 and Period 2 are calculatedbased on the Category Average (as obtained above) for each category and period by using the following formula:

$$\sigma_{dcj} = \sqrt{\frac{\sum_{i=1}^{n_d}(r_i - \bar{r}_{dc})^2}{n_d}}; r_i < \bar{r}_{dc} and \; j = 1,2$$

Where, σ_{dcj} = downside standard deviation below category average of fund for period *j*, n_d= number of actual data points below category average,r_i = rolling return of fund for ^{ith}week, $\bar{r}dc$ = category average for period *i*

The composite downside standard deviation below category average is calculated by using the following formula:

$$\sigma^2 dc - comp = \sum((w))_j * \sigma^2 dc_j) \; ; j = 1,2$$

Where, σ^2*dc-comp* = composite downside variance below category average of a fund, w_i = weightage for period *j*, $\sigma^2 dc_j$ = downside variance below category average of fund for period *j* and *σdc-comp* = composite downside standard deviation below category average of a fund

$$\sigma_{dc-comp} = \sqrt{\sigma^2 dc - comp}$$

The weightage for period *j* (w_j) should be equal to the values chosen by the investor while calculating the return statistic.For this exercise, we have taken same weights for calculating downside standard deviation below category average as those of return above.

3.2.3.Zero Return and Downside Standard Deviation below Zero Return

The downside standard deviation below zero return of a fund for a particular period and category can be calculated by using the following formula:

$$\sigma_{d0j} = \sqrt{\frac{\sum_{i=1}^{n_0}(r_i - 0)^2}{n_0}}; r_i < 0 \; and \; j = 1,2$$

Where, σ_{doj} = downside standard deviation below zero return of fund for period *j*, n_0 = number of actual data points below zero return,r_i = rolling return of fund for ^{ith}week

The composite downside standard deviation below zero return is calculated by using the following formula:

$$\sigma^2_{d0-comp} = \sum((w)_j * \sigma^2_j) \; ; \; j = 1,2$$

Where, $\sigma^2 d0\text{-}comp$ = composite downside variance below zero return of a fund, w_j = weightage for period j, $\sigma^2 i$ = downside variance below zero return of fund for period j and $\sigma d0\text{-}comp$ = composite downside standard deviation below zero return of a fund

$$\sigma_{d0-comp} = \sqrt{\sigma^2_{d0-comp}}$$

The weightage for period j (w_j) should be equal to the values chosen by the investor while calculating the return statistic.For this exercise, we have taken same weights for calculating downside standard deviation below zero return as those of return above.

The Risk Statistic for a fund is the weighted average of the above calculated risk components. It is calculated by using the risk components (as calculated above) and the weightages chosen by the user. For this exercise, we have chosen the above mentioned weightages for risk calculation.

$$risk^2_{comp} = \sigma^2_{comp} * w_1 + \sigma^2_{dc-comp} * w_2 + \sigma^2_{d0-comp} * w_3$$

$$risk_{comp} = \sqrt{risk^2}_{comp}$$

The risk components of top 10 funds in the three categories can be found in Table 4, 5 and 6 in Appendix II.

3.3.Rating Index

To develop a risk adjusted measure, we define Rating Index as return per unit of risk. Therefore, the higher is the rating index the better performing is the fund. Rating index for the above funds is calculated by dividing the return statistic with the risk statistic.

$$Rating\ Index = {((return)_{comp} - r_f)} \Big/ {risk_{comp}}$$

Where, r_f = risk-free rate of return which is assumed to be the return on a 91-day treasury bill during the period March 2010 to June 2010.

Thereafter, we rank the Rating Index in descending order to arrive at the cream layer funds (top 10%) in each category.

4. Results and Analysis

Using the methodology discussed above, the funds were successfully ranked. Cream layer funds (Top 10%) of each category are listed below and the rankings of top 10 funds of each category can be found in Appendix III.

Large Cap Funds

1. HDFC Core and Satellite Fund
2. HDFC Equity Fund
3. ICICI Prudential Focused Bluechip Equity Fund - Institutional Option I - Growth
4. ICICI Prudential Focused Bluechip Equity Fund - Growth

Mid Cap Funds

1. Principal Emerging Bluechip Fund
2. DSP Blackrock Small and Midcap Fund
3. HDFC Mid-Cap Opportunities Fund

Sectoral Funds

1. Reliance Pharma Fund
2. Sahara Banking and Financial Services Fund

3. SBI Magnum Sector Umbrella - FMCG Fund
4. Franklin Pharma Fund
5. Birla Sun Life MNC Fund
6. Franklin FMCG Fund – Growth

4.1. Analysis of Results

To test the applicability of the ranking suggested by our model of the cream layer funds, we calculated the actual fund performance in subsequent two quarters (July 2010-Dec 2010) and ranked them based on simple rate of return. It was encouraging to find the cream layer funds performing well.

Figure 1 compares the large cap fund's actual performance over the next two quarters with the rating index calculated basis our model. The cream layer funds of our model show superior performance when compared with the rest of the funds in the category. Figure 2 and 3 compare the mid cap and sectoral fund's actual performance with the cream layer funds of our model. Our results for mid cap and sectoral categories are in agreement with the superior performing funds in the subsequent two quarter re-iterating the practical applicability of the model.

Figure 1: Comparison between Actual Fund Performance from July 2010 -Dec 2010 and Rating Indexfor Select Large Cap Funds

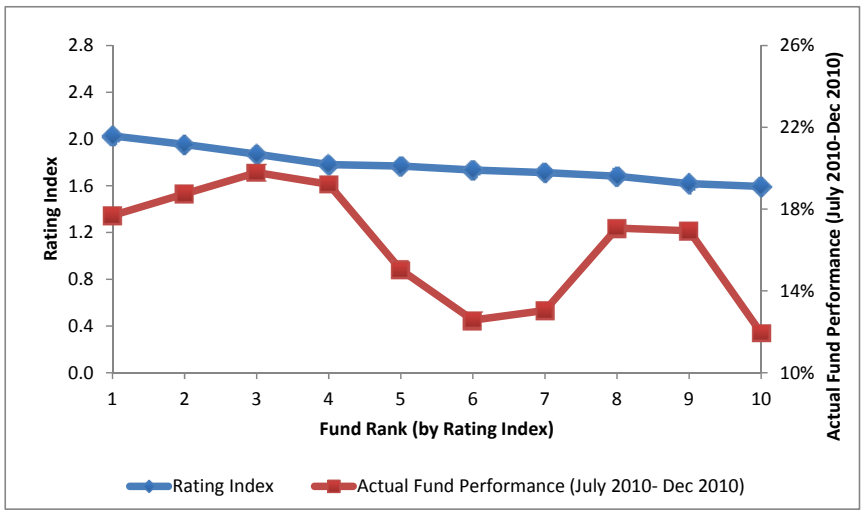


Figure 2: Comparison between Actual Fund Performance from July 2010 - Dec 2010 and Rating Index for Select MidCap Funds

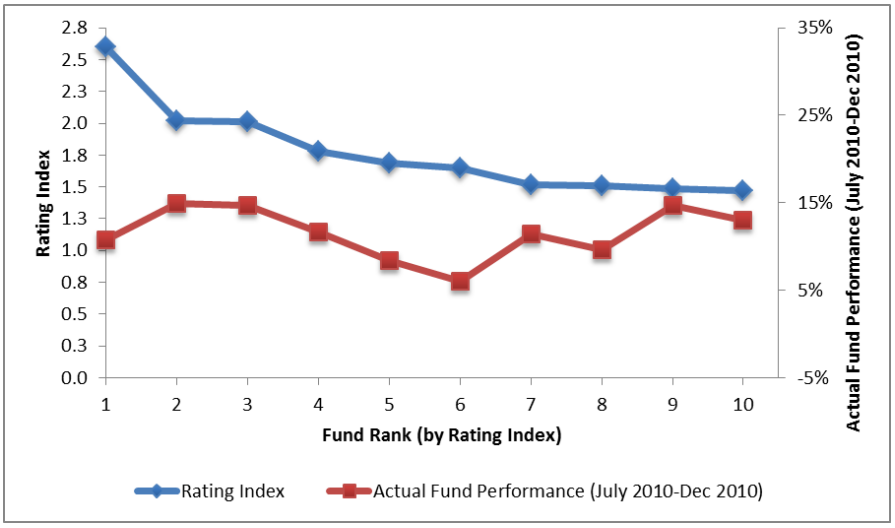
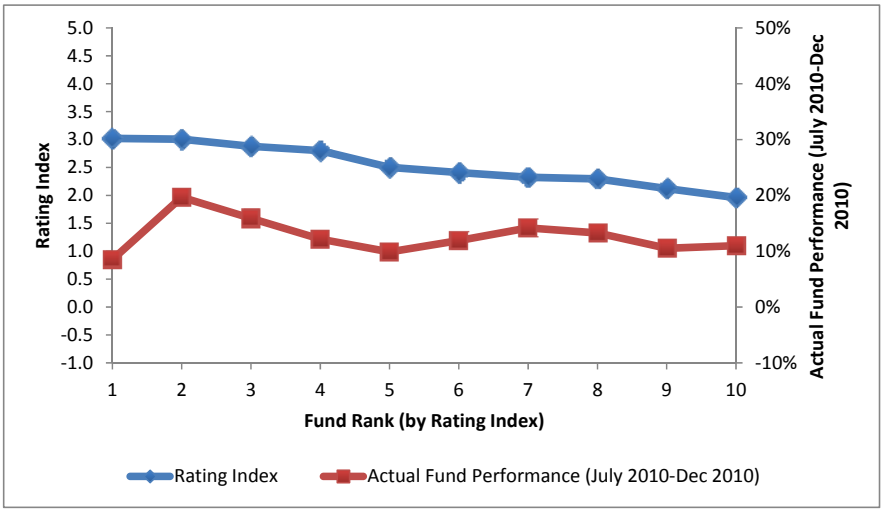


Figure 3: Comparison between Actual Fund Performance from July 2010 - Dec 2010 and Rating Index for Select Sectoral Funds



4.2. Limitations of the Study

The present study has the following limitations:

1. The past and the future performance of mutual funds may not be correlated. Therefore, the past performance does not necessarily indicate the future performance of a fund and one may not take sound investment decision based on past performance.
2. The actual fund performance was calculated based on the NAV data from the AMFI (Association of Mutual Funds in India) which in turn is uploaded by the members. The members have not followed any set of uniform rules due to the flexibilities offered under the SEBI regulations to determine NAV. Therefore, reliability of the comparison of our rankings with the actual fund performance estimates is highly sensitive to the reliability of estimates of the NAV.
3. The effect of entry and exit loads has been excluded from the study and thus, our returns estimated are approximately true.

5. Summary and Concluding Remarks

The objective of the exercise was to develop a rating model which provides the user with a benchmark for selecting mutual funds. The developed model can be applied by number of users with different investment objectives. The results of the exercise adjust according to the preference of the user as the return and risk statistics are defined accordingly. Moreover, the model can be customized to be applied to debt or index based funds selection. The current exercise was to select the top performing mutual funds of each category which have minimal downside. This objective was successfully achieved and validated by comparison with actual performance of selected funds.

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Annexure[5]

Appendix I

Table 1: Descriptive Statistics of Large Cap Funds for Period 1 and Period 2

Funds[6]	Period 1			Period 2		
	Mean	Min	Max	Mean	Min	Max
HDFC Core and Satellite Fund	39.30	14.86	90.29	77.26	4.66	158.02
HDFC Equity Fund	30.99	9.90	80.97	79.05	10.36	152.65
ICICI Prudential Focused Bluechip Equity Fund - Institutional Option - I	25.59	7.36	68.80	65.49	14.57	114.72
ICICI Prudential Focused Bluechip Equity Fund	24.64	6.40	67.93	63.89	13.26	113.00
Templeton India Growth Fund	32.52	11.58	83.28	70.83	2.54	143.06
Reliance NRI Equity Fund	21.34	6.71	67.88	71.87	18.66	129.27
Principal Large Cap Fund	25.63	8.81	75.28	73.47	9.87	136.17
Franklin India Bluechip Fund	24.68	8.20	57.48	59.58	10.51	115.33
HDFC Top 200 Fund	20.48	3.45	61.02	68.48	13.06	128.31
SBI Magnum Multiplier Plus Scheme 1993	25.63	8.38	70.25	59.26	2.86	109.11

Table 2: Descriptive Statistics of Mid Cap Funds for Period 1 and Period 2

Funds	Period 1			Period 2		
	Mean	Min	Max	Mean	Min	Max
Principal Emerging Bluechip Fund	41.14	14.26	105.10	132.13	45.90	204.47
DSP BlackRock Small and Midcap Fund	48.97	24.81	112.46	87.66	1.59	162.59
HDFC Mid-Cap Opportunities Fund	45.16	25.48	92.09	73.84	1.38	141.57
Religare Mid Cap Fund	44.87	25.23	106.34	79.30	-9.26	156.43
UTI Thematic - Mid Cap Fund	44.17	19.29	117.65	78.39	-5.71	153.80
ICICI Prudential Emerging S T A R Fund	48.07	25.84	94.87	75.33	-17.58	165.27
Franklin India Prima Fund	36.85	9.39	100.84	78.15	-0.20	157.52
Reliance Growth Fund	31.80	13.46	81.05	69.24	3.69	136.02
SBI Magnum Global Fund	36.76	13.92	91.71	79.69	-6.50	172.34
Kotak Midcap	36.66	16.92	89.12	65.06	-9.32	127.77

[5] Numerical Analysis of Top 10 funds in each category have been mentioned here. Analysis for all the funds will be provided on request.
[6] Selected funds in the three categories have growth option as their investment style as opposed to dividend option.

Table 3: Descriptive Statistics of Sectoral Funds for Period 1 and Period 2

Funds	Period 1			Period 2		
	Mean	Min	Max	Mean	Min	Max
Reliance Pharma Fund	75.78	36.45	147.32	102.27	14.93	172.19
Sahara Banking and Financial Services Fund	33.66	4.87	73.77	111.63	37.71	159.18
SBI Magnum Sector Umbrella - FMCG Fund	44.82	32.45	62.02	58.90	13.04	98.48
Franklin Pharma Fund	69.57	38.04	125.03	90.93	8.50	154.20
Birla Sun Life MNC Fund	43.89	26.59	89.28	74.07	12.90	124.00
Franklin FMCG Fund	34.04	16.82	56.93	51.72	13.89	84.15
UTI Transportation and Logistics Fund	42.51	14.49	120.49	92.80	19.11	149.48
UTI-Pharma & Healthcare	56.41	34.13	92.52	52.80	-5.85	96.46
UTI MNC Fund	34.27	17.42	77.26	60.02	11.29	98.39
Tata Life Sciences & Technology Fund	31.50	11.58	95.64	90.86	11.02	152.42

Appendix II

Table 4: Risk Components of Large Cap Funds for Period 1 and 2

Funds	Period 1			Period 2		
	$StdDev_1$[7]	$StdDev_2$[8]	$StdDev_3$[9]	$StdDev_1$	$StdDev_2$	$StdDev_3$
HDFC Core and Satellite Fund	20.33	4.65	0.00	45.07	34.14	0.00
HDFC Equity Fund	17.65	6.29	0.00	42.52	30.13	0.00
ICICI Prudential Focused Bluechip Equity Fund - Institutional Option I	14.22	6.99	0.00	32.62	29.22	0.00
ICICI Prudential Focused Bluechip Equity Fund	14.18	7.48	0.00	32.33	30.37	0.00
Templeton India Growth Fund	18.23	8.41	0.00	42.38	35.89	0.00
Reliance NRI Equity Fund	15.25	8.74	0.00	34.97	27.78	0.00
Principal Large Cap Fund	15.92	6.82	0.00	40.62	32.99	0.00
Franklin India Bluechip Fund	12.40	8.79	0.00	32.41	32.56	0.00
HDFC Top 200 Fund	13.17	9.48	0.00	35.43	30.61	0.00
SBI Magnum Multiplier Plus Scheme 1993	14.74	6.90	0.00	33.52	36.47	0.00

Table 5: Risk Components of Mid Cap Funds for Period 1 and 2

Funds	Period 1			Period 2		
	$StdDev_1$	$StdDev_2$	$StdDev_3$	$StdDev_1$	$StdDev_2$	$StdDev_3$
Principal Emerging Bluechip Fund	24.57	14.63	0.00	48.15	25.36	0.00
DSP BlackRock Small and Midcap Fund	23.54	7.99	0.00	49.28	49.09	0.00
HDFC Mid-Cap Opportunities Fund	17.54	6.72	0.00	41.86	48.19	0.00
Religare Mid Cap Fund	19.84	6.94	0.00	50.47	54.62	5.67
UTI Thematic - Mid Cap Fund	26.54	11.14	0.00	48.64	53.23	4.15
ICICI Prudential Emerging S T A R Fund	18.57	8.60	0.00	55.16	62.60	10.90
Franklin India Prima Fund	23.61	18.41	0.00	48.21	51.58	0.20
Reliance Growth Fund	16.89	14.30	0.00	40.61	49.65	0.00
SBI Magnum Global Fund	19.02	12.93	0.00	54.94	56.68	5.06
Kotak Midcap	17.74	11.21	0.00	42.04	58.25	5.18

Table 6: Risk Components of Sectoral Funds for Period 1 and 2

Funds	Period 1			Period 2		
	$StdDev_1$	$StdDev_2$	$StdDev_3$	$StdDev_1$	$StdDev_2$	$StdDev_3$
Reliance Pharma Fund	15.37	12.01	0.00	35.58	33.99	0.00

[7] Std Dev_1 is the standard deviation of the fund
[8] Std Dev_2 is the downside standard deviation below category average of the fund
[9] Std Dev_3 is the downside standard deviation below zero return of the fund

Table 6: Risk Components of Sectoral Funds for Period 1 and 2 - continued

Sahara Banking and Financial Services Fund	27.28	0.00	0.00	48.15	40.16	0.00
SBI Magnum Sector Umbrella - FMCG Fund	14.51	26.85	6.11	36.51	49.41	5.03
Franklin Pharma Fund	13.65	27.77	4.67	31.36	40.31	0.00
Birla Sun Life MNC Fund	17.41	17.61	0.00	40.53	44.62	0.00
Franklin FMCG Fund	11.82	19.19	0.00	19.27	25.64	0.00
UTI Transportation and Logistics Fund	26.88	7.14	0.00	40.40	28.77	0.00
UTI-Pharma & Healthcare	14.60	25.46	3.94	28.01	43.63	3.42
UTI MNC Fund	14.60	0.00	0.00	33.32	48.90	3.68
Tata Life Sciences & Technology Fund	21.79	12.85	0.00	42.79	30.72	0.00

Appendix III

Table 7: Rating Index of Large Cap Funds

Funds	Return Statistic	Risk Statistic	Rating Index
HDFC Core and Satellite Fund	50.56	22.48	2.03
HDFC Equity Fund	45.23	20.60	1.95
ICICI Prudential Focused Bluechip Equity Fund - Institutional Option I	37.41	17.33	1.87
ICICI Prudential Focused Bluechip Equity Fund	39.80	17.55	1.78
Templeton India Growth Fund	36.27	21.98	1.77
Reliance NRI Equity Fund	34.99	18.05	1.73
Principal Large Cap Fund	43.86	20.31	1.71
Franklin India Bluechip Fund	36.30	17.83	1.68
HDFC Top 200 Fund	34.69	18.35	1.62
SBI Magnum Multiplier Plus Scheme 1993	35.60	19.20	1.59

Table 8: Rating Index of Mid Cap Funds

Funds	Return Statistic	Risk Statistic	Rating Index
Principal Emerging Bluechip Fund – Growth	67.77	24.17	2.60
DSP BlackRock Small and Midcap Fund – Growth	60.48	27.45	2.02
HDFC Mid-Cap Opportunities Fund	53.70	24.24	2.01
Religare Mid Cap Fund – Growth	55.11	28.09	1.78
UTI Thematic - Mid Cap Fund – Growth	54.38	29.27	1.69
ICICI Prudential Emerging S T A R Fund	56.16	30.98	1.65
Franklin India Prima Fund – Growth	49.10	29.14	1.51
Reliance Growth Fund –Growth	49.47	25.12	1.51
SBI Magnum Global Fund – Growth	45.12	29.96	1.48
Kotak Midcap – Growth	42.89	27.28	1.47

Table 9: Rating Index of Sectoral Funds

Funds	Return Statistic	Risk Statistic	Rating Index
Reliance Pharma Fund	83.73	26.08	3.02
Sahara Banking and Financial Services Fund	57.05	17.32	3.01
SBI Magnum Sector Umbrella	49.04	15.30	2.88
Franklin Pharma Fund	75.98	25.34	2.80
Birla Sun Life MNC Fund	52.94	19.18	2.50
Franklin FMCG Fund	39.34	14.26	2.41
UTI Transportation and Logistics Fund	57.60	22.62	2.33
UTI-Pharma & Healthcare – Growth	55.33	21.92	2.30
UTI MNC Fund	41.99	17.43	2.12
Tata Life Sciences & Technology Fund	49.36	22.63	1.96