

PERFORMANCE EVALUATION OF INDIAN MUTUAL FUNDS SCHEMES WITH RESPECT TO THEORETICAL PERFOR- MANCE EVALUATION MEASURES

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Abstract

The present study has made an attempt to evaluate the performance of equity oriented mutual funds in India during May 2000 to March 2012 taking into consideration the impact of global financial and economic crisis (2008). Findings of the study reveal that the global financial crisis has affected the performance of Indian mutual funds schemes which had larger exposure in equity shares. Secondly, the average return of the sample mutual fund schemes (growth, ELSS and balanced) have outperformed the market indices for all the periods. However, based on the multi criteria conformity the top five schemes during the overall period belong to mainly two AMCs, Reliance and HDFC out of forty one AMCs which is currently in vogue in the Indian capital market. This is not an encouraging finding in respect of the performance of the Indian mutual funds industry as a whole.

Keywords: *Mutual funds, Financial crisis, Performance evaluation, Risk-adjusted performance*

JEL classification: G23, G01, G10, G12

Introduction

The mutual funds industry in India started its journey in 1964 with the formation of the Unit Trust of India (UTI). Since then it has come a long way and has grown significantly during the last five decades in terms of mobilization of funds, number of schemes offered and participation of retail investors in the industry. This transformation has occurred owing to various policy initiatives taken by the Government of India (GOI) to provide an opportunity for middle- and lower-income groups to participate in the capital market. Consequently, to fulfill the

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expectations of those millions of investors, the mutual funds are required to function as successful institutional investor. In this backdrop, performance evaluation of mutual funds is an important issue for different stakeholders of the market. This will enable an investor to know how much return has been generated by the concerned fund manager and what risk level has been considered in generating such returns. Besides, such an evaluation exercise may help an investor to compare the performances of different fund managers over time and also vis-à-vis their peers in the industry. For the fund managers, it provides a method for identifying their strengths and weaknesses in the investment process which will help them to take appropriate future course of actions. In this respect, one typical approach is to select several attributes which are common to all the investment instruments and then try to figure out to what extent one particular instrument possesses these attributes. Among those attributes, two extremely important attributes for all kinds of investment avenues are return and risk. Every investor is interested in getting maximum returns but those returns are to be achieved with minimum level of risk.

Nevertheless, a closer look at the fund fact sheets of various mutual funds schemes also reveal that too much importance has been given on the returns provided by the schemes in the past. There are also comparisons between fund return and the benchmark return but the problem of risk is not properly addressed. However, risk as mentioned earlier is the most crucial input in people's decision making about investment in mutual funds. This is why an attempt has been made in this study to internalize the component of risk in performance evaluation measures which in turn would enable investors and fund managers to efficiently evaluate the relative performance of different mutual funds schemes in terms of their risk-adjusted returns.

The theoretical foundation of performance evaluation owes much to the capital asset pricing theory (CAPM) which was developed simultaneously by Sharpe (1964), Lintner (1965) and Mossin (1966) based on Markowitz's (1952) mean-variance portfolio theory. Following CAPM, Treynor (1965), Sharpe (1966) and Jensen (1968) developed relative and absolute performance evaluation models which contributed significantly to the literature.

The single factor CAPM came under severe criticism from Roll (1977) on the ground of benchmark appropriateness. Roll argues that the use of CAPM as a benchmark is inconsistent, since the market portfolio is unobservable and consequently, different benchmark portfolios give different results. Besides, there are studies such as Ross (1976), Fama and French (1992, 1993), which showed that expected returns cannot be adequately explained by a single risk factor. Fama and French (1993) proposed a 3-factor model taking into account the market portfolio and two additional variables related to firm size and book-to-market ratio which showed empirical evidence of the power to explain a cross-section of average returns. In addition to Fama and French's three-factor model, Carhart (1997) suggested that fund managers employed momentum strategy¹ in order to earn superior returns.

In the Indian context there are some studies which critically examined the risk-adjusted performance of mutual funds. Notable contributions on this aspect were made by Jayadev (1996), Thomas (1998), Kulkarni (1998), Gupta and Sehgal (1998), Chakrabarti and Rungta (2000), Gupta (2001), Chander (2002), Guha (2008) and Anand and Murugaiah (2008). However, the evidence of superior performance of Indian mutual funds schemes with respect to various risk-adjusted performance measures is not conclusive according to these studies. Consequently, this study has tried to examine the performance of equity oriented mutual funds in India in respect of seven conventional performance measures, viz. Sharpe ratio, Treynor ratio, Jensen alpha, Information ratio, Appraisal ratio, Sharpe differential return measure and M² measure, all of which were not studied by the earlier studies. Further, in order to evaluate the performance of sample mutual funds schemes with robustness this study has invoked the multi-criteria approach usually not found in performance appraisal analysis of mutual funds schemes in India. Finally, this study has attempted to capture the impact of global financial and economic crisis (2008) on these conventional performance evaluation measures.

Thus, the objectives of the present study may be identified as follows:

- (i) To evaluate the performance of the Indian mutual fund schemes in terms of seven conventional measures.
- (ii) To adopt multi-criteria approach for robust conclusion.
- (iii) To capture the impact of global financial and economic crisis (2008) on performance evaluation of Indian mutual funds schemes.

Theoretical Performance Evaluation Measures

(i) **Sharpe ratio:** It is a ratio of the excess return of the portfolio (mutual fund scheme) over risk-free return and total risk of the portfolio measured in terms of standard deviation. This risk-adjusted method is used to rank the performance of mutual funds. This measure can be given as:

$$S_R = \frac{R_p - R_f}{\sigma_p} \dots\dots\dots (1)$$

where, R_p = average return of the scheme p for the concerned period

R_f = average risk- free return for the same period

σ_p = the total risk of the scheme p for the same period

S_R is a measure of return per unit of risk earned by the scheme. A mutual fund scheme that provides the highest return per unit of risk would be considered as the best performer.

(ii) **Treynor ratio:** It is a ratio of the excess return of the portfolio (mutual fund scheme)

over risk-free return and volatility of the portfolio return measured in terms of portfolio beta. Beta of a mutual fund scheme shows how the return of a fund changes due to the changes in the market. Now, as the market risk of a fund represents its sensitivity to market movements, beta is considered as a measure of market risk or systematic risk. This measure can be given as:

$$T_R = \frac{R_p - R_f}{\beta_p} \dots\dots\dots (2)$$

where, R_p = average return of the scheme p for the concerned period

R_f = average risk- free return for the same period

β_p = the market risk or systematic risk of the scheme p for the same period

Likewise, Sharpe ratio it is also a measure of return per unit of risk and this risk-adjusted method is used to rank the performance of mutual funds. A mutual fund scheme that provides the highest Treynor ratio would be considered as the best performer.

(iii) **Jensen’s Alpha (α):** Jensen measure is an absolute measure of performance which explicitly takes into account the effects of the risk on returns of the portfolio. This measure has a great importance to the practitioners as it is logically derived from the capital asset pricing model (CAPM). The Jensen measure may be expressed using excess return version of the CAPM as follows:

$$R_p - R_f = \alpha_p + \{\beta_p * (R_m - R_f)\} + \epsilon_p \dots\dots\dots (3)$$

where, R_p = the return of the scheme p for the concerned period

R_f = the risk- free return for the same period

R_m = the market return for the same period

β_p = the systematic risk of the scheme p

ϵ_p = the error term

The intercept term α also known as Jensen’s Alpha is the differential return earned by the scheme due to fund manager’s stock selection ability. A positive value of α implies that the scheme ‘p’ has an average return greater than benchmark return, i.e. superior performance. On the other hand, a negative value of α indicates that the scheme or portfolio return is less than the benchmark return.

(iv) **Information ratio:** Information ratio is defined as the manager’s excess return over the relevant benchmark relative to the standard deviation of those excess returns. Information ratio denoted by IR is given as,

$$IR = \frac{R_p - R_b}{S_{p-b}} \dots\dots\dots (4)$$

where, R_p = average return of the scheme p for the concerned period

R_b = average return of the benchmark for the same period

S_{p-b} = standard deviation of the difference between returns of the scheme and the benchmark return.

The numerator of equation (4) is known as the ‘tracking error’ (TE) which is widely used in the Indian mutual funds industry to determine the superiority of performance of a fund. The denominator is known as the ‘tracking error volatility’ (TEV). Thus, information ratio is the ratio of TE and TEV. While determining risk on a relative return basis, this ratio eliminates market risk, showing only risk taken from active management. Therefore, the information ratio shows how a manager has performed per unit of active risk taken. This is why this measure is widely used for comparing the active management skills of the fund managers. The higher the information ratio, the higher will be the active return of the portfolio, given the amount of risk taken, and the better the managerial performance.

(v) **Appraisal ratio:** This ratio is used to measure the quality of a fund’s stock picking ability. It is defined as the fund’s alpha to the portfolio’s unsystematic risk or residual standard deviation. This measure can be given as:

$$AR = \frac{\alpha}{\sigma_e} \dots\dots\dots (5)$$

The appraisal ratio measures the manager’s performance by comparing the return of the stocks selected by them to the unsystematic or specific risk of those selections. The higher the Appraisal ratio, the better is the performance of the manager concerned.

(vi) **M² measure:** Sharpe ratio though widely used for performance evaluation of managed portfolios is not easy to interpret; particularly the economic implication of the difference between the Sharpe ratios of two portfolios is very difficult to explain. To address this problem Leah Modigliani and Franco Modigliani proposed a new measure called M² measure which is given as,

$$M^2 = R_{p^*} - R_m \dots\dots\dots (6)$$

where M² is the Modigliani-Modigliani measure, R_{p^*} is the return of the adjusted portfolio and R_m is the market return.

The adjusted portfolio is the managed portfolio adjusted in such a way that its total risk is identical with the market portfolio. This portfolio is constructed as a weighted

combination of managed portfolio and risk-free asset where weights are given as:

$$w_1 = \frac{\sigma_m}{\sigma_p} \dots\dots\dots (7)$$

$$w_2 = 1 - w_1 \dots\dots\dots (8)$$

Where w_1 is the weight given to the managed portfolio which is equal to the ratio of standard deviation of the market portfolio (σ_m) and the standard deviation of the managed portfolio (σ_p) and w_2 is the weight of the risk-free asset which is equal to the one minus weight of the managed portfolio.

Plugging (6), (7) and (8) the ultimate expression for M^2 measure is given as

$$M^2 = \left(\frac{\sigma_m}{\sigma_p}\right) * R_p + \left(1 - \frac{\sigma_m}{\sigma_p}\right) * R_f \dots\dots\dots (9)$$

The higher the M^2 , superior is the performance of the managed portfolio or the mutual fund scheme.

(vii) **Sharpe differential return measure:** Sharpe differential return measure denoted by SH_p and is given as,

$$SH_p = R_p - \left[R_f + \frac{(R_m - R_f)\sigma_p}{\sigma_m} \right] \dots\dots\dots (10)$$

where, notations have their usual meaning.

This measure actually indicates the differential return earned by the managed portfolio or mutual fund scheme over the expected return for a given level of risk. Sharpe differential return measure takes into account both the selectivity skill of the fund manager as well as his ability to provide diversification. A positive Sharpe differential return indicates superior performance of the scheme. For a well-diversified portfolio Sharpe and Jensen differential return measure will be identical. However, if portfolio is not perfectly diversified then Sharpe measure will be smaller than the Jensen.

Data and Methodology

Data

The present study uses a sample of eighty mutual fund schemes. The details of these schemes are given in Table A- 1.1 Out of eighty schemes the sample comprises of sixty six growth schemes and fourteen equity linked savings schemes (ELSS). Since balanced schemes of the sample are basically equity oriented, they are also treated as equity schemes. The data used in the study mainly comprise of monthly net asset values (NAV) for the eighty mutual funds

schemes during May 2000 to March 2012. These NAV data are collected from www.mutualfundsindia.com. This study has used different important stock indices namely, Sensex, BSE 200, S&P CNX 500 and S&P CNX Nifty as the benchmark indices for performance evaluation. These monthly indices data are collected from BSE and NSE websites. Monthly yield on 91 day treasury bills of GOI is used in the study as a proxy for risk-free return. These data are collected from RBI website.

Methodology

In this study performance of sample mutual funds schemes has been evaluated using seven theoretical or conventional performance evaluation measures during May 2000 to March 2012. In order to capture the impact of global financial and economic crisis (2008) on these conventional evaluation measures the study period is divided into two halves: pre-crisis period (May 2000 - December 2007) denoted as P_1 and post-crisis period (Jan 2009 - March 2012) denoted as P_2 .

At the outset, the returns for each of the sample schemes have been computed by using the following equation:

$$R_t = (NAV_t - NAV_{t-1} + D_t) / NAV_{t-1} \dots\dots\dots (11)$$

where,

NAV_t = Net asset value of the scheme at the end of the month t

D_t = Dividend paid during the month t.

Similarly, the returns for the market indices have been computed. The returns on the risk-free asset, i.e., the yields on 91-day T-bills are given on annual basis in the RBI website which are converted to the monthly basis.

All the theoretical performance evaluation measures i.e. Sharpe ratio, Treynor ratio, Jensen's Alpha, Information ratio, Appraisal ratio, Sharpe differential return measure and M^2 measure are computed on the basis of monthly returns of the schemes, that of the corresponding market indices and the monthly risk free rates during the period of the study (P_1 , P_2 and overall). In this context it may be mentioned here that except Information ratio for all other measures Sensex is used as a benchmark portfolio or overall market proxy. But in case of Information ratio benchmarks of the respective schemes are used as market proxy. In order to calculate the Information ratio, the first step is to find out the tracking error or the excess over the benchmark. The monthly excess returns of the schemes over their respective benchmarks are first calculated and then averaged over the relevant periods. The standard deviations of these monthly tracking error figures for a particular period provide the tracking error volatility. The ratio of average tracking error and tracking error volatility gives the Information ratio. In case

of other measures, where standard deviation is used as a measure of total risk or fund beta is used as a measure of market risk the same procedure is followed for computation.

Empirical Results

Summary Statistics of Mutual Funds Return

The descriptive statistics of the monthly returns of the different categories of mutual funds schemes and their respective benchmarks during pre-crisis period, post-crisis period and overall period are given in tables 1- 3. These tables depict that average return of growth schemes are higher followed by ELSS and balanced schemes during pre-crisis, post-crisis and overall period.

Table 1 : Descriptive Statistics for monthly returns of mutual fund schemes according to investment objectives in the pre-crisis period

| | ELSS | BALANCED | GROWTH | SENSEX | BSE200 | CNX500 | CNX NIFTY |
|-----------------|--------|--------------|------------|---------|--------|----------|-----------|
| Mean | 0.026 | 0.022692571 | 0.02787296 | 0.01919 | 0.0125 | -0.00167 | 0.018952 |
| Median | 0.0343 | 0.026355 | 0.03669946 | 0.02227 | 0.0241 | -0.01736 | 0.024524 |
| Maximum | 0.3035 | 0.208133643 | 0.29925544 | 0.15742 | 0.1881 | 0.25904 | 0.175112 |
| Minimum | -0.305 | -0.151216571 | -0.2202657 | -0.1583 | -0.264 | -0.22707 | -0.173988 |
| Std.Dev. | 0.1031 | 0.063979357 | 0.09319498 | 0.06845 | 0.084 | 0.09402 | 0.06974 |
| Skewness | 0.0288 | -0.015518214 | 0.05087552 | -0.4672 | -0.782 | 0.69994 | -0.406863 |
| Kurtosis | 5.0936 | 4.508429071 | 4.07128243 | 2.86358 | 3.7346 | 3.64585 | 3.075251 |

Source: Calculated by author

Table 2 : Descriptive Statistics for monthly returns of mutual fund schemes according to investment objectives in the Post-crisis Period

| | ELSS | BALANCED | GROWTH | SENSEX | BSE200 | CNX500 | CNX NIFTY |
|-----------------|--------|----------|--------|--------|--------|--------|-----------|
| Mean | 0.0237 | 0.0221 | 0.0269 | 0.0179 | 0.019 | -0.004 | 0.0177 |
| Median | 0.0179 | 0.0157 | 0.0295 | 0.0018 | 0.0056 | 0.0095 | 0.0055 |
| Maximum | 0.4396 | 0.3595 | 0.4744 | 0.2826 | 0.3236 | 0.1797 | 0.2807 |
| Minimum | -0.103 | -0.072 | -0.128 | -0.106 | -0.104 | -0.266 | -0.102 |
| Std.Dev. | 0.0975 | 0.0754 | 0.1047 | 0.0768 | 0.0804 | 0.0794 | 0.0759 |
| Skewness | 2.542 | 2.8788 | 2.5179 | 1.1292 | 1.4533 | -0.626 | 1.0854 |
| Kurtosis | 12.719 | 14.194 | 13.502 | 5.0205 | 6.5795 | 4.811 | 4.9577 |

Source: Calculated by author

Similarly, risks of the growth schemes are also higher than ELSS and balanced schemes. Growth and ELSS schemes (which invest at least 70% in equity shares) are expected to have higher returns with high risk. On the contrary, balanced schemes are expected to earn moderate returns with moderate risk. Thus, it can be inferred from the above tables that returns and risks are in conformity with the stated investment objectives of the sample mutual funds schemes.

Further, the results reveal that average monthly return of the ELSS schemes is 1% higher in

Table 3 : Descriptive Statistics for monthly returns of mutual fund schemes according to investment objectives during overall period

| | ELSS | BALANCED | GROWTH | SENSEX | BSE200 | CNX500 | CNX NIFTY |
|-----------------|---------|------------|-----------|-----------|----------|-----------|--------------|
| Mean | 0.01655 | 0.01554807 | 0.018425 | 0.012614 | 0.014279 | 0.005302 | 0.012537 |
| Median | 0.02374 | 0.01872243 | 0.020937 | 0.012113 | 0.018099 | -0.011024 | 0.015565 |
| Maximum | 0.34759 | 0.32488821 | 0.464365 | 0.282551 | 0.323612 | 0.368421 | 0.28066 |
| Minimum | -0.324 | -0.1817195 | -0.281332 | -0.238901 | -0.26356 | -0.266272 | -0.264103 |
| Std.Dev. | 0.10532 | 0.07240821 | 0.101824 | 0.07666 | 0.082773 | 0.098308 | 0.077568 |
| Skewness | 0.13437 | 0.75278621 | 0.631564 | -0.190084 | -0.23828 | 0.730971 | -0.268969 |
| Kurtosis | 7.10477 | 7.28582413 | 7.800435 | 3.873348 | 4.544417 | 4.389942 | 4.161302 |

Source: Calculated by author

the pre-crisis period and 0.71% higher in the post-crisis period than the overall period. The same is true for the pure growth schemes where average return is 1.2% higher in the pre-crisis period and 0.65% higher in the post-crisis period than the entire study period. These actually indicate that despite higher growth of the ELSS and growth schemes separately during pre-crisis and post-crisis periods they have performed so badly during the crisis period that ultimately pull down the overall average monthly return of those schemes. Moreover, the above tables display that performance of balanced fund schemes are better during the post-crisis period than the pre-crisis one. This is not surprising since during crisis period and after balanced schemes perform better than ELSS and growth schemes.

Another important result to mention here is that the average return of the sample mutual fund schemes (growth, ELSS and balanced) have outperformed the market indices for all the periods. However, the standard deviations of the growth and ELSS schemes are also found to be higher than their respective benchmarks i.e. these schemes are riskier than their benchmarks which can be a worrying factor for the common investors.

Further, it is evident from the above tables that sample mutual funds schemes have shown positive skewness (except balanced scheme in post-crisis period) and leptokurtic return distribution which implies a few very high returns in the data series and presence of higher than normal frequency around extreme values in the return distribution.

Risk-adjusted Theoretical Performance Evaluation Measures

A closer look at the tables A-1 - A-3 of the Appendix I show that sample mutual funds schemes have performed quite well according to the Sharpe ratio during the overall period. Of the eighty mutual funds schemes under consideration there are seventy eight schemes for which Sharpe ratios are positive during overall period. Among these the top five performers

include two balanced and three growth schemes which are ICICI PRUDENTIAL BALANCED, HDFC EQUITY, RELIANCE VISION, HDFC PRUDENCE and RELIANCE GROWTH. Nevertheless, the performance of sample schemes during pre-crisis and post-crisis periods are very poor than the overall period.

The results relating to the Treynor ratio also reflect the same kind of findings for the mutual funds schemes under consideration as in case of Sharpe ratio for the overall period. Tables A-1 - A-3 show that Treynor ratios for seventy-nine schemes are positive during the overall period. The top five schemes are ICICI PRUDENTIAL FMCG, SBI MAGNUM SECTOR FUNDS UMBRELLA – CONTRA, SUNDARAM BALANCED, RELIANCE VISION and TATA LIFE SCIENCES & TECHNOLOGY.

The results pertaining to Jensen measure as given in tables A-1 - A-3 in the Appendix I indicate that out of eighty schemes alpha values of twenty schemes are positive and significant at 5% level during the entire study period. This means these mutual funds schemes have generated superior returns than the benchmark return. The corresponding figures for the pre-crisis and post-crisis periods are twenty nine and twenty three respectively. Thus, Indian fund managers, in general, cannot outperform the benchmark return, only some of the fund managers possess superior stock selection skills. Further, the global financial crisis also affected the performance of mutual funds schemes.

Information ratio is a widely used measure for comparing the active management skills of the fund managers. The higher the information ratio; the better will be the managerial performance. It is evident from tables A-1- A-3 that thirty nine mutual funds schemes possess positive Information ratio during all the periods indicating that fund managers of these schemes outperformed the corresponding benchmark indices. The top five performers are HDFC TOP 200, HDFC EQUITY, HDFC TAXSAVER, RELIANCE GROWTH and DSP BLACKROCK OPPORTUNITIES. Also, it is found that financial crisis did not affect the performance of the sample mutual funds schemes measured in terms of this ratio.

The results based on Sharpe differential return measure as revealed by tables A-1 - A-3 in the appendix document that of the eighty schemes under consideration forty eight schemes have positive differential returns thereby indicating superior performance during overall period. The top five performers are RELIANCE VISION, HDFC EQUITY, JM EQUITY, ICICI PRUDENTIAL BALANCED and RELIANCE GROWTH. The remaining thirty two schemes have shown negative differential returns implying that they could not earn superior returns according to the risk they assumed. It is also found that in the pre-crisis period the number of superior performers is thirty-six while in the post-crisis period the corresponding figure is sixty one. Thus, due to the poor performance in the crisis period the overall differential return performance of the mutual funds schemes was affected despite their

good performance in the post- crisis period.

It can be inferred from tables A-1 - A-3 that performance of sample mutual funds schemes according to the Appraisal ratio is more or less same for all the periods, i.e. pre-crisis, post-crisis and overall period. Out of eighty sample schemes there are fifty six schemes which have shown positive Appraisal ratio. Thus, as in the Sharpe differential return measure here also majority of the schemes (70%) have outperformed the market. The top five schemes as per this method are HDFC TOP 200, FT INDIA BALANCED, FRANKLIN INDIA PRIMA PLUS, HDFC TAX SAVER and FRANKLIN INDIA BLUECHIP. The remaining twenty four schemes which have negative Appraisal ratio indicating that they failed to earn sufficient return commensurate with their unsystematic risk.

Sample mutual funds schemes have performed most efficiently in respect of M^2 measure compared to other performance evaluation measures. This is because seventy-nine mutual funds schemes out of eighty have positive M^2 measure during the overall period. The best five schemes according to this measure are RELIANCE VISION, FRANKLIN INDIA PRIMA, RELIANCE GROWTH, ICICI PRUDENTIAL TAXPLAN and HDFC EQUITY. However, the performance of mutual funds schemes during pre-crisis and post-crisis periods is worse than the overall period.

Based on the preceding analysis it can be inferred that among the superior performers the top five schemes according to all the performance evaluation criterion (multi criteria conformity) suggested by table A- 4 in the Appendix I during the overall period are RELIANCE VISION, RELIANCE GROWTH, HDFC PRUDENCE, HDFC TAXSAVER and HDFC TOP 200. Thus these top five performers consist of three growth schemes, one balanced scheme and one ELSS scheme. Nevertheless, these five schemes mainly belong to two AMCs Reliance and HDFC.

Similarly, table A- 5 of Appendix I indicates that the worst five schemes for the overall period are BARODA PIONEER ELSS 96, UTI ENERGY FUND, JM BASIC FUND, SAHARA TAX GAIN, JM BALNCED, TAURUS DISCOVERY and UTI TOP 100 FUND among which the last three schemes conformed to equal number of evaluation criterion. Again, among these worst schemes there are three growth schemes, two balanced schemes and one ELSS scheme.

Conclusion

In this chapter performance of sample mutual funds schemes has been evaluated using seven theoretical or conventional performance evaluation measures during May 2000 to March 2012. Besides, to capture the impact of global financial and economic crisis (2008) on these conventional evaluation measures the study period is divided into two halves: pre-crisis period

(May 2000 - December 2007) and post-crisis period (Jan 2009 - March 2012).

The findings of this study lead to the following conclusions:

First, it can be inferred from the empirical results that returns and risks of the sample mutual funds schemes are in conformity with their stated investment objectives.

Second, in spite of higher average return of the ELSS and growth schemes separately during pre-crisis and post-crisis periods they have performed so badly during the crisis period that ultimately pull down the overall average monthly return of those schemes. So, the global financial crisis has affected the performance of Indian mutual funds schemes which had larger exposure in equity shares.

However, with respect to various risk-adjusted performance measures the impact of financial crisis on the Indian mutual funds industry is not conclusive.

Third, the average return of the sample mutual fund schemes (growth, ELSS and balanced) have outperformed the market indices for all the periods. However, the standard deviations of the growth and ELSS schemes are also found to be higher than their respective benchmarks i.e. these schemes are riskier than their benchmarks which can be a worrying factor for the common investors.

Fourth, it is evident from the findings that mutual funds schemes have shown positive skewness (except balanced scheme in post-crisis period) and leptokurtic return distribution which implies a few very high returns in the data series and presence of higher than normal frequency around extreme values in the return distribution.

Fifth, based on the multi criteria conformity the top five schemes during the overall period are RELIANCE VISION, RELIANCE GROWTH, HDFC PRUDENCE, HDFC TAXSAVER and HDFC TOP 200. Thus, these top five performers consist of three growth schemes, one balanced scheme and one ELSS scheme. Nevertheless, these five schemes mainly belong to two asset management companies (AMCs) Reliance and HDFC, out of forty one AMCs which is currently in vogue in the Indian capital market. This is not an encouraging finding in respect of the performance of the Indian mutual funds industry as a whole. The worst five schemes for the overall period are BARODA PIONEER ELSS 96, UTI ENERGY FUND, JM BASIC FUND, SAHARA TAX GAIN, JM BALNCED, TAURUS DISCOVERY and UTI TOP 100 FUND among which the last three schemes conformed to equal number of evaluation criterion.

Finally, it can be concluded that RELIANCE VISION and RELIANCE GROWTH schemes are two best performers among all the schemes of the sample as they are performed well in terms of all the theoretical performance evaluation measures.

Limitations of the present study

In the present study performance of mutual fund schemes has been evaluated using domestic stock market index as the benchmark portfolio or market proxy (in absolute sense) or by comparing the rank of different sample mutual fund schemes based on different measures (in relative sense). But whether Indian mutual funds industry has performed well in comparison with mutual funds of other emerging markets (Brazil, Russia, China, South Korea etc.) or the developed capital markets has not been studied here. This study has used macroeconomic factors for evaluating performance of mutual fund schemes. However, different microeconomic information or firm specific factors may also affect performance of mutual fund schemes which have not been considered in the present study.

End Note:

1. Momentum strategy is a strategy of buying stocks that were past winners and selling stocks that were past losers.

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Appendix
Details of Sample Mutual Fund Schemes

Table A-1.1 : Objective and Benchmark Indices corresponding to different mutual fund schemes

| Sl. No. | Name of the Scheme | Benchmark | Objective |
|---------|---|----------------|-----------|
| 1. | Baroda Pioneer ELSS 96 | Sensex | ELSS |
| 2. | Birla Sun Life 95 | Sensex | G |
| 3. | Birla Sun Life Advantage Fund | Sensex | G |
| 4. | Birla Sun Life buy India Fund | BSE 200 | G |
| 5. | Birla Sun Life Equity Fund | BSE 200 | G |
| 6. | Birla Sun Life India Opportunities Fund | BSE 200 | G |
| 7. | Birla Sun Life MNC Fund | BSE 200 | G |
| 8. | Birla Sun Life New Millennium | BSE 200 | G |
| 9. | Canara Robeco Balance | S&P CNX Nifty | B |
| 10. | DSP BlackRock Balanced Fund | S&P CNX Nifty | B |
| 11. | DSP BlackRock Opportunities Fund | BSE 200 | G |
| 12. | DSP BlackRock Technology.com Fund | BSE 200 | G |
| 13. | Escorts Tax Plan | S&P CNX Nifty | ELSS |
| 14. | Franklin India Bluechip | Sensex | G |
| 15. | Franklin India Opportunity Fund | BSE 200 | G |
| 16. | Franklin India Prima Fund | BSE 200 | G |
| 17. | Franklin India Prima Plus | BSE 200 | G |
| 18. | Franklin India Taxshield | BSE 200 | ELSS |
| 19. | Franklin Infotech Fund | BSE 200 | G |
| 20. | FT India Balanced Fund | S&P CNX Nifty | B |
| 21. | HDFC Balanced Fund | S&P CNX Nifty | B |
| 22. | HDFC Capital Builder Fund | BSE 200 | G |
| 23. | HDFC Equity Fund | BSE 200 | G |
| 24. | HDFC Growth Fund | Sensex | G |
| 25. | HDFC Prudence Fund | S& P CNX Nifty | B |
| 26. | HDFC Tax saver | BSE 200 | ELSS |
| 27. | HDFC Top 200 | BSE 200 | G |
| 28. | ICICI Prudential Balanced | S& P CNX Nifty | B |
| 29. | ICICI Prudential FMCG | BSE 200 | G |
| 30. | ICICI Prudential Taxplan | BSE 200 | ELSS |
| 31. | ICICI Prudential Top 100 Fund | S& P CNX Nifty | G |
| 32. | ICICI Prudential Top 200 Fund | BSE 200 | G |
| 33. | ICICI Prudential Technology Fund | BSE 200 | G |
| 34. | ING Balanced Fund | S& P CNX Nifty | B |
| 35. | ING Core Equity Fund | BSE 200 | G |

Table A-1 Continued

| Sl. No. | Name of the Scheme | Benchmark | Objective |
|----------------|--|------------------|------------------|
| 36. | JM Balanced | BSE 200 | B |
| 37. | JM Basic Fund | BSE 200 | G |
| 38. | JM Equity | Sensex | G |
| 39. | Kotak 50 | S& P CNX Nifty | G |
| 40. | Kotak Balance | S& P CNX Nifty | B |
| 41. | L&T Opportunities Fund | BSE 200 | G |
| 42. | LIC Nomura Equity Fund | Sensex | G |
| 43. | LIC Nomura MF Growth Fund | Sensex | G |
| 44. | LIC Nomura Tax Plan | Sensex | ELSS |
| 45. | PRINCIPAL Balanced Fund | S& P CNX Nifty | B |
| 46. | PRINCIPAL Index Fund | S& P CNX Nifty | G |
| 47. | PRINCIPAL Growth Fund | BSE 200 | G |
| 48. | Reliance Growth | BSE 100 | G |
| 49. | Reliance Vision | BSE 100 | G |
| 50. | Sahara Taxgain | BSE 200 | ELSS |
| 51. | SBI Magnum Balanced Fund | S& P CNX Nifty | B |
| 52. | SBI Magnum Equity Fund | S& P CNX Nifty | G |
| 53. | SBI Magnum Global Fund 94 | BSE 200 | G |
| 54. | SBI Magnum Multiplier Plus 93 | BSE 200 | G |
| 55. | SBI Magnum Sector Funds Umbrella – Contra | BSE 200 | G |
| 56. | SBI Magnum Sector Funds Umbrella – Pharma | BSE 200 | G |
| 57. | SBI Magnum Tax Gain Scheme 93 | BSE 100 | ELSS |
| 58. | Sundaram Balanced Fund | S& P CNX Nifty | B |
| 59. | Sundaram Growth Fund | BSE 200 | G |
| 60. | Sundaram Taxsaver | BSE 200 | ELSS |
| 61. | Tata Balanced Fund | S& P CNX Nifty | B |
| 62. | Tata Ethical Fund | BSE 200 | G |
| 63. | Tata Life Sciences and Technology Fund | BSE 200 | G |
| 64. | Tata Pure Equity Fund | Sensex | G |
| 65. | Tata Tax Saving Fund | Sensex | ELSS |
| 66. | Taurus Bonanza Fund | BSE 100 | G |
| 67. | Taurus Discovery Fund | BSE 200 | G |
| 68. | Taurus Starshare Fund | BSE 200 | G |
| 69. | Taurus Taxshield | BSE 200 | ELSS |
| 70. | Templeton India Growth Fund | Sensex | G |
| 71. | UTI Balanced Fund | S& P CNX Nifty | B |
| 72. | UTI Energy Fund | BSE 200 | G |

Table A-1 Continued

Performance Evaluation of Indian Mutual Funds Schemes with Respect...

| Sl. No. | Name of the Scheme | Benchmark | Objective |
|---------|--------------------------------|----------------|-----------|
| 73. | UTI Equity Fund | BSE 100 | G |
| 74. | UTI Equity Tax Savings Plan | BSE 100 | ELSS |
| 75. | UTI Masterplus Unit Scheme 91 | Sensex | G |
| 76. | UTI MNC Fund | BSE 200 | G |
| 77. | UTI Pharma and Healthcare Fund | BSE 200 | G |
| 78. | UTI Nifty Fund | S& P CNX Nifty | G |
| 79. | UTI Top 100 Fund | BSE 200 | G |
| 80. | UTI Services Industries Fund | S& P CNX Nifty | G |

G-Growth, B-Balanced, ELSS – Equity linked savings scheme

Table A-1 : Performance of mutual fund schemes with respect to risk-adjusted theoretical performance evaluation measures in the pre-crisis period (arranged as per best to worst performer)

| Sc h. N o. | S _R | Sc h. N o. | J _a | Sc h. N o. | T _R | Sc h. N o. | IR | Sc h. No | AR | Sc h. No | SHp | Sc h. No | M ² |
|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|---------|----------------|---------|----------------|----------|----------------|----------------|
| 36 | 0.98105 | 55 | 0.03429 | 36 | 0.86023 | 11 | 0.41482 | 27 | 0.57733 | 36 | 0.08090 | 36 | 0.07984 |
| 25 | 0.30252 | 29 | 0.02621 | 66 | 0.28156 | 27 | 0.40651 | 25 | 0.56398 | 16 | 0.03003 | 16 | 0.03655 |
| 49 | 0.27307 | 48 | 0.02035 | 49 | 0.26794 | 48 | 0.35237 | 23 | 0.52961 | 66 | 0.02754 | 66 | 0.03272 |
| 16 | 0.27052 | 58 | 0.01956 | 55 | 0.20964 | 49 | 0.32462 | 17 | 0.46383 | 49 | 0.02606 | 55 | 0.03038 |
| 66 | 0.25621 | 49 | 0.01902 | 48 | 0.19266 | 26 | 0.30021 | 26 | 0.46383 | 55 | 0.02063 | 49 | 0.02827 |
| 23 | 0.21714 | 25 | 0.01611 | 72 | 0.18287 | 23 | 0.29078 | 20 | 0.45137 | 48 | 0.01940 | 48 | 0.02235 |
| 55 | 0.21293 | 63 | 0.01598 | 70 | 0.13909 | 70 | 0.28981 | 49 | 0.43167 | 72 | 0.01924 | 1 | 0.02050 |
| 27 | 0.18940 | 23 | 0.01422 | 29 | 0.11727 | 16 | 0.27871 | 11 | 0.43066 | 25 | 0.01920 | 23 | 0.02033 |
| 48 | 0.18340 | 26 | 0.01328 | 74 | 0.10556 | 14 | 0.26182 | 48 | 0.41473 | 23 | 0.01905 | 27 | 0.01881 |
| 26 | 0.15141 | 20 | 0.01304 | 47 | 0.09750 | 59 | 0.21815 | 55 | 0.39621 | 27 | 0.01745 | 25 | 0.01787 |
| 1 | 0.14206 | 66 | 0.01255 | 32 | 0.09704 | 64 | 0.21804 | 10 | 0.37480 | 30 | 0.01534 | 30 | 0.01747 |
| 21 | 0.14106 | 27 | 0.01105 | 69 | 0.09537 | 20 | 0.21602 | 58 | 0.36678 | 26 | 0.01419 | 26 | 0.01489 |
| 70 | 0.136383 | 24 | 0.01062 | 77 | 0.08351 | 30 | 0.21527 | 29 | 0.34047 | 70 | 0.01328 | 11 | 0.01330 |
| 30 | 0.13558 | 16 | 0.01031 | 56 | 0.07846 | 5 | 0.20479 | 9 | 0.32839 | 11 | 0.012549 | 32 | 0.01105 |
| 72 | 0.12628 | 17 | 0.01031 | 59 | 0.06303 | 24 | 0.20457 | 70 | 0.32831 | 74 | 0.01154 | 47 | 0.01088 |
| 11 | 0.11600 | 30 | 0.01023 | 58 | 0.06160 | 7 | 0.20204 | 28 | 0.32058 | 69 | 0.01142 | 24 | 0.01058 |
| 20 | 0.11579 | 14 | 0.00999 | 40 | 0.06089 | 13 | 0.18790 | 61 | 0.31658 | 32 | 0.01044 | 56 | 0.00904 |
| 77 | 0.10932 | 7 | 0.00988 | 71 | 0.05484 | 66 | 0.17976 | 14 | 0.30132 | 47 | 0.01024 | 13 | 0.00882 |

Table A-1 Continued

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| Sc h. N o. | S _R | Sc h. N o. | Ja | Sc h. N o. | T _R | Sc h. N o | IR | Sc h. No | AR | Sc h. No | SHp | Sc h. No | M ² |
|---------------------|----------------|---------------------|---------|---------------------|----------------|--------------------|----------|----------------|---------|----------------|----------|----------------|----------------|
| 47 | 0.10600 | 70 | 0.00977 | 60 | 0.05180 | 31 | 0.17261 | 59 | 0.28440 | 24 | 0.00952 | 20 | 0.00833 |
| 32 | 0.10318 | 68 | 0.00973 | 61 | 0.04531 | 25 | 0.17011 | 32 | 0.27893 | 20 | 0.00917 | 59 | 0.00830 |
| 58 | 0.09826 | 11 | 0.00874 | 65 | 0.03367 | 32 | 0.15413 | 7 | 0.26777 | 21 | 0.00897 | 60 | 0.00742 |
| 24 | 0.09194 | 71 | 0.00869 | 64 | 0.03359 | 78 | 0.15413 | 47 | 0.26363 | 56 | 0.008693 | 18 | 0.00737 |
| 40 | 0.09165 | 32 | 0.00862 | 16 | 0.03261 | 39 | 0.13681 | 21 | 0.25738 | 13 | 0.00788 | 7 | 0.00653 |
| 28 | 0.09091 | 9 | 0.00861 | 73 | 0.03132 | 22 | 0.13437 | 71 | 0.25465 | 59 | 0.00754 | 22 | 0.00636 |
| 56 | 0.08979 | 10 | 0.00844 | 25 | 0.02923 | 76 | 0.13245 | 30 | 0.23361 | 18 | 0.00715 | 58 | 0.00622 |
| 10 | 0.08662 | 61 | 0.00828 | 23 | 0.02129 | 18 | 0.12127 | 22 | 0.23208 | 60 | 0.00704 | 28 | 0.00607 |
| 71 | 0.08235 | 4 | 0.00823 | 27 | 0.01736 | 62 | 0.10237 | 31 | 0.23028 | 28 | 0.006752 | 40 | 0.00603 |
| 13 | 0.07515 | 64 | 0.00786 | 1 | 0.01518 | 47 | 0.10124 | 76 | 0.22801 | 58 | 0.00660 | 10 | 0.00600 |
| 69 | 0.07235 | 28 | 0.00774 | 26 | 0.01456 | 38 | 0.07197 | 18 | 0.22583 | 10 | 0.00656 | 9 | 0.00544 |
| 9 | 0.07038 | 76 | 0.00764 | 30 | 0.01367 | 53 | 0.03890 | 66 | 0.22103 | 40 | 0.00641 | 31 | 0.00541 |
| 59 | 0.06401 | 21 | 0.00717 | 21 | 0.01352 | 29 | 0.03189 | 64 | 0.21120 | 7 | 0.00627 | 65 | 0.00520 |
| 18 | 0.06235 | 2 | 0.007 | 20 | 0.01074 | 61 | 0.02432 | 63 | 0.19270 | 22 | 0.00603 | 61 | 0.00502 |
| 7 | 0.06059 | 47 | 0.00697 | 11 | 0.01072 | 60 | 0.02198 | 5 | 0.19199 | 71 | 0.00600 | 64 | 0.00494 |
| 61 | 0.05944 | 36 | 0.00694 | 28 | 0.00840 | 65 | 0.02130 | 2 | 0.18657 | 2 | 0.00574 | 2 | 0.00396 |
| 22 | 0.04809 | 72 | 0.00636 | 24 | 0.00837 | 58 | 0.01573 | 68 | 0.17990 | 9 | 0.00559 | 5 | 0.00308 |
| 60 | 0.04424 | 59 | 0.00631 | 10 | 0.00793 | 10 | 0.01415 | 78 | 0.17562 | 61 | 0.00528 | 70 | 0.00062 |
| 31 | 0.04085 | 5 | 0.00626 | 9 | 0.00660 | 69 | 0.01392 | 4 | 0.16004 | 31 | 0.00527 | 77 | 0.00039 |
| 73 | 0.03268 | 6 | 0.00626 | 18 | 0.00580 | 9 | 0.01376 | 40 | 0.15866 | 65 | 0.00506 | 75 | 0.00037 |
| 2 | 0.03189 | 31 | 0.00614 | 13 | 0.00556 | 3 | 0.01219 | 16 | 0.15254 | 64 | 0.00482 | 72 | 0.00036 |
| 64 | 0.03015 | 40 | 0.00580 | 7 | 0.00533 | 2 | 0.00057 | 39 | 0.14136 | 73 | 0.00465 | 74 | 0.00034 |
| 65 | 0.02722 | 39 | 0.00515 | 22 | 0.00483 | 55 | -0.00012 | 45 | 0.11764 | 42 | 0.00074 | 29 | 0.00031 |
| 5 | 0.01029 | 56 | 0.00511 | 2 | 0.00309 | 74 | -0.00059 | 38 | 0.11386 | 79 | 0.00028 | 45 | 0.00027 |
| 42 | -0.01572 | 18 | 0.00485 | 5 | 0.00097 | 17 | -0.00223 | 6 | 0.10192 | 14 | 6.03E-05 | 69 | 0.00026 |
| 79 | -0.01801 | 38 | 0.00484 | 14 | -0.00201 | 75 | -0.00300 | 36 | 0.08982 | 45 | -6.6E-05 | 73 | 0.00026 |
| 14 | -0.02298 | 51 | 0.00419 | 17 | -0.00223 | 67 | -0.00330 | 56 | 0.08943 | 38 | -0.00014 | 76 | 0.00024 |
| 17 | -0.02382 | 45 | 0.00408 | 6 | -0.00313 | 42 | -0.00338 | 51 | 0.07854 | 76 | -0.00015 | 79 | 0.00020 |

Table A-1 Continued

Performance Evaluation of Indian Mutual Funds Schemes with Respect...

| Sc h. N o. | S _R | Sc h. N o. | J _α | Sc h. N o. | T _R | Sc h. N o. | IR | Sc h. N o. | AR | Sc h. N o. | SHp | Sc h. N o. | M ² |
|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------|---------------------|----------|---------------------|----------|---------------------|----------------|
| 45 | -0.02410 | 62 | 0.00296 | 4 | -0.00385 | 28 | -0.00662 | 13 | N.A. | 17 | -0.00021 | 17 | 6E-05 |
| 38 | -0.02461 | 69 | 0.00296 | 3 | -0.00712 | 4 | -0.00695 | 62 | 0.07236 | 29 | -0.00033 | 42 | 6.25E-06 |
| 29 | -0.02476 | 60 | 0.00256 | 15 | -0.00926 | 15 | -0.0085 | 72 | 0.04916 | 63 | -0.00052 | 78 | -4E-06 |
| 76 | -0.026744 | 3 | 0.00149 | 12 | -0.01022 | 12 | -0.01513 | 60 | 0.04095 | 78 | -0.00081 | 80 | -3.4E-05 |
| 63 | -0.027348 | 74 | 0.00122 | 8 | -0.01316 | 71 | -0.01713 | 3 | 0.03505 | 6 | -0.00086 | 14 | -0.00027 |
| 6 | -0.02903 | 43 | 0.00102 | 19 | -0.01723 | 54 | -0.02915 | 69 | 0.03381 | 62 | -0.00115 | 71 | -0.00034 |
| 78 | -0.03222 | 78 | 0.00090 | 42 | -0.01831 | 45 | -0.03010 | 74 | 0.02972 | 5 | -0.00138 | 63 | -0.00055 |
| 62 | -0.03262 | 73 | 0.00062 | 79 | -0.01850 | 63 | -0.03283 | 43 | 0.01903 | 75 | -0.00146 | 4 | -0.00066 |
| 4 | -0.03280 | 75 | 0.00050 | 45 | -0.02113 | 43 | -0.03990 | 73 | 0.01816 | 46 | -0.00152 | 38 | -0.00084 |
| 68 | -0.03782 | 44 | 0.00039 | 76 | -0.02470 | 73 | -0.06319 | 75 | 0.01677 | 68 | -0.00179 | 46 | -0.0018 |
| 46 | -0.04085 | 65 | 0.00032 | 38 | -0.02612 | 57 | -0.06630 | 44 | 0.00686 | 3 | -0.00222 | 62 | -0.00206 |
| 75 | -0.04113 | 67 | -0.00023 | 63 | -0.026963 | 44 | -0.06889 | 65 | 0.00604 | 37 | -0.00295 | 6 | -0.00216 |
| 37 | -0.04345 | 77 | -0.00025 | 78 | -0.03216 | 51 | -0.07718 | 67 | -0.00379 | 44 | -0.00323 | 68 | -0.00328 |
| 44 | -0.06106 | 46 | -0.00086 | 62 | -0.03721 | 52 | -0.07863 | 77 | -0.00493 | 39 | -0.00374 | 39 | -0.00445 |
| 39 | -0.06348 | 42 | -0.00090 | 46 | -0.04028 | 8 | -0.08023 | 42 | -0.02088 | 4 | -0.00453 | 44 | -0.00452 |
| 53 | -0.06842 | 34 | -0.00125 | 75 | -0.04290 | 79 | -0.08098 | 12 | -0.03062 | 53 | -0.00468 | 34 | -0.005 |
| 3 | -0.07767 | 79 | -0.00154 | 68 | -0.04298 | 73 | -0.09144 | 34 | -0.03487 | 43 | -0.00593 | 51 | -0.00584 |
| 50 | -0.08309 | 12 | -0.00202 | 37 | -0.06168 | 6 | -0.09747 | 53 | -0.04010 | 34 | -0.0061 | 53 | -0.00679 |
| 43 | -0.09154 | 52 | -0.00211 | 44 | -0.06680 | 56 | -0.09824 | 79 | -0.04010 | 51 | -0.00633 | 3 | -0.00682 |
| 57 | -0.09286 | 53 | -0.00211 | 39 | -0.06874 | 72 | -0.10669 | 52 | -0.04572 | 15 | -0.00768 | 37 | -0.00763 |
| 12 | -0.09331 | 15 | -0.00221 | 53 | -0.07506 | 35 | -0.11140 | 15 | -0.05301 | 52 | -0.008 | 43 | -0.00852 |
| 15 | -0.09442 | 33 | -0.00533 | 34 | -0.09167 | 40 | -0.11286 | 33 | -0.06672 | 12 | -0.00819 | 15 | -0.00987 |
| 33 | -0.10329 | 54 | -0.00563 | 51 | -0.09514 | 1 | -0.11510 | 8 | -0.07709 | 57 | -0.00864 | 52 | -0.01001 |
| 51 | -0.10514 | 57 | -0.00597 | 43 | -0.10103 | 50 | -0.11748 | 57 | -0.07898 | 33 | -0.00946 | 12 | -0.01184 |
| 34 | -0.10593 | 8 | -0.0060 | 52 | -0.11899 | 21 | -0.13019 | 50 | -0.10748 | 50 | -0.00968 | 57 | -0.01237 |
| 8 | -0.11006 | 41 | -0.00745 | 57 | -0.12372 | 37 | -0.13749 | 1 | -0.10972 | 8 | -0.0105 | 33 | -0.01386 |
| 52 | -0.11043 | 1 | -0.00755 | 33 | -0.13329 | 36 | -0.14406 | 37 | -0.12063 | 67 | -0.01051 | 8 | -0.01521 |
| 67 | -0.11725 | 13 | -0.00944 | 67 | -0.14140 | 19 | -0.16473 | 54 | -0.12685 | 80 | -0.01149 | 67 | -0.01603 |
| 80 | -0.13380 | 80 | -0.00985 | 50 | -0.14271 | 34 | -0.17468 | 19 | -0.14765 | 19 | -0.0137 | 50 | -0.01789 |

Table A-1 Continued

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| Sc h. N o. | S _R | Sc h. N o. | Ja | Sc h. N o. | T _R | Sc h. N o. | IR | Sc h. N o. | AR | Sc h. N o. | SHp | Sc h. N o. | M ² |
|---------------------|----------------|---------------------|----------|---------------------|----------------|---------------------|----------|---------------------|----------|---------------------|----------|---------------------|----------------|
| 19 | -0.13465 | 35 | -0.01158 | 80 | -0.15137 | 77 | -0.19188 | 41 | -0.15888 | 54 | -0.01438 | 54 | -0.01855 |
| 54 | -0.15011 | 37 | -0.01178 | 41 | -0.18656 | 41 | -0.20668 | 35 | -0.19125 | 1 | -0.01484 | 19 | -0.01942 |
| 35 | -0.15396 | 19 | -0.01268 | 54 | -0.18766 | 80 | -0.20702 | 80 | -0.20733 | 41 | -0.01531 | 42 | -0.01959 |
| 41 | -0.17699 | 50 | -0.01371 | 35 | -0.20619 | 46 | -0.31063 | 46 | -0.23085 | 35 | -0.01617 | 35 | -0.02208 |

Source: Calculated by author

Note: Sch. No. stands for Scheme No. representing the same schemes as given in Table A- 1.1.

Table A-2 : Performance of mutual fund schemes with respect to risk-adjusted theoretical performance evaluation measures in the post-crisis period (arranged as per best to worst performer)

| Sc h. No. | S _R | Sc h. N o. | Ja | Sc h. N o. | T _R | Sc h. N o. | IR | Sc h. N o. | AR | Sc h. N o. | SHp | Sc h. N o. | M ² |
|-----------------|----------------|---------------------|----------|---------------------|----------------|---------------------|---------|---------------------|----------|---------------------|----------|---------------------|----------------|
| 54 | -0.01656 | 57 | 0.00276 | 31 | -0.00185 | 57 | -0.0134 | 48 | 0.12549 | 19 | -0.00017 | 15 | 0.00025 |
| 56 | -0.01663 | 74 | 0.00253 | 11 | -0.00185 | 61 | -0.0165 | 75 | 0.10952 | 57 | -0.00018 | 31 | 0.00024 |
| 11 | -0.01672 | 71 | 0.00247 | 36 | -0.00185 | 32 | -0.0204 | 4 | 0.09846 | 75 | -0.00018 | 13 | 0.00022 |
| 18 | -0.01674 | 34 | 0.00247 | 60 | -0.00185 | 49 | -0.0241 | 69 | 0.09561 | 51 | -0.00022 | 78 | 0.00020 |
| 25 | -0.01674 | 48 | 0.00244 | 18 | -0.00186 | 5 | -0.0274 | 80 | 0.08691 | 60 | -0.00022 | 80 | 0.00020 |
| 75 | -0.01676 | 79 | 0.00225 | 15 | -0.00187 | 58 | -0.0302 | 49 | 0.08543 | 31 | -0.00021 | 10 | 0.0002 |
| 4 | -0.01685 | 69 | 0.00205 | 32 | -0.00187 | 28 | -0.0421 | 8 | 0.08337 | 11 | -0.00022 | 45 | 0.00017 |
| 62 | -0.01688 | 39 | 0.00192 | 35 | -0.00188 | 35 | -0.0571 | 53 | 0.05594 | 32 | -0.00022 | 14 | 0.00015 |
| 47 | -0.01696 | 3 | 0.00149 | 62 | -0.00190 | 10 | -0.0583 | 79 | 0.03255 | 18 | -0.00022 | 48 | 0.00015 |
| 17 | -0.01793 | 49 | 0.00149 | 39 | -0.00190 | 37 | -0.0665 | 47 | 0.01681 | 62 | -0.00022 | 51 | 0.00010 |
| 58 | -0.01799 | 80 | 0.00148 | 76 | -0.00192 | 3 | -0.0897 | 15 | 0.00214 | 76 | -0.00023 | 11 | 0.00010 |
| 72 | -0.01833 | 75 | 0.00119 | 54 | -0.00193 | 75 | -0.0899 | 45 | 0.00035 | 15 | -0.00024 | 32 | 9.96E-05 |
| 74 | -0.01837 | 47 | 0.00028 | 47 | -0.00193 | 71 | -0.1007 | 60 | -0.00928 | 35 | -0.00024 | 61 | 7.92E-05 |
| 51 | -0.01870 | 15 | 1.84E-05 | 19 | -0.00197 | 74 | -0.104 | 68 | -0.01105 | 39 | -0.00025 | 75 | 7.8E-05 |
| 31 | -0.01878 | 45 | 0.00006 | 17 | -0.00199 | 39 | -0.1056 | 46 | -0.03465 | 45 | -0.00025 | 46 | 7.71E-05 |

Table A-2 Continued

Performance Evaluation of Indian Mutual Funds Schemes with Respect...

| Sc h. No | S _R | Sc h. N o. | J _a | Sc h. N o. | T _R | Sc h. N o | IR | Sc h. N o | AR | Sc h. N o | SHp | Sc h. N o | M ² |
|----------------|----------------|---------------------|----------------|---------------------|----------------|--------------------|---------|--------------------|----------|--------------------|----------|--------------------|----------------|
| 63 | -0.01917 | 46 | -0.00007 | 71 | -0.00207 | 66 | -0.1066 | 51 | -0.04938 | 36 | -0.00026 | 59 | 6.96E-05 |
| 39 | -0.01923 | 60 | -0.00018 | 74 | -0.00207 | 20 | -0.1097 | 41 | -0.05143 | 54 | -0.00026 | 58 | 6.62E-05 |
| 73 | -0.01941 | 68 | -0.00035 | 2 | -0.00209 | 34 | -0.1379 | 55 | -0.06245 | 56 | -0.00027 | 18 | 3.24E-05 |
| 45 | -0.01945 | 78 | -0.00041 | 21 | -0.00211 | 55 | -0.1472 | 59 | -0.09501 | 47 | -0.00031 | 40 | 2.56E-05 |
| 9 | -0.020384 | 51 | -0.00086 | 10 | -0.00211 | 60 | -0.1556 | 67 | -0.10965 | 9 | -0.00032 | 66 | -2.4E-05 |
| 21 | -0.02038 | 41 | -0.00103 | 56 | -0.00213 | 59 | -0.1568 | 66 | -0.10981 | 21 | -0.00032 | 52 | -8.7E-05 |
| 65 | -0.02045 | 59 | -0.00182 | 34 | -0.00217 | 45 | -0.1626 | 43 | -0.12581 | 71 | -0.00036 | 53 | -0.00011 |
| 71 | -0.02116 | 43 | -0.00208 | 72 | -0.00217 | 79 | -0.1689 | 72 | -0.14698 | 74 | -0.00037 | 34 | -0.00014 |
| 64 | -0.02129 | 66 | -0.00209 | 73 | -0.00222 | 65 | -0.1803 | 40 | -0.16375 | 72 | -0.00040 | 67 | -0.00015 |
| 34 | -0.02174 | 44 | -0.00252 | 20 | -0.00225 | 13 | -0.1838 | 1 | -0.22822 | 34 | -0.00040 | 36 | -0.00019 |
| 79 | -0.02176 | 42 | -0.00281 | 4 | -0.00234 | 47 | -0.1877 | 13 | -0.24144 | 73 | -0.00043 | 37 | -0.0002 |
| 10 | -0.02239 | 72 | -0.00328 | 40 | -0.00236 | 15 | -0.2022 | 44 | -0.2604 | 10 | -0.00043 | 64 | -0.00024 |
| 20 | -0.02260 | 65 | -0.00339 | 63 | -0.00240 | 46 | -0.2051 | 78 | -0.2609 | 40 | -0.00044 | 65 | -0.00031 |
| 40 | -0.02281 | 36 | -0.00371 | 61 | -0.00263 | 1 | -0.2113 | 42 | -0.28413 | 20 | -0.00044 | 49 | -0.00047 |
| 76 | -0.02361 | 1 | -0.00380 | 28 | -0.00279 | 72 | -0.2548 | 38 | -0.3812 | 63 | -0.00048 | 7 | -0.00054 |
| 29 | -0.02475 | 40 | -0.00413 | 77 | -0.00430 | 38 | -0.2731 | 37 | -0.43762 | 79 | -0.00055 | 4 | -0.00072 |
| 61 | -0.02570 | 67 | -0.00496 | 55 | -0.00840 | 40 | -0.2879 | 3 | NA | 61 | -0.00057 | 5 | -0.00092 |
| 77 | -0.02635 | 13 | -0.00944 | 58 | -0.00958 | 42 | -0.31 | 5 | NA | 28 | -0.00063 | 77 | -0.00108 |
| 5 | -0.02675 | 38 | -0.00972 | 46 | -0.01617 | 36 | -0.3233 | 10 | NA | 29 | -0.00066 | 55 | -0.00112 |
| 3 | -0.02707 | 55 | -0.01313 | 45 | -0.01630 | 78 | -0.3314 | 36 | NA | 77 | -0.00070 | 74 | -0.002 |
| 28 | -0.02718 | 37 | -0.02096 | 29 | -0.02308 | 44 | -0.3511 | 52 | NA | 1 | -0.00217 | 79 | -0.01433 |

Source: Calculated by author

Note: Sch. No. stands for Scheme No. representing the same schemes as given in Table A- 1.1.

Table A-3 : Performance of mutual fund schemes with respect to risk-adjusted theoretical performance evaluation measures during overall period (arranged as per best to worst performer)

| Sc h. N o. | S _R | Sc h. N o. | J _a | Sc h. N o. | T _R | Sc h. N o. | IR | Sc h. N o. | AR | Sc h. N o. | SHp | Sc h. N o. | M ² |
|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|---------|---------------------|----------|---------------------|---------|---------------------|----------------|
| 28 | 0.89063 | 32 | 0.21512 | 29 | 0.49051 | 27 | 0.43426 | 27 | 0.34830 | 49 | 0.02448 | 49 | 0.04042 |
| 23 | 0.58235 | 33 | 0.13021 | 55 | 0.26663 | 23 | 0.32097 | 20 | 0.33266 | 23 | 0.01882 | 16 | 0.03136 |
| 49 | 0.40593 | 34 | 0.12652 | 58 | 0.09664 | 26 | 0.28989 | 17 | 0.32082 | 38 | 0.01460 | 48 | 0.03114 |
| 25 | 0.29681 | 35 | 0.10594 | 49 | 0.04490 | 48 | 0.28765 | 26 | 0.31660 | 28 | 0.01219 | 30 | 0.02745 |
| 46 | 0.26536 | 36 | 0.05767 | 63 | 0.03269 | 11 | 0.26581 | 14 | 0.296062 | 48 | 0.01145 | 23 | 0.02643 |
| 26 | 0.26390 | 37 | 0.01982 | 25 | 0.03059 | 70 | 0.25024 | 48 | 0.27966 | 25 | 0.01081 | 68 | 0.02550 |
| 29 | 0.26343 | 25 | 0.01372 | 48 | 0.02949 | 49 | 0.24900 | 10 | 0.27532 | 26 | 0.00980 | 27 | 0.02544 |
| 27 | 0.26212 | 48 | 0.01346 | 23 | 0.02867 | 30 | 0.22478 | 49 | 0.27513 | 27 | 0.00948 | 26 | 0.02469 |
| 21 | 0.25337 | 49 | 0.01233 | 26 | 0.02809 | 16 | 0.21911 | 25 | 0.27259 | 20 | 0.00926 | 24 | 0.02383 |
| 10 | 0.24552 | 16 | 0.01219 | 27 | 0.02736 | 25 | 0.19918 | 21 | 0.26484 | 40 | 0.00887 | 70 | 0.02379 |
| 24 | 0.24448 | 29 | 0.01214 | 77 | 0.02722 | 24 | 0.19465 | 24 | 0.24217 | 16 | 0.00865 | 53 | 0.02344 |
| 7 | 0.23953 | 26 | 0.01136 | 61 | 0.02705 | 7 | 0.19263 | 70 | 0.23953 | 30 | 0.00786 | 5 | 0.02292 |
| 16 | 0.23693 | 27 | 0.01118 | 16 | 0.02674 | 14 | 0.18568 | 61 | 0.22771 | 29 | 0.00774 | 11 | 0.02263 |
| 9 | 0.23595 | 55 | 0.01093 | 30 | 0.02569 | 70 | 0.17311 | 9 | 0.22716 | 7 | 0.00729 | 64 | 0.02228 |
| 66 | 0.23511 | 30 | 0.01038 | 21 | 0.02529 | 18 | 0.16429 | 11 | 0.22645 | 24 | 0.00708 | 22 | 0.02191 |
| 30 | 0.23472 | 17 | 0.00931 | 24 | 0.02464 | 31 | 0.15901 | 28 | 0.21612 | 70 | 0.00701 | 14 | 0.02187 |
| 20 | 0.23422 | 20 | 0.00903 | 4 | 0.02428 | 20 | 0.15570 | 18 | 0.21514 | 11 | 0.00646 | 62 | 0.02163 |
| 76 | 0.22707 | 7 | 0.00848 | 22 | 0.02423 | 22 | 0.14248 | 7 | 0.20871 | 21 | 0.00645 | 69 | 0.02090 |
| 11 | 0.22634 | 14 | 0.00843 | 10 | 0.02420 | 5 | 0.12882 | 30 | 0.20536 | 22 | 0.00604 | 59 | 0.02089 |
| 84 | 0.22426 | 22 | 0.00822 | 9 | 0.02381 | 76 | 0.12857 | 16 | 0.19142 | 14 | 0.00595 | 32 | 0.02046 |
| 22 | 0.22261 | 24 | 0.00816 | 17 | 0.02369 | 32 | 0.11549 | 64 | 0.19044 | 10 | 0.00591 | 18 | 0.02011 |
| 70 | 0.21971 | 11 | 0.00795 | 11 | 0.02359 | 17 | 0.10027 | 32 | 0.19029 | 9 | 0.00580 | 7 | 0.02001 |
| 18 | 0.21946 | 70 | 0.00795 | 56 | 0.02353 | 66 | 0.09903 | 31 | 0.18849 | 61 | 0.00560 | 25 | 0.01996 |
| 19 | 0.21946 | 76 | 0.00733 | 20 | 0.02336 | 68 | 0.09870 | 22 | 0.18311 | 76 | 0.0056 | 33 | 0.01955 |
| 14 | 0.21865 | 18 | 0.00683 | 32 | 0.023017 | 59 | 0.08913 | 58 | 0.18207 | 18 | 0.00551 | 12 | 0.01944 |
| 17 | 0.21762 | 9 | 0.00673 | 18 | 0.02297 | 39 | 0.08198 | 76 | 0.18202 | 70 | 0.00531 | 54 | 0.01916 |
| 2 | 0.21619 | 10 | 0.00672 | 2 | 0.02293 | 62 | 0.07459 | 2 | 0.17389 | 17 | 0.00525 | 66 | 0.01896 |

Table A-3 Continued

Performance Evaluation of Indian Mutual Funds Schemes with Respect...

| Sc h. N o. | S _R | Sc h. N o. | J _a | Sc h. N o. | T _R | Sc h. N o. | IR | Sc h. N o. | AR | Sc h. N o. | SH _p | Sc h. N o. | M ² |
|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------|---------------------|----------|---------------------|-----------------|---------------------|----------------|
| 32 | 0.21512 | 4 | 0.00671 | 28 | 0.02254 | 78 | 0.06699 | 29 | 0.15761 | 31 | 0.00477 | 31 | 0.01885 |
| 31 | 0.20835 | 77 | 0.00666 | 70 | 0.02234 | 9 | 0.05892 | 71 | 0.14323 | 32 | 0.00476 | 60 | 0.01872 |
| 4 | 0.20374 | 21 | 0.00649 | 14 | 0.02182 | 53 | 0.05617 | 4 | 0.13444 | 2 | 0.00461 | 17 | 0.01869 |
| 58 | 0.19881 | 64 | 0.00642 | 7 | 0.02175 | 10 | 0.04623 | 59 | 0.13332 | 71 | 0.00386 | 39 | 0.01864 |
| 71 | 0.19415 | 61 | 0.00631 | 71 | 0.02055 | 2 | 0.04126 | 5 | 0.13309 | 4 | 0.00354 | 15 | 0.01764 |
| 63 | 0.19411 | 56 | 0.00622 | 5 | 0.02054 | 29 | 0.03692 | 77 | 0.12289 | 58 | 0.00347 | 29 | 0.01744 |
| 5 | 0.19289 | 2 | 0.00579 | 64 | 0.02039 | 61 | 0.03346 | 63 | 0.11194 | 5 | 0.00311 | 63 | 0.01743 |
| 59 | 0.19183 | 63 | 0.00554 | 76 | 0.02031 | 69 | 0.02646 | 56 | 0.10454 | 39 | 0.00273 | 4 | 0.01726 |
| 77 | 0.18497 | 28 | 0.00545 | 59 | 0.02025 | 4 | 0.02251 | 39 | 0.10183 | 73 | 0.00266 | 13 | 0.01702 |
| 39 | 0.18326 | 31 | 0.00544 | 31 | 0.02013 | 60 | 0.01899 | 73 | 0.10143 | 68 | 0.00235 | 47 | 0.0169 |
| 56 | 0.18174 | 5 | 0.00518 | 73 | 0.01963 | 73 | 0.01330 | 62 | 0.08995 | 59 | 0.00232 | 3 | 0.01680 |
| 49 | 0.18168 | 59 | 0.00459 | 47 | 0.01934 | 21 | 0.01329 | 66 | 0.081043 | 62 | 0.00205 | 76 | 0.01671 |
| 73 | 0.18084 | 58 | 0.00438 | 62 | 0.01932 | 28 | 0.00980 | 55 | 0.08067 | 77 | 0.00179 | 78 | 0.01643 |
| 62 | 0.17795 | 62 | 0.00434 | 68 | 0.019232 | 71 | 0.00294 | 68 | 0.06737 | 63 | 0.00126 | 56 | 0.01641 |
| 68 | 0.16875 | 66 | 0.00425 | 60 | 0.01865 | 58 | -0.00082 | 53 | 0.06012 | 56 | 0.00125 | 42 | 0.01632 |
| 53 | 0.16423 | 68 | 0.00406 | 53 | 0.01848 | 13 | -0.00376 | 60 | 0.04722 | 45 | 0.00107 | 19 | 0.01627 |
| 45 | 0.15766 | 39 | 0.00398 | 39 | 0.01818 | 63 | -0.01064 | 45 | 0.04636 | 60 | 0.00071 | 67 | 0.01600 |
| 78 | 0.15753 | 73 | 0.00365 | 69 | 0.01666 | 56 | -0.01191 | 47 | 0.04296 | 43 | 0.00062 | 43 | 0.01588 |
| 60 | 0.15600 | 53 | 0.00356 | 33 | 0.01659 | 12 | -0.01767 | 74 | 0.03266 | 55 | 0.00057 | 38 | 0.01579 |
| 13 | 0.15296 | 71 | 0.00353 | 54 | 0.01658 | 3 | -0.01969 | 78 | 0.03190 | 53 | 0.00053 | 35 | 0.01566 |
| 75 | 0.15004 | 60 | 0.00262 | 74 | 0.01640 | 54 | -0.02265 | 54 | 0.02695 | 78 | 0.00035 | 41 | 0.01562 |
| 74 | 0.14990 | 69 | 0.00178 | 12 | 0.01624 | 74 | -0.02587 | 69 | 0.02146 | 74 | -4.8E-05 | 65 | 0.01560 |
| 54 | 0.14975 | 74 | 0.00151 | 51 | 0.01591 | 33 | -0.02639 | 13 | 0.01693 | 75 | -0.00044 | 8 | 0.01557 |
| 41 | 0.14391 | 54 | 0.00136 | 45 | 0.01578 | 45 | -0.02865 | 33 | 0.01677 | 13 | -0.00062 | 57 | 0.01542 |
| 51 | 0.14251 | 47 | 0.00133 | 15 | 0.01560 | 75 | -0.0291 | 12 | 0.01672 | 69 | -0.00072 | 73 | 0.01537 |
| 15 | 0.14249 | 45 | 0.00122 | 13 | 0.01560 | 65 | -0.03227 | 15 | 0.01244 | 46 | -0.0009 | 52 | 0.01535 |
| 12 | 0.13631 | 12 | 0.00110 | 19 | 0.01501 | 47 | -0.03904 | 51 | 0.01229 | 51 | -0.00137 | 74 | 0.01533 |
| 3 | 0.13223 | 78 | 0.00071 | 78 | 0.01472 | 43 | -0.03987 | 75 | 0.00791 | 54 | -0.00198 | 2 | 0.01533 |

Table A-3 Continued

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| Sc h. N o. | S _R | Sc h. N o. | J _a | Sc h. N o. | T _R | Sc h. N o. | IR | Sc h. N o. | AR | Sc h. N o. | SH _p | Sc h. N o. | M ² |
|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------|---------------------|----------|---------------------|-----------------|---------------------|----------------|
| 40 | 0.13084 | 13 | 0.00067 | 40 | 0.01472 | 42 | -0.04171 | 79 | 0.00601 | 34 | -0.00205 | 75 | 0.01519 |
| 33 | 0.13021 | 15 | 0.00064 | 75 | 0.01459 | 52 | -0.04305 | 19 | -0.0019 | 3 | -0.00223 | 6 | 0.01508 |
| 69 | 0.13019 | 79 | 0.00049 | 46 | 0.01344 | 77 | -0.04311 | 52 | -0.01878 | 15 | -0.00233 | 41 | 0.0149 |
| 34 | 0.12652 | 51 | 0.00044 | 3 | 0.01320 | 55 | -0.04404 | 46 | -0.02203 | 52 | -0.00279 | 9 | 0.01439 |
| 65 | 0.12631 | 75 | 0.00020 | 8 | 0.01290 | 15 | -0.04713 | 34 | -0.02408 | 12 | -0.00314 | 20 | 0.01414 |
| 52 | 0.12585 | 19 | -0.00015 | 34 | 0.01288 | 19 | -0.05281 | 65 | -0.02718 | 42 | -0.00325 | 61 | 0.01376 |
| 43 | 0.12260 | 46 | -0.00050 | 52 | 0.01282 | 57 | -0.05439 | 8 | -0.02855 | 65 | -0.00329 | 21 | 0.01359 |
| 38 | 0.11895 | 52 | -0.00091 | 43 | 0.01276 | 38 | -0.05713 | 80 | -0.02939 | 43 | -0.00347 | 10 | 0.0135 |
| 41 | 0.10899 | 3 | -0.00116 | 57 | 0.01248 | 51 | -0.06451 | 3 | -0.03118 | 33 | -0.00447 | 58 | 0.01222 |
| 42 | 0.10899 | 65 | -0.00128 | 42 | 0.01247 | 8 | -0.0698 | 57 | -0.03162 | 44 | -0.00512 | 45 | 0.01215 |
| 35 | 0.10594 | 80 | -0.00155 | 65 | 0.01244 | 50 | -0.07093 | 43 | -0.03758 | 57 | -0.00538 | 50 | 0.01213 |
| 6 | 0.10444 | 40 | -0.00156 | 6 | 0.01225 | 67 | -0.07201 | 6 | -0.03826 | 6 | -0.00617 | 44 | 0.01208 |
| 57 | 0.10388 | 43 | -0.00173 | 35 | 0.01221 | 6 | -0.07488 | 40 | -0.04052 | 35 | -0.00676 | 28 | 0.01207 |
| 44 | 0.10303 | 23 | -0.00179 | 38 | 0.01219 | 35 | -0.09136 | 36 | -0.04729 | 19 | -0.00677 | 80 | 0.01196 |
| 8 | 0.10293 | 8 | -0.00208 | 41 | 0.01214 | 44 | -0.09475 | 35 | -0.05078 | 8 | -0.00709 | 51 | 0.01193 |
| 67 | 0.09014 | 57 | -0.00220 | 79 | 0.01124 | 79 | -0.10637 | 42 | -0.06017 | 80 | -0.00748 | 71 | 0.01114 |
| 80 | 0.08989 | 42 | -0.00222 | 44 | 0.01102 | 72 | -0.10852 | 72 | -0.06245 | 79 | -0.00749 | 77 | 0.01093 |
| 79 | 0.06919 | 6 | -0.00247 | 67 | 0.010383 | 1 | -0.12223 | 44 | -0.06413 | 41 | -0.00803 | 34 | 0.00951 |
| 36 | 0.05767 | 38 | -0.00271 | 80 | 0.00988 | 34 | -0.12441 | 38 | -0.06963 | 67 | -0.00806 | 79 | 0.00757 |
| 50 | 0.05624 | 44 | -0.00304 | 36 | 0.009446 | 40 | -0.13755 | 50 | -0.07478 | 1 | -0.00924 | 40 | 0.00644 |
| 1 | 0.03415 | 41 | -0.00375 | 50 | 0.00850 | 36 | -0.1424 | 41 | -0.07766 | 36 | -0.00969 | 37 | 0.00638 |
| 72 | 0.03199 | 67 | -0.00539 | 72 | 0.00776 | 41 | -0.14864 | 67 | -0.07878 | 50 | -0.01228 | 36 | 0.00635 |
| 37 | 0.01982 | 72 | -0.0062 | 1 | 0.00342 | 37 | -0.15537 | 1 | -0.12273 | 66 | -0.01235 | 72 | 0.00630 |
| 55 | -0.01341 | 1 | -0.00702 | 37 | 0.00251 | 80 | -0.16554 | 37 | -0.16136 | 72 | -0.01589 | 1 | 0.00600 |
| 66 | -0.57245 | 50 | -0.00739 | 66 | -0.02796 | 46 | -0.27117 | 23 | -1.2416 | 37 | -0.02245 | 55 | -0.00059 |

Source: Calculated by author

Note: Sch. No. stands for Scheme No. representing the same schemes as given in Table A- 1.1.

Table A-4 : Top Ten performers according to various performance evaluation criterion

| Sch. No. | S _R | T _R | J _α | IR | AR | SHp | M ² |
|----------|----------------|----------------|----------------|----|----|-----|----------------|
| 28 | √ | | | | | √ | |
| 23 | √ | √ | | √ | | √ | √ |
| 49 | √ | √ | √ | √ | √ | √ | √ |
| 25 | √ | √ | √ | √ | √ | √ | |
| 48 | √ | √ | √ | √ | √ | √ | √ |
| 26 | √ | √ | | √ | √ | √ | √ |
| 29 | √ | | | | | | |
| 27 | √ | √ | | √ | √ | √ | √ |
| 21 | √ | | | | √ | | |
| 10 | √ | | | | √ | | |
| 29 | | √ | | | | | |
| 55 | | √ | | | | | |
| 58 | | √ | | | | | |
| 63 | | √ | | | | | |
| 32 | | | √ | | | | |
| 33 | | | √ | | | | |
| 34 | | | √ | | | | |
| 35 | | | √ | | | | |
| 36 | | | √ | | | | |
| 37 | | | √ | | | | |
| 16 | | | √ | √ | | | √ |
| 11 | | | | √ | | | |
| 70 | | | | √ | | | |
| 30 | | | | | √ | | √ |
| 20 | | | | | √ | √ | |
| 17 | | | | | √ | | |
| 14 | | | | | √ | | |
| 38 | | | | | | √ | |
| 40 | | | | | | √ | |
| 68 | | | | | | | √ |
| 24 | | | | | | | √ |

Source: Calculated by author

Note: Sch. No. stands for Scheme No. representing the same schemes as given in Table A- 1.1.

Table A-5 : Bottom Ten performers according to various performance evaluation criterion

| Sch. No. | S _R | T _R | J α | IR | AR | SHp | M ² |
|----------|----------------|----------------|------------|----|----|-----|----------------|
| 67 | √ | √ | √ | | √ | √ | |
| 80 | √ | √ | | √ | | √ | |
| 79 | √ | √ | | √ | | √ | √ |
| 36 | √ | √ | | √ | | √ | √ |
| 50 | √ | √ | √ | | √ | √ | |
| 1 | √ | √ | √ | √ | √ | √ | √ |
| 72 | √ | √ | √ | √ | √ | √ | √ |
| 37 | √ | √ | √ | √ | √ | √ | √ |
| 55 | √ | | | | | | √ |
| 66 | √ | √ | | | | √ | |
| 44 | | √ | √ | | √ | | |
| 57 | | | √ | | | | |
| 42 | | | √ | | √ | | |
| 6 | | | √ | | | | |
| 38 | | | √ | | √ | | |
| 41 | | | √ | √ | √ | √ | |
| 34 | | | | √ | | | √ |
| 40 | | | | | | | |
| 46 | | | | √ | | | |
| 23 | | | | | √ | | |
| 71 | | | | | | | √ |
| 77 | | | | | | | √ |

Source: Calculated by author

Note: Sch. No. stands for Scheme No. representing the same schemes as given in Table A- 1.1.