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Contributions to books

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

Journal and other articles

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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- Chandel K.S. (2009): "Ethics in Commerce Education." Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2006): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Kelkar V. (2009): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on February 17, 2011 http://epw.in/epw/user/viewabstract.jsp

RETURN - BASED PERFORMANCE ANALYSIS OF SELECTED EQUITY MUTUAL FUNDS SCHEMES IN INDIA – AN EMPIRICAL STUDY

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ABSTRACT

Risk and return plays a key role in most individual investors' decision making process. Every investor wants to avoid risk and maximize return. Investment decisions, therefore, involve a trade off between risk and return, which is considered to be central to the investment decision making. In today's environment, it is prudent for a rationale investor to look into the real interest on an investment as the inflation is moving out of the gear. While investors like return they abhor risk. This necessitates for optimization of risk and reward. Mutual fund is considered to be the most suitable investment option for the common man as it offers the opportunity to invest in a diversified, professional managed basket of securities at a relatively low cost. Mutual funds provide investment opportunities depending on investor's risk, return expectations. The present paper address the financial performance of mutual funds in the framework of risk – return dimensions. In order to achieve the objectives set, investment performance measures, cluster analysis and correlation analysis are used.

KEYWORDS
Cluster Analysis, Equity Mutual Funds, Return – Based Performance, Risk and Return trade off

INTRODUCTION

Risk and return plays a key role in most individual investors' decision making process. Every investor wants to avoid risk and maximize return. In general, risk and return go hand in hand. If an investor wishes to earn higher returns than the investor must appreciate that this will only be achieved by accepting a commensurate increase in risk. Risk and return are positively correlated; an increase in one is accompanied by an increase in the other. Investment decisions, therefore, involve a trade off between risk and return, which is considered to be central to the investment decision making.

In today's environment, it is prudent for a rationale investor to look into the real interest on an investment as the inflation is moving out of the gear. While investors like return they abhor risk. This necessitates for optimization of risk and reward. A common investor necessarily has to invest in bank deposits, post office savings, public provident funds for reasons such as liquidity, safety, assured return, tax benefits and so on. Here comes the need for the investors to invest something beyond these investment avenues with an appetite for higher rewards and of course with minimum risk. Mutual fund is considered to be the most suitable investment option for the common man as it offers the opportunity to invest in a diversified, professional managed basket of securities at a relatively low cost. Mutual funds provide investment opportunities depending on investor's risk, return expectations.

The rest of the paper is organised as follows. Section 2 presents the brief review of existing literature. Section 3 provides the data and their sources. The methodology employed for the present study is presented in section 4. Section 5 describes the empirical findings and discussions based on which the final section gives the summary of the paper along with conclusions.

REVIEW OF LITERATURE

Treynor (1965) developed a methodology for evaluating the fund performance called reward to volatility measure. In his path breaking study, Sharpe (1966) developed reward to variability measure and found 11 funds reported superior performance out of 34 funds to that of DJIA. Jensen's (1968) devised a measure based on CAPM and reported that mutual funds did not appear to achieve abnormal performance when transactions cost were considered. Fama (1972) developed a methodology for evaluating investment performance of managed portfolios. He suggested that overall performance could be broken down into several components.

Gupta (1974) evaluated the performance of select mutual funds categorized in terms of their broad investment objectives for the period 1962-71.He reported that all fund types outperformed the market irrespective of choice of market index and performance measure.

Jayadev (1996) evaluated the performance of two growth -oriented mutual funds on the basis of monthly returns compared to benchmark returns over a study period of 21 months (June 1992 to March 1994). He employed risk- adjusted performance, measures suggested by Jensen, Treynor and Sharpe for evaluation. He found that both the funds were poor in earning better returns either adopting market timing strategy or in selecting under – priced securities. Further, the study concluded that the two growth -oriented funds have not performed better in terms of total risk and were not offering advantages of diversification and professionalism to the investors.

Sethu (2001) attempted to evaluate the performance of 18 open-ended growth schemes in India for the period April 1995 to July 1999. Using three alternative indices for equity markets, viz., NSE Nifty, Sensex and S&P CNX 500, the study concluded that fund portfolios are not sufficiently diversified and portfolios do not show any market timing.

Noulas et al (2005) evaluated the performance of 23 Greek equity funds using risk – return analysis. The ranking of the mutual funds was based on the techniques used by Treynor, Sharpe and Jensen. The study showed that the equity funds have neither the same risk nor the same return. They reported that there were big differences among the equity mutual funds with respect to risk and return.

Muthappan and Damodharan (2006) evaluated the performance of Indian mutual fund schemes in the risk and return framework during the period April 1995 to March 2000 employing Sharpe, Treynor, Jensen, Sharpe differential measure and Fama's components of performance measures. The results indicated that the risk and return of mutual fund schemes were not in conformity with their investment objectives. The sample schemes were found to be inadequately diversified. However, the funds were able to earn higher returns due to selectivity.

Tripathy (2006) empirically investigated the market timing abilities of Indian fund managers of thirty one tax planning schemes in India over the period December 1995 to January 2004 using Treynor and Mazuy Model and Henriksson and Merton Model. The study reported that the fund managers were not successful in reaping returns in excess of the market returns; rather they were timing the market in wrong direction.

Deb et al (2007) employed conditional and unconditional approaches to find the stock selection and market timing abilities of 96 Indian mutual fund managers. The study reported lack of market timing abilities and presence of stock selection abilities among the fund managers in both conditional as well as unconditional approaches. Further, from pooled regressions, they confirmed the strong evidence of positive stock selection and negative market timing.

Sehgal and Jhanwar (2008) evaluated the performance of 60 growth and growth – income mutual fund schemes in India from January 2000 to December 2004.They examined both the stock selection skills and the timing abilities of the sample fund managers and argued that multi-factor benchmarks provide better selectivity and timing measures compared to one-factor CAPM as they control for style characteristics such as size, value and momentum. It found that the evidence on selectivity improved marginally when higher frequency data such as daily returns are used instead of monthly returns.

Zabiulla (2010) examined the investment performance of twelve selected sector funds during April 2006 to July 2009 using high frequency data. The study revealed that performance measured in terms of downside and relative risk criteria revealed that almost all the schemes posted poor performance. The study concluded that time tested models alone cannot give a fair view of the fund manager's competence skills in delivering abnormal returns; downside risk measures could definitely augment the performance evaluation framework of managed portfolios.

DATA AND THEIR SOURCES

SAMPLE: We have used a sample of 30 equity diversified mutual fund schemes to examine the risk – return relationship. These schemes are aggressive in nature and are ranked based on their three year performance by ICRA as on 31st December 2009.

PERIOD OF STUDY: Data concerning this study covers a period of recent 45 months that span from April 2006 to December 2009.

DATA: This study is both descriptive and empirical in nature. The overall data set up for the analysis in this study is based on secondary data. Daily NAVs of the sample equity diversified schemes are taken from the website of Association of Mutual Funds in India (AMFI). S&P CNX 500 is used as a proxy for the market return and the daily index close values are retrieved form the website of National Stock Exchange (NSE). The bank rate is used as a surrogate for risk free rate of return and is taken from the Reserve Bank of India (RBI) website.

OBJECTIVES THE STUDY: The study aims at analyzing the risk – return relationship of select equity diversified mutual fund schemes using emerging market data.

TOOLS USED FOR ANALYSIS: In order to examine the return based performance of the sample equity mutual fund schemes, the following tools are employed:

a) Performance measures: Average Returns, Standard Deviation, Beta, R – Squared, Jensen's Alpha and Sharpe Index.
b) Cluster Analysis for stratification of schemes based on average cluster centres.
c) Correlation Analysis for understanding the relationship between the performance measures.

Data collected from different sources was analysed through SPSS 17.0 (Statistical Package for Social Sciences).

METHODOLOGY

RISK BASED PERFORMANCE MEASURES

The daily NAV data have been converted into daily return using the equation $R_{it} = \ln\left(NAV_t / NAV_{t-1}\right) * 100$. Daily return on market portfolio has been calculated using equation except that in place of NAV, closing index values are used. The series so developed is averaged to arrive at the average return for the scheme as well as the benchmark portfolio. Standard deviation is a measure of variability in returns. The higher the standard deviation, higher will be the risk and vice – versa.

The systematic risk of a portfolio is measured by beta. Systematic risk is the variability in the portfolio return caused by the changes in the economy or the market. A higher variability would indicate higher systematic risk and vice – versa. Regression method is used for calculating beta in the present study. Excess portfolio return is regressed over excess market return to estimate the beta coefficient. A beta of 1.0 indicates a fund of average risk. A fund with beta greater than 1.0 has above average risk. Its returns would be more volatile than the market return. A fund with a beta less than 1.0 would have below average risk variability in its return and would be comparatively lower than the market variability. Beta can also be negative, implying that the fund return moves in a direction opposite to that of the market return.

R – Squared is the ratio of the explained variation to the total variation. It measures the extent of portfolio diversification. In other words, it measures the extent to which market index has been able to explain the variation in mutual fund. The high value of R – Squared indicates the fund manager has exploited the diversification strategy to the optimum extent.

Jensen's alpha measures the difference between the actual return earned on a portfolio and a return expected from the portfolio given its level of risk. The differential return gives an indication of the portfolio manager's predictive abilities of stock selection. The differential return is calculated as $\alpha_p = R_p - E(R_p)$ where α_p is the differential return earned, R_p is the actual returned earned on the portfolio and $E(R_p)$ is the expected return and is obtained using CAPM methodology. A positive alpha indicates that superior return has been earned due to superior management skills, when alpha is zero, it indicates neutral performance meaning that the portfolio manager has done just as well as

an unmanaged randomly selected portfolio with a naïve buy – hold strategy. A negative alpha reflects that the portfolio performance has been worse than that of the market or a randomly selected portfolio of equivalent risk.

Sharpe index measures the risk premium of the portfolio relative to the total amount of risk in the portfolio. The larger the Sharpe index, the better the fund has performed and vice – versa. Sharpe index has been calculated as: $(R_p - R_f)/\sigma_p$, where $R_p - R_f$ is the excess portfolio return over risk free rate of return and σ_p is the standard deviation of portfolio return.

CLUSTER ANALYSIS

Cluster Analysis is a multivariate statistical tool that attempts to identify relatively homogeneous groups of cases based on selected characteristics. The cluster analysis is an exploratory data analysis which aims at sorting different objects into groups in a away that the degree of association between two objects is maximal if they belong to the same group and minimal otherwise. It is regarded as data reduction technique. For the purpose of this study, the researcher has selected updating cluster centers iteratively for classifying cases.

CORRELATION ANALYSIS

Correlation Analysis is a statistical device which helps us in analysing the correlation of two or more variables. The problem of analysing the relation between different series should be broken into three steps:

(i) Determining a whether a relation exists and, if it does, measuring it,
(ii) Testing whether it is significant, and
(iii) Establishing the cause and effect relation, if any.

In the present study, Karl Pearson correlation coefficient is used.

ANALYIS OF RESULTS

RESULTS OF PERFORMANCE MEASURES

Table 1(a) summarises the results of performance measures of the sample equity mutual fund schemes. Table 1(b) presents the descriptive statistics of the performance measures. The average daily returns were positive for all the schemes under consideration. The maximum daily average returns was found in Reliance Diversified Power Fund – Growth (0.102%); while two schemes have posted least average returns namely, Birla Sun Life India Opportunities Fund – Growth (Plan B) and Taurus Bonanza Fund – Growth (0.01%). The average returns for all the schemes stood at 0.046%. Majority of the schemes (16 schemes) have posted above average retruns of 0.046% during the sample period. All the schemes have standard deviation greater than unity. LIC Equity Fund – Growth is more volatile in comparison with the other sample schemes while Birla Sun Life MNC Fund – Growth has recorded least estimate of standard deviation among the sample schemes. Further, LIC Equity Fund – Growth is highly risky as its beta exceeds the market beta of one. Other schemes are less volatile than the market index. It is interesting to note that almost all the schemes have exploited the diversification strategy as evidenced by their higher R—squared values. Alpha predicts the stock selectivity skills of a fund manager. Nine schemes have recorded negative alpha, which is a true indicator of poor performance. Reliance Diversified Power Fund – Growth has shown better performance in terms of alpha. LIC Equity Fund – Growth, SBI MSU – Emerging Businesses – Growth, Taurus Bonanza Fund – Growth and Birla Sun Life India Opportunities Fund – Growth (Plan B) has shown poor performance in terms of providing excess returns per unit total risk exposure a fund is confronted with as revealed by their negative Sharpe ratios.

TABLE 1(A): RESULTS OF PERFORMANCE MEASURES

Sl. No.	Mutual Fund Scheme	μ	σ	β	R^2	α	SI
1	Birla Sun Life Basic Industries – Growth	0.040	2.050	0.947	0.952	0.004	0.008
2	Birla Sun Life Buy India Fund – Growth	0.040	1.710	0.753	0.859	0.002	0.010
3	Birla Sun Life India GenNext Fund – Growth	0.040	1.650	0.731	0.867	-0.001	0.010
4	Birla Sun Life India Opportunities Fund – Growth (Plan B)	0.010	1.790	0.799	0.881	-0.029	-0.007
5	Birla Sun Life MNC Fund – Growth	0.030	1.430	0.619	0.831	-0.004	0.005
6	Canara Robeco Infrastructure Fund – Growth	0.050	2.110	0.971	0.941	0.008	0.013
7	Fidelity Equity Fund – Growth	0.050	1.800	0.837	0.966	0.016	0.015
8	Fidelity India Special Situations Fund – Growth	0.060	1.920	0.875	0.916	0.006	0.019
9	Franklin India Flexi Cap Fund – Growth	0.050	1.960	0.913	0.957	0.007	0.014
10	HDFC Capital Builder Fund – Growth	0.050	1.730	0.771	0.884	0.008	0.015
11	HDFC Core & Satellite Fund – Growth	0.040	1.900	0.857	0.903	-0.002	0.009
12	HDFC Equity Fund – Growth	0.060	1.870	0.857	0.929	0.024	0.020
13	HDFC Top 200 – Growth	0.070	1.880	0.871	0.954	0.027	0.025
14	ICICI Prudential Infrastructure Fund – Growth	0.070	2.050	0.943	0.942	0.031	0.023
15	ICICI Prudential Service Industries Fund – Growth	0.030	1.890	0.860	0.920	-0.007	0.004
16	LIC Equity Fund – Growth	0.020	2.310	1.039	0.911	-0.019	-0.001
17	PRINCIPAL Services Industries Fund – Growth	0.030	1.880	0.862	0.933	-0.013	0.004
18	Reliance Diversified Power Fund – Growth	0.100	1.890	0.844	0.886	0.064	0.041
19	Reliance Growth – Growth	0.070	1.820	0.826	0.916	0.028	0.026
20	SBI Magnum Multiplier Plus 93 – Growth	0.050	1.800	0.808	0.893	0.012	0.015
21	SBI MSU – Emerging Businesses – Growth	0.020	2.090	0.894	0.817	-0.023	-0.002
22	Sundaram BNP Paribas CAPEX Opportunities Fund – Growth	0.050	2.020	0.884	0.848	0.011	0.013
23	Sundaram BNP Paribas Rural India Fund – Growth	0.040	1.940	0.856	0.871	-0.006	0.009
24	Tata Dividend Yield Fund – Growth (App)	0.050	1.800	0.798	0.869	0.010	0.015
25	Tata Equity P/E Fund – Growth	0.070	1.910	0.856	0.895	0.030	0.024
26	Tata Infrastructure Fund – Growth	0.050	2.110	0.980	0.958	0.011	0.013

27	Tata Life Sciences and Technology Fund – Appr.	0.040	1.640	0.672	0.747	0.009	0.010
28	Tata Select Equity Fund – Appr	0.030	1.950	0.878	0.902	-0.008	0.003
29	Taurus Bonanza Fund – Growth	0.010	2.140	0.964	0.903	-0.029	-0.006
30	UTI Opportunities Fund – Growth	0.050	1.820	0.831	0.922	0.011	0.015

TABLE 1(B): DESCRIPTIVE STATISTICS OF PERFORMANCE MEASURES

Descriptive Statistics	μ	σ	β	R^2	α	SI
Mean	0.046	1.895	0.853	0.899	0.006	0.012
Median	0.050	1.890	0.857	0.903	0.008	0.013
Maximum	0.100	2.310	1.039	0.966	0.064	0.041
Minimum	0.010	1.430	0.619	0.747	-0.029	-0.007
Std. Dev.	0.019	0.175	0.089	0.048	0.020	0.010

RESULTS OF CLUSTER ANALYSIS

TABLE 2(A) – STRATIFICATION BASED ON AVERAGE RETURNS FINAL CLUSTER CENTERS

	Cluster		
	1	2	3
Return	.052	.023	.100

TABLE 2(B) – NUMBER OF CASES IN EACH CLUSTER

Cluster	1	21.000
	2	8.000
	3	1.000
Valid		30.000
Missing		.000

Source: SPSS 17.0 Output

Using K – Mean Cluster Analysis, all the 30 mutual fund schemes were classified into three clusters based on average returns. The final cluster centres, after all iterations, along with the number of funds in each cluster are computed using SPSS 17.0. Based on the average cluster centre, only one fund, Reliance Diversified Power Fund has performed better in terms of providing returns to the investors. Eight funds have shown poor performance proxied by average returns which includes Birla Sun Life India Opportunities Fund (Plan B), Birla Sun Life MNC Fund, ICICI Prudential Service Industries Fund, LIC Equity Fund, PRINCIPAL Services Industries Fund, SBI MSU – Emerging Businesses, Tata Select Equity Fund and Taurus Bonanza Fund. While remaining twenty- one sample equity diversified funds have posted average performance in generating average returns.

TABLE 3(A) – STRATIFICATION BASED ON STANDARD DEVIATION FINAL CLUSTER CENTERS

	Cluster		
	1	2	3
Std. Dev	2.110	1.872	1.632

TABLE 3(B) – NUMBER OF CASES IN EACH CLUSTER

Cluster	1	8.000
	2	17.000
	3	5.000
Valid		30.000
Missing		.000

Source: SPSS 17.0 Output

Standard deviation is a measure of portfolio risk. Using K – Mean Cluster Analysis, all the 30 mutual fund schemes were classified into three clusters based on standard deviation. The final cluster centres, after all iterations, along with the number of funds in each cluster are computed using SPSS 17.0. Based on the average cluster centre, five funds have posted least standard deviation. They include Birla Sun Life Buy India Fund, Birla Sun Life India GenNext Fund, Birla Sun Life MNC Fund, HDFC Capital Builder Fund and Tata Life Sciences and Technology Fund. Eight of the sample funds are considered to be more risky as evidenced by their highest estimate of standard deviation. The highly risky funds are Birla Sun Life Basic Industries Fund, Canara Robeco Infrastructure Fund, ICICI Prudential Infrastructure Fund, LIC Equity Fund, SBI MSU – Emerging Businesses, Sundaram BNP Paribas CAPEX Opportunities Fund, Tata Infrastructure Fund and Taurus Bonanza Fund. While remaining 17 funds falling under cluster -2 have posted moderate level of risk.

TABLE 4(A) – STRATIFICATION BASED ON BETA FINAL CLUSTER CENTERS

	Cluster		
	1	2	3
Beta	.97	.85	.69

TABLE 4(B) – NUMBER OF CASES IN EACH CLUSTER

Cluster	1	7.000
	2	19.000
	3	4.000
Valid		30.000
Missing		.000

Source: SPSS 17.0 Output

Beta is a measure of systematic risk. It measures the sensitivity of fund's return in relation with the market return. By convention, the beta of the market portfolio is 1. If the beta of the fund's return is higher than the market beta, the funds is highly risky and is aggressive in nature. On the other hand, if the fund's return is lower than the market beta, the funds is less risky and is defensive in nature.

Using K – Mean Cluster Analysis, all the 30 mutual fund schemes were classified into three clusters based on beta. The final cluster centres, after all iterations, along with the number of funds in each cluster are computed using SPSS 17.0. It is observed from the above table that all the clusters have a beta less than unity. It implies that the sample mutual fund schemes are less volatile than the market portfolio. Based on the average cluster centre, the best funds with low beta in the sample include Birla Sun Life Buy India Fund, Birla Sun Life India GenNext Fund, Birla Sun Life MNC Fund and Tata Life Sciences and Technology Fund. The portfolios of these funds were prone to less fluctuation in comparison with the market portfolio. Cluster – 1 indicates the number of funds with highest beta. These schemes were tend to hold portfolios that replicate the market portfolio.

TABLE 5(A) – STRATIFICATION BASED ON R – SQUARED FINAL CLUSTER CENTERS

	Cluster		
	1	2	3
R – Squared	.94	.80	.88

TABLE 5(B) – NUMBER OF CASES IN EACH CLUSTER

Cluster	1	13.000
	2	3.000
	3	14.000
Valid		30.000
Missing		.000

Source: SPSS 17.0 Output

Diversification helps reduce the risk associated with the investments. Whether the fund manager has exploited the diversification strategy in forming their portfolio or not can be examined with the help of R – squared. It measures the extent to which market index has been able to explain the variation in mutual fund. The high value of R^2 indicates high diversification of portfolio while a low value of R^2 indicates less diversification of the portfolio.

Using K – Mean Cluster Analysis, all the 30 mutual fund schemes were classified into three clusters based on R- Squared. The final cluster centres, after all iterations, along with the number of funds in each cluster are computed using SPSS 17.0. It is observed from the above table that thirteen funds falling under cluster -1 could explain 94% of the total variation in fund's return, while the other 6% of the total variation remains unexplained. It shows that these funds are highly correlated with the market index. Further, three funds under cluster – 3 could able to explain the variation in fund's return to the extent of 80%. The analysis of the above table reveals 43% of the sample schemes are well diversified in churning their portfolios, while the others are reasonably diversified.

TABLE 6(A) – STRATIFICATION BASED ON ALPHA FINAL CLUSTER CENTERS

	Cluster		
	1	2	3
Alpha	.014	-.013	.064

TABLE 6(B) – NUMBER OF CASES IN EACH CLUSTER

Cluster	1	18.000
	2	11.000
	3	1.000
Valid		30.000
Missing		.000

Source: SPSS 17.0 Output

Alpha reflects the difference between the return actually earned on a portfolio and the return the portfolio was supposed to earn, given its systematic risk (beta). A positive alpha shows that the fund has performed better and has outperformed the market; while a negative alpha

suggests that the fund has underperformed as compared to the market. An alpha estimate of zero indicates that the fund has just performed what it is expected to.

Using K – Mean Cluster Analysis, all the 30 mutual fund schemes were classified into three clusters based on Alpha. The final cluster centres, after all iterations, along with the number of funds in each cluster are computed using SPSS 17.0. Based on average cluster centre, the best performing fund is formed under cluster – 3 viz., Reliance Diversified Power Fund. Of 35 schemes, 11 schemes have posted negative alpha values thus reflecting poor performance. These schemes failed to compensate the investors with the return that commensurate the level of systematic risk undertaken.

TABLE 7(A) – STRATIFICATION BASED ON SHARPE RATIO FINAL CLUSTER CENTERS

	Cluster		
	1	2	3
Sharpe Ratio	.041	.015	.000

TABLE 7(B) – NUMBER OF CASES IN EACH CLUSTER

Cluster	1	1.000
	2	21.000
	3	8.000
Valid		30.000
Missing		.000

Source: SPSS 17.0 Output

Sharpe ratio is a reward to variability ratio and uses the standard deviation as the measure of total risk. All other things being equal, higher Sharpe Index translates into a higher performance and vice – versa.

Using K – Mean Cluster Analysis, all the 30 mutual fund schemes were classified into three clusters based on Sharpe Ratio. The final cluster centres, after all iterations, along with the number of funds in each cluster are computed using SPSS 17.0. Based on average cluster centre, the best performing fund is formed under cluster – 3 viz., Reliance Diversified Power Fund. Of 35 schemes, 8 schemes have posted least value of Sharpe ratio thus reflecting poor performance. These include Birla Sun Life India Opportunities Fund, Birla Sun Life MNC Fund, ICICI Prudential Service Industries Fund, LIC Equity Fund, PRINCIPAL Services Industries Fund, SBI MSU – Emerging Businesses Fund, Tata Select Equity Fund, and Taurus Bonanza Fund.

RESULTS OF CORRELATION ANALYSIS

TABLE 8– CORRELATION MATRIX OF RISK AND RETURN MEASURES

		Average Return	Std. Deviation	Beta	R Squared	Alpha	Sharpe Ratio
Average Return	Pearson Correlation	1	-.092	-.014	.253	.977**	.997**
	Sig. (2-tailed)		.628	.942	.177	.000	.000
	N	30	30	30	30	30	30
Std. Deviation	Pearson Correlation	-.092	1	.972**	.432*	-.149	-.144
	Sig. (2-tailed)	.628		.000	.017	.432	.447
	N	30	30	30	30	30	30
Beta	Pearson Correlation	-.014	.972**	1	.630**	-.076	-.066
	Sig. (2-tailed)	.942	.000		.000	.690	.730
	N	30	30	30	30	30	30
R Squared	Pearson Correlation	.253	.432*	.630**	1	.201	.227
	Sig. (2-tailed)	.177	.017	.000		.287	.228
	N	30	30	30	30	30	30
Alpha	Pearson Correlation	.977**	-.149	-.076	.201	1	.978**
	Sig. (2-tailed)	.000	.432	.690	.287		.000
	N	30	30	30	30	30	30
Sharpe Ratio	Pearson Correlation	.997**	-.144	-.066	.227	.978**	1
	Sig. (2-tailed)	.000	.447	.730	.228	.000	
	N	30	30	30	30	30	30
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Source: SPSS 17.0 Output

It is inferred from the above table that the average return is positively correlated (high) with alpha and Sharpe ratio and the association is found to be substantially significant at 1% level of significance. Average returns and standard deviation is negatively correlated but the magnitude is not high as evidenced by its correlation coefficient of 0.092.

Standard deviation and beta is highly correlated (positive) and statistically significant. A moderate correlation is found between standard deviation and coefficient of determination as measured by R – squared. Alpha and Sharpe ratio negatively correlated with standard deviation. Besides, beta and R –Squared are statistically significant and highly correlated. Beta bears an inverse relationship with alpha and Sharpe ratio.

CONCLUSION

Reliance Diversified Power Fund has performed better in terms of providing returns to the investors. Eight funds have shown poor performance proxied by average returns which includes Birla Sun Life India Opportunities Fund (Plan B), Birla Sun Life MNC Fund, ICICI Prudential Service Industries Fund, LIC Equity Fund, PRINCIPAL Services Industries Fund, SBI MSU – Emerging Businesses, Tata Select Equity Fund and Taurus Bonanza Fund.

Eight of the sample funds are considered to be more risky as evidenced by their highest estimate of standard deviation. The highly risky funds are Birla Sun Life Basic Industries Fund, Canara Robeco Infrastructure Fund, ICICI Prudential Infrastructure Fund, LIC Equity Fund, SBI MSU – Emerging Businesses, Sundaram BNP Paribas CAPEX Opportunities Fund, Tata Infrastructure Fund and Taurus Bonanza Fund

The sample mutual fund schemes are less volatile than the market portfolio. The results showed that 43% of the sample schemes are well diversified in churning their portfolios, while the others are reasonably diversified. Of 35 schemes, 11 schemes have posted negative alpha values thus reflecting poor performance. These schemes failed to compensate the investors with the return that commensurate the level of systematic risk undertaken.

The results of correlation matrix showed that the average return is positive and highly correlated with alpha and Sharpe ratio and the association is found to be statistically significant. Standard deviation and beta is highly correlated (positive) and statistically significant. Alpha and Sharpe ratio are negatively correlated with standard deviation. Besides, beta and R – squared are statistically significant and highly correlated. Beta bears an inverse relationship between alpha and Sharpe ratio.

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