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CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	SERVICE QUALITY DIMENSIONS IN RETAIL SETTINGS: AN EMPIRICAL STUDY AT SELECTED APPAREL SPECIALTY STORES OF MUMBAI <i>DR. SUDHEER DHUME</i>	1
2.	REDUCING HEALTH INEQUALITIES: KERALA COMPREHENSIVE HEALTH INSURANCE SCHEME A ROLE MODEL FOR DEVELOPING COUNTRIES <i>DEVI NAIR & KORA TUSHUNE</i>	6
3.	FACTOR AFFECTING FOREIGN DIRECT INVESTMENT (FDI) INFLOW IN THE BUILDING AND CONSTRUCTION SECTOR <i>DR. S.A. BUSTANI, I.S. YESUFU, E.A. UFUAH & DR. S.M. JIMAH</i>	13
4.	ESTABLISHING CRM IN SMALL ENTERPRISES <i>BORIS MILOVIC</i>	18
5.	FINANCIAL DEVELOPMENT AND AGRICULTURAL SECTOR GROWTH IN CAMEROON <i>DR. ARMAND GILBERT NOULA & NEBA CLETUS YAH</i>	22
6.	ECONOMIC COST IMPLICATIONS OF THE USE OF GENERATORS AS ALTERNATIVE SOURCE OF ENERGY IN KANO METROPOLIS - NIGERIA <i>DR. AHMAD MUHAMMAD TSAUNI & ABUBAKAR HASSAN</i>	28
7.	FACTORS INFLUENCING PATIENT'S DECISION OF SELECTING A HOSPITAL <i>MOHAMMED ARIF RAZA</i>	34
8.	AVAILABILITY AND AWARENESS OF MICROFINANCE IN JAMMU & KASHMIR STATE <i>MUBASHIR NABI & DR. ASHOK AIMA</i>	40
9.	RURAL LIVELIHOOD MARKETS AND ECONOMIES <i>DR. NITIN RAGHUNATH ZAWARE</i>	48
10.	NREGA UNDER SOCIAL AUDIT: A SWOT ANALYSIS <i>S.P. NAGANAGOUD & DR. H. H. ULIVEPPA</i>	51
11.	PERCEPTION AND PRACTICES OF INDIVIDUALS ON PUBLIC HEALTH CENTRES <i>V. SANGEETHA, DR. G. PAULRAJ, DR. S. RAMESHKUMAR & L. DINESH.</i>	56
12.	THE EFFECT OF MERGERS AND ACQUISITIONS ON SHAREHOLDERS' WEALTH – AN EMPIRICAL ANALYSIS <i>DR. S. VANITHA & DR. M. SELVAM</i>	59
13.	A STUDY ON ROADSIDE FOOD STALLS IN TIRUCHIRAPPALLI CORPORATION WITH SPECIAL REFERENCE TO FOOD INDUSTRY AND HOTEL INDUSTRY <i>DR. J. MOHAN RAJ</i>	70
14.	BIOFUELS CONSUMPTION IN EASTERN HIMALAYAS HOUSEHOLDS - AN EMPIRICAL ANALYSIS <i>DR. RABINJYOTI KHATANAR & DR. BIDYUT JYOTI BHATTACHARJEE</i>	75
15.	IMPACT OF WOMAN EMPOWERMENT THROUGH MICRO FINANCE INSTITUTES: SOCIO-ECONOMIC AND BEHAVIORAL PERSPECTIVES AFFECTING TO RULER SEGMENT WOMAN OF GANDHINAGAR IN GUJARAT <i>URVI AMIN & BANSI PATEL</i>	81
16.	A STUDY OF BANK TRANSACTION COST OF PCARDBS IN MYSORE DISTRICT <i>DR. C. MAHADEVA MURTHY & DR. VEENA. K.P</i>	89
17.	WOMEN ENTREPRENEURSHIP THROUGH SELF-HELP GROUPS: A CASE STUDY OF TIRUNELVELI DISTRICT, TAMIL NADU <i>A. ANGEL ANILA</i>	93
18.	HANDLOOM AS AN ACTIVITY TO ENSURE FOOD SECURITY SPECIAL REFERENCE TO WEST BENGAL <i>CHITTARANJAN DAS</i>	97
19.	AGRICULTURAL INFRASTRUCTURE DEVELOPMENT IN THE GENERATION OF INCOME AMONG THE SMALL AND MARGINAL FARMERS <i>DR. C. GUNASEKARAN</i>	102
20.	FACTORS INFLUENCING THE EFFECTIVE FUNCTIONING OF THE SELF-HELP GROUPS - AN ANALYTICAL STUDY <i>DR. M. GURUPANDI</i>	104
21.	PUBLIC DISTRIBUTION SYSTEM IN TAMIL NADU NEEDS DEFINITE OVERHAULING <i>DR. S. MAYILVAGANAN & B. VARADARAJAN</i>	108
22.	PERCEPTION OF ORGANIZATIONAL CLIMATE: A STUDY OF SMALL ENTERPRISES IN AMRITSAR <i>DR. GURPREET RANDHAWA & KULDEEP KAUR</i>	110
23.	ROLE OF EXCESS OF MALES IN MARRIAGE SQUEEZE OF INDIA AND ITS EAG STATES <i>RANJANA KESARWANI</i>	114
24.	PERFORMANCE EVALUATION OF MUTUAL FUNDS IN INDIA: AN APPLICATION OF RISK-ADJUSTED THEORETICAL PARAMETERS <i>JOITY TOMER</i>	120
25.	SMALL FAMILY NORMS IN INDIA AND ITS QUALITATIVE IMPLICATIONS ON CHILD CARE: A MULTIVARIATE ANALYSIS <i>RITWIKA MUKHERJEE</i>	134
	REQUEST FOR FEEDBACK	142

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PERFORMANCE EVALUATION OF MUTUAL FUNDS IN INDIA: AN APPLICATION OF RISK-ADJUSTED THEORETICAL PARAMETERS

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ABSTRACT

Mutual fund provides a readymade option to households for portfolio diversification as well as relative risk aversion through collecting and investing their savings in different risk-return profile instruments. Its performance depends on the performance of underlying portfolio. If one or more schemes perform badly in the portfolio, that can effect or hurt the investment decisions of investors and may get them out from the scenario of wealth creation process. For saving investors' money from such a hazard, it becomes necessary to evaluate the performance of mutual fund portfolio so that investors can take/judge their investment decisions rationally. This evaluation would help in checking the prime idea of "putting all eggs in different baskets" behind mutual funds and guessing that how far this idea is doing well for investors. Therefore, our study has attempted to evaluate the comparative performance of public and private sector mutual fund schemes in terms of risk-return measures (Average returns, Standard Deviation and Beta) and Risk-Adjusted theoretical parameters suggested by Sharpe (1966) and Treynor (1965). Sample of our study consists of 57 mutual fund schemes for the period, 2005 to 2010. Results reveal that the performance of private sector mutual funds has been superior to public sector funds in almost of the frames. Private sector mutual fund is found to be the more efficient allocator of resources for investors than public sector mutual funds. Though, they together are failed on the prime idea of "putting all eggs in different baskets" because of inadequate diversification results. Mutual funds are found to do well only on the part of optimizing portfolio returns and not on the part of portfolio risk diversification process.

KEYWORDS

mutual fund Performance, investment, risk-return Treynor Ratio, sharpe Ratio.

INTRODUCTION

A person with more money in hands can satisfy his consumption requirements as well as save for the needed time is meant to be the potential investor who can put his money in securities, bank deposits/ real estate/ gold or in any other assets of his interest. So, the person or entities who have extra cash keep on investing it into different types of assets in order to amplifying their wealth. This cycle of wealth creation continues which termed to be the investment in broader sense. Investment is made with an aim of increasing present wealth or earning income and involves two important elements namely the time and risk. Current consumption is sacrificed in hope to earn some returns in future. The sacrifice that has to be borne is definite but return in future is not definite. This indicates the risk element of any investment made. All investments involve certain element of risk and their risk profiles vary according to the changing degree of returns.

The economic and financial meanings of investment have slightly different approaches. Former considers investment as a net addition to the nation's capital stock while later, the allocation of money to assets class that can yield some returns over the periods of time. Both approaches are absolutely linked to each other because savings of the people are invested into capital or money market instruments as financial investment first and then, it is to be utilized as the economic investment further. Financial investment made in securities is rather underside approach of investment and varies according to the financial goals of the individuals. The retired people would like to save for their future needs; private individual would like to increase their present wealth; private corporate would prefer to expand the existing business and government would prefer to finance its projects. Hence, finance is the key to investment and thus to economic growth in a nation. Finance is one of the main functions of financial system which involves the sum total of functions performed by all financial intermediaries. Financial intermediaries carry out the function of mediating money between saver and borrower and assist in spreading the risk of financial investments in a diversified form. They also provide the liquidity facility to investors with some necessary information and guidance about the investment process. In simple terms, "financial intermediaries are the firms that provide services and products that customers may not be able to get more efficiently by themselves in the financial market."² They include credit unions, banks, saving & loans, mutual funds, leasing companies and insurance organizations. Mutual fund is one of the finest examples of financial intermediary which offers the opportunity to invest in a diversified, professionally managed basket of securities at a relatively low cost.

Mutual fund works on the maxims of twin properties namely, the optimization of portfolio returns and diversification of portfolio risk. The suitability of investment in mutual funds can be judged by evaluating its portfolio performance in terms of the aforesaid twin properties. If one or more schemes perform badly in the portfolio that can effect or hurt the investment decisions of investors and may get them out from the scenario of wealth creation process. For saving investors' money from such vulnerability, it is important to evaluate the performance of mutual fund portfolio so that investors can judge their investment decisions rationally for present as well as for the future time. This evaluation would help in checking the prime idea of putting all eggs in different baskets behind mutual fund and guessing that how far this idea is doing well for investors. Therefore, our study is aimed to gauge the comparative performance of mutual fund portfolio in terms of risk and return offered and risk adjusted returns provided to investors.

THEORETICAL BACKGROUND OF PORTFOLIO PERFORMANCE DYNAMICS

The foundation for studying the risk-return quantification was first laid by Markowitz (1952) and Tobin (1958). In 1950's, Markowitz, who called as "the father of modern portfolio theory", proposed the basic portfolio model based on the mean-variance characteristics of underlying investment, that later became the base of developing asset pricing models in financial literature. Before the development of these two parameter mean-variance portfolio theory, investors generally measured the performance of portfolio in terms of comparing the returns generated with some broad yardstick.³ That time, source of measuring the performance of fund managers were not available or considered like now. Therefore, with the development of modern portfolio theory (MPT), Markowitz transformed the philosophy on portfolio performance issues by answering, what a rational investor should do. Since his attempt in the area, the drive of thinking on portfolio performance issues was started and gave some direction to William S. Sharpe (1964), Linter (1965) and Black (1972) to develop the kind of model that could answer that how risk and returns are related for any portfolio, thus developed the Capital Asset Pricing Model (CAPM). This model was an extension of MPT and proposed that how risky assets are priced in the market or returns on securities are determined through systematic part of risk. The model specification can be written as follows,

$$E(R_i) = R_f + \beta_i [E(R_m) - R_f] + e_i$$

This equation form of relationship is also called the *ex post* Security Market Line (SML). It is the equation line simply goes through the points (0, R_f) and (1, R_m).⁴ In SML, there is a linear relationship between expected return on security and covariance between market return and security return. But when the returns on security and market are perfectly correlated, this is termed as the *ex post* Capital Market Line (for efficient portfolios) which is the special case of *ex post* Security Market Line (SML). Thus with CAPM, two fundamental relationship came in view, the capital market line and security market line.

With the passage of time, several measures of portfolio performance in CAPM framework were developed keeping risk and return characteristics in the mind. The prominent contributors whose performance measures have had been accepted widely by researchers and academicians in the world are William S. Sharpe (1966), Jack L. Treynor (1966), Michael C. Jensen (1968) and Eugene F. Fama (1970). They produced the refinements of work over one other and reduced the shortcomings of each others' measures. Like, Sharpe refined his research work on the ranking of fund portfolio against market portfolio after Treynor's work on predictive ability. Thus, our study of mutual funds performance follows these two models (Sharpe's and Treynor's) in measuring the portfolio performance.

REVIEW OF LITERATURE

The review of studies done on mutual fund performance would help us to identify the dearth of literature on it. Subject of mutual funds has extensively been studied in U.S. and other developed countries. So, our survey of literature focuses more on studies pertaining to U.S. as compared to other countries. It is pertinent to mention here that the concept of mutual fund is quite new in developing countries. As a result, studies pertaining to mutual funds in developing countries are limited in terms of number and coverage. Therefore, we have reviewed only selected important and extensive studies in order to capture the area or direction of research which is still not or addressed very minimally.

FOREIGN LITERATURE

The credit to popularize the performance of mutual funds goes to **Sharpe (1966)** who developed the composite measure for performance evaluation (widely known as Sharpe's reward to variability ratio) considering average risk and return. He evaluated the performance of 34 U.S. open-ended mutual funds by the measure so developed during 1944-63 and found the performance of 11 funds superior to that of Dow Jones Industrial Average (DJIA) index. Reward to variability ratio for most of the funds was found significantly lower as compared to the same measured for DJIA benchmark index. On the basis of these results, Sharpe concluded that performance of mutual fund portfolio was distinctly inferior to that of the portfolio performance by DJIA index. **Robert S. Carlson (1970)** applied the single measure of investment performance to evaluate the aggregate performance of mutual funds for twenty years. He observed the positive relation between fund outperformance and the high cash inflows where the fund size and expense ratio did not matter much in rating fund performance. Thus, past values were found minor predictor for future values of funds and no-load funds were generally used to earn the elevated performance. **John G. MacDonald (1974)** evaluated the performance of 123 American mutual funds relative to their stated objectives during the period 1960-69. He used risk-adjusted return measures of performance and found that higher risky funds outperformed the lower risky funds though insignificantly. For the whole sample of funds, no significant 'superior' or 'inferior' performance was reported. **Manak C. Gupta (1974)** examined the performance of mutual fund by classifying it in several subgroups according to their objectives and investment goals. The general conclusion of the study was that all risk-adjusted models were likely to show the identical performance. For the subgroups of mutual fund class, growth funds performed much better than the income and balanced class of funds. **Tye Kim (1978)** applied the weighted index benchmark portfolio approach for evaluating quarterly investment performance of mutual funds during 1969-1975. He also tested its conformation to the theory of Efficient Market Hypothesis (EMH) by analyzing 138 mutual funds against the benchmark standards. His study found that most of the sample funds had registered underperformance and supported the fact of efficient market hypothesis i.e. "mutual funds, on an average, failed to outperform the market overtime" which stood in line to the conclusion of previous studies. **Tom W. Miller and Nicholas Gressis (1980)** addressed the issue of nonstationarity in risk-return relationship of mutual funds. Study concluded for the strong presence of nonstationarity in risk-return relationships which indicated that risk level changes in relation to the change in mutual fund portfolio composition. **Mark Grinblatt and Sheridan Titman (1994)** tested the different measures of mutual fund performance evaluation in rendering the inferences for a variety of benchmark portfolios. Findings of the study suggest that the different measures of mutual fund performance evaluation generally yielded similar inferences for the same benchmark but varied in yielding inferences for the different benchmarks. **James L. Davis (2001)** examined the issue, whether there exists any relationship between mutual fund performance and managers style. His study found no evidence for positive abnormal returns directed by the investment style, against some evidence for short term persistence among the best performing growth funds and worst performing small-cap funds. Thus, negligible evidence was reported in relationship. **Timotej Jagric, Boris Podobnik, Sebastjan Strasek and Vita Jagric (2007)** tried to investigate the risk-adjusted performance of Slovenian mutual funds. They adopted the method of ranking in funds performance results. Their study stated the well diversification for funds obtaining the same ranking according to Sharpe and Treynor ratios and exposed the underperformance of market by funds on the risk-adjusted basis. **Talat Afza and Ali Rauf (2009)** evaluated the mutual funds performance in relation to their management effectiveness. The study concludes for the poor performance by close-ended funds, significant impact of fund attributes on mutual fund performance and a positive relationship between risk adjusted mutual fund returns and expenses.

INDIAN LITERATURE

One of the earliest studies on performance of Indian mutual funds was done by **Barua and Varma (1991)**. He analysed the three years daily return data (1987-1990) of one close-ended fund i.e. Mastershares in CAPM framework. In another study (1994), they examined the relationship between market price and the NAV of close-ended mutual fund schemes. **Sarkar and Majumdar (1995)** evaluated the performance of five growth oriented close-ended funds of four different categories in pre and post-scandam period and referred varied performance of funds in these two periods. Their study suggests one important fact that beta of the portfolio schemes was not remained stationary. **M. Jayadev (1996)** examined the monthly performance of two growth-oriented mutual funds (Mastergain and Magnum Express) comparing to the ETOSHPI (The Economic Times Ordinary Share Price Index) Market Index in the study. The results indicate that according to Jensen and Treynor measure, Mastergain had registered better performance but according to Sharpe ratio, it was found to underperform the market index. **M.S. Narasimhan and S. Vijayalakshmi (2001)** analysed the performance of 76 mutual fund schemes from January 1998 to March 1999. According to them, no mutual fund schemes revealed superior performance. **Muthappan and Damodaran (2006)** used the risk and return parameters for evaluating the performance of mutual fund schemes from 1995 to 2000. They found the divergence of risk and returns from the stated objectives of selected schemes and the schemes were not diversified adequately. The returns attributed from the diversification of schemes were found to be minimal. The study concluded that Indian mutual funds suffer from improper diversification level. **N. S. Malik and Suresh Kumar Mittal (2007)** analysed the performance of 74 equity funds from 1986 to 2006. They tried to examine the actual rate of returns of mutual fund schemes and their comparative performance in terms of public and private sector sponsorship. Using the S&P CNX Nifty as market benchmark and two risk-adjusted performance measures (Sharpe and Treynor's Index), study found that time horizon and performance of a fund had positive relationship. The actively managed funds performed superiorly to the market benchmark mostly over a longer period of time (generally five years). In private sector funds (26), 21.92 percent funds had outperformed and in public sector funds (48), only 15.38 percent funds had performed superiorly. **Madhumita Chakraborty, P.K. Jain and Vinay Kallianpur (2009)** studied the performance evaluation of some select growth funds in terms of their returns and risk-adjusted approaches. Taking treasury bills as risk free asset and using BSE-100 as benchmark index, study reported the satisfactory performance of funds and indefinable performing capabilities of fund managers. **Ira Bapna, Yogesh Mehta and Vishal Sood (2010)** compared the performance of public and private sponsored nineteen ELSS mutual funds by using the Sharpe ratio and using S&P CNX Nifty as a market benchmark for six years (2003-2008). Their results referred the superior performance for private sponsored index funds with Sharpe ratio of -0.29 against -0.51 for public sponsored index funds. In the category of ELSS funds, the Sharpe ratio of 1.21 for private sponsored funds revealed better performance compared to public sponsored (with 0.67 Sharpe ratio). Thus, study favors that the managerial expertise of private sponsored funds is more able to beat the public sponsored funds.

To sum the review of literature, it can be said clearly that most of the studies have evaluated mutual fund performance on the risk adjusted basis but very few have seen its comparative performance. So, there is a need to focus on this minimally addressed aspect of mutual fund performance in Indian perspective.

DATA BASE AND RESEARCH METHODOLOGY

The entire research study is based on the secondary data. For the performance evaluation of sample schemes, month end Net Asset Value (NAV) data of 57 open-ended mutual fund schemes from both public and private sector are taken from the 'Alpha Database' of Centre for Monitoring of Indian Economy (CMIE). Out of these 57 schemes, 29 are from public and other 28 are from private sector. In all the sample schemes, 20 comprises growth schemes, 9 balance schemes, 7 tax plan schemes, 10 income schemes, 6 gilt schemes and 5 liquid schemes. The period of performance ranges for six years from January 1, 2005 to December 30, 2010. Study came across some missing values of NAVs for month ends which we filled by taking up the averages of two nearest cases NAVs. In order to

evaluate the performance of managed portfolio, benchmark comparison is an imperative measure for indicating that to what level fund manager or investor is successful in rating the managed portfolio in comparison to a selected market surrogate or index portfolio. From this point of view, present study finds BSE 100 National Index as a suitable market surrogate for making comparison in between BSE 100 and fund scheme. For analysis, we have used month end values of BSE 100 National Index. As a surrogate of risk-free asset, month end yields on 91 days Treasury Bills (T-Bills) is used. Its average monthly risk free rate is determined by taking out the average of 72 month end values of T-Bills return. It comes out to be 5.85 percent per annum. Dividing it by 12 months gives us the mean monthly risk free return of 0.49 percent per month for the sample schemes chosen. Thus, average monthly returns are calculated for month end values of mutual fund NAVs and closing prices of BSE 100 National Index data. Commensurate to the above discussed methodological key-ins, our study has the following objective:

- To evaluate the comparative performance of public and private sector open-ended mutual funds for finding the most efficient allocator for investors' resources

Based on this objective, we intend to test the following hypothesis:

H0₁: Private sector mutual funds provide more returns to investors against benchmark as compared to public sector funds

H1₁: Private sector mutual funds do not provide more returns to investors against benchmark as compared to public sector funds

H0₂: Private sector mutual funds are more volatile than public sector

H2₂: Private sector mutual funds are not more volatile than public sector

H0₃: Indian mutual fund managers are distinct diversifiers of schemes and private sector managers show better diversification ability

H3₃: Indian mutual fund managers are not distinct diversifiers of schemes and private sector managers are poor diversifiers

H0₄: Public sector mutual funds compensates better than the private sector in terms of risk taken

H4₄: Public sector mutual funds compensates better than the private sector in terms of risk taken

A) RISK-RETURN MEASURES

Risk and return express the performance of any investment. Investor can easily rank the portfolio by superior or inferior outcomes generated from both the measures and can decide to choose the risky, less risky or risk free schemes as per their investment objectives.

I) RETURN MEASURE

Return can be defined as the reward received for sacrificing the amount of wealth over a certain period of time. For the same, in order to find the reward for mutual fund investors, return on mutual fund has been computed using the month end NAV of schemes as follows:

$$R_{pt} = (\text{NAV}_t - \text{NAV}_{t-1}) / \text{NAV}_{t-1} \quad (1)$$

Where R_{pt} = return on fund in month 't', NAV_t = net asset value in month 't' and NAV_{t-1} = net asset value in previous month. The return on market is also calculated on the similar lines for Bombay Stock Exchange 100 National Index (BSE 100) as market benchmark. Monthly return on market benchmark (portfolio) is calculated as:

$$R_{mt} = (R_t - R_{t-1}) / R_{t-1} \quad (2)$$

Where R_{mt} is the return on market, R_t and R_{t-1} = return on market in month 't' and return on market in previous month $t-1$.

Risk free asset is already in the return form. Its average monthly rate of risk free return is come out to be 0.49 percent per month. Average monthly returns are calculated from month end values of mutual fund NAVs and closing prices of BSE 100 National Index. Therefore, only the month end values are selected to compute the results.

II) RISK MEASURE

Risk may be defined as the variation of returns from an average expected level of return. Degree of risk varies according to the preference of assets by investors. There are two broader types of risks associated with any portfolio: 1) Total risk (σ) and 2) Systematic risk (also called market risk) or non-diversifiable risk (β). Total risk is measured by the standard deviation denoted by ' σ ' and systematic risk is measured by the beta coefficient denoted by ' β '. Formula for measuring standard deviation is:

$$\text{Standard Deviation } (\sigma_p) = \sqrt{\sum [(R_p - \text{AR}_p)^2 / t-1]} \quad (3)$$

The square root of variance is also called the standard deviation $\sigma = \sqrt{\text{Var}}(R)$. Standard deviation and variance are equivalent measures of asset's total risk and acceptable widely. Standard deviation is calculated for scheme and market portfolio. Beta coefficient indicates the variability of fund returns against the market returns. When $\beta > 1$, mutual fund is more volatile and favourable for investors during the bull market phase whereas in $\beta < 1$, mutual fund is less volatile and favourable for investors during the bear market phase. To calculate the beta (market risk) of mutual fund, CAPM version of the market model is used,

$$R_p = \alpha + \beta R_m + e_p \quad (4)$$

Where R_p is the return on mutual fund, R_m = return on market, α = intercept, β_1 = slope or beta coefficient and e_p = error term. The value of constants α and β is computed by regressing mutual fund return on market return with the above market model. Regression results of above market model also provides the value of R^2 (coefficient of determination) – A Measure of Diversification, which shows the extent of co-relationship that exists between market and mutual fund returns and measures the diversification level. A high R^2 indicates the high diversification of funds. A high diversified fund is able to reduce the market risk (β).

B) RISK-ADJUSTED THEORETICAL PARAMETERS

Risk-adjusted measures follow the simple approach of combining two different dimensions of performance into one by adjusting the risk differences. Two main risk-adjusted measures are discussed here as under:

I) TREYNOR RATIO

Jack Treynor devised the measure of portfolio performance in 1965, with an objective to evaluate the excess return or risk premium per unit of systematic risk (β). His model is called the reward to volatility ratio (RVOLp), in which he presumes that by holding diversified portfolio, one can eliminate the unsystematic risk. Treynor ratio can be computed by dividing the average excess return by its market risk.

$$\text{Treynor ratio (TRp)} = \text{Average Excess Return} / \text{Market Risk} = R_p - R_f / \beta_p \quad (5)$$

Where TRp corresponds to the Treynor ratio, R_p = average return on portfolio, R_f = average return on risk free asset, β_p = beta coefficient for portfolio. The TRp for benchmark portfolio is, $TRp = R_m - R_f / \beta_m$, where $(R_m - R_f)$ is average excess market return and β_m is beta coefficient for market returns. If mutual fund portfolio provides the highest return per unit of systematic risk that implies the superior performer or vice-versa.

II) SHARPE RATIO

William F. Sharpe developed a composite index of portfolio performance in 1966, which is majorly known as the reward to variability ratio (RVARp). This index measures returns relative to the total risk of portfolio, where total risk is the standard deviation of the portfolio returns. Sharpe presumes that small investors put their wealth completely in mutual funds with the prior expectation of holding premium for total risk. Sharpe measure of portfolio performance can be computed by dividing portfolio's average excess return (Risk Premium) by its total risk (Standard Deviation):

$$\text{Sharpe ratio (SRp)} = \text{Average Excess Return} / \text{Total Risk} = R_p - R_f / \sigma_p \quad (6)$$

Where SRp corresponds to the Sharpe's Ratio, R_p = average return on portfolio, R_f = average return on risk free asset, σ_p = standard deviation of portfolio returns. In the same way, Sharpe ratio (SRp) for benchmark portfolio can be computed by dividing average excess return for market portfolio by standard deviation of market returns as $SRp = R_m - R_f / \sigma_m$. Therefore, if the SRp for mutual fund portfolio is found to be greater than market portfolio, this implies the superior performance earned by mutual fund portfolio or vice-versa. The basic difference between Sharpe and Treynor ratio is the use of total risk and market risk.

The performance of selected sample mutual fund schemes is carried out by using Risk-Return Measures (Average returns, Standard Deviation and Beta) and Risk-Adjusted theoretical parameters as Sharpe ratio and Treynor ratio. The overall analysis is done from the view point of investors. The details of sample mutual fund schemes for study are given in table (1) as below:

TABLE: (1) SAMPLE MUTUAL FUND SCHEMES

Scheme Name	Mutual Fund	Classification	Option	Aim	Observations (4104)
Baroda Pioneer Balance Fund	BOB	Open	Growth	Balance	72
Baroda Pioneer E L S S 96 Fund	BOB	Open	Dividend	Tax Plan	72
Baroda Pioneer Growth Fund	BOB	Open	Growth	Growth	72
Baroda Pioneer Liquid Fund	BOB	Open	Growth	Liquid	72
Birla Sun Life Advantage Fund	Birla Sun Life	Open	Dividend	Growth	72
Birla Sun Life Cash Manager	Birla Sun Life	Open	Growth	Liquid	72
Birla Sun Life Equity Fund	Birla Sun Life	Open	Dividend	Growth	72
Birla Sun Life Freedom Fund	Birla Sun Life	Open	Dividend	Balance	72
Birla Sun Life Income Fund	Birla Sun Life	Open	Growth	Income	72
Birla Sun Life'95 Fund	Birla Sun Life	Open	Growth	Balance	72
Canara Robeco Equity Diversified.	Canara Robeco	Open	Growth	Growth	72
Canara Robeco Equity Tax Saver	Canara Robeco	Open	Growth	Tax Plan	72
Canara Robeco Gilt (Pgs)	Canara Robeco	Open	Growth Plan Growth	Gilt	72
Canara Robeco Income	Canara Robeco	Open	Growth	Income	72
H D F C Balanced Fund	HDFC	Open	Growth	Balance	72
H D F C Capital Builder Fund	HDFC	Open	Growth	Growth	72
H D F C Equity Fund	HDFC	Open	Growth	Growth	72
H D F C Growth Fund	HDFC	Open	Growth	Growth	72
H D F C Income Fund	HDFC	Open	Growth	Income	72
H D F C Long Term Advantage Fund	HDFC	Open	Growth	Tax Plan	72
H D F C Prudence Fund	HDFC	Open	Dividend	Balance	72
H D F C Short Term Plan	HDFC	Open	Growth	Income	72
H D F C Tax Saver	HDFC	Open	Growth	Tax Plan	72
H D F C Top 200 Fund	HDFC	Open	Growth	Growth	72
H S B C Equity Fund	HSBC	Open	Growth	Growth	72
H S B C Gilt Fund	HSBC	Open	Dividend	Gilt	72
Kotak 30	Kotak Mahindra	Open	Growth	Growth	72
Kotak Bond	Kotak Mahindra	Open	Regular Plan Growth	Income	72
Kotak Gilt	Kotak Mahindra	Open	Investment Plan Regular Plan Growth	Gilt	72
Kotak Income Plus	Kotak Mahindra	Open	Growth	Income	72
L I C M F Balanced Fund	LIC	Open	Dividend	Balance	72
L I C M F Bond Fund	LIC	Open	Dividend	Income	72
L I C M F Equity Fund	LIC	Open	Dividend	Growth	72
L I C M F G-Sec Fund	LIC	Open	Growth	Gilt	72
L I C M F Growth Fund	LIC	Open	Growth	Growth	72
L I C M F Liquid Fund	LIC	Open	Growth	Liquid	72
L I C M F Savings Plus Fund	LIC	Open	Growth	Income	72
L I C M F Unit Linked Insurance Scheme	LIC	Open	Growth	Balance	72
Reliance Liquid Fund	Reliance	Open	Treasury & Retail Plan Growth	Liquid	72
Reliance Vision Fund	Reliance	Open	Dividend	Growth	72
S B I Magnum Balanced Fund	SBI	Open	Growth	Balance	72
S B I Magnum Contra Fund	SBI	Open	Growth	Growth	72
S B I Magnum Equity Fund	SBI	Open	Dividend	Growth	72
S B I Magnum Global Fund	SBI	Open	Growth	Growth	72
S B I Magnum Insta Cash Fund	SBI	Open	Growth	Liquid	72
S B I Magnum Multiplier Plus Fund	SBI	Open	Growth	Growth	72
S B I Magnum Tax Gain	SBI	Open	Growth	Tax Plan	72
Sahara Gilt Fund	Sahara	Open	Growth	Gilt	72
Sahara Growth Fund	Sahara	Open	Dividend	Growth	72
Sahara Income Fund	Sahara	Open	Growth	Income	72
Sahara Tax Gain Fund	Sahara	Open	Dividend	Tax Plan	72
U T I Balanced Fund	UTI	Open	Growth	Balance	72
U T I Bond Fund	UTI	Open	Growth	Income	72
U T I Equity Fund	UTI	Open	Growth	Growth	72
U T I Equity Tax Savings Plan	UTI	Open	Dividend	Tax Plan	72
U T I Gilt Advantage Fund	UTI	Open	LTP Growth	Gilt	72
U T I Masterplus	UTI	Open	Growth	Growth	72

APPLICATION AND RESULTS

1. RISK-RETURN PERFORMANCE

A) RISK-RETURN ANALYSIS AND DIVERSIFICATION OF SCHEMES

The summary statistics for risk-return analysis of 57 mutual fund schemes (public and private sector) is presented in Table (2) and (3). Interestingly, among all the 57 schemes, only two schemes, LICMF Unit Linked Insurance Scheme and Sahara Tax Gain Fund are showing negative returns and other 55 (96.49 percent) are showing the positive returns. In which, first scheme falls in the category of public sector mutual fund and second in the private sector mutual fund. As a whole, SBI Magnum Contra Fund earns the maximum monthly return of 2.48 percent, whereas the HSBC Gilt Fund earns the minimum monthly return of 0.10 percent per month. Both funds are also being the highest and lowest return gainer in public and private funds category. The public sector funds exposing to the maximum monthly risk is Canara Robeco Equity Tax Saver (10.65 percent) and minimum monthly risk (0.11 percent) is Baroda Pioneer Liquid Fund. In private sector mutual funds, Sahara Tax Gain Fund reveals the maximum monthly risk (14.44 percent) and Reliance Liquid Fund the minimum monthly risk (0.13 percent). However, the systematic risk or beta (β) of Sahara Income Fund is indicated to be the lowest (0.08 percent) and of HDFC Equity Fund (93.04 percent) is to be the highest among sample private sector funds. In public sector funds, SBI Magnum Global Fund assumes the highest systematic risk (104.14 percent) and LICMF G-Sec Fund the lowest systematic risk (2.14 percent). The average beta of public sector funds (55.96 percent) remains to be higher than private sector funds (49.37 percent) which refers that public sector funds are more volatile than private sector funds.

TABLE: (2) RISK-RETURN OF PUBLIC SECTOR MUTUAL FUND (MF) SCHEMES

Scheme Name	Fund Return (Rp)	Fund Risk (op)	Fund Beta (βp)	Beta (t)	R2 (Diversification)
Baroda Pioneer Balance Fund	0.0145	0.0931	0.5843	5.2606*	0.2833
Baroda Pioneer ELSS 96 Fund	0.0069	0.1005	0.9831	12.4172*	0.6877
Baroda Pioneer Growth Fund	0.0218	0.0796	0.8966	27.2771*	0.9140
Baroda Pioneer Liquid Fund	0.0049	0.0011	-0.0030	-1.9180***	0.0490
Canara Robeco Equity Diversified.	0.0206	0.0855	0.9485	23.1811*	0.8847
Canara Robeco Equity Tax Saver	0.0134	0.1065	0.9758	10.3419*	0.6044
Canara Robeco Gilt (Pgs)	0.0060	0.0171	-0.0231	-0.9616	0.0130
Canara Robeco Income	0.0081	0.0134	-0.0155	-0.8236	0.0096
L I C M F Balanced Fund	0.0031	0.0687	0.6755	12.6427*	0.6954
L I C M F Bond Fund	0.0007	0.0149	0.0235	1.1324	0.0180
L I C M F Equity Fund	0.0048	0.1013	1.0347	14.5362*	0.7512
L I C M F G-Sec Fund	0.0038	0.0208	0.0214	0.7356	0.0077
L I C M F Growth Fund	0.0151	0.0898	0.9556	17.5578*	0.8150
L I C M F Liquid Fund	0.0056	0.0014	-0.0044	-2.2802**	0.0691
L I C M F Savings Plus Fund	0.0049	0.0029	-0.0018	-0.4344	0.0027
L I C M F Unit Linked Insurance Scheme	-0.0011	0.0672	0.6328	11.1257*	0.6388
S B I Magnum Balanced Fund	0.0189	0.0856	0.7294	8.7532*	0.5226
S B I Magnum Contra Fund	0.0248	0.0976	0.9331	11.5996*	0.6578
S B I Magnum Equity Fund	0.0154	0.0896	0.9747	20.0590*	0.8518
S B I Magnum Global Fund	0.0230	0.0979	1.0414	17.5285*	0.8144
S B I Magnum Insta Cash Fund	0.0052	0.0014	-0.0039	-2.0313**	0.0557
S B I Magnum Multiplier Plus Fund	0.0235	0.0808	0.8821	20.5052*	0.8573
S B I Magnum Tax Gain	0.0134	0.0890	0.8136	10.2788*	0.6015
U T I Balanced Fund	0.0133	0.0578	0.6649	37.5285*	0.9527
U T I Bond Fund	0.0055	0.0177	0.0293	1.1852	0.0197
U T I Equity Fund	0.0170	0.0704	0.7794	22.7733*	0.8811
U T I Equity Tax Savings Plan	0.0038	0.0847	0.8117	11.6798*	0.6609
U T I Gilt Advantage Fund	0.0055	0.0235	-0.0082	-0.2470	0.0009
U T I Masterplus	0.0170	0.0778	0.8974	39.8644*	0.9578
Average	0.0110	0.0599	0.5596	----	0.49.23

*Significant at 1 % level

** Significant at 5 % level

*** Significant at 10 % level

TABLE: (2.1) RISK AND RETURN OF PRIVATE SECTOR MF SCHEMES

Scheme Name	Fund Return (Rp)	Fund Risk (op)	Fund Beta (βp)	Beta (t)	R2 (Diversification)
Birla Sun Life Cash Manager	0.0052	0.0014	-0.0037	-1.9451***	0.0513
Birla Sun Life Advantage Fund	0.011	0.0849	0.8915	16.3940*	0.7930
Birla Sun Life Equity Fund	0.0135	0.0869	0.8897	14.6811*	0.7500
Birla Sun Life Freedom Fund	0.0029	0.0569	0.4496	7.5675*	0.4500
Birla Sun Life Income Fund	0.0062	0.0221	0.0083	0.2652	0.0010
Birla Sun Life'95 Fund	0.0176	0.0587	0.5507	10.9837*	0.6328
H D F C Balanced Fund	0.0163	0.0568	0.6407	27.5367*	0.9155
H D F C Capital Builder Fund	0.0202	0.0786	0.8678	22.4805*	0.8783
H D F C Equity Fund	0.0245	0.0812	0.9304	34.3508*	0.9440
H D F C Growth Fund	0.0218	0.0755	0.8560	29.4735*	0.9254
H D F C Income Fund	0.0052	0.0186	0.0455	1.7761***	0.0431
H D F C Long Term Advantage Fund	0.0186	0.074	0.8232	23.9034*	0.8909
H D F C Prudence Fund	0.0077	0.0779	0.7097	10.1989*	0.5977
H D F C Short Term Plan	0.0064	0.0069	0.0118	1.2204	0.0208
H D F C Tax Saver	0.0226	0.0796	0.8903	25.0013*	0.8993
H D F C Top 200 Fund	0.0236	0.0764	0.8894	51.2987*	0.9741
H S B C Equity Fund	0.018	0.0715	0.8113	29.4972*	0.9255
H S B C Gilt Fund	0.0010	0.0121	0.0156	0.9174	0.0119
Kotak 30	0.0202	0.076	0.8682	32.6503*	0.9384
Kotak Bond	0.0064	0.0206	0.0332	1.1514	0.0186
Kotak Gilt	0.0057	0.0243	0.0095	0.2774	0.0011
Kotak Income Plus	0.0053	0.0154	0.1639	17.2912*	0.8103
Reliance Liquid Fund	0.0051	0.0013	-0.0042	-2.2985	0.0702
Reliance Vision Fund	0.0075	0.0867	0.8934	15.0940*	0.7650
Sahara Gilt Fund	0.0131	0.1385	0.0396	0.2029	0.0006
Sahara Growth Fund	0.0137	0.164	0.7134	3.3224*	0.1362
Sahara Income Fund	0.0064	0.0114	0.0008	0.0498	0.00004
Sahara Tax Gain Fund	-0.0012	0.1444	0.8287	4.6633*	0.2370
Average	0.0116	0.0608	0.4937	----	0.4886

TABLE (3): RISK-RETURN OF PUBLIC SECTOR MF SCHEMES AGAINST BENCHMARK PORTFOLIO

Scheme Name	Fund Return (Rp)	Fund Risk (op)	Risk Free Return	Market Return (Rm)	Market Risk (om)
Baroda Pioneer Balance Fund	0.0145	0.0931	0.0049	0.0189	0.0848
Baroda Pioneer E L S S 96 Fund	0.0069	0.1005	0.0049	0.0189	0.0848
Baroda Pioneer Growth Fund	0.0218	0.0796	0.0049	0.0189	0.0848
Baroda Pioneer Liquid Fund	0.0049	0.0011	0.0049	0.0189	0.0848
Canara Robeco Equity Diversified.	0.0206	0.0855	0.0049	0.0189	0.0848
Canara Robeco Equity Tax Saver	0.0134	0.1065	0.0049	0.0189	0.0848
Canara Robeco Gilt (Pgs)	0.0060	0.0171	0.0049	0.0189	0.0848
Canara Robeco Income	0.0081	0.0134	0.0049	0.0189	0.0848
L I C M F Balanced Fund	0.0031	0.0687	0.0049	0.0189	0.0848
L I C M F Bond Fund	0.0007	0.0149	0.0049	0.0189	0.0848
L I C M F Equity Fund	0.0048	0.1013	0.0049	0.0189	0.0848
L I C M F G-Sec Fund	0.0038	0.0208	0.0049	0.0189	0.0848
L I C M F Growth Fund	0.0151	0.0898	0.0049	0.0189	0.0848
L I C M F Liquid Fund	0.0056	0.0014	0.0049	0.0189	0.0848
L I C M F Savings Plus Fund	0.0049	0.0029	0.0049	0.0189	0.0848
L I C M F Unit Linked Insurance Scheme	-0.0011	0.0672	0.0049	0.0189	0.0848
S B I Magnum Balanced Fund	0.0189	0.0856	0.0049	0.0189	0.0848
S B I Magnum Contra Fund	0.0248	0.0976	0.0049	0.0189	0.0848
S B I Magnum Equity Fund	0.0154	0.0896	0.0049	0.0189	0.0848
S B I Magnum Global Fund	0.0230	0.0979	0.0049	0.0189	0.0848
S B I Magnum Insta Cash Fund	0.0052	0.0014	0.0049	0.0189	0.0848
S B I Magnum Multiplier Plus Fund	0.0235	0.0808	0.0049	0.0189	0.0848
S B I Magnum Tax Gain	0.0134	0.089	0.0049	0.0189	0.0848
U T I Balanced Fund	0.0133	0.0578	0.0049	0.0189	0.0848
U T I Bond Fund	0.0055	0.0177	0.0049	0.0189	0.0848
U T I Equity Fund	0.0170	0.0704	0.0049	0.0189	0.0848
U T I Equity Tax Savings Plan	0.0038	0.0847	0.0049	0.0189	0.0848
U T I Gilt Advantage Fund	0.0055	0.0235	0.0049	0.0189	0.0848
U T I Masterplus	0.0170	0.0778	0.0049	0.0189	0.0848
Average	0.0110	0.0599	0.0049	0.0189	0.0848

TABLE (3.1): RISK-RETURN OF PRIVATE SECTOR MF SCHEMES AGAINST BENCHMARK PORTFOLIO

Scheme Name	Fund Return (Rp)	Fund Risk (op)	Risk Free Return	Market Return (Rm)	Market Risk (om)
Birla Sun Life Advantage Fund	0.0110	0.0849	0.0049	0.0189	0.0848
Birla Sun Life Cash Manager	0.0052	0.0014	0.0049	0.0189	0.0848
Birla Sun Life Equity Fund	0.0135	0.0869	0.0049	0.0189	0.0848
Birla Sun Life Freedom Fund	0.0029	0.0569	0.0049	0.0189	0.0848
Birla Sun Life Income Fund	0.0062	0.0221	0.0049	0.0189	0.0848
Birla Sun Life'95 Fund	0.0176	0.0587	0.0049	0.0189	0.0848
H D F C Balanced Fund	0.0163	0.0568	0.0049	0.0189	0.0848
H D F C Capital Builder Fund	0.0202	0.0786	0.0049	0.0189	0.0848
H D F C Equity Fund	0.0245	0.0812	0.0049	0.0189	0.0848
H D F C Growth Fund	0.0218	0.0755	0.0049	0.0189	0.0848
H D F C Income Fund	0.0052	0.0186	0.0049	0.0189	0.0848
H D F C Long Term Advantage Fund	0.0186	0.074	0.0049	0.0189	0.0848
H D F C Prudence Fund	0.0077	0.0779	0.0049	0.0189	0.0848
H D F C Short Term Plan	0.0064	0.0069	0.0049	0.0189	0.0848
H D F C Tax Saver	0.0226	0.0796	0.0049	0.0189	0.0848
H D F C Top 200 Fund	0.0236	0.0764	0.0049	0.0189	0.0848
H S B C Equity Fund	0.0180	0.0715	0.0049	0.0189	0.0848
H S B C Gilt Fund	0.0010	0.0121	0.0049	0.0189	0.0848
Kotak 30	0.0202	0.076	0.0049	0.0189	0.0848
Kotak Bond	0.0064	0.0206	0.0049	0.0189	0.0848
Kotak Gilt	0.0057	0.0243	0.0049	0.0189	0.0848
Kotak Income Plus	0.0053	0.0154	0.0049	0.0189	0.0848
Reliance Liquid Fund	0.0051	0.0013	0.0049	0.0189	0.0848
Reliance Vision Fund	0.0075	0.0867	0.0049	0.0189	0.0848
Sahara Gilt Fund	0.0131	0.1385	0.0049	0.0189	0.0848
Sahara Growth Fund	0.0137	0.164	0.0049	0.0189	0.0848
Sahara Income Fund	0.0064	0.0114	0.0049	0.0189	0.0848
Sahara Tax Gain Fund	-0.0012	0.1444	0.0049	0.0189	0.0848
Average	0.0116	0.0608	0.0049	0.0189	0.0848

Table (4) shows the mean characteristics of monthly risk-return of public and private sector mutual fund schemes. The average return earned by public sector mutual fund schemes is 1.10 percent per month against the average return of 1.16 percent by private sector. It shows clearly that private sector mutual fund has generated more returns per month vis-a-vis the public sector funds. But on an average, both the sectors have performed meagerly against mean market return (1.89 percent per month) and performed superiorly before risk free asset return (0.49 percent per month). Against mean market return, only 4 public (13.79 percent) and 6 private sector schemes (21.42 percent) become able to outperform the market.

TABLE: (4) MONTHLY MEAN RISK-RETURNS OF SAMPLE MUTUAL FUND SCHEMES

Public Sector		Private Sector	
Mean Characteristics	Value (%)	Mean Characteristics	Value (%)
Fund Mean Return	1.10	Fund Mean Return	1.16
Risk Free Mean Return	0.49	Risk Free Mean Return	0.49
Mean Market Return	1.89	Mean Market Return	1.89
Mean Fund Risk (S.D)	5.99	Mean Fund Risk (S.D)	6.08
Mean Beta of Funds	55.96	Mean Beta of Funds	49.37

b) Risk- Return Grid of Sample Schemes

In Table (5) and figure (1), total 57 sample mutual fund schemes are classified into four categories according to their risk-return profile. These four categories are following: (1) Low Return - Low Risk Funds (2) Low Return - High Risk Funds (3) High Return – Low Risk Funds (4) High Return – High Risk Funds. All the four categories are shown through four quadrants.

TABLE: (5) CATEGORISATION OF SCHEMES ACCORDING TO RISK AND RETURN PROFILE

(Quadrant I)

Low Return and Low Risk Profile Schemes ($R_p < R_m; \sigma_p < \sigma_m$)*

Scheme Name	Market Return (Rm)	Fund Return (Rp)	Low Return	Market Risk (σ_m)	Fund Risk (σ_p)	Low Risk
Baroda Pioneer Liquid Fund	0.0189	0.0049	0.0140	0.0848	0.0011	0.0837
Birla Sun Life Cash Manager	0.0189	0.0052	0.0137	0.0848	0.0014	0.0834
Birla Sun Life Freedom Fund	0.0189	0.0029	0.016	0.0848	0.0569	0.0279
Birla Sun Life Income Fund	0.0189	0.0062	0.0127	0.0848	0.0221	0.0627
Birla Sun Life'95 Fund	0.0189	0.0176	0.0013	0.0848	0.0587	0.0261
Canara Robeco Gilt (Pgs)	0.0189	0.006	0.0129	0.0848	0.0171	0.0677
Canara Robeco Income	0.0189	0.0081	0.0108	0.0848	0.0134	0.0714
H D F C Balanced Fund	0.0189	0.0163	0.0026	0.0848	0.0568	0.028
H D F C Income Fund	0.0189	0.0052	0.0137	0.0848	0.0186	0.0662
H D F C Long Term Advantage Fund	0.0189	0.0186	0.0003	0.0848	0.074	0.0108
H D F C Prudence Fund	0.0189	0.0077	0.0112	0.0848	0.0779	0.0069
H D F C Short Term Plan	0.0189	0.0064	0.0125	0.0848	0.0069	0.0779
H S B C Equity Fund	0.0189	0.018	0.0009	0.0848	0.0715	0.0133
H S B C Gilt Fund	0.0189	0.001	0.0179	0.0848	0.0121	0.0727
Kotak Bond	0.0189	0.0064	0.0125	0.0848	0.0206	0.0642
Kotak Gilt	0.0189	0.0057	0.0132	0.0848	0.0243	0.0605
Kotak Income Plus	0.0189	0.0053	0.0136	0.0848	0.0154	0.0694
L I C M F Balanced Fund	0.0189	0.0031	0.0158	0.0848	0.0687	0.0161
L I C M F Bond Fund	0.0189	0.0007	0.0182	0.0848	0.0149	0.0699
L I C M F G-Sec Fund	0.0189	0.0038	0.0151	0.0848	0.0208	0.064
L I C M F Liquid Fund	0.0189	0.0056	0.0133	0.0848	0.0014	0.0834
L I C M F Savings Plus Fund	0.0189	0.0049	0.014	0.0848	0.0029	0.0819
L I C M F Unit Linked Insurance Scheme	0.0189	-0.0011	0.02	0.0848	0.0672	0.0176
Reliance Liquid Fund	0.0189	0.0051	0.0138	0.0848	0.0013	0.0835
S B I Magnum Insta Cash Fund	0.0189	0.0052	0.0137	0.0848	0.0014	0.0834
Sahara Income Fund	0.0189	0.0064	0.0125	0.0848	0.0114	0.0734
U T I Balanced Fund	0.0189	0.0133	0.0056	0.0848	0.0578	0.027
U T I Bond Fund	0.0189	0.0055	0.0134	0.0848	0.0177	0.0671
U T I Equity Fund	0.0189	0.017	0.0019	0.0848	0.0704	0.0144
U T I Equity Tax Savings Plan	0.0189	0.0038	0.0151	0.0848	0.0847	0.0001
U T I Gilt Advantage Fund	0.0189	0.0055	0.0134	0.0848	0.0235	0.0613
U T I Masterplus	0.0189	0.017	0.0019	0.0848	0.0778	0.007

(Quadrant II)

Low Return and High Risk Profile Schemes ($R_p < R_m; \sigma_p > \sigma_m$)

Scheme Name	Market Return (Rm)	Fund Return (Rp)	Low Return	Market Risk (σ_m)	Fund Risk (σ_p)	High Risk
Baroda Pioneer Balance Fund	0.0189	0.0145	0.0044	0.0848	0.0931	-0.0083
Baroda Pioneer E L S S 96 Fund	0.0189	0.0069	0.012	0.0848	0.1005	-0.0157
Birla Sun Life Advantage Fund	0.0189	0.011	0.0079	0.0848	0.0849	-0.0001
Birla Sun Life Equity Fund	0.0189	0.0135	0.0054	0.0848	0.0869	-0.0021
Canara Robeco Equity Tax Saver	0.0189	0.0134	0.0055	0.0848	0.1065	-0.0217
L I C M F Equity Fund	0.0189	0.0048	0.0141	0.0848	0.1013	-0.0165
L I C M F Growth Fund	0.0189	0.0151	0.0038	0.0848	0.0898	-0.005
Reliance Vision Fund	0.0189	0.0075	0.0114	0.0848	0.0867	-0.0019
S B I Magnum Equity Fund	0.0189	0.0154	0.0035	0.0848	0.0896	-0.0048
S B I Magnum Tax Gain	0.0189	0.0134	0.0055	0.0848	0.089	-0.0042
Sahara Gilt Fund	0.0189	0.0131	0.0058	0.0848	0.1385	-0.0537
Sahara Growth Fund	0.0189	0.0137	0.0052	0.0848	0.164	-0.0792
Sahara Tax Gain Fund	0.0189	-0.0012	0.0201	0.0848	0.1444	-0.0596

(Quadrant III)

High Return and High Risk Profile Schemes ($R_p > R_m; \sigma_p > \sigma_m$)

Scheme Name	Market Return (Rm)	Fund Return (Rp)	High Return	Market Risk (σ_m)	Fund Risk (σ_p)	High Risk
Canara Robeco Equity Diversified.	0.0189	0.0206	0.0017	0.0848	0.0855	0.0007
S B I Magnum Contra Fund	0.0189	0.0248	0.0059	0.0848	0.0976	.0128
S B I Magnum Global Fund	0.0189	0.023	0.0041	0.0848	0.0979	0.0131
S B I Magnum Balanced Fund	0.01892	0.01889	0.00003	0.0848	0.0856	0.0008

(Quadrant IV)

High Return and Low Risk Profile Schemes ($R_p > R_m ; \sigma_p < \sigma_m$)

Scheme Name	Market Return (Rm)	Fund Return (Rp)	High Return	Market Risk (σm)	Fund Risk (σp)	Low Risk
Baroda Pioneer Growth Fund	0.0189	0.0218	0.0029	0.0848	0.0796	0.0052
H D F C Capital Builder Fund	0.0189	0.0202	0.0013	0.0848	0.0786	0.0062
H D F C Equity Fund	0.0189	0.0245	0.0056	0.0848	0.0812	0.0036
H D F C Growth Fund	0.0189	0.0218	0.0029	0.0848	0.0755	0.0093
H D F C Tax Saver	0.0189	0.0226	0.0037	0.0848	0.0796	0.0052
H D F C Top 200 Fund	0.0189	0.0236	0.0047	0.0848	0.0764	0.0084
Kotak 30	0.0189	0.0202	0.0013	0.0848	0.0760	0.0088
S B I Magnum Multiplier Plus Fund	0.0189	0.0235	0.0046	0.0848	0.0808	0.0040

FIGURE (1) RISK-RETURN GRID OF SAMPLE MUTUAL FUND SCHEMES

High Return and Low Risk Schemes ($R_p > R_m ; \sigma_p < \sigma_m$) Private Schemes = 6 Public Schemes = 2	High Return and High Risk Schemes ($R_p > R_m ; \sigma_p > \sigma_m$) Private Schemes = 0 Public Schemes = 4
Baroda Pioneer Growth Fund H D F C Capital Builder Fund H D F C Equity Fund H D F C Growth Fund (Quadrant II) H D F C Tax Saver H D F C Top 200 Fund Kotak 30 S B I Magnum Multiplier Plus Fund	Canara Robeco Equity Diversified. S B I Magnum Contra Fund S B I Magnum Global Fund SBI Magnum Balanced Fund (Quadrant III)
Baroda Pioneer Liquid Fund Birla Sun Life Cash Manager Birla Sun Life Freedom Fund Birla Sun Life Income Fund Birla Sun Life'95 Fund Canara Robeco Gilt (Pgs) Canara Robeco Income H D F C Balanced Fund H D F C Income Fund H D F C Long Term Advantage Fund H D F C Prudence Fund H D F C Short Term Plan H S B C Equity Fund (Quadrant I) H S B C Gilt Fund Kotak Bond Kotak Gilt Kotak Income Plus L I C M F Balanced Fund L I C M F Bond Fund L I C M F G-Sec Fund L I C M F Liquid Fund L I C M F Savings Plus Fund L I C M F Unit Linked Insurance Scheme Reliance Liquid Fund S B I Magnum Insta Cash Fund Sahara Income Fund U T I Balanced Fund U T I Bond Fund U T I Equity Fund U T I Equity Tax Savings Plan U T I Gilt Advantage Fund U T I Masterplus	Baroda Pioneer Balance Fund Baroda Pioneer E L S S 96 Fund Birla Sun Life Advantage Fund Birla Sun Life Equity Fund Canara Robeco Equity Tax Saver L I C M F Equity Fund L I C M F Growth Fund Reliance Vision Fund S B I Magnum Equity Fund S B I Magnum Tax Gain Sahara Gilt Fund Sahara Growth Fund Sahara Tax Gain Fund (Quadrant IV)
Low Return and Low Risk Schemes ($R_p < R_m ; \sigma_p < \sigma_m$) Private Schemes = 16 Public Schemes = 16	Low Return and High Risk Schemes ($R_p < R_m ; \sigma_p > \sigma_m$) Private Schemes = 6 Public Schemes = 7

- In Quadrant I (Low Return and Low Risk): This quadrant contains the schemes whose average returns are lower than the average market or benchmark returns. Their risks also remain lower than that of the risk of market portfolio. Such type of category includes 16 private and 16 public sector schemes. HDFC Long Term Advantage Fund and UTI Equity Fund are the toppers among such funds.

- In Quadrant II (High Return and Low Risk): In this quadrant, those schemes are included whose average returns are more than the average market returns but their risks remain lower than the risk of market portfolio. There are 6 private and 2 public sector schemes fall in this category. HDFC Equity Fund and SBI Magnum Multiplier Plus topped in this category of funds. Interestingly, all schemes in this quadrant are growth schemes which should come under the high return and high risk category. However, these schemes are the best schemes for common investors.

- In Quadrant III (High Return and High Risk): This quadrant includes those schemes whose returns as well as risk (standard deviations) are higher than that of the market portfolio. Only 4 public sector schemes are fitted into this category. SBI Magnum Contra Fund and SBI Magnum Global Fund, SBI Magnum Balanced Fund and Canara Robeco Equity Diversified Fund are the outperformers of this category. These schemes appear to follow their investment objectives very well.

- In Quadrant IV (Low Return and High Risk): This category consists of all those schemes whose returns are less than market return but risk is higher than market portfolio. The results show that out of 29 public and 28 private sector schemes, only 6 private and 7 public schemes are falling in this quadrant. These 13 schemes have been the poorest performers among all schemes.

c) Risk and Scheme Investment Objectives

Table (6) shows the aim wise categorization of mutual fund schemes in private and public sector. An examination of the affirmation, "mutual fund follows risk and return in commensuration to their investment objectives" is made in order to know the truth of schemes. The entire 57 sample schemes have been

classified into six major categories according to their investment objectives: (1) balanced schemes (2) tax plans (3) growth schemes (4) liquid schemes (5) income schemes (6) gilt schemes. Balanced schemes have investment objective of modest returns with modest risk. Tax plans are connected more to the equities so as expected to have big share of equities (70-80 percent) in portfolio. Same is the case of growth funds which also invest around 80-90 percent in equities. On the other hand, income schemes are having low return and low risk profile against very low or negligible risk profile of gilt schemes. Liquid schemes generally invest 100 percent of their corpus in debts and money market securities therefore acquire very low risk profile. Investment objectives of all schemes are studied pertaining to their assumed total risk, systematic risk and unique or unsystematic risk point of view.

- For Total Risk and Investment Objectives

Table (6) presents average risk and return of mutual fund schemes. The average return and risk earned by private sector balanced schemes are 1.11 percent and 6.26 percent while in case of public sector; it is 0.97 percent and 7.45 percent. This reflects that none of the private or public sector balanced schemes has followed risk and return in commensuration to its investment objectives as balanced schemes are supposed to follow moderate risk and return profile. Tax plan schemes in private sector, give average return of 2.06 percent per month with 7.68 percent of average risk, whereas the public sector tax plans give 0.73 percent per month average return with 10.50 percent average risk. The private sector tax plans performed better than public sector tax plans in following the investment objective. The private sector growth schemes have earned monthly average return and risk of 1.74 percent and 8.81 percent vis-a-vis 1.83 percent and 8.70 percent per month earned by public sector growth schemes. Growth schemes of both sectors perform approximately the same though public sector a bit good. The performance of private sector tax plans has been much better than that of other schemes.

The average returns of private and public sector liquid funds are 0.52 percent and 0.53 percent per month. Their average risk stands at 0.14 percent and 0.13 percent. It is remarkable to notice that the public and private sector liquid funds are found to follow their stated objectives. In income schemes, both sectors have followed their objectives but public sector has done well. The category of gilt schemes is expected to have low return and negligible risk. Results indicate that both public and private gilt schemes are not found to perform in accordance to their stated objectives. Though, the presentation of private sector schemes has been inferior which has created average low return of 0.66 percent and taken high level of risk i.e. 5.83 percent per month against the average return and risk of 0.51 percent and 2.05 percent per month by public sector gilt schemes. Thus, liquid and income funds of public as well as private sector and tax plans of only private sector are found to generate risk and returns in line to their stated investment objectives. As a whole, public sector schemes have performed better than the private sector schemes. Thus, it may be concluded that risk and return of mutual fund schemes are not always in commensuration to their stated objectives and investor should be cautious while investing in mutual funds.

TABLE: (6) AIM WISE CATEGORIZATION AND COMPARISON OF MUTUAL FUND SCHEMES

Scheme Name	Fund Return (Rp)	Fund Risk (σ p)	Fund Beta (β p)	Beta (t)	Aim
Birla Sun Life Freedom Fund	0.0029	0.0569	0.4496	7.5675	Balance
Birla Sun Life'95 Fund	0.0176	0.0587	0.5507	10.9837	Balance
H D F C Balanced Fund	0.0163	0.0568	0.6407	27.5367	Balance
H D F C Prudence Fund	0.0077	0.0779	0.7097	10.1989	Balance
Average (Private Sector - Balance)	0.0111	0.0626	0.5877		
L I C M F Balanced Fund	0.0031	0.0687	0.6755	12.6427	Balance
L I C M F Unit Linked Insurance Scheme	-0.0011	0.0672	0.6328	11.1257	Balance
S B I Magnum Balanced Fund	0.0189	0.0856	0.7294	8.7532	Balance
U T I Balanced Fund	0.0133	0.0578	0.6649	37.5285	Balance
Baroda Pioneer Balance Fund	0.0145	0.0931	0.5843	5.2606	Balance
Average (Public Sector - Balance)	0.0097	0.0745	0.6574		
H D F C Long Term Advantage Fund	0.0186	0.074	0.8232	23.9034	Tax Plan
H D F C Tax Saver	0.0226	0.0796	0.8903	25.0013	Tax Plan
Average (Private Sector – Tax Plan)	0.0206	0.0768	0.8567		
Baroda Pioneer E L S S 96 Fund	0.0069	0.1005	0.9831	12.4172	Tax Plan
Canara Robeco Equity Tax Saver	0.0134	0.1065	0.9758	10.3419	Tax Plan
S B I Magnum Tax Gain	0.0134	0.089	0.8136	10.2788	Tax Plan
Sahara Tax Gain Fund	-0.0012	0.1444	0.8287	4.6633	Tax Plan
U T I Equity Tax Savings Plan	0.0038	0.0847	0.8117	11.6798	Tax Plan
Average (Public Sector – Tax Plan)	0.0073	0.1050	0.8826		
Birla Sun Life Advantage Fund	0.011	0.0849	0.8915	16.3940	Growth
Birla Sun Life Equity Fund	0.0135	0.0869	0.8897	14.6811	Growth
Reliance Vision Fund	0.0075	0.0867	0.8934	15.0940	Growth
H D F C Capital Builder Fund	0.0202	0.0786	0.8678	22.4805	Growth
H D F C Equity Fund	0.0245	0.0812	0.9304	34.3508	Growth
H D F C Growth Fund	0.0218	0.0755	0.8560	29.4735	Growth
H D F C Top 200 Fund	0.0236	0.0764	0.8894	51.2987	Growth
H S B C Equity Fund	0.018	0.0715	0.8113	29.4972	Growth
Kotak 30	0.0202	0.076	0.8682	32.6503	Growth
Sahara Growth Fund	0.0137	0.164	0.7134	3.3224	Growth
Average (Private Sector - Growth)	0.0174	0.0882	0.8611		
Baroda Pioneer Growth Fund	0.0218	0.0796	0.8966	27.2771	Growth
Canara Robeco Equity Diversified.	0.0206	0.0855	0.9485	23.1811	Growth
L I C M F Equity Fund	0.0048	0.1013	1.0347	14.5362	Growth
L I C M F Growth Fund	0.0151	0.0898	0.9556	17.5578	Growth
S B I Magnum Contra Fund	0.0248	0.0976	0.9331	11.5996	Growth
S B I Magnum Equity Fund	0.0154	0.0896	0.9747	20.0590	Growth
S B I Magnum Global Fund	0.023	0.0979	1.0414	17.5285	Growth
S B I Magnum Multiplier Plus Fund	0.0235	0.0808	0.8821	20.5052	Growth
U T I Equity Fund	0.017	0.0704	0.7794	22.7733	Growth
U T I Masterplus	0.017	0.0778	0.8974	39.8644	Growth
Average (Public Sector - Growth)	0.0183	0.0870	0.9343		
Birla Sun Life Cash Manager	0.0052	0.0014	-0.0037	-1.9451	Liquid
Reliance Liquid Fund	0.0051	0.0013	-0.0042	-2.2985	Liquid
S B I Magnum Insta Cash Fund	0.0052	0.0014	-0.0039	-2.0313	Liquid
Average (Private Sector - Liquid)	0.0052	0.0014	-0.0039		
Baroda Pioneer Liquid Fund	0.0049	0.0011	-0.0030	-1.9180	Liquid
L I C M F Liquid Fund	0.0056	0.0014	-0.0044	-2.2802	Liquid
Average (Public Sector - Liquid)	0.0053	0.0013	-0.0037		
Sahara Income Fund	0.0064	0.0114	0.0008	0.0498	Income
Birla Sun Life Income Fund	0.0062	0.0221	0.0083	0.2652	Income
H D F C Income Fund	0.0052	0.0186	0.0455	1.7761	Income
H D F C Short Term Plan	0.0064	0.0069	0.0118	1.2204	Income
Kotak Bond	0.0064	0.0206	0.0332	1.1514	Income
Kotak Income Plus	0.0053	0.0154	0.1639	17.2912	Income
Average (Private Sector -Income)	0.0060	0.0158	0.0439		
L I C M F Bond Fund	0.0007	0.0149	0.0235	1.1324	Income
L I C M F Savings Plus Fund	0.0049	0.0029	-0.0018	-0.4344	Income
Canara Robeco Income	0.0081	0.0134	-0.0155	-0.8236	Income
U T I Bond Fund	0.0055	0.0177	0.0293	1.1852	Income
Average (Public Sector - Income)	0.0048	0.0122	0.0089		
H S B C Gilt Fund	0.001	0.0121	0.0156	0.9174	Gilt
Sahara Gilt Fund	0.0131	0.1385	0.0396	0.2029	Gilt
Kotak Gilt	0.0057	0.0243	0.0095	0.2774	Gilt
Average (Private Sector - Gilt)	0.0066	0.0583	0.0215		
L I C M F G-Sec Fund	0.0038	0.0208	0.0214	0.7356	Gilt
U T I Gilt Advantage Fund	0.0055	0.0235	-0.0082	-0.2470	Gilt
Canara Robeco Gilt (Pgs)	0.006	0.0171	-0.0231	-0.9616	Gilt
Average (Public Sector - Gilt)	0.0051	0.0205	-0.0033		

FOR SYSTEMATIC RISK AND INVESTMENT OBJECTIVES

Beta is the measure of systematic risk (market risk) in a portfolio. Schemes those are having aggressive investment objectives (growth and tax plan schemes) should have a high amount of systematic risk in spite of the schemes having moderate (balanced schemes) and conservative investment objectives (income, gilt and liquid schemes) having moderate to very low amount of systematic risk (beta). Table (6) presents the beta of mutual fund schemes. Among the public-private balanced schemes, HDFC Prudence Fund (70.97 percent) and SBI Magnum Balanced Fund (72.94 percent) are the highest beta funds which have the maximum beta, greater than their mean beta of 58.77 percent and 65.74 percent. Birla Sun Life Freedom and Baroda Pioneer Balance Fund have the lowest beta of 44.96 and 58.43 percent. The beta of public sector tax schemes varies from a minimum of 81.17 to maximum of 98.31 percent and of private sector from 82.32 to 89.03 percent with an average of 88.27 and 85.67 percent. For public sector growth funds, beta ranges from 77.94 to 104.14 percent and for private sector funds, it ranges between 81.13 and 93.04 percent. Both these categories of aggressive funds (tax plan and growth) seem to have market risk ($60 < \beta < 90\%$) in line to their investment objectives. Excluding the Birla Sun Life Freedom fund, the category of moderate investment objective funds (balanced schemes) is not found in accordance to its market risk ($20 < \beta < 50\%$) as this category of funds is medially exposed to the market.

Liquid, income and gilt schemes are not much to do with the market. They are expected to have very low or negligible market risk ($0 < \beta < 20\%$). It can be seen that public and private sector liquid funds are showing negative beta values. Liquid schemes are being managed as per their investment objectives. Average beta for public and private sector liquid funds come out to be -0.37 and -0.39 percent. In case of income schemes, majority of the public-private schemes show low beta values which ranges from 0.08 to 16.39 percent for private sector and 2.35 to -1.55 percent for public sector with an average beta of 4.39 and 0.89 percent. All gilt schemes have also exposed very low beta values ranging from a minimum of 0.96 to a maximum of 3.96 percent for private sector and -2.31 to 2.13 percent for public sector. The average beta for public and private sector gilt schemes are -0.33 and 2.15 percent. Thus, the analysis of systematic risk commensuration with its stated objective reveals that on an average basis, only public and private sector balanced schemes seep out slightly from its investment objectives. In income schemes category, private sector mutual funds outperform the public sector funds while in liquid schemes, case is in favour of public sector. Thus, the big part of the Indian schemes assumes the beta in line to its investment objectives. In case of gilt, income, liquid and growth schemes, public sector mutual funds emerge to be the superior beta assumer and for balance and tax plans, it comes out to be the private sector.

TABLE: (7) AVERAGE RISK - RETURN OF MUTUAL FUND SCHEMES: AIM WISE

Aim	Mean Returns (%)		Mean Risk (%)		Mean Systematic Risk (%)		Outperformer Mutual Fund
	Public	Private	Public	Private	Public	Private	
Balance	0.97	1.11	7.45	6.26	65.74	58.77	Private sector
Tax Plan	0.73	2.06	10.5	7.68	88.26	85.67	Private sector
Growth	1.83	1.74	8.70	8.82	93.43	86.11	Public sector
Liquid	0.53	0.52	0.13	0.14	-0.37	-0.39	Public sector
Income	0.48	0.60	1.22	1.58	0.89	4.39	Public sector
Gilt	0.51	0.66	2.05	5.83	-0.33	2.15	Public sector

D) UNIQUE RISK AND DIVERSIFICATION

The main attribute of investing in mutual funds is diversification, by which a fund manager reduces the level of risk in a portfolio and generates return above than average return on any security for investors. It is interesting to find that in which fund, investors should park their money so they can have maximum benefit of diversification in mutual funds. Unique risk is diversifiable in nature which can be reduced by following the diversification process in portfolio. How far the fund managers have been successful in providing the benefit of diversification to mutual fund investors is analysed under this section. Table (8) and (8.1) confer the information of unsystematic or unique risk and diversification level followed by sample mutual fund schemes.

TABLE: (8) UNIQUE RISK AND DIVERSIFICATION OF PUBLIC SECTOR MUTUAL FUND SCHEMES

Scheme Name	Unique Risk	R2 (Diversification)
Baroda Pioneer Balance Fund	0.0062	0.2833
Baroda Pioneer E L S S 96 Fund	0.0031	0.6877
Baroda Pioneer Growth Fund	0.0005	0.9140
Baroda Pioneer Liquid Fund	0.0000	0.0490
Canara Robeco Equity Diversified.	0.0008	0.8847
Canara Robeco Equity Tax Saver	0.0045	0.6044
Canara Robeco Gilt (Pgs)	0.0003	0.0130
Canara Robeco Income	0.0002	0.0096
L I C M F Balanced Fund	0.0014	0.6954
L I C M F Bond Fund	0.0002	0.0180
L I C M F Equity Fund	0.0026	0.7512
L I C M F G-Sec Fund	0.0004	0.0077
L I C M F Growth Fund	0.0015	0.8150
L I C M F Liquid Fund	0.0000	0.0691
L I C M F Savings Plus Fund	0.0000	0.0027
L I C M F Unit Linked Insurance Scheme	0.0016	0.6388
S B I Magnum Balanced Fund	0.0035	0.5226
S B I Magnum Contra Fund	0.0033	0.6578
S B I Magnum Equity Fund	0.0012	0.8518
S B I Magnum Global Fund	0.0018	0.8144
S B I Magnum Insta Cash Fund	0.0000	0.0557
S B I Magnum Multiplier Plus Fund	0.0009	0.8573
S B I Magnum Tax Gain	0.0032	0.6015
U T I Balanced Fund	0.0002	0.9527
U T I Bond Fund	0.0003	0.0197
U T I Equity Fund	0.0006	0.8811
U T I Equity Tax Savings Plan	0.0024	0.6609
U T I Gilt Advantage Fund	0.0006	0.0009
U T I Masterplus	0.0003	0.9578
Average	0.0014	0.4759

TABLE: (8.1) UNIQUE RISK AND DIVERSIFICATION OF PRIVATE SECTOR MUTUAL FUND SCHEMES

Scheme Name	Unique Risk	R2 (Diversification Level)
Birla Sun Life Advantage Fund	0.0015	0.7930
Birla Sun Life Cash Manager	0.0000	0.0513
Birla Sun Life Equity Fund	0.0019	0.7500
Birla Sun Life Freedom Fund	0.0018	0.4500
Birla Sun Life Income Fund	0.0005	0.0010
Birla Sun Life'95 Fund	0.0013	0.6328
H D F C Balanced Fund	0.0003	0.9155
H D F C Capital Builder Fund	0.0008	0.8783
H D F C Equity Fund	0.0004	0.9440
H D F C Growth Fund	0.0004	0.9254
H D F C Income Fund	0.0003	0.0431
H D F C Long Term Advantage Fund	0.0006	0.8909
H D F C Prudence Fund	0.0024	0.5977
H D F C Short Term Plan	0.0000	0.0208
H D F C Tax Saver	0.0006	0.8993
H D F C Top 200 Fund	0.0001	0.9741
H S B C Equity Fund	0.0004	0.9255
H S B C Gilt Fund	0.0001	0.0119
Kotak 30	0.0003	0.9384
Kotak Bond	0.0004	0.0186
Kotak Gilt	0.0006	0.0011
Kotak Income Plus	0.0000	0.8103
Reliance Liquid Fund	0.0000	0.0702
Reliance Vision Fund	0.0018	0.7650
Sahara Gilt Fund	0.0192	0.0006
Sahara Growth Fund	0.0232	0.1362
Sahara Income Fund	0.0001	0.00004
Sahara Tax Gain Fund	0.0159	0.2370
Average	0.0027	0.4886

It can be seen that average unique risk and diversification of public sector schemes are 0.14 percent and 47.59 per month whereas in private sector schemes these are 0.27 and 48.86 percent per month. It indicates that both public and private sector mutual fund managers do not seem adequate diversifiers of schemes and schemes are not diversified properly. In public sector schemes, 18 schemes (62.06 percent) possess unique risk lower than its average unique risk and interestingly, 11 schemes possess more than its average unique risk. Of 18 < average unique risk, 17 schemes (58.92 percent) have diversification higher than their average diversification level and of the rest 11 schemes > average unique risk, 9 schemes have diversification higher than their average diversification level. Hence, 9 public sector schemes show above than average diversification level and 11 schemes above than average unique risk indicates the improper diversification in mutual fund schemes. Only 9 public sector schemes are properly diversified. In private sector schemes, 25 schemes (89.28 percent) lie below to its average unique risk and 13 schemes (46.43 percent) below to its average diversification. Remarkably, the remaining three private sector schemes (10.71 percent) having higher than average unique risk show lower diversification than its average level. Thus, diversification is quite improper and low particularly in private sector schemes.

(2) RISK-ADJUSTED PERFORMANCE ANALYSIS

After analyzing the risk-return performance, there occurs the need of predicting risk-adjusted performance of selected mutual funds schemes which is useful to assess the differential return that arises after adjusting the return for risk. Results of risk-adjusted mutual fund performance are presented below using the two measures: Sharpe Ratio and Treynor Ratio.

A) RESULTS OF SHARPE RATIO

Sharpe ratio measures the excess returns earned per unit total risk (standard deviation). Table (9) and (9.1) shows the results of Sharpe ratio for mutual funds and benchmark portfolio. Out of 29 public sector schemes, 8 schemes (27.58 percent) reveal the positive Sharpe ratio against the benchmark portfolio. Rest of the 21 schemes (72.41 percent) show negative Sharpe ratio compare to respective benchmark which refers that these schemes are failed to provide minimum risk-adjusted returns to investors. These are meant to be the worst performers. In terms of Sharpe ratio, first top five rankers are LICMF Liquid Fund (49.84 percent) and Canara Robeco Income (24.31 percent), SBI magnum Multiplier Plus Fund (6.45 percent), SBI Magnum Insta Cash Fund (5.26 percent) and Baroda Pioneer Growth Fund (4.73 percent) which have outperformed superiorly than others and LICMF Liquid has topped the list. In private sector, 12 mutual fund schemes (42.86 percent) have better Sharpe ratio against respective benchmark portfolio. The maximum positive ranking is shown by HDFC Top 200 Fund (24.52 percent), HDFC Equity Fund (24.14 percent) and HDFC Growth Fund (22.44 percent) with minimum by Reliance Liquid Fund (17.11 percent), HSBC Equity Fund (18.40 percent) and HDFC Long term Advantage Fund (18.44 percent). Thus, Sharpe ratios of both mutual fund sectors are not found much satisfactory for investors hence large number of schemes are failed to offer risk-adjusted returns. In 57 sample schemes, only 20 schemes have taken positive Sharpe ratio pertaining to the benchmark. On an average, the Sharpe ratio of the private sector schemes (10.02 percent) has been higher than public sector schemes (8.00 percent). Large number of private sector schemes has outperformed the public sector schemes based on Sharpe ratio.

TABLE: (9) SHARPE AND TREYNOR RATIO FOR PUBLIC SECTOR MUTUAL FUND SCHEMES AND BENCHMARK PORTFOLIO

Scheme Name	Sharpe Ratio		Treyner Ratio	
	Fund	Benchmark	Fund	Benchmark
Baroda Pioneer Balance Fund	0.1033	0.1653	0.0165	0.0140
Baroda Pioneer E L S S 96 Fund	0.0196	0.1653	0.0020	0.0140
Baroda Pioneer Growth Fund	0.2126	0.1653	0.0189	0.0140
Baroda Pioneer Liquid Fund	0.0038	0.1653	-0.0014	0.0140
Canara Robeco Equity Diversified.	-0.2982	0.1653	-0.0269	0.0140
Canara Robeco Equity Tax Saver	0.0801	0.1653	0.0144	0.0140
Canara Robeco Gilt (Pgs)	0.0663	0.1653	-0.0493	0.0140
Canara Robeco Income	0.2431	0.1653	-0.2102	0.0140
L I C M F Balanced Fund	-0.0261	0.1653	-0.0027	0.0140
L I C M F Bond Fund	-0.2823	0.1653	-0.1790	0.0140
L I C M F Equity Fund	-0.0010	0.1653	-0.0001	0.0140
L I C M F G-Sec Fund	-0.0532	0.1653	-0.0517	0.0140
L I C M F Growth Fund	0.1140	0.1653	0.0107	0.0140
L I C M F Liquid Fund	0.4984	0.1653	-0.1586	0.0140
L I C M F Savings Plus Fund	-0.0095	0.1653	0.0153	0.0140
L I C M F Unit Linked Insurance Scheme	-0.0884	0.1653	-0.0094	0.0140
S B I Magnum Balanced Fund	0.1641	0.1653	0.0193	0.0140
S B I Magnum Contra Fund	0.2037	0.1653	0.0213	0.0140
S B I Magnum Equity Fund	0.1170	0.1653	0.0108	0.0140
S B I Magnum Global Fund	0.1856	0.1653	0.0174	0.0140
S B I Magnum Insta Cash Fund	0.2179	0.1653	-0.0782	0.0140
S B I Magnum Multiplier Plus Fund	0.2298	0.1653	0.0211	0.0140
S B I Magnum Tax Gain	0.0959	0.1653	0.0105	0.0140
U T I Balanced Fund	0.1460	0.1653	0.0127	0.0140
U T I Bond Fund	0.0356	0.1653	0.0215	0.0140
U T I Equity Fund	0.1720	0.1653	0.0155	0.0140
U T I Equity Tax Savings Plan	-0.0131	0.1653	-0.0014	0.0140
U T I Gilt Advantage Fund	0.0277	0.1653	-0.0793	0.0140
U T I Masterplus	0.1556	0.1653	0.0135	0.0140
Average	0.0800	0.1653	-0.0209	0.0140

TABLE: (9.1) SHARPE AND TREYNOR RATIO FOR PRIVATE SECTOR MUTUAL FUND SCHEMES AND BENCHMARK PORTFOLIO

Scheme Name	Sharpe Ratio		Treyner Ratio	
	Fund	Benchmark	Fund	Benchmark
Birla Sun Life Advantage Fund	0.0725	0.1653	0.0069	0.0140
Birla Sun Life Cash Manager	-0.0029	0.1653	-0.0766	0.0140
Birla Sun Life Equity Fund	0.0987	0.1653	0.0158	0.0140
Birla Sun Life Freedom Fund	-0.0348	0.1653	-0.0044	0.0140
Birla Sun Life Income Fund	0.0602	0.1653	0.1602	0.0140
Birla Sun Life'95 Fund	0.2166	0.1653	0.0254	0.0140
H D F C Balanced Fund	0.2005	0.1653	0.0178	0.0140
H D F C Capital Builder Fund	0.1947	0.1653	0.0176	0.0140
H D F C Equity Fund	0.2414	0.1653	0.0211	0.0140
H D F C Growth Fund	0.2244	0.1653	0.0198	0.0140
H D F C Income Fund	0.0178	0.1653	0.0073	0.0140
H D F C Long Term Advantage Fund	0.1855	0.1653	0.0167	0.0140
H D F C Prudence Fund	0.0367	0.1653	0.0040	0.0140
H D F C Short Term Plan	0.2160	0.1653	0.1263	0.0140
H D F C Tax Saver	0.2223	0.1653	0.0199	0.0140
H D F C Top 200 Fund	0.2452	0.1653	0.0211	0.0140
H S B C Equity Fund	0.1840	0.1653	0.0162	0.0140
H S B C Gilt Fund	-0.3196	0.1653	-0.2495	0.0140
Kotak 30	0.2016	0.1653	0.0176	0.0140
Kotak Bond	0.0728	0.1653	0.0452	0.0140
Kotak Gilt	0.0331	0.1653	0.0846	0.0140
Kotak Income Plus	0.0292	0.1653	0.0027	0.0140
Reliance Liquid Fund	0.1711	0.1653	-0.0529	0.0140
Reliance Vision Fund	0.0306	0.1653	0.0030	0.0140
Sahara Gilt Fund	0.0597	0.1653	0.2087	0.0140
Sahara Growth Fund	0.0538	0.1653	0.0124	0.0140
Sahara Income Fund	0.1358	0.1653	1.9352	0.0140
Sahara Tax Gain Fund	-0.0425	0.1653	-0.0074	0.0140
Average	0.1002	0.1653	0.0862	0.0140

B) RESULTS OF TREYNOR RATIO

Table (9) and (9.1) presents the results of Treynor ratio for sample schemes and benchmark portfolios. Treynor ratio measures the excess return adjusted per unit of systematic risk (beta). In all 57 schemes, Treynor ratio for 25 schemes turns to be positive. In 29 public sector schemes, the Treynor ratio of 10 schemes (34.48 percent) is positive for the selected benchmark. The top five performers in terms of Treynor ratio include, UTI Bond Fund, SBI Magnum Contra Fund, SBI Magnum Multiplier Plus Fund, SBI Magnum Balanced Fund and Baroda Pioneer Growth Fund. One thing is important to notice here that LICMF Savings Plus Fund, SBI Magnum Balanced Fund, Baroda Pioneer Balanced Fund and Canara Robeco Equity Tax Saver show underperformance in terms of Sharpe ratio and outperformance in terms of Treynor ratio. This is because that fund managers are able to provide the sufficient risk-adjusted returns to investors only the basis of market risk (beta) but not on the basis of total risk (standard deviation). Therefore, a scheme which performs less or underperforms in terms of Sharpe ratio

may perform high or outperform in terms of Treynor ratio. In other words, this difference arises because Sharpe ratio adjusts return per unit of total risk while Treynor ratio adjusts return per unit of systematic risk. Because of this difference, ranking of funds as per both ratios generally differs. Moreover, in case of Sharpe ratio, portfolio may take more amount of unique risk and caused fund to give less risk-adjusted return. Thus, unique risk is important for only Sharpe ratio not for the Treynor ratio. Other condition may also happen that many schemes outperform and underperform according to both the ratios i.e. Sharpe ratio and Treynor ratio.

In private sector mutual fund schemes, 15 schemes (53.57 percent) are having positive Treynor ratio. These schemes have outperformed their relevant benchmark successfully and compensated highly to investors for per unit of systematic risk taken. Sahara Income Fund (193.52 percent), Sahara Gilt Fund (20.87 percent), Birla Sun Life Income Fund (16.02 percent), HDFC Short Term Plan (12.63 percent) and Kotak Gilt (8.46 percent) are the top five rankers and HDFC Long Term Advantage Fund (1.67 percent), HDFC balanced Fund (1.78 percent), HDFC Capital Builder Fund (1.76 percent), HSBC Equity Fund (1.62 percent), Birla Sun Life Equity Fund (0.18 percent) are the five bottom performers. Remaining 13 are underperformed in terms of volatility compensation. Surprisingly, all top performers are gilt, income and balanced category funds and equity funds are of the bottom performers. This suggests that in spite of growth funds which are much exposed to the market and expected to compensate highly in terms of volatility, low risk-return profile funds are being managed as growth funds and growth funds are as others. Thus, 53.57 percent of private sector schemes have positive Sharpe ratio against 34.48 percent of public sector schemes. It reflects clearly that private sector schemes have outperformed public sector schemes in terms of Treynor ratio.

CONCLUSION

The study has compared the public and private sector mutual funds in six major categories of funds. Summary of results is presented in table (10). In India, innumerable public and private sector mutual fund schemes are available to common investors which generally perplex them to pick the best out of them. This study provides some insights on mutual fund performance so as to assist the common investors in taking the rational investment decisions for allocating their resources in correct mutual fund scheme. Results reveal that the performance of private sector mutual funds has been superior to public sector funds in almost the frames. Private sector mutual fund is found to be the more efficient allocator of investors’ resources than public sector mutual funds. Though, they together are failed on the prime idea of “putting all eggs in different baskets” because of inadequate diversification results. Mutual funds are found to do well only on the part of optimizing portfolio returns and least on the part of portfolio risk diversification process. These two letdowns show the concern for mutual fund industry and suggest that fund managers should do hard for improving the fund performance so that, the faith of investors in mutual funds can be increased at far. Nevertheless, on the basis of performance results, it cannot be ignored that Indian mutual fund industry has enough potential to go a long way in future.

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TABLE

TABLE (10): SUMMARY OF RESULTS

Methodology	Public Sector (%)	Private Sector (%)	Outperformer	Interpretation	Hypothesis
Risk-Return Performance					
On Return Basis	48.27 > mean return	42.85 > mean return	Public sector	- Public sector mutual funds outperform private sector in terms of generating absolute returns.	
On Risk Basis	62.07 > mean risk	17.86 > mean risk	Private sector	- Public sector mutual funds are more volatile than private sector funds.	H0₂: Reject
Return Against Market (Rm)	13.79 > mean Rm	21.43 > mean Rm	Private sector	- Private sector mutual funds outperform public sector in terms of generating returns against market.	H0₁: Accept
Risk Against Market	5.99 < market portfolio risk	6.08 < market portfolio risk	None	- Mutual funds are less volatile than market portfolio.	
Unique Risk	37.93 > mean unique risk	10.71 > mean unique risk	None		
Diversification	58.62 > mean diversification	53.57 > mean diversification	None	-Both public and private sector mutual funds are inadequate diversifiers however, the public did well in comparison.	H0₃: Reject
Risk-Adjusted Performance					
Sharpe Ratio	8.00	10.02	Private sector	- Private sector mutual funds provide higher returns per unit of risk against its counterpart.	H0₄: Reject
Treynor Ratio	34.48	53.57	Private sector	- Private sector mutual funds pay more rewards per unit of volatility than public sector.	

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