

# Performance Evaluation of Selected Mutual Funds

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With integration of national and international market, global mutual fund market witnessed a phase of expansion and innovation during eighties and early nineties. In India mutual fund industry gained momentum during late eighties and has grown rapidly in the last decade. The Mutual fund industry in India has emerged as a dominant financial intermediary in Indian capital market. Today investors expects higher return with lower risk and wants to protect against inflation, leads to depreciation of money over a time. Modern investors concentrated more on diversion of investment and mobilization of savings from banks, insurance and other financial instruments towards stock market through mutual funds. Those who have limited or no knowledge of stock market becomes difficult and challenging to gain good returns from stock market. Mutual funds offer new path to those investors. Mutual funds are investment vehicles that act as mobilize of savings as well as provider of capital to capital market. As fund managers have knowledge skill and experience for decisions. Investors consider mutual funds less risky than stocks.

In this paper, an attempt has been made to study the performance of selected schemes of mutual funds based on risk-return relationship models and measures: Treynor ratio, Sharpe ratio, Jensen's alpha. To evaluate the performance monthly returns are compared with market returns.

**Keywords:** Risk-Return Analysis, NAV, Beta, Portfolio Management

## Introduction

Over the past decade, mutual funds have become the investor's vehicle of choice for long-term investing. A Mutual Fund pools the savings of a number of investors who share a common financial goal. Mutual Fund is one of the most preferred investment alternatives for the risk avert investors as it offers chance to invest in a diversified, professionally handled portfolio at low cost. With emphasis on increase in domestic savings and increase in investment through capital markets, the need and scope for mutual fund operation has increased tremendously. Growth and developments of various mutual funds products in the Indian capital market has demonstrated to be one of the most important instruments in generating significant growth in the capital market. In this context, evaluation of mutual funds has become essential. It becomes relevant to study the performance of the Indian mutual fund industry. The relation between risk-return determines the performance of a mutual fund scheme.

## Objectives of The Study

- i) To measure the growth oriented Mutual Fund are earning higher returns than the benchmark returns (or market Portfolio/Index returns).
- ii) To find out those mutual fund schemes offering the advantages of diversification.
- iii) To analyze the excess return per unit of risk evidenced by mutual fund of public sector and private sector.

Mutual funds are investment companies that pool money from investors at large and offer to sell and buy back its shares on a continuous basis and use the capital thus raised to invest in securities of different companies. Mutual funds possess shares of several companies and receive dividends in lieu of them and the earnings are distributed among the share holders. Mutual funds can be either or both of open ended and closed ended investment companies depending on their fund management pattern. An open-end fund offers to sell its shares (units) continuously to investors either in retail or in bulk without a limit on the number as opposed to a closed-end fund. Closed end funds have limited number of shares. Mutual funds have diversified investments spread in calculated proportions amongst securities of various economic sectors. Mutual funds get their earnings in two ways. First is the most organic way, which is the dividend they get on the securities they hold. Second is by the redemption of their shares by investors will be at a discount to the current NAVs (net asset values)

## NAV

NAV or Net Asset Value of the fund is the cumulative market value of the assets of the fund

net of its liabilities. NAV per unit is simply the net value of assets divided by the number of units outstanding. Buying and selling into funds is done on the basis of NAV-related prices.

NAV is calculated as follows:

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NAV = Market value of the fund's investments + Receivables + Accrued Income - Liabilities - Accrued Expenses / Number of Outstanding units

### Research Methodology

The research methodology adopted for the study is described below:

#### Scope of the study

The scope of the study is limited to growth schemes in India for the period 1st March 2011 – 29th Feb 2012. Five public as well as private funds are randomly taken for study.

**Secondary Data:** The study has been carried out entirely on the basis secondary source. The major sources of secondary data are as given below:

Net Asset Values (NAVs) on the opening and closing day of each of the 12 months of the study period (1st March 2011 to 29th Feb 2012) of the 10 growth oriented funds are collected from the websites of the Association of Mutual Fund of India (AMFI).

Monthly Bombay Stock Exchange 100 Index values have been drawn from Bombay Stock Exchange website. The BSE 100 Index is proxy for the market return in study.

**Risk-free rate of return:** There are two basic criteria, one the security should be highly liquid and another is that it should be capable of generating a return, with negligible variation from expected returns. 91 days treasury bills falls within this yardstick. Return on 91 days T-bills has been taken as surrogate measure of risk-free return. Data on coupon rates of 91 days T-bills for the period 1st March 2011- 29th Feb 2012 have been collected from the website of government securities.

Single period change of NAV per unit has been computed. Single period has been defined as one month. The period of study is 2011-2012, divided into 12 single periods of one month each. Monthly returns have been based on month-end NAV's per unit. The monthly returns for each of the single periods so computed have been compounded to get single compounded monthly rate of returns on the mutual fund portfolio.

#### Return

For each mutual fund scheme under study, the monthly returns are computed as:

$$R_1 = (P_1 - P_0)$$

$$P_0$$

Where

$R_1$  = Return of fund during period over 12 months

$P_1$  = Value of the Fund at the end of period

$P_0$  = Value of the Fund at the start of period

The market returns are computed on similar lines with BSE Sensex (The Bombay Stock Exchange Sensitive Index) as benchmark. The return on the market portfolio is computed as:

$$R_m = (P_1 - P_0)$$

$$P_0$$

Where

$R_1$  = Return of fund during period over 12 months

$P_1$  = Value of the Fund at the end of period

$P_0$  = Value of the Fund at the start of period. (Shown in Table 1)

#### Return Relative:

The concept of return relative is used in cumulative wealth index or geometric mean as in such calculations negative returns cannot be used. It is defined as,

Relative return = 1 + Total return in decimals.

The geometric mean  $R_j$  is the total return for period and  $n$  is the number of time periods. It is computed to obtain mean monthly market return. The returns thus obtained are absolute returns and are retained throughout the study. The expression shown below has been used to compute monthly compounded rate of return,  $R$ , for fund 'j'.

$$R = (R_{j1} \times R_{j2} \times R_{j3} \times \dots \times R_{jn})^{1/n}$$

Where,

$R$  = Compounded monthly rate of return on fund 'j'

$R_{jn}$  = Monthly rate of return on fund 'j' for  $n^{\text{th}}$  month

$n$  = Number of months

#### Risk

Standard deviation is measure of total risk. The square root of the variance is called the standard deviation  $\sigma = \text{Var} (r)$ .

The standard deviation and the variance are equally acceptable and equivalent quantitative measures of an asset's total risk. The variance and standard deviation are computed from average monthly returns.

Beta is measure of Systematic Risk or non diversifiable risk. It measures the sensitivity of the stock with reference to a broad based market index.

$$\beta = \sigma_j / \sigma_m \cdot \text{COR}_{jm}$$

**Coefficient of Variation (CV):** It means risk per unit of return i.e. standard deviation/mean. It measured the degree of variation relative to mean as a percentage.

**Co-efficient of Determination ( $R^2$ ):** i.e., the extent to which the movement in the fund can be explained by corresponding benchmark index (here, NSE Nifty)

For further evaluating the performance of mutual funds, the risk-return relation models given by Sharpe (1966), Treynor (1965) and Jensen (1968) have been applied.

### Treynor's Ratio

Jack Treynor (1965) conceived an index of portfolio performance measure called as reward to volatility ratio, based on systematic risk. He assumes that the investor can eliminate unsystematic risk by holding a diversified portfolio. Hence his performance measure denoted as  $T_j$  is the excess return over the risk free rate per unit of systematic risk, in other words it indicates risk premium per unit of systematic risk.

$$\text{Treynor's index} = (R_j - R_f) \div \beta_{pj}$$

Where,

$R_j$  = Portfolio return over a period

$R_f$  = Risk-free return over a period

$\beta_p$  = Market-risk, beta coefficient

If TP of the mutual fund scheme is greater than  $(R_m - R_f)$ , then the scheme has out performed the market. The major limitation of the Treynor Index is that it can be applied to the schemes with

positive betas during the bull phase of the market. The results will mislead if applied during bear phase of the market to the schemes with negative betas. The second limitation is it ignores the reward for unsystematic or unique risk.

### Sharpe's Ratio

Sharpe (1966) devised an index of portfolio performance measure, referred to as reward to variability ratio denoted by  $S_j$ . He assumes that small investor invests fully in the mutual fund and does not hold any portfolio to eliminate unsystematic risk and hence demands a premium for the total risk.

$$\text{Sharpe's index} = (R_j - R_f) \div \sigma_j$$

$R_j$  = Portfolio return over a period

$R_f$  = Risk-free return over a period

$\sigma_j$  = Total risk, standard deviation of portfolio return

If  $S_j$  of the mutual fund scheme is greater than that of the market portfolio, the fund has out performed the market. The superiority of the Sharpe ratio over the Treynor ratio is, it considers the point whether investors are reasonably rewarded for the total risk in comparison to the market. A mutual fund scheme with a relatively large unique risk may outperform the market in

Treynor's index and may under perform the market in Sharpe ratio. A mutual fund scheme with large Treynor ratio and low Sharpe ratio can be concluded to have relatively larger unique risk. Thus the two indices rank the funds differently.

### Jensen's Measure

Jensen (1968) has given different dimension and confined his attention to the problem of evaluating a fund manager's ability of providing higher returns to the investors. He measures the performance as the excess return provided by the portfolio over the expected (CAPM) returns. The performance measure, denoted by JP. He assumes that the investor expects at least CAPM returns.

$$(R_p) = R_f + \beta_j \times [(R_m) - R_f],$$

Where,

$(R_p)$  = Expected portfolio return during a particular period

$R_f$  = Risk free interest rate

$R_m$  = return on market/benchmark portfolio

$\beta_j$  = Volatility of portfolio return against that of market Portfolio return or portfolio's market risk.

$\beta_j$  is a measure of systematic risk of the portfolio and is calculated using following equation

$$\beta_j = \frac{\text{Cov}(R_j, R_m)}{\text{Variance of}(R_m)}$$

A positive value of  $\beta_j$  would indicate that the scheme has provided a higher return over the CAPM return and lies above Security Market Line (SML) and a negative value would indicate it has provided a lower than expected returns and lies below SML. The Jensen model assumes that the portfolio is fully invested and is subjected to the limitations of CAPM.

### Analysis of Selected Mutual Funds:

#### Comparison of fund returns with market index returns:

Observing column 3 & 4 in Table 2, all funds better perform than market returns except two funds i.e. LIC Nomura and Sundram Capex fund. Kotak and IDBI funds outperform than market returns that is also proved by Sharpe, Treynor and Jensen measure.

#### Beta:

The study depicts that public sector funds like Magnum equity, LIC Nomura, Canara Robeco eco & UTI fund are less risky than the market index (BSE-100) by 28%, 10%, 76% and 24% respectively. (Shown in Table 2)

Canara Rob fund is slower than movement in market index. If market goes up, fund goes up slower & vice-versa.

IDBI fund (0.00982) is less correlated with market index and has minimum risk.

In case of private funds, Religare fund, Fidelity fund, Sundram Capex fund are less risky than benchmark index by 22%, 21% & 10% respectively.

Reliance banking fund is 32% riskier than the index. It moves

faster than the index. It moves faster than the movement in market index.

Kotak Gold Fund (-0.17045) is negatively related with benchmark index. There is no relation with market index in terms of returns & risk.

LIC Nomura fund (0.9028) of public sector fund & Sundram Capex Opp. Fund (0.908754) of private sector fund are adequately risky portfolio well below the market risk.

#### Co-efficient of Determination ( $R^2$ ):

$R^2$  is high in case of IDBI fixed fund, which reflects high percentage of diversification of fund, so total risk (STD) of this fund is low. Kotak Gold fund have low  $R^2$  that reflects low diversification of fund (0.03865), where the risk is high (STD=0.060806). As result return on fund is high, proved by Sharpe and Jensen measure (Sharpe= 5.612425, Jensen=0.39544).

**Looking at Treynor measure**, all selected funds, except Kotak Gold fund, has positive values. It indicates risk premium per unit of systematic risk. (Shown in Table 3)

IDBI fixed (33.45) & Canara robeco fund (1.34) have high risk premium (return) per unit of systematic risk. These funds outperform than market.

Reliance Banking fund & Kotak Gold fund are under performer under, in Treynor measure.

There are two conditions: one  $R_j > R_f$  and  $B > 0$ , T-value will be positive. Positive or higher Treynor value means better performance of funds.

Another, when  $R_j < R_f$  or when  $B < 0$ , T-value will be negative.

Here Kotak Gold fund have negative value, but as negativity of T-value, comes from negative beta, fund's performance is superb, which is proved by Jensen measure. Jensen measure reflects that excess of risk premium over expected return of fund. ( $T = -2.00218$  &  $J_j = 0.39544$ )

#### Sharpe Measure:

Sharpe measure is an excess return earned over risk free return per unit of risk i.e. per unit of standard deviation.

Positive values of scheme indicate better performance that is observed in all selected funds.

Higher positive values of Sharpe, found in IDBI fixed maturity fund (114.51) followed by Canara Robeco fund (9.19). Among all funds least performer is Reliance Banking fund.

#### Jensen Measure:

All funds have positive value except Reliance Banking Fund. All positive value indicates difference between risk premium and expected return. Kotak Gold Fund has high positive value followed by IDBI fixed fund.

#### Hypothesis testing

The following statistical tests were conducted to ascertain whether Public Growth funds outperformed the Private funds.

#### Student's t-test (1 – tailed test)

$\mu_1$  = Mean returns of the population of Public funds

$\mu_2$  = Mean returns of the population of Private funds

$H_0$ :  $\mu_1 = \mu_2$  (Null Hypothesis): There is no difference in the mean returns of Public funds and Private funds.

$H_1$ :  $\mu_1 > \mu_2$  (Alternate Hypothesis): The Mean returns of Public funds are greater than the Mean returns of Private funds.

$N_1$  = sample size of Public Growth Plans = 05

$N_2$  = sample size of Private Growth Plans = 05

Degrees of Freedom =  $N_1 + N_2 - 2 = 08$

$S_1$  = Standard deviation of selected Public Growth funds = 0.00459

$S_2$  = Standard deviation selected Private Growth funds = 0.01225

$X_1$  = Mean of selected Public Growth funds = 1.0030

$X_2$  = Mean of selected Private Growth funds = 1.0006

The value of test statistic is 0.3373716. The critical values of  $t^*$  for right tail test at 5% level of significance ( $\alpha$ ) for 08 degrees of freedom is 1.860. Comparing the test static (t) value of 0.3373 with critical value, test static is lower than critical value at 5% level of significance. Test value falls in acceptance region leading to acceptance of null hypothesis i.e. there is no difference between average monthly returns of Public and Private funds. (Shown in Table 4).

#### Findings of Study:

Returns of all funds are more than market index returns, but not high.

Reliance Banking Fund is poor performer under all three measures.

Kotak Gold Fund and IDBI Fixed Maturity Fund have outperformed than the market benchmark.

Average monthly returns of public and private funds are equal, in randomly selected funds. **Limitations of the Study:**

The present study has the following limitations:

1. The NAVs used in the study are obtained from AMFI's website, which in turn is supplied by the members.
2. Banks are free to accept deposits at any interest within the ceilings fixed by Reserve Bank of India and there can be an inaccuracy in the risk-free rates.

3. The analysis is not free from the limitations of non-identical time periods and unequal sample observations.
4. The study excludes the effect of entry and exit loads of the mutual funds.

Table 1: Market Index  
(BSE-100)

Opening return of market	Closing return of market	Monthly returns of market	Geomean
9325.06	10095.74	0.082646	1.082646
10100.53	9991.88	-0.010757	0.989243
10029.87	9720.96	-0.030799	0.969201
9731.43	9803.89	0.007446	1.007446
9857.37	9537.41	-0.032459	0.967541
9600.31	8727.88	-0.090875	0.909125
8849.09	8613.22	-0.026655	0.973345
8534.71	9196.79	0.077575	1.077575
9129.35	8330.57	-0.087496	0.912504
8515.37	7927.94	-0.068985	0.931015
7959.35	8970.08	0.126987	1.126987
8963.25	9321.49	0.039968	1.039968
Average monthly market returns			0.996660
Standard deviation			0.070138

Table 2

Name of Fund	Average Returns	Geomean returns of funds $R_j$	Average Market return $R_m$	Risk Free Rate $R_f$	STD $\sigma_j$	Beta	(R2)
Magnum Equity Fund	0.00669	1.00480	0.99666	0.67885	0.06547	0.72448	0.60241
LIC Nomura MF Equity Fund Growth	-0.00282	0.99533	0.99666	0.67885	0.06389	0.90284	0.98230
IDBI Fixed Maturity Fund	0.00730	1.00730	0.99666	0.67885	0.00275	0.00982	0.06249
Canara Robeco Balance Fund	0.00542	1.00489	0.99666	0.67885	0.03403	0.24304	0.25087
UTI Equity Fund	0.00399	1.00267	0.99666	0.67885	0.05403	0.76079	0.97531
Religare Contra Fund	0.00108	0.99962	0.99666	0.67885	0.05660	0.78619	0.94920
Reliance Banking Fund	0.00133	0.99723	0.99666	0.67885	0.09655	1.32314	0.92384
Fidelity Equity Fund	0.00127	0.99984	0.99666	0.67885	0.05622	0.79203	0.97625
Kotak Gold Fund	0.02176	1.02012	0.99666	0.67885	0.06081	0.17045	0.03865
Sundaram Capex Opportunities	-0.01152	0.98622	0.99666	0.67885	0.07091	0.90875	0.80801
BSE-100					0.01108	0.72448	

Table 3

Name of Fund	Average Market return	Geomean	Treynor	Sharpe	Jensen
Magnum Equity Fund	0.99666	1.00480	0.44991	4.97873	0.09570
LIC Nomura MF Equity Fund Growth	0.99666	0.99533	0.35054	4.95346	0.02955
IDBI Fixed Maturity Fund	0.99666	1.00730	33.45211	119.22502	0.32533
Canara Robeco Balance Fund	0.99666	1.00489	1.34150	9.58003	0.24880
UTI Equity Fund	0.99666	1.00267	0.42563	5.99313	0.08203
Religare Contra Fund	0.99666	0.99962	0.40801	5.66755	0.07091
Reliance Banking Fund	0.99666	0.99723	0.24062	3.29747	0.10213
Fidelity Equity Fund	0.99666	0.99984	0.40528	5.70933	0.06928
Kotak Gold Fund	0.99666	1.02012	-2.00218	5.61242	0.39544
Sundaram Capex Opportunities	0.99666	0.98622	0.33823	4.33481	0.01856
BSE-100			0.43868	28.68683	0.08756

Table 4

	Geomean of fund returns	STD
<b>PUBLIC FUNDS</b>		
Magnum Equity Fund	1.00480	0.06547
LIC Nomura MF Equity Fund Growth	0.99533	0.06389
IDBI Fixed Maturity Fund	1.00730	0.00275
Canara Robeco Balance Fund	1.00489	0.03403
UTI Equity Fund	1.00267	0.05403
Mean Return	1.00300	
Standard Deviation of Fund Return	0.00459	
<b>PRIVATE FUNDS</b>		
Religare Contra Fund	0.99962	0.05660
Reliance Banking Fund	0.99723	0.09655
Fidelity Equity Fund	0.99984	0.05622
Kotak Gold Fund	1.02012	0.06081
Sundaram Capex Opportunities	0.98622	0.07091
Mean Return	1.00061	
Standard Deviation of Fund Return	0.01225	
<b>T TEST STATISTIC</b>	0.3373716	

**References:**

- Debasish, S. (2010). Investigating Performance of Equity-based Mutual Fund Schemes in Indian Scenario. Retrieved from <http://diaryintan.wordpress.com/2010/05/10/investigating-performance-of-equity-based-mutual-fund-schemes-in-indian-scenario/>
- Jensen, M. C. (1968). The performance of Mutual Funds in the period 1945-1964, *Journal of Finance*, 23(2), 389-416.
- Treynor, J. L. (1965). How to Rate Management of Investment Funds. 63-75.
- Sharpe, W. F. (1966) Mutual Fund Performance, *Journal of Business*, 39(1), 119-138.
- <http://ikonfinancials.com/Mutual%20Fund.html>