Performance Evaluation of Mutual Fund

Y.V Reddy *
S.B.Patkar **

Mutual funds are the fastest growing segment of the financial service industry. It has emerged as a main vehicle of investment and important source of returns for small investors on their investments. The volatility in the capital market and reduction of interest rates on deposits diverted a large number of small investors towards mutual funds. The present study aims to evaluate the performance of mutual fund schemes through risk return analysis. The paper is based on secondary data and for each mutual fund schemes in the sample, the returns have been calculated taking weekly -end Net Asset Value since from 1998 to 2001 . The study considers interest rates on bank deposits as risk free asset. The risk return analysis such as Sharpe, Jenson and Treynor measures has been used to find performance evaluation of mutual fund schemes. The Sharpe ratio of Magnum sector pharma ,Magnum multiplier plus schemes were identified as greater than Benchmark. The Treynor ratio of SBI global fund,Magnum sector pharma, Canexpro, Magnum sector umbrella and Canbonus were performed better than benchmark. The Alpha value of Canexpro is positive, thus it signifies that it has performed well in the market.

* Dr.Y.V Reddy, Reader, Department of commerce, Goa University, Goa .

** Mr. S.B.Patkar, Lecturer in commerce, Saraswat vidyalayas college of commerce, Mapusa, Goa

Introduction

Mutual fund is one of the fastest growing products of the financial service industry. It has emerged as a main vehicle of investment and important source of return for small investors on their investments. The volatility in the capital market and reduction of interest rates on deposits diverted a large number of small investors towards mutual funds.

Mutual fund is a trust which accepts savings from investors and invests the same in diversified financial instruments. It is a process of pooling large funds from small investors and return back with handful dividend or with appreciated value of units.

According to Securities and Exchange Board of India (mutual fund) Regulations,1996 a mutual fund means a fund established in the form of trust to raise monies through the sale of units to the public or a section of the public under one or more schemes for investing in securities, including money market instruments, Amitabh(2002).

The concept of mutual fund in India was introduced in the sixtees. Unit Trust of India made its entry in to mutual fund business in 1964 with Unit Scheme 64, popularly known as US 64.

The domination of the UTI was over when Government opened mutual fund business to public sector banks in 1987 and further to private sector in 1993. The fund mobilized through various schemes by UTI, public sector banks and private sector mutual fund companies brought about a significant contribution in the Indian mutual fund industry.

Objectives of the study

The present study aims to evaluate the performance of mutual fund schemes through risk return analysis. Investors invests their fund in mutual fund schemes

with an objective of earning higher income through either better dividend or capital appreciation.. Thus it is essential to identify whether the mutual fund schemes has resulted better earning on portfolio as compared to benchmark market return.

Concepts

Capital Assets Pricing Model (CAPM) - Describes simple linear relationship between risk and return.. The model expresses the expected return and the relationship is forward and not backward.

Beta - measures the systematic risk of a portfolio. Higher beta for any security, the higher must be its expected return. Securities with larger betas will have larger amount of market risk. If beta is more than 1 , it indicates that stock is more risky than market and vice versa. If beta is zero than risk is as same as of the market.

Systematic risk- The risk which cannot be diversified away is considered as systematic risk or non- diversifiable risk.

Unsystematic risk -The risk which can be eliminated through effective diversification is considered as diversifiable or unsystematic risk. It is also called as avoidable risk as it can be eliminated or diversified by investing in larger number of securities.

Alpha- It measures the extent to which the fund under evaluation provided above or below average performance. If the alpha is negative, fund performance is below the average and vice versa

Standard deviation- It measures the dispersion of returns or the degree to which they vary from period to period. It is commonly used as a standard measure of risk in portfolio selection and asset pricing.

Risk -free return

Any asset which does not have any type of risk considered as risk -free asset. Investment in securities where rate of return is absolute and safe is considered to be as risk -free return.

Methodology

The sample size consists of 9 mutual fund schemes of SBI and CanBank Mutual fund were selected for the study. For each mutual fund scheme in the sample, the returns have been calculated taking weekly -end Net Asset Value since from 1998 to 2001. The returns are computed as follows

$$\mathbf{Rpt = LN}\left(\frac{NAVt}{NAVt-1}\right)$$

Where Rpt = is return of the Mutual fund scheme(portfolio) on the basis of NAV for t period.

t and t-1 indicate weekly end and weekly beginning respectively.

t= 1,2,3[1] …..n

LN is the Natural logarithm to the base e

The Average return on the portfolio is determined as follows

$$Arp = \sum_{t=1}^{n} Rpt \Big/ n$$

Where n

Arp is average return on the mutual fund schemes

BSE sensitive index is assumed as bench-mark. The value of market index on the respective date of NAV is taken and market return are calculated

The returns on market portfolio is computed as follows

$$Rmt=Ln(It-It-1)$$

Rmt= is the return on the market index and I is the index value

LN= is the natural logarithm to the base e

Return on market index are averaged as follows

$$Arm = \sum_{t=1}^{n} Rmt \Big/ n$$

Where, Arm is average return on the market

Thus, the performance evaluation is mainly concentrated to comparision of the scheme risk with benchmark portfolio risk .

Standard deviation of weekly returns is to be taken as risk

$$\sigma_p = \left[\frac{1}{n} \sum_{t=1}^{n} (Rpt - ARp)^2 \right]^{1/2}$$

Where,

σ_p is total risk of the scheme portfolio

Standard deviation of the portfolio return is considered as total risk. The studies conducted by Sharpe(1966),Jayadev(1998) and Harvinder Kaur(2004) have considered as standard deviation as total risk of fund return.

The total risk on the market portfolio is computed as follows

$$\sigma_m = \left[\frac{1}{n} \sum_{t=1}^{n} (Rmt - ARm)^2 \right]^{1/2}$$

Where σ_m is the total risk of the market portfolio

The systematic risk (Beta) of the portfolio is computed by using CAPM version of market model. The estimable form of CAPM is as under, Sharpe, Alexander and Bailey (1995).

$$RPt = a + \beta pRmt + et$$

Where,

Rpt is the return on the mutual fund schemes.

Rmt is the return on market index

et is the error term

a is the constant

β = the measure of systematic risk of the security or portfolio.

Risk free return

The study considers interest rates on bank fixed deposits as risk free return. Since interest rates of the public sector banks are not uniform, the State Bank of India fixed deposit rate for the three years period is considered as risk free return. The studies conducted by Ajay shah and Susan Thamos (1994), Jayadey (1998) and Gurucharan Singh (2003) assumed interest rate on Bank fixed deposit as risk -free return. The study conducted by Gupta (1991) on Indian share owners identifies, that 91.4 per cent of households (out of sample of 5822) noticed that bank fixed deposits are absolutely safe in terms of risk. Interest rate prevailing at the time of commencement is considered as risk -free return.

Performance evaluation measures

1) Sharpe ratio

This ratio was propounded by W.F Sharpe(1966). It is a ratio indicating the relationship between the portfolios additional return over risk-free return and total risk of the portfolio measured in terms of standard deviations. It is also known as reward -to variability ratio It is a measure of risk -adjusted performance that uses a benchmark based on the expost capital market line .It measures returns relative to the total risk of the portfolio, where total risk is the standard deviations of the portfolio returns.

$$RVAR_p = \frac{AR_p - AR}{\sigma p} f$$

Where

$RVAR_p$ = reward -to- variability ratio for portfolio

ARp = Average rate of return for portfolio

ARf = Risk free return

σ_p = Variability (standard deviation of actual rate of return) of portfolio

The benchmark is return on market index

$$RVAR_m = \frac{Arm - Arf}{\sigma m}$$

If the RVARp is greater than this value, indicates it has outperformed the market and vice versa

2) Treynor Ratio

This ratio is propounded by Treynor (1965) and it is also known as Reward -to- Volatility ratio.This ratio measures the relationship

between funds additional return over risk free return(Rp-Rf) and funds volatility (market risk) measured by beta(b). The calculation of the reward to volatility ratio for a portfolio involves dividing its average excess return by its market risk as follows

$$RVOLp = \frac{ARp - ARf}{\beta}$$

AR_p= is the average return on the portfolio(fund)

AR_f = is the average risk free return

β is systematic risk of the portfolio

Here, additional returns of market over risk free return (Rm-Rf) is the Benchmark. If RVOLp is greater than this value, it indicates that it has outperformed the market and if RVOLP is less than this value, it indicates that it has not performned as well as market.

3) Jensen measure

The risk adjusted return measure was developed by Miechael Jensen (1968) and it is referred as Jensen measure.The Jensen measure is computed as follows.

The following Jensen equation is used

$$R_{pt}-R_{ft} = \alpha + \beta \ (Rmt-Rft)+Upt$$

Where

α is the differential return earned by the scheme

β is the systematic risk of the scheme portfolio

If alpha is positive , the portfolio has performed better otherwise it is assumed that it is not performed up to the market index.

Analysis and Discussions

The performance evaluation begins with the comparision of the returns of a mutual fund scheme(a managed portfolio) with the returns that would have been obtained by the investors if one or more alternative random portfolios had been chosen for investment.

Table 1

SHARPE RATIO OF SBI AND CANBANK MUTUAL FUND SCHEMES

Sr no.	Schemes	Sharpe ratio of the schemes	Sharpe ratio of the benchmark
	Corpus size less than 50crs		
1	SBI Global fund	-0.04028	-0.038105
2	SBI Magnum sector (Infotech)	-1.8455	-0.0933
3	Magnum sector -Pharma	-0.05974	-0.09024
4	Canexpro	-1.8278	0.0333
5	CanPep95	-0.0728	-0.0706
	Corpus size above 50crs		
1	SBI Growth fund	-2.4988	-0.0798
2	Magnum multiplier plus	-0.0610	-0.2019
3	Magnum sector umbrella	-0.6858	-0.6825
4	CanBonus	-0.0849	0.0341

Source : computed from NAV s and Market return from BSE sensex

Table 1 presents sharpe ratios of mutual fund schemes. It can be observed from the table that, schemes in the corpus size of 50 crs only Magnum sector Pharma has outperformed the Benchmark. The return earned on portfolio is higher as compared with the Benchmark i.e market return. Other schemes viz SBI global fund, SBI Magnum sector, Canexpro and canpep 95 have not performed as according to the market.

In the corpus size of above 50 crs, only Magnum multiplier plus has outperformed the benchmark whereas SBI growth fund, Magnum sector umbrella and Canbonus have not performed as according to the market.

Table2

TREYNOR RATIO OF SBI AND CANBANK MUTUAL FUND SCHEMES

Sr no.	Schemes	Fund	Benchmark
	Corpus size less than 50crs		
1	SBI Global fund	0.252839	0.17
2	SBI Magnum sector (Infotech)	-13.2281	-0.4521
3	Magnum sector -Pharma	-0.2072	-0.4383
4	Canexpro	-0.0904	-0.2815
5	CanPep95	-1.3358	0.1375
	Corpus size above 50crs		
1	SBI Growth fund	-0.9222	-0.3343
2	Magnum multiplier plus	-1.0018	-0.3084
3	Magnum sector umbrella	-0.6825	-3.32
4	CanBonus	0.5437	-0.1658

Source: computed from NAVs from BSE -sensex from 1998 to 2001

Table 2 reveals Treynor ratio of mutual fund schemes of SBI and CanBank Mutual fund. It can be observed from the table that ,in the corpus size of below 50crs,SBI Global fund ,Magnum sector -pharma and Canexpro have performed well in the market as compared to benchmark. In the corpus size of above 50 crs, Magnum sector umbrellas and Canbonus have performed well compared to benchmark.

Table 3

JENSEN MEASURES OF SBI AND CANBANK MUTUAL FUND SCHEMES

Sr no	Schemes	Actual Return	Equilibrium Return	Alpha value	t-value
	Corpus size less than 50crs				
1	SBI Global fund	-0.24	0.31103	-0.07103	12.5434
2	SBI Magnum sector (Infotech)	-0.27435	-13.50245	-13.2281	10.2249
3	Magnum sector -Pharma	-0.2743	0.2346	-0.0397	7.5774
4	Can expro	-0.0945	0.5889	0.4944	1.2599
5	CanPep95	0.2784	-0.49974	-0.22134	3.12067
	Corpus size above 50crs				
1	SBI Growth fund	-0.0153	-0.3338	-0.3185	-11.692
2	Magnum multiplier plus	-0.3871	0.1185	-0.2686	1.7340
3	Magnum sector umbrella	-0.4321	-0.5675	-0.1354	11.816
4	CanBonus	0.3657	-0.6199	-0.2542	14.8112

Source: computed from NAVs from BSE -sensex from 1998 to 2001

Table 3 reveals Jensen measures of SBI and CanBank mutual fund. In the corpus size of less than 50crs,canexpro has positive alpha value indicating superior performance. The value of alpha is an absolute, which indicates differential return of the portfolio between equilibrium return and actual return. Equilibrium return is the return ,the benchmark portfolio is expected to earn with the given level of systematic risk .The additional return earned by the fund manager over equilibrium return can be attributed to his ability to select the securities. In the corpus size of above 50 crs, all the schemes alpha are negative hence performance are not good as per equilibrium return.

Conclusion

1) The Sharpe ratio of Magnum sector pharma ,Magnum multiplier plus schemes were identified as greater than Benchmark. Thus it signifies that these schemes have outperformed the market

2) The Treynor ratio of SBI global fund, Magnum sector pharma, Canexpro, Magnum sector umbrella and Canbonus were performed better than benchmark.

3) The Alpha value of Canexpro is positive , thus it signifies that it has performed well in the market. where as other schemes alpha value is negative thus it indicates that they do not performed well in the market.

References

1) Harry Markowitz, Portfolio selection, Journal of Finance,Vol 7,No 1 ,March 1952

2) Jack L Trenor , How to Rate management of Investment Funds, Harvard Business Review, Jan-February 1965,pp 63-75

3) William F. Sharpe, Mutual Fund Performance, Journal of Business,39,No 1 (Jan 1966) pp119-138

4) Miechael C Jensen ,The performancew of Mutual Funds in the period 1945- 1964 , Journal of Finance, 23, No2 (May 1968) pp 389-416

5) Gupta L.C, Indian share owners : A survey Delhi: Soceity for capital markets research and Development, 1991, p 92

6) Shah Ajay, Thomas Susan, Performance Evaluation of professional portfolio Management in India, CMIE, April 10, 1994

7) Mohinder N.Kaura and M.Jayadev, Performance of growth oriented mutual funds: An evaluation, The ICFAI Journal of Applied Finance,No1 ,1995

8) William F.Sharpe , Gordon J. Alexander and Jeffery V. Bailey ,Parentice -Hall of India Pvt. Ltd. ,New Delhi,1995

9) Amitabh Gupta,Mutual funds in India,Anmol publications pvt. Ltd. ,page 10, 2002

10) Gurucharan Singh(2003) Mutual Funds-performance Evaluation of Equity Funds,The Indian Journal of Commerce , Vol56,No4, Oct-Decm, 2003

11) Harvinder Kaur(2004) Stock Markets volatility in India, The Indian Journal of commerce,Vol 57,No 4,Oct-Decm 2004