An Investigation into Risk- Returns Analysis of Selected Equity Mutual Funds

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ABSTRACT

Mutual fund is one of its types of innovation that plays as an investment avenue. Apart from the various benefits that investing in this instrument caters like diversification, professional management, the simplicity of investment procedure has turned out to be a major key factor. The broad diverseness of schemes introduced by these mutual fund AMCs has given in-depth investment option for the investors.

Many investors have a tendency to concentrate solely on investment returns with limited concern for investment risk. There are five major risk measures which can be studied to provide the answer to the risk-return equation.

The analysis has been attempted to answer whether only the returns given in the past are enough to choose the mutual fund schemes are not? For this purpose the performance of selected equity mutual funds in different categories based on returns of top 10 equity-based mutual funds and comparison with benchmarks of Nifty 50 and Sensex as well as indexes of different market caps have been studied along with risk-return analysis on the basis of standard deviation, Sharpe ratio, Sortina ratio, Beta, Alpha and R Squared.

Keywords : *Mutual Fund, Returns, Risk-Return Equation, Investment Risk, Ratios*

INTRODUCTION

A mutual fund is an investment instrument that ponds the money of a number of investors who have the same financial objective. The money thus collected is then invested in capital market instruments such as shares, debentures and other securities. The income acquired through these funds and the capital gained and realized is apportioned by its unit holders in ratio to the number of units possessed by them.

Generically, an investment decision is a trade-off between risk and return. Thus, a mutual fund is the appropriate and good choice as an investment for an individual as it provides an opportunity to invest in a diversified, professionally handled group of securities at a comparatively low price. The mutual fund industry in India facilitate a lot of innovative schemes, the world of mutual funds nowadays has a lot to offer to its investors.

There are five primary devices for showing investment risk that are applied to the analytical thinking of mutual fund portfolios. They are Alpha, Beta, R-squared, Standard Deviation and the Sharpe ratio. These statistical measures are historical forecasters of investment risk and volatility and all major constituents of modern portfolio theory (MPT). MPT is an established financial and academic philosophy used for evaluating the performance of equity, fixed-income and mutual fund investments by comparing them to market benchmarks. All of these risk ratios are meant to assist investors to check

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the risk-return variables of their investments. In this research paper, a concise description of each of these usually used indicators is given.

Lots of investors tend to concentrate solely on investment returns with limited concern for investment risk. While evaluating a stock, bond or mutual fund investment, volatility risk is just one of the elements that should be considered that can affect the quality of an investment. The five risk measurements discussed can furnish some balance to the risk-return equation.

REVIEW OF LITERATURE

- Agarwal Mayank (2017) Mutual funds are supposed to relieve small investors from the headaches of investing in turbulent stock or other capital-instrument markets. With a plethora of financial tools and research analysts on their rolls, mutual funds are supposed to safely invest money entrusted to them by others. The funds give the investors a good return on their portfolio in return for a small management fee. So, theoretically, mutual funds are supposed to be safe avenues for small investors to park their hard-earned money.
- Singh (2017) stated the mutual funds have specific objectives for the investors. They have certain representatives called trustees who look after their funds and diversify them into a proper portfolio.
- Agarwal (2017) mentioned that the advent of mutual fund culture in India is inevitable in international context. Due to their size, operating economies and expertise available, mutual funds are gaining popularity thus are emerging as institutional investor in the market.
- Walia and Kiran (2009) observed that the understanding of investor's anticipations from mutual funds has become an important issue to study due to mutual funds inability to enhance the required pace of growth.
- Acharya and Sidana (2007) attempted to classify hundred mutual funds employing cluster analysis and using a host of criteria like the 1 year total return, 2, 3, 5 years annualized return, alpha, beta, R-squared, Sharpe's ratio, mean and standard deviation etc., The data is obtained from Value research online. They do find evidences of inconsistencies between the investment style/objective classification and the return obtained by the fund.
- Agarwal (2007) found that choosing the best investment depends on one's personal circumstances as well as general market conditions. However, in each case, right investment is a balance of four things viz. liquidity, safety, returns and taxation.
- Malhotra and McLeod (1997) conducted an empirical analysis of mutual fund expenses. The results of their analysis of equity funds suggest that expense-conscious investors should look at the fund size, age, turnover ratio and cash ratio as key determinants of expenses. Their analysis of bond funds suggests that the key factors are the fund's sales charge, weighted average maturity and size.
- Grinblatt and Titman (1989) reported that superior performance existed particularly among the aggressive growth funds and in those funds with smallest net asset values. Incidentally, these funds also had the highest expenses. As a result, their actual returns net of expenses did not exhibit superior performance. It indicated that investors could not take advantage of the superior abilities of portfolio managers.
- Sharpe (1966) has developed a composite measure that considered return and risk, which is popularly known as Sharpe's reward to variability ratio. He assessed the performance of 34 open-ended mutual funds during the period 1954-63 by the method formulated by him. He resolved that the average mutual fund performance was clearly inferior to an investment in the Dow Jones Industrial Average (DJIA). It was also exposed in his study that good performance was linked with low expense ratio and only low relationship was found out between fund size and performance.

OBJECTIVES OF THE STUDY

To study the performance of Selected Equity mutual funds in different categories based on:

(a) Returns of top 10 equity-based mutual funds and comparison with benchmarks of Nifty 50 and Sensex as well as indexes of different market caps.

(b) Risk-returns analysis on the basis of Standard Deviation, Sharpe ratio, Sortino ratio, Beta, Alpha and R Squared.

RESEARCH METHODOLOGY

(a) Scope of Study

The period of the study is for 5 Years ending on 31st May 2018. The study uses a sample of different mutual fund schemes comprising of selected equity funds of different categories based on mutual funds giving maximum returns in past three years in all types of market caps and in direct plans excluding sectoral funds and regular plans. The following mutual funds have been considered for the study:

Table 1: Selected Mutual funds and their major characteristics:

Fund	Capitalisation	Market Cap (Cr)	Turnover(Cr)	Net Assets (Cr)
Aditya Birla Sun Life Pure Value Fund	Mid Cap	11909.81	245	3865.53
Aditya Birla Sun Life Small Cap Fund	Small Cap	4976.14	34	2289.63
Canara Robeco Emerging Equities Fund	Large Cap	27965.65	48	3558.8
HDFC Small Cap Fund	Small Cap	4268.34	33.27	3646.65
L&T Emerging Businesses Fund	Mid Cap	5494.63	46.96	5001.23
L&T Midcap Fund	Mid Cap	13184.74	47.07	2738.69
Mirae Asset Emerging Bluechip Fund	Large Cap	30591.4	73	5447.63
Motilal Oswal Long Term Equity Fund	Large Cap	60355.44	33	1044.84
Reliance Small Cap Fund	Small Cap	4496.24	143	7207.07
SBI Small Cap Fund	Small Cap	2932.61	81	836.02

(b) Sources of Data

To arrive at an overview of the current returns and movements of the mutual fund industry, secondary data have been applied and gathered from the fact sheets, newspapers, journals, books and publications. The data were also gathered from various websites of AMCs, AMFI, moneycontrol.com and valueresearch.com etc.

(c) Tools to analyze

To evaluate the performance of the schemes of mutual funds, following statistical methods and techniques have been used:

i. For Return Analysis: Returns of top 10 mutual funds and comparison with benchmarks of Nifty 50 and Sensex as well as indexes of different market caps.
ii. For Risk-return analysis: on the basis of Standard Deviation, Sharpe ratio, Sortino ratio, Beta, Alpha and R Squared.

ANALYSIS OF DATA

A: Return Analysis

The return evaluation is done by comparing the returns on year on year basis of a mutual fund scheme with returns of benchmark indices.

Net Asset Value (NAV) is the most accepted standard used for comparison of the performance of mutual funds. The NAV is the market value of the assets of the schemes minus outstanding liabilities. The per unit NAV is the net asset value of the scheme divided by the number of units outstanding on the valuation date.

Net Asset Value (NAV) = (Assets – Debts) / (Number of Outstanding units)

Here:

Assets = Market value of mutual fund investments +

Receivables + Accrued Income
Debts = Liabilities + Expenses (accrued)

The market value of the stocks & debentures is usually the closing price on the stock exchange where these are listed.

Table 2: Returns of Selected Mutual funds

Fund	1-Year Return (%)	3-Year Return (%)	5-Year Return (%)	Average (%)
Aditya Birla Sun Life Pure Value Fund	17.12	18.7	29.54	21.79
Aditya Birla Sun Life Small Cap Fund	14.52	20.62	28.06	21.07
Canara Robeco Emerging Equities Fund	15.16	18.18	31.42	21.59
HDFC Small Cap Fund	31.43	23.33	25.64	26.80
L&T Emerging Businesses Fund	20.33	24.92	-	22.63
L&T Midcap Fund	15.08	19.15	29.9	21.38
Mirae Asset Emerging Bluechip Fund	9.67	18.49	29.65	19.27
Motilal Oswal Long Term Equity Fund	16.77	19.71	-	18.24
Reliance Small Cap Fund	23.73	23.67	37.15	28.18
SBI Small Cap Fund	34.88	24.96	35.91	31.92

Source: valueresearch.com

Table 3: Returns shown by major indices

Index	1Year (%)	3 Year (%)	5Year (%)	Average (%)
Nifty 50	11.522	8.35	8.22	9.36
Sensex	13.32	8.25	11.79	11.12
Nifty Midcap 100	8.54	12.73	19.04	13.44
Nifty Small Cap 100	10.14	12.02	19.34	13.83
Equity Large cap	10.1	9.18	14.47	11.25
Equity Multicap	11.34	11.41	18.26	13.67
Equity MidCap	12.58	13.05	24.02	16.55
Equity Small Cap	16.46	18.39	30.51	21.79

Source: valueresearch.com

1. Small-cap funds have a shorter cycle that implies they tend to rise and fall at a faster rate than large-cap or mid-cap.
2. Mutual funds need more time to give higher returns, but they eventually give better returns than the benchmarks.

B: Risk- returns analysis
Risk is the lack of uniformity in the actual returns in relation to the estimated returns. Risk Premium is the return received over and above, the risk-free rate of return that investors demand for the risk contributed. Risk may be categorized into diversifiable (unsystematic) and non-diversifiable (systematic). Systematic risk refers to the overall market risk that involves all securities and cannot be diversified. Unsystematic risk is firm-specific known as unique risk. It originates due to unique uncertainness of individual securities. These unique uncertainties can be taken out by organizing well-

diversified portfolios by mixing a large number of securities. Thus unsystematic risk can be got rid of through diversification.

Total Risk = Systematic Risk + Unsystematic Risk
The risks mutual funds that have and investors should be aware of are–

Table 4: Mutual fund types and associated risks:

Type of Mutual Fund	Risks
Debt Mutual Funds	Interest Rate Risk Credit Rate Risk
Balanced Mutual Funds	Higher exposure to Equity Debt Holdings
Money Market Mutual Funds	Inflation Risk Opportunity Loss
Equity Mutual Funds	Volatility Risk Performance Risk Concentration Risk

Source: Authors' own compilation

B1. Standard Deviation (SD)
Its quality lays in the conception that sample is free from defects of sampling, it evaluates the absolute dispersion, the more the standard deviation; greater will be the degree of deflection of the values from their mean. Small standard deviation means a high degree of uniformity & homogeneity between values. The entire risk is assessed in terms of standard deviation. There is an inverse relationship between the coefficient of variation and consistency. More the value of the coefficient of variation, lesser will be the consistency and vice-versa.
The greater the number, the more volatile is the fund's returns. Investors should prefer funds with lower volatility.
Formula:
Standard Deviation= square root of variance

$$\text{Variance} = \frac{\sum(x - \bar{x})^2}{n - 1}$$

Referring to the sum of squared difference between each monthly return and its mean divided by number of monthly return data minus 1.

B2. The Sharpe Measure
The Sharpe Ratio assesses the fund's surplus return per unit of its risk (i.e. total risk). This ratio suggests the relativeness between the portfolio's additional return over risk-free return and total risk of the portfolio, which is evaluated in terms of standard deviation. A high and positive Sharpe Ratio establishes a superior risk-adjusted performance of a fund while low and negative Sharpe Ratio is an indicator of adverse performance. Broadly, if Sharpe Ratio is greater than the benchmark comparison, the fund's performance is better than the market and vice-versa. Thus, it is the total risk of the fund that the investors are worried about. If the Sharpe ratio is 1.25 p.a., then it means 1.25%p.a. excess return for 1% annual volatility. So, the ratio measures fund on the basis of reward per unit of total risk.

Formula:
Sharpe Ratio= (Total Return – risk-free return)/ Standard Deviation of fund

B3. Sortino ratio
Sortino ratio is the instrument that assesses the performance of the investment related to the downward deviation. The Sortino ratio is like to the Sharpe ratio, apart from it utilizes downside deviation for the denominator rather than Standard Deviation. Standard deviation regards both the upward and downward volatility. Because investors are majorly worried about the downward volatility, Sortino ratio demonstrates a practical view of the downside risk in the fund. Sortino ratio subtracts the risk-free rate of return from the expected return and

then divides that by the downside deviation. A large Sortino ratio suggests there is a low probability of a large loss.

Formula:
Sortino Ratio= Expected return- Risk-free return/Standard Deviation of negative Asset returns

B4. Beta
Beta assesses the systematic risk, which cannot be brought down. It evaluates the risk (volatility) of a security in relation to the market portfolio. Beta is a moderately sufficient method to be used as a measure of risk. It fundamentally suggests the level of volatility linked with the fund, as equated to the benchmark. The result of beta is greatly determined by the correlation between a fund and its benchmark. If the fund portfolio does not have similarity to benchmark index then the beta would be poor. A beta that is more than one signifies that fund is more volatile than the benchmark, while a beta of less than one signifies that the fund is less volatile than the index. A fund with a beta just about 1 means the fund's performance nearly corresponds to the index or benchmark.

Formula:
Beta = Standard Deviation of Fund/ Standard Deviation of Benchmark x R Square

Beta describes how practically a fund's performance would shift in relation to a benchmark. If a fund has a beta of 1.25, it implies that for every 10% upside or downside, the fund's NAV would be 12.5% in the same direction.

Beta	Fund Movement
= 1	price movement is Closely similar as that of market
> 1	price movement exceed market movement
< 1	price moves to a lesser extent in comparison of market

B5. Alpha
Alpha is the surplus returns of the fund over the benchmark. Alpha is performance ratio to assess risk-adjusted evaluation of a fund, meant to assist investors to decide the risk-reward degree of exposure of a mutual fund. Alpha evaluates the deviation from a fund's reported returns and its anticipated performance, given its level of risk. A fund's alpha is many times believed to correspond to the value that a portfolio manager adds to or subtracts from a fund's return in excess to a relevant index's risk/reward profile.

Formula:
Alpha= (Funds Reported Returns - Risk-free Returns)-{(Funds Beta) (Benchmark Return - Risk-free return)}
The Alpha in terms of percentage suggests underachieved or exceeded its benchmark in considering risk levels. A positive alpha represents the fund has exceeded its benchmark index whereas, a negative alpha would represent underachievement.
As a fund's return and its risk both lead to its alpha, two funds with the same returns could have different alphas and comparison may be more fruitful.

B6. R-Squared
R-Squared assesses the relationship between a portfolio and its benchmark. It can be looked upon as a percentage from 1 to 100. R-squared is not a standard of the performance of a funds portfolio. A good portfolio may have a very low R-squared. It is merely a degree of the correlation of the portfolio's returns to the benchmark's returns.
If a fund's NAV or return that behaves like the benchmark, it is then high R squared. On the other hand, if a portfolio that doesn't go like the benchmark, it is a low R-squared.

Formula:
R2 = square of correlation
Correlation= Covariance between index and portfolio/Standard Deviation of portfolio x Standard Deviation of index

Implications of R-Squared:

R-Squared	correlation between the portfolio's returns and the benchmark's returns
70-100%	good
40-70%	average
1-40%	low

Index funds will have an R-squared very close to 100. R-squared can be utilised to check the implication of a particular beta or alpha. By and large, a higher R-squared will suggest a more useful beta figure. If the R-squared is low, then the beta is less applicable to the fund's performance.

RESULTS AND FINDINGS

The results for risk-return analysis ratios for the selected equity mutual funds are as follows:

Table 5

Fund	Standard Deviation	Sharpe Ratio	Sortino Ratio	Beta	Alpha	R-Squared	Fund Risk Grade
Aditya Birla Sun Life Pure Value Fund	18.42	0.83	1.23	1.06	2.85	0.89	Above Average
Aditya Birla Sun Life Small Cap Fund	17.85	0.89	1.33	0.84	6.03	0.93	Average
Canara Robeco Emerging Equities Fund	18.14	0.79	1	1.04	2.12	0.88	Average
HDFC Small Cap Fund	16.74	1.06	1.38	0.78	8.58	0.91	Below Average
L&T Emerging Businesses Fund	18.18	1.13	1.45	0.85	10.46	0.92	Average
L&T Midcap Fund	16.01	0.94	1.24	0.91	4.45	0.86	Below Average
Mirae Asset Emerging Bluechip Fund	14.91	0.93	1.22	0.87	3.57	0.92	Low
Motilal Oswal Long Term Equity Fund	13.33	1.18	1.51	0.85	9.72	0.8	Low
Reliance Small Cap Fund	19.2	1.02	1.31	0.91	8.88	0.94	Average
SBI Small Cap Fund	18.06	1.1	1.51	0.78	10.6	0.79	Below Average

The performance of selected funds is evaluated using Average Returns, Standard Deviation, Sharpe ratio, Sortino ratio, Beta, Alpha and R squared. Return alone should not be considered as the basis of measurement of the performance of a mutual fund scheme, the examination should also comprise the risk taken by the fund manager as different funds will have different levels of risk accompanied with them. Risk related with a fund can be defined as variability or fluctuations in the returns yielded by it in relation to its benchmark. The higher the variations in the returns of a fund during a given period, higher will be the risk linked with it.

Table 6

Standard Deviation	MOST Long term equity fund and Maire Emerging Bluechip Fund has smaller SD showing a high degree of uniformity & homogeneity. Also indicating that large-cap funds are more stable then mid and small caps.
Sharpe Ratio	Most of the funds have a high and positive (more than 1) Sharpe Ratio showing superior risk-adjusted performance of a fund. Suggesting, the relativeness between the portfolio's additional return over risk-free return and total risk of the portfolio in terms of standard deviation is better than benchmark indices.
Sortino Ratio	None of the selected mutual funds have Sortino ratio less than one. SBI Small cap, Most Long Term Fund and L&T Emerging business fund have a large Sortino ratio indicating there is a low probability of a large loss.
Beta	Most of the funds have a beta (except ABSL Pure Value and Carana Rebeco Emerging Equities) of less than one, meaning that the fund is less volatile than the index. Thus, price moves to a lesser extent in comparison of market.
Alpha	All funds have a positive alpha meaning the fund has outperformed its benchmark index specially Small Cap funds during the period of study.
R-Squared	Most of the selected funds have values more than .80 indicating returns are closely related to the market.

CONCLUSION

The study has compared the several equities diversified mutual funds. A compact presentation of results is presented in different tables. In India, many mutual fund schemes are available to retail investors which broadly confound them to choose the best out of them. This study furnishes some insights on mutual fund performance so as to help the common investors in taking the rational investment decisions for apportioning their money in the right mutual fund scheme. The data used in the study consisted of monthly NAVs for the open-ended schemes. The study utilized benchmark portfolios according to the scheme objective such as Nifty 50, BSE Sensex and different market indices for all growth/equity schemes.

The performance of sample mutual fund schemes has been evaluated in terms of return and risk analysis, and risk-adjusted performance measures such as Standard Deviation, Sharpe ratio, Sortino ratio, Beta, Alpha and R squared. In a nutshell, the performance of most of the mutual funds in terms of Average returns, the diversified equity fund schemes have shown higher and superior returns. In terms of risk-return analysis in the present market conditions for the past five years the selected mutual funds have given better performance than the risk taken.

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