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PERFORMANCE EVALUATION OF SELECT MUTUAL FUNDS IN TERMS OF RISK ADJUSTMENT PARAMETERS

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ABSTRACT

Capital Market has always been one of the most important avenues for the investors to invest their savings. Any rational investor initially holds a combination of the riskless asset and an index portfolio. He considers whether to tilt his portfolio holdings towards an actively managed fund by investing a small proportion of his wealth in it. He should do so only if it raises his expected utility and, hence, only if it raises the overall portfolio. Performance measures are used to compare a portfolio's performance pertaining to different periods or to compare different portfolios in the same period. The present paper evaluates the performance of select mutual fund schemes on the basis of returns and comparison with their bench marks using risk adjusted parameters such as Sharpe, Treynor & Jensen's ratios.

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INTRODUCTION

The financial market plays a crucial role in the economic development of a country by assisting the allocation of scare resources from the savers to the borrowers; it directs resources from the idle to the dynamic sector thus accelerating investment in the economy *(Akyuz and Held, 1993)*. The economic and financial scenario of India prior to 1991 was pessimistic. Indian economy was suffering from various macroeconomic dimensions like low savings, low Gross Domestic Product (GDP), high inflation, high unemployment, high rate of interest low Foreign Exchange reserve and so on *(World Bank Report, ed.2021)*. The Indian economy had entered into an era of economic reforms have taken place in the year 1991 with the introduction of Liberalization, Privatization and Globalization.

These reforms confiscate various regulatory mechanisms, global performance standards could be introduced in the working of our economic system. The financial sector occupies a crucial role in the overall working of economy and its link the rest of world. The financial reforms refer to general improvements in the functioning and efficiency of the financial system, as a whole and the removal of hindrance to its long term development *(Estrada, Park, and Ramayandi, 2010)*. These economic reforms have provided much needed momentum to the capital market for its growth and development. The important reforms introduced in the Indian securities market are the fully automated and screen based trading system, dematerialization, electronic transfer of securities, introduction of rolling settlement trading in derivatives and risk management *(Endo, 2021)*. The SEBI (Securities and Exchange Board of India) has been established as an independent statutory authority in 1992 for regulating the

stock exchanges and supervising the major players in the capital markets to protect the interest of the investors *(SEBI (Insider Trading) (Amendment) Regulations, 2002).*The reforms in the Indian capital market have grown impressively during the recent years. The Nifty 50 (NSEI) appreciated by 7849 points in 2015-16 from 3557 points in 2006-07. There is a noticeable change of 120 percentage growth in the performance of the market *(Chavannaavar and Patel, 2016).* It is viewed from the past that the capital market has always been one of the most important avenues for the investors to invest their savings. However, uncertainty in the security price movements makes it difficult to effectively predict the returns. Uncertainty means that the current as well as the previous prices cannot be used as a measure to predict the future returns. This is in consistent with the practice of the Efficient Market Hypothesis (EMH), which was one of the most acceptable paradigms in the 1970's *(Malkeil, 2003)*. The investors often try to guess the expected returns based on past records but this may not be possible without the collection of costly insider trading information. Due to this, the individual investors hardly walk out to invest in the stock markets. As a result, different types of financial institutions come into picture in an economy *(Fama, 1970)*. The purpose of this study is to measure and evaluate the objectives, risk, and return of 12 mutual funds using standard deviation of the fund, risk free rate, beta of the portfolio and fund returns of the select mutual funds in the 2011-21. The paper evaluates risk adjustment parameters of select mutual fuds by using Sharpe Ratio, Treynor's Ratio and Jensen's Ratio. The Sharpe ratio is the ratio between expected or average excess return and risk, where risk is attributed as standard deviation of return. According to static mean-variance portfolio theory, if investors face an exclusive choice among a number of funds, then they can unambiguously rank them on the basis of their Sharpe ratios (*Neilsen and Vassalou, 2004)*. A fund with a higher Sharpe ratio will enable all investors to achieve a higher expected utility. The modified or instantaneous Sharpe ratio is effectively the same as the discrete Sharpe ratio, except that the rates of return over finite time intervals are replaced by instantaneous rates of return (*Miller and Gehr, 1978*). We show that if investors face an exclusive choice among a number of funds, each of which has a constant instantaneous Sharpe ratio and if they are able to dynamically reallocate wealth between their chosen fund and a money market account, then they can unambiguously rank the funds on the basis of their instantaneous Sharpe ratios. A fund with a higher instantaneous Sharpe ratio will enable all investors to achieve a higher expected utility *(Platen and Christensen,2007).* The assumption of constant instantaneous Sharpe ratios is obviously restrictive, but it does allow the volatilities and expected excess returns of the funds to change stochastically over time (*Consumption-Based Model and Overview)*. As long as a fund invests in an underlying portfolio that has a constant instantaneous Sharpe ratio, it may well engage in a dynamic strategy with respect to the fraction of asset value invested in the portfolio and the fraction invested in the riskless asset, or the degree of leverage employed *(Aragon and Ferson. 2006)*. If the underlying portfolio has constant volatility, then the fund may also engage in a strategy that involves buying and selling contingent claims such as put and calls options on the portfolio *(Nielsen and Vassalou.2004)*.Jensen's alpha was proposed by Jensen is used by both practitioners and academics. To construct a version of Jensen's alpha that is appropriate in continuous time, we need to interpret it in terms of optimal portfolio choice *(Nielsen and Vassalou. 2004)*.

If an investor identifies a fund that has a positive alpha, then what exactly does that tell him about how to maximize his expected utility? The literature seems to have been silent on this point, although the following answer is not sur- prizing *(Nielsen and Vassalou, 2004).*Suppose the investor initially holds a combination of the riskless asset and an index portfolio. He considers whether to tilt his portfolio holdings towards an actively managed fund by investing a small proportion of his wealth in it. He should do so only if it raises his expected utility and, hence, only if it raises the Sharpe ratio of his overall portfolio. We show that Jensen's alpha is proportional to the first derivative of the overall Sharpe ratio with respect to the proportion invested in the active fund *(Jobsonand Korkie, 1981)*. Hence, a positive alpha means that the investor can increase his expected utility by investing at least a small amount in the fund. This relation between Jensen's alpha and the Sharpe ratio holds in a dynamic model as well as in a static model *(Goetzmann, 2007)*. In a dynamic model, the relevant version of alpha is the instantaneous alpha. It is effectively the same as the discrete alpha, except that in calculating it, the rates of return over finite time intervals are replaced by instantaneous rates of return.

We show that the instantaneous alpha is equal to the discrete alpha plus half the variance of the portfolio minus half the covariance of the portfolio with the benchmark *(Ismail and Pham, 2018).*Performance measures are used to compare a portfolio's performance in some time period relative to another period or to compare different portfolios in the same period *(Grinblatt and Titman, 1993)*. There are three general classes of two parameter performance measures dependent on their inherent usage and definition of risk - the first class includes performance measures based on total (standard deviation) risk of return; the second class is comprised of measures based on systematic (beta or covariance) risk of return *(Lynch, 2004)*; and the third class does not require a risk pricing model. In the first category are the Sharpe index and its variations. The second category of measures can be partitioned into measures which are prediction error based and those which are not. The common characteristic of the prediction error measures is the requirement of an *ex ante* expected return generating model that is usually estimated with data prior to the test period. Prediction errors are then computed as the difference between the *ex-ante* expected returns and the actual returns in the test period *(Dyckman, Phlbrick and Stephan, 1984)*. These prediction errors are then aggregated into a performance measure. Some members of this class are the additive index of Fama, Fisher, Jensen, and Roll, the multiplicative index of Pettit, and the Ball and Brown multiplicative- additive index. The members of the non-prediction error group are the *(Treynor, 1965)* and Jensen measures including the extensions by Black and Langetieg. Finally, in the third category is the Cornell procedure which computes the sample mean return prior to the test period and computes the sample mean's prediction errors in the test period. By assuming normality of returns, t-tests may be used limited. The Jensen index suffers from the "leverage bias" problem discussed, for example, in Modigliani and Pogue, which may limit its usefulness *(Jobson and Korkie, 1981).*

Literature Review: The Review of literature on mutual funds schemes presented in the preceding section has shown that existing research work on evaluation of performance of mutual funds based on risk adjusted models, relationship between portfolio performance and the macro economic variables, and performance evaluation based on efficiency scores. There has

been considerably less attention devoted to the evaluation of mutual funds. Based on this review, the research gaps in the literature have been identified and have been used to formulate the research hypotheses that have been examined in this research study. *Sharpe (1966)* suggested the Sharpe's Measure for measuring portfolio performance, which is basically a reward to risk ratio. Reward is equal to the excess return over and above the risk free rate and risk is the standard deviation of return. *Treynor (1965*) proposed the Treynor's Measure, which is basically a reward to risk ratio. Reward is equal to the excess return over and above the risk-free rate and risk is the Beta measure, which is a relative measure of risk. However, for Treynor's measure it is assumed that the portfolio is sufficiently diversified and the portfolio is only subjected to market risk. The most widely used measure is the Jensen Measure proposed by *Jensen (1969).* It is the intercept from a regression of the excess return of the managed portfolio on the excess return of a benchmark portfolio. However, academics have pointed out certain shortcomings. *Roll (1978)* showed the measure's sensitivity to the choice of benchmark portfolio. *Jensen, Black, & Scholes (1972)* have shown that Jensen Measure may provide a biased evaluation for market timers. *Elton et al. (1996)*examined predictability is stock mutual funds performed based on risk adjusted returns and found past performance predictive of risk to predict risk adjusted future performance. The study also demonstrated that the application of modern portfolio techniques on past data could improve construction of fund portfolios that significantly outperformed a rule based on the past rank alone. The portfolio so selected was reported to have small, but statistically significant, positive risk- adjusted returns during a period when Mutual fund in general had negative risk- adjusted returns. *Jayadev(1996),*studied related to Evaluation of performance of two-growth oriented mutual funds operating in India (Master gain and Magnum Express) on the basis of monthly returns compared to benchmark returns. For this purpose, he employed the risk-adjustment measures suggested by Jensen, Treynor and Sharpe. And found that performance of Magnum Express is poor on the basis of all these measures but Master gain has performed better according to Jensen and Treynor measures and on the basis of Sharpe ratio its performance is not performed better in terms of total risk and the funds are not offering advantages of diversification and professionalism to inventors. *Kothari and Warner (2001),*argue that standard mutual fund performance measures are inadequate for detected abnormal fund performance. They suggest event study procedures that analyze a fund's stock trades.

OBJECTIVES AND METHODOLOGY

The present paper evaluates the performance of select mutual fund schemes on the basis of returns and comparison with their benchmarks using risk adjusted parameters such as Sharpe, Treynor & Jensen's ratios. These are quantitative statistical tools, which assess the performance of mutual fund with reward to variability, reward to volatility and reward to the expected return *(Bajracharya, 2016)*. The variability of return happens due to the variations in the total risk i.e., the factors influenced by the internal and external mechanism of the select mutual funds. Whereas the volatility of the returns represents the variation caused due to the changes in the systematic risk i.e., the factors influenced by the external macroeconomic variables. The excess of actual return over the expected return is calculated by using the Jensen's measure which actually depicts the financial reward for an investment in a select mutual fund schemes. The companies select for the paper Canara Robeco Bluechip Equity Fund, IDBI India Top 100 Equity Fund, Kotak Bluechip Fund, Franklin India Bluechip Fund, Invesco India Large-cap Fund, SBI Blue Chip Fund, Union Large-cap Fund, UTI Master-share Unit Scheme, Aditya Birla Sun Life Frontline Equity Fund, Axis Bluechip Fund, Baroda Large Cap Fund, Edelweiss Large Cap Fund to study and evaluate the aforementioned reward to variability, reward to volatility and reward to the expected return.

Analysis and Interpretation:

The performance of mutual fund with reward to variability, reward to volatility and reward to the expected return, and comparison with their bench marks using Sharpe, Treynor & Jensen's ratios.

•***Sharpe's Ratio***: The general formula used in the Table-1 for evaluating performance of the Mutual Funds of select companies is presented asunder:

Sharpe Ratio= (Rp - Rf) /σp

Where SP = Sharpe ratio for a portfolio
Rp = Return of portfolio
Rf = risk-free rate
σp =standard deviation of the portfolio's excess return.

The table – 1 depicts the performance of the select mutual funds using Sharpe Ratio for the period 2011- 2021 showing positive value for Twelve funds. This signifies that security return is performing better as the ratio of the select funds is much higher than 1.0 which is considered as readily acceptable. From the table we can observe that all the funds are having Ratio higher than 3.0 indicating that these funds are yielding good for investors. It is suggestable that investments can be made into these twelve select funds considering the excellent performance of the fund portfolio. The Fund Return of Canara Robeco Blue-chip Equity Fund (CANRLDG) performance for a period of 10 years study i.e., from 2011 - 2021is288.19. The scheme risk is equal for all the schemes are 6.369 whereas the Beta (market sensitivity) of the portfolio is rangedfrom0.77to0.97.Therefore,itisObserved that the best performer fund scheme is CANRLDG and the least performed scheme is Franklin India Blue- Chip Fund (FRANKLIN) because its Sharpe ratio is 22.73.

Treynor's Ratio: Trenyor's Ratio, also known as the reward to volatility, is a performance measurement of return based on systematic risk. The results of Treynor Ratio (Reward to Volatility) show how investors enjoy the reward for each unit of risk. Treynor's ratio used in Table-2 for calculating the performance of mutual funds is applied as:
Treynor ratio= (Rp - Rf) / ßp

Where Rp = Realised return on the portfolio
Rf = Risk free rate of return ßp = portfolio beta

The table – 2 depicts the performance of the select mutual funds using Treynor's Ratio for the period 2011-2021 showing positive value for Twelve funds. This signifies that security return is well diversified and a negative ratio indicates that the investment has performed worse than a risk free instrument. This ratio uses a portfolio's "beta (ß)" as its risk. A high Treynor ratio provides higher return on a risk adjusted basis.

Table 1. Performance evaluation of mutual funds of risk adjustment parameters for the year 2011-2021

Name of the fund	Fund return	Standard Deviation	Risk free rate	Beta of the portfolio	Sharpe ratio
CANRLDG	288.19	1.009	6.369	0.89	279.3
IDO1	281.81	1.00143	6.369	0.92	275.04
KOLB	282.2	1.001433	6.369	0.92	275.43
FRANKLIN	33.70442	1.2021	6.369	0.93	22.73
INRI	283.84	1.02	6.369	0.91	272
SBUH	217.68	0.010693	6.369	0.96	197.61
UNLO	69.76	1.159	6.639	0.97	54.69
UTHM	80.29	1.11	6.369	0.92	66.59
ADTOL	77.13	1.13	6.639	0.92	62.62
AXLB	92.58	1.13	6.639	0.82	76.29
BARD	114.32	1.18	6.639	0.77	91.48
EDAI	124.73	1.05	6.639	0.89	112.72

Source: *Ticker Tape*

Note: *i) CANRLDG - Canara RobecoBluechip Equity Fund; ii) IDO1 - IDBI India Top 100 Equity Fund; iii) KOLB - Kotak bluiechip fund; iv) Franklin - Franklin India Bluechip Fund; v) INRI - InvescoIndiaLarge-capFund;vi)SBUH-SBIBlueChipFund;vii)UNLO-UnionLarge-capFund;*

• UTHM - UTI Master-share Unit Scheme; ix) ADTOL - Aditya Birla Sun Life Frontline Equity Fund; x) AXLB - Axis Bluechip Fund; xi) BARD - Baroda Large Cap Fund; xii) EDAI - Edelweiss Large Cap Fund.

Table 2. Performance Evaluation of Mutual Funds Of Risk Adjustment Parameters For The Year 2011-2021

Name of the fund	Fund return	Standard Deviation	Risk free rate	Beta of the portfolio	Trenyors ratio
CANRLDG	288.19	1.009	6.369	0.89	316.65
IDO1	281.81	1.00143	6.369	0.92	299.39
KOLB	282.2	1.001433	6.369	0.92	299.8
FRANKLIN	33.70442	1.2021	6.369	0.93	29.39
INRI	283.84	1.02	6.369	0.91	304.9
SBUH	217.68	0.010693	6.369	0.96	220.11
UNLO	69.76	1.159	6.639	0.97	65.35
UTHM	80.29	1.11	6.369	0.92	80.34
ADTOL	77.13	1.13	6.639	0.92	76.91
AXLB	92.58	1.13	6.639	0.82	105.13
BARD	114.32	1.18	6.639	0.77	140.19
EDAI	124.73	1.05	6.639	0.89	132.68

Source: Ticker Tape

Note: i) CANRLDG - Canara RobecoBluechip Equity Fund; ii) IDO1 - IDBI India Top 100 Equity Fund; iii) KOLB - Kotak bluiechip fund; iv) Franklin - Franklin India Bluechip Fund; v) INRI - InvescoIndiaLarge-capFund;vi)SBUH-SBIBlueChipFund;vii)UNLO-UnionLarge-capFund;

•UTHM - UTI Master-share Unit Scheme; ix) ADTOL - Aditya Birla Sun Life Frontline Equity Fund; x) AXLB - Axis Bluechip Fund; xi) BARD - Baroda Large Cap Fund; xii) EDAI - Edelweiss Large Cap Fund.

Table 3. Performance evaluation of mutual funds of risk adjustment parameters for the year 2011-2021

Name of the fund	Fund return	Standard Deviation	Risk free rate	Beta of the portfolio	Trenyors ratio
CANRLDG	288.19	1.009	6.369	0.89	275.62
IDO1	281.81	1.00143	6.369	0.92	97.48
KOLB	282.2	1.001433	6.369	0.92	11.02
FRANKLIN	33.70442	1.2021	6.369	0.93	-197.37
INRI	283.84	1.02	6.369	0.91	13
SBUH	217.68	0.010693	6.369	0.96	-134.89
UNLO	69.76	1.159	6.639	0.97	5.46
UTHM	80.29	1.11	6.369	0.92	-161.51
ADTOL	77.13	1.13	6.639	0.92	-203.08
AXLB	92.58	1.13	6.639	0.82	-201.12
BARD	114.32	1.18	6.639	0.77	40.56
EDAI	124.73	1.05	6.639	0.89	-149.84

Source: Ticker Tape

Note: i) CANRLDG - Canara RobecoBluechip Equity Fund; ii) IDO1 - IDBI India Top 100 Equity Fund; iii) KOLB - Kotak bluiechip fund; iv) Franklin - Franklin India Bluechip Fund; v) INRI - InvescoIndiaLarge-capFund;vi)SBUH-SBIBlueChipFund;vii)UNLO-UnionLarge-capFund;

•UTHM - UTI Master-share Unit Scheme; ix) ADTOL - Aditya Birla Sun Life Frontline Equity Fund; x) AXLB - Axis Bluechip Fund; xi) BARD - Baroda Large Cap Fund; xii) EDAI - Edelweiss Large Cap Fund.

The Treynor Index of Canara Robeco Blue-chip Equity Fund (CANRLDG) is 316.65 ranked as the top performer, whereas, Franklin India Blue- Chip Fund (FRANKLIN) as poor performer because it's Treynor ratio is29.39. Due to the market reward to risk premium is comparatively high, therefore the return of this scheme is high.

Jenson's Ratio: Jensen's Ratio of the scheme determines the extra return earned above, the expected return while considering the non-diversifiable risk of the market. considering the non- diversifiable risk of the market.

Therefore, the higher value of this ratio indicates with a positive alpha, the mutual fund manager would have earned enough return given the amount of risk they were taking.

$$Jensen\ Ratio\ (\alpha\ p) = Rp - E(Rp)$$

Using the CAPM model, the expected return of the portfolio can be calculate as: E (RP) = R + (ßp (Rm - Rt)

Where, (αp)=Differentialreturnof portfolio

Rp = Portfolio return

E (Rp) = Expected portfolio return Re=Risk free rate

ßp = Systematic risk of the portfolio Rm = Return on market index

Thus, the αp represents the difference between actual return and expected return. If αp has a positive value, it indicates that superior return has been earned due to superior management skills. When αp = 0, it indicates neutral performance. The aforementioned formula for evaluating performance is adopted for arriving at Table-3 here From the Table-3, it is evident that Jensen's Ratio of Canara Robeco Blue- chip Equity Fund (CANRLDG) ranked as the top performer followed by IDBI India Top 100 Equity Fund (IDO1), whereas Aditya Birla Sun Life Frontline Equity Fund(ADTOL) performed poor with negative results. However, it can be attributed due to comparatively lower fund returns as against high performing and high fund return companies.

Summary

The need for evaluating the performance of the Mutual Funds to present with a concise and solid ground work for investors, so that they can make a rather informed decision while investing into any mutual funds. Awareness about investment into Mutual Funds as a better avenue for investments has been started in the recent years and younger generation is actively investing into such schemes. One the primary reasons for such a change in investment can be accredited to escalating real estate's costs and precious metals like gold. From the aforementioned analysis, it is discernible that Canara Robeco Blue-chip Equity Fund (CANRLDG) out performed when compared to all other schemes because of the excess actual return over expected return is comparatively high, therefore the return of this scheme is high. Further, followed by Kotak Blue-chip Fund (KOLB) and IDBI India Top 100 Equity Fund(IDO1).

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