

Original Article

Analysis of Bluechip Mutual Fund Schemes using ANOVA and T-Test

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Abstract: Mutual funds have become a vital source of capital and have played a significant part in the growth of India's financial market. Mutual funds also offer diverse portfolio management, risk reduction, and return maximization. The best investing option for the average person is a mutual fund scheme, which offers a professionally managed stock market, minimal risk, and maximum profits. In this study we tried to find the returns of various blue chip mutual fund schemes using monthly Net Asset Values (NAVs). And also applied statistical techniques to know the performance of schemes, so that it helps the investor to take decision on best investment scheme.

Keywords: Mutual Funds, NAV, Returns, ANOVA, T-test.

I. INTRODUCTION

As defined by the Securities and Exchange Board of India (SEBI) Regulations, 1993, a mutual fund is "a fund established in the form of a trust by sponsor to raise money by the trustees through the sale of units to the public under one or more schemes for investing in securities in accordance with the regulations" (SEBI, 1993). Furthermore, by spreading their investments across a variety of securities through a technique called as diversification, mutual funds have grown in popularity and success as a means for investors to participate in the financial markets in a straightforward, low-cost manner while lowering risk. In an individual's investing plan, it could play a significant role. Through investments, they offer the chance for capital growth and income.

Mutual funds have been the go-to long-term investment plans for many investors over the past many years and as the Indian economy and capital markets have expanded in recent years, so number of investors is increasing every year. As the Indian government launched economic reforms in the areas of trade, industry, and commerce to bring the Indian economy into line with the global economy, the capital market in India saw substantial changes. Innovative new instruments and institutions have emerged as new financial intermediaries. The demand for mutual funds and their range of operations has increased with a focus on boosting investment deployment through markets and raising domestic savings. Consequently, the role that mutual funds have played in the restructuring of the Indian economy.

Mutual Fund schemes are divided into 1) Equity/ Growth funds 2) Income/Bond/Fixed Income Funds 3) Hybrid Funds 4) Open Ended schemes 5) Closed Ended schemes.

II. REVIEW OF LITERATURE

Dr. Amir Rehmani(2022), Analysed the performance of various mutual Fund schemes selected from April 2010 to March 2020 against risk free rate and market index. Researcher has applied the risk adjusted measures to find the performance of various schemes. He found that sample funds performed out rightly well and fund managers played very important role in selecting funds.

Dr. Amit Gupta (2020), analysed the investor's perceptions towards risk and expectations in mutual funds. Dr.Chirappa I B (2023), examined the performance of different mutual fund schemes and compared with SBI domestic term deposit rates and concluded that most of the mutual fund schemes are not able to produce returns in comparison with SBI domestic term deposits.

Dr. D. Devarajan and R. Poornima (2018), discussed about various mutual fund schemes, benefits, tax, risk and rewards which are available to the public in India. Komal B. Sharma (2020), studied debt mutual fund schemes and also examined the risk and return of 5 debt mutual funds and researcher observed that out of 5 mutual funds 3 are performed well and 2 funds have not performed well.

Krishna Samaddar (2018), studied 10 equity mutual fund schemes from April 2017 to March 2018 using performance measures and concluded that all sample schemes produced higher and better average returns than the market returns. And



found that HDFC small cap fund is better than all other sample fund schemes taken for the study.

B. Sharmila and Dr. R. Khanchana, analyzed various mutual equity funds schemes to know best alternative from the galaxy of investment alternatives. Time series analysis is applied to get an idea of the market conditions and best alternative.

Shivangi Agarwal, Nawazish Mirza (2017), assessed the performance of 100 mutual fund schemes which are available in India by measuring Sharpe ratio, Treynor Ratio, Jensen's Alpha and Value at risk. Researcher selected the period from January 2013 to June 2016 and said 90% of the schemes have performed better when compared to their bench marks.

Dr. K. Mahesh and Sujatha S.L. (2020), studied yield of each scheme and risk involved in it and also found the variation in prices with respect to NIFTY index and revealed that, construction and metal product sectors stand in top five mutual fund schemes.

Dr.Naliniprava Tripathy (2004), studied the performance of 31 equity linked savings schemes of India by applying performance evaluation measures namely, Rate of Return Measure, Treynor Measure, Sharpe Measure, Jensen Measure, Sharpe Differential Return and Fama's Decomposition Measure. Researcher found that only one fund has linear relationship between return and risk. 13 mutual fund schemes are highly fluctuated as per returns are concerned. Out of 31 schemes 9 schemes performed very well and gave high returns.

A. Objectives:

1. To find the returns of various mutual fund schemes
2. To find best scheme of the mutual funds. Assuming that the Net Asset Values (NAVs) of selected samples are same and also asses the best scheme out of selected sample schemes.

B. Data Collection:

Secondary data was collected from the Association of Mutual Funds India (AMFI) website. Net Asset Value (NAV) of various mutual fund schemes from March 2022 to April 2023 was collected. The collected data was analyzed using statistical techniques.

III. METHODOLOGY

To analyse the data, monthly returns and monthly average returns are calculated using monthly NAVs. ANOVA test was conducted to know the significant difference between various mutual fund schemes. t- test was applied to find the best scheme of the collected samples. The outcomes of the analysis are presented in the following sections

A. Summary:

Table 1: NAVs of the sample mutual funds from 1st March 2022 to 30th April 2023

Date	Axis Bluechip Fund - Regular Plan - Growth	Bank of India Bluechip Fund Regular Plan Growth	Canara RobecoBluechip Equity Fund - Regular Plan - Growth	ICICI Prudential Bluechip Fund - Growth	Kotak Bluechip Fund - Growth	SBI Blue Chip Fund- Regular Plan Growth	Sundaram Large Cap Fund
01-04-2022	45.22	10.68	41.12	66.23	372.636	60.752	14.8339
02-05-2022	42.92	10.17	39.64	64.08	360.093	59.2581	14.3032
01-06-2022	41.02	9.72	38.59	62.75	351.89	57.7536	13.9089
01-07-2022	39.18	9.33	36.95	60.33	337.056	55.7778	13.3522
01-08-2022	43.53	10.39	40.49	65.74	368.502	61.0277	14.6179
01-09-2022	44.33	10.59	41.17	66.8	376.545	62.2819	14.883
03-10-2022	42.81	10.31	39.83	64.95	362.506	59.9661	14.4233
01-11-2022	44.77	10.96	42.55	69.75	385.566	64.0818	15.4466
01-12-2023	45.28	11.11	43.46	71.96	396.148	65.7815	15.9757
02-01-2023	43.77	10.74	42.13	70.07	385.332	63.8927	15.4831
01-02-2023	42.09	10.27	41.09	68.24	376.722	62.8009	14.887
01-03-2023	41.91	10.21	40.89	67.76	375.191	62.3665	14.7552

Samples collected from Association of Mutual Funds India (AMFI) website:

Analysis of variance (ANOVA) was performed to determine the significant difference between the selected schemes. The null hypothesis (Ho) was considered as collected sample schemes are same in their returns against the alternative hypothesis (H1) was contradict to the null hypothesis. The descriptive statistics and results of the ANOVA was shown in the following table:2 and table:3

Table 2: Descriptive Statistics Result of ANOVA

Descriptive Statistics				
Schemes	Count	Sum	Average	Variance
Axis Bluechip Fund - Regular Plan - Growth	12	516.83	43.06917	3.31059
Bank Of India Bluechip Fund Regular Plan Growth	12	124.48	10.37333	0.25097
Canara Robeco Blue Chip Equity Fund - Regular Plan - Growth Option	12	487.91	40.65917	3.099063
ICICI Prudential Bluechip Fund - Growth	12	798.66	66.555	10.80261
Kotak Bluechip Fund - Growth	12	4448.187	370.6823	258.8411
Sbi Blue Chip Fund-Regular Plan Growth	12	735.7406	61.31172	8.026517
Sundaram Large Cap Fund (Formerly Known as Sundaram Blue Chip Fund)	12	176.87	14.73917	0.50475

Table 3: Analysis of Variance (ANOVA)

Analysis of Variance (ANOVA)						
Source of Variation	SS	df	MS	F	P-Value	F Crit
Between Schemes	1160686	6	193447.6	4754.087	9.11E-97	2.218817
Within Schemes	3133.192	77	40.6908			
Total	1163819	83				

From the above ANOVA table p-value is much more less than 0.05 ($0.000000 < 0.05$). Therefore, null hypothesis was rejected. i.e., there is a significant difference between the various schemes.

Table 4: Monthly Returns of Mutual Fund

Date	Axis Bluechip Fund - Regular Plan - Growth	Bank of India Bluechip Fund Regular Plan Growth	Canara RobecoBluechip Equity Fund - Regular Plan - Growth Option	ICICI Prudential Bluechip Fund - Growth	Kotak Bluechip Fund - Growth	SBI Blue Chip Fund-Regular Plan Growth	Sundaram Large Cap Fund
01-04-2022	-	-	-	-	-	-	-
02-05-2022	-5.09	-4.78	-3.6	-3.25	-3.37	-2.46	-3.58
01-06-2022	-4.43	-4.42	-2.65	-2.08	-2.28	-2.54	-2.76
01-07-2022	-4.49	-4.01	-4.25	-3.86	-4.22	-3.42	-4
01-08-2022	11.1	11.36	9.58	8.97	9.33	9.41	9.48
01-09-2022	1.84	1.92	1.68	1.61	2.18	2.06	1.81
03-10-2022	-3.43	-2.64	-3.25	-2.77	-3.73	-3.72	-3.09
01-11-2022	4.58	6.3	6.83	7.39	6.36	6.89	7.09
01-12-2023	1.14	1.37	2.14	3.17	2.74	2.65	3.43
02-01-2023	-3.33	-3.33	-3.06	-2.63	-2.73	-2.87	-3.08
01-02-2023	-3.84	-4.38	-2.47	-2.61	-2.23	-1.71	-3.85
01-03-2023	-0.43	-0.58	-0.49	-0.7	-0.41	-0.69	0.89
Total	-6.38	-3.19	0.46	3.24	1.64	3.6	2.34
Average Return	-0.53	-0.27	0.04	0.27	0.14	0.3	0.2

From the above data visualization, it was clear that returns of selected sample schemes are more or less high in August month. Bank of India Bluechip Fund Regular Plan Growth scheme shows maximum returns in the month of August 2022 during the period, April 2022 to March 2023. In almost all months, investor got loss during the study period. And all

schemes showed the same trend throughout the study period. Graph shows that in the month of August, September, November and December, investors received profits and in all other months they are at loss. To assist the more benefit schemes, t-test was applied for a randomly selected two independent schemes. Results were précised and interpretation was given in conclusions section.

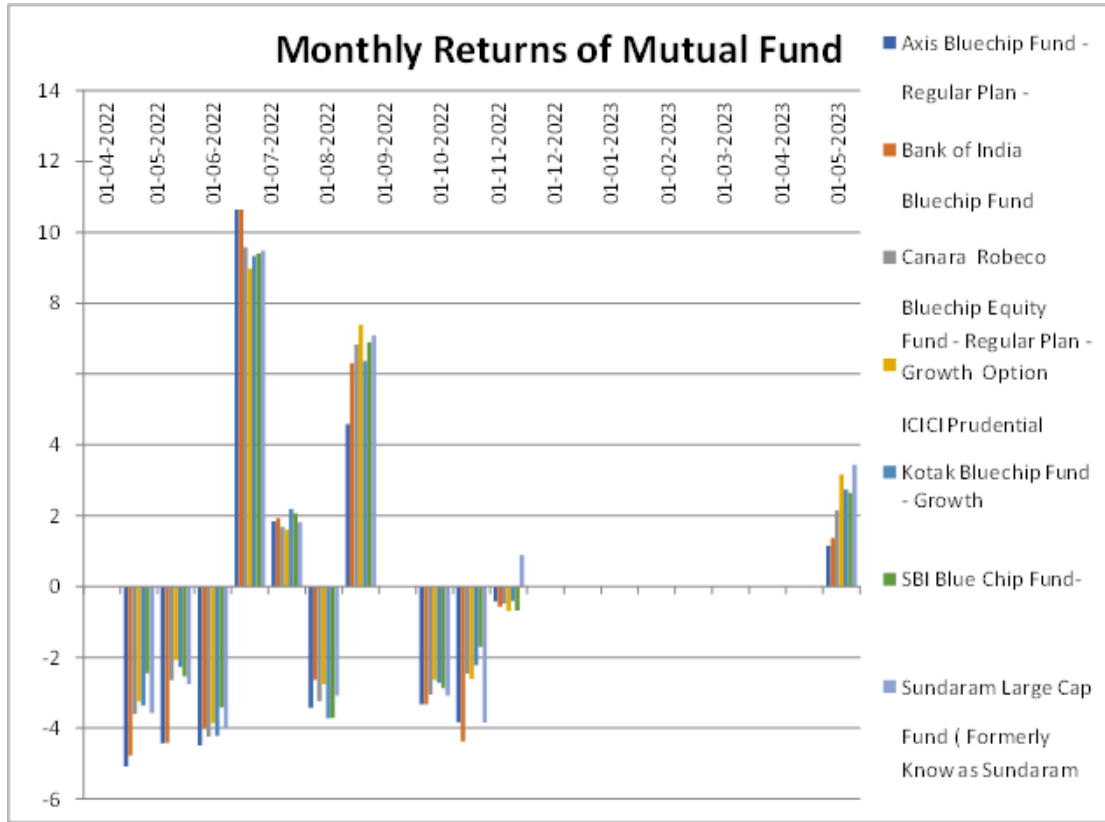


Figure 1: Monthly Returns of Mutual Fund

Table 5: Pair wise Comparison of Mutual fund Schemes

Name of the Schemes	Mean	Variance	t Stat	P(T<=t) one-tail	T Critical one-tail
Axis Bank	43.0692	3.31059			
Bank of India	10.3733	0.25097	60.01543	1.41032E-17	1.770933
Bank of India	10.3733	0.25097			
CanaraRobeco	40.6592	3.099063	-57.3199	2.5577E-17	1.770933
CanaraRobeco	40.6592	3.099063			
ICICI Prudential	66.555	10.80261	-24.0595	7.16152E-15	1.739607
ICICI Prudential	66.555	10.80261			
Kotak	370.682	258.8411	-64.158	6.81265E-17	1.782288
Kotak	370.682	258.8411			
SBI	61.3117	8.026517	65.60269	5.21882E-17	1.782288
SBI	61.3117	8.026517			
Sundaram	14.7392	0.50475	55.23494	4.08606E-16	1.782288

From the above table indicated that Bank of India Vs Canara bank, Canara bank Vs ICICI bank and ICICI Vs Kotak bank shows that there is left tailed test because the t-stat value is negative(-57.312,-24.059 and -64.158 respectively). Therefore the one tail p-value is for the left tailed test is 0.0000. The t-critical value of these one tail test are 1.77, 1.74 and 1.78 respectively. Here the p value for these banks are almost 0.0000 which is less than 0.05. Thus reject hypothesis and conclude that (Bank of India<Canara Robeco <ICICI Prudential <Kotak) are statistically significant. In the same way Axis bluechip Vs Bank of India, Kotak Vs SBI and SBI Vs Sundaram shows right tailed test. Here t-stat values are positive (60.015,65.602 and 55.235 respectively). As per the statistical theory for right tailed test the p-values for these schemes are almost equal to one which is greater than 0.05. Therefore accept hypothesis and conclude that (Axis<Bank of India, Kotak<SBI<Sundaram) the compared banks are not statistically significant.

IV. CONCLUSION

To understand the performance of selected samples schemes ANOVA technique and t-test is applied. As per results it is concluded that there is significant difference between mutual fund schemes. From the selected schemes random comparison was made to assist the best one. Pair wise independent t-test was performed to know the maximum returns come from which mutual fund scheme. The results describing that out of all selected schemes kotak scheme gives maximum returns, which was statistical evidence from the selected data. Results were shown in table:5. The remaining schemes were more or less giving same returns.

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