

Performance Evaluation of Thematic Mutual Fund Schemes Using Capital Asset Pricing Model (CAPM)

¹Dr. Anand Muley, ² Mr. Satish Tiwari, ³ Dr. Jaspal Gidwani

¹Assistant Professor, Department of Commerce,
J.M. Patel College, Bhandara, Nagpur

²Assistant Professor, Department of Mathematics,
Priyadarshini College of Engineering, Nagpur

³Assistant Professor, Department of Management Studies,
Gurunanak Institute of Engineering & Technology, Nagpur

ABSTRACT

In Today's era, as earning money is important so as the Investments since just earning money is not enough. As we are working hard to earn the money, our money should also work hard for us, this is why we invest. Money lying idle in our bank account is an opportunity lost. We should invest that money smartly to get good returns out of it. For a novice Investors, it is being advised to adopt a particular investment strategy and diversify their portfolio, as through Diversification overall investment risk can be reduced.

Various investment options have been provided by Indian capital market to the investors, to help them to invest in various sectors and organizations and to ensure the profitable return. Among various financial products, Growth and developments of various mutual funds products in the Indian capital market has proved to be one of the most catalytic instruments in generating momentous investment growth in the capital market. Many AMC's Floated lots of schemes for the investors to invest their surplus savings. In this context, close evaluation of mutual funds has become essential. Hence, picking out profitable mutual funds for investment is a very important issue. This study, basically, deals with the Thematic based Infrastructure Mutual fund schemes in India.

This study mainly focused on the performance of selected Infrastructure equity mutual fund schemes in terms of risk- return relationship. The main objective of this research work is to analyze financial performance of selected Infrastructure mutual fund schemes through the statistical parameters such as (Average annualised Return, beta, standard deviation, Capital Asset Pricing Model). The findings of this research study will be help full to investors for their future investment decisions.

Keywords: Mutual funds, Infrastructure mutual fund schemes, investors

1. INTRODUCTION

Mutual fund is a mechanism for pooling the resources by issuing units to the investors and investing funds in securities in accordance with objectives as disclosed in offer document. Investors need to know how risky individual assets are and what their contribution to the total risk of a portfolio would be.

Plenty of Mutual Funds are available where the investors can put their money. Before investing they want to know which fund gives more return, which fund is performing well, which fund is more risky etc. All these can be found out using certain key statistics. With the help of these key statistics an investor can analyze different mutual funds and put his/her money in a fund which suits his/ her risk perception. Mutual fund returns can be evaluated using Arithmetic mean, Compounded Annual Growth Rate; etc, Whereas risk can be analyzed by finding out standard deviation, Beta.

The performance evaluation of mutual funds has been an enormous interest to researchers and investors all over the world, as it is a widely discussed issue in the field of finance. The investment performance of mutual funds has been so far extensively examined in the developed capital markets. Several measures of performance of managed portfolio have been developed by taking risk and return characteristics into consideration. Taking this into account an another approach to judge the performance of mutual fund schemes is Capital Asset Pricing Model (CAPM) .It is a model that describes the relationship between risk and expected return and that is used in the pricing of risky securities .

The Capital Asset Pricing Model (CAPM) attempts to quantify the relationship between the beta of an asset and its corresponding expected return.

2. Infrastructure Thematic Funds:-

Infrastructure thematic_funds prominently make investment in essential public assets, such as toll roads, airports and rail facilities.

They have a broader continuum when compared to sector funds, but have limitations when compared to Diversified equity mutual funds. Thematic funds by nature are more prone to risk and volatility. The performance of these funds is dependent on the performance of a particular set sector or a theme, unlike a diversified fund which moves in line with the broader markets. Thematic funds could have themes ranging from Multi-Sector, International / Multi - Economy, Commodity, particular style of investing etc. Thematic funds are suited for investors who are well versed with market trends and are hence in a better position to take thematic calls.

Infrastructure funds are managed by specialist fund managers, who make investment decisions on behalf of investors. Infrastructure assets include toll roads, airports, communications assets such as broadcasting towers, materials-handling facilities such as docks, Utilities such as electricity power lines and gas pipelines.

Returns from infrastructure funds usually combine capital growth and dividend income in varying proportions. In growth-oriented infrastructure funds, there may not be stable income in the near term but the fund seeks to

achieve capital growth in the medium term. Infrastructure funds that generate steady income streams tend to invest in more mature assets.

3. Literature Review:-

Sathy.S.D. and Bishnupriya .M. (2006) examined the performance of 23 selected growth - oriented and open-ended mutual funds, from 1996-1997 to 2004-2005. On the basis of returns they found that UTI mutual fund schemes and Franklin Templeton schemes have performed exceedingly well in public and private domain respectively.

Soumya Guha(2008) “performance of Indian equity Mutual funds Vis-a-Vis their style benchmarks” has suggested that in her evaluation of fund managers performance, she found that Indian equity fund managers have not been able to beat their style benchmarks (William Sharpe ratio) on the average and pointed out the weaknesses of fund managers. Several researchers have tried to study the various factors and their impact on fund’s performance.

Mehta and Chander (2010) designed to empirically test the three factor model suggested by Fama and French on Indian stock market and to document the evidences as to how firm characteristics are used as a better way to explain the stock return behaviour. The overall findings indicated that the three factor model given by Fama and French is more powerful, than its other variants of taking one or two factors in explaining the variability in the returns of all six portfolios.

Pala and Chandnib (2014) in their study examined the performance of the few income and debt mutual fund scheme on the basis of their daily NAVs. from the period Oct 2007 to Oct 2012. The study finds that the best scheme were HDFC Mid Cap Opportunity, Birla Sun Life MNC Fund and Quantum Long-Term Equity.

Dr. R. Perumal, (2016), Investment decision making towards mutual funds by using Statistical tools and ratio analysis of mutual fund schemes. The objective of this research work is to exploit the use of statistical tools and ratio analysis in terms of financial performance. The research findings are useful to the Mutual Fund Companies in terms of understand their performance among the mutual fund companies in the market.

4. Objectives:-

1. To assess the performance of Thematic Infrastructure Mutual fund schemes in terms of their Annualised return.
2. To measure the risk occupied by Thematic Infrastructure Mutual fund schemes by means of calculating Standard Deviation & Beta of Schemes.
3. To evaluate Thematic Infrastructure Mutual Fund using Capital Asset Pricing Model and Enlighten investors about outperforming funds.

5. Need of the Study:-

The literature review revealed that various performance measures of mutual funds include Absolute rate of return, benchmark comparison, risk adjusted returns (Treynor and Sharpe's indices) 'Stock Selectivity' abilities and market timing skills of the fund managers have been taken into account for assessment.

Though many empirical studies measuring performance of mutual funds were conducted in USA and other developed countries, but till date, an empirical study in the context of Indian mutual funds on investigating Performance of mutual funds through the application of Capital Asset Pricing Model on Thematic mutual fund schemes are yet to be undertaken. Hence, the study is an attempt in this direction to unearth the nature of relationship that exists between the Investors expected returns and actual returns of Theme based Indian mutual fund schemes.

5. Significance of the Study:-

Investigating Past performance of any investment is essential, as such it is applicable to mutual funds also, evaluating past performance of mutual funds is important both for investors as well as for fund managers. It allow an investor to calculate as to how much return has been generated by the fund manager and what risk level has been taken in generating such returns. Further, an investor can also weigh up the comparative performance of different fund managers. Similarly fund managers would also be able to know their performance over time and also vis-a-vis that of other competitors in the industry.

The evaluation also provides a mechanism to make a comparison between the investor's expected returns and actual returns earned by mutual fund managers and also it provide a podium for identifying strengths and weaknesses of fund managers in the investment process, which helps them to take corrective actions.

6. Research Methodology:-

Data: - This study examines 22 open-ended infrastructure schemes being launched by selected mutual funds namely LIC, HDFC, ICICI, Reliance and Birla Sun Life. These schemes have been selected on the basis of regular data availability during the period of January 2013 to December 2017. Annual Net Asset Value (NAV) data has been used and the period of the data considered is from the date 1st January 2013 of the scheme or from the date of availability till December 31, 2017.

The data of NAVs of infrastructure equity mutual funds are collected from Association of Mutual Funds in India website from the period 1st January 2013 to 31st December 2017. The data of S&P CNX Nifty Index are collected from NSE India website.

Period of Study: - The growth oriented thematic infrastructure schemes, which have been floated by the selected funds during the period January 2013 to December 2017, have been considered for the purpose of the study. Annual Net Asset Value (NAV) as declared by the relevant mutual funds from the January 1st 2013 of a particular scheme to 31st December 2017 has been used for the purpose.

Risk Free Rate: - Risk free rate of return refers to that minimum return on investment that has no risk of losing the investment over which it is earned. For the present study, it has been marked as 7% (0.07) per annum.

Tools and techniques For the purpose of Return and Risk analysis, appropriate statistical and financial tools, i.e., Average Annualised Return, Standard deviation, Beta, Capital asset Pricing Model etc. have been applied.

7. Data Analysis & Interpretation:-

7.1 Return Measures

Investors have to look into the return part before investing in the Mutual funds. Returns are the key indicators of their investment performance and are calculated from the historical NAV's.

In Mutual funds, NAV is the basic element used in calculating the returns because it keeps varying from one point of time to other. Thus, the purchase and sale value of investment is derived by multiplying the units purchased with NAV for respective period i.e. purchase date and sale date. In simple words, Net Asset Value is the market value of the securities held by the scheme. Since market value of securities changes every day, NAV of a scheme also varies on day-to-day basis.

A) Annualized Return

Return is the gain or loss in the value of an asset in a particular period. It is usually quoted as a percentage. The general rule is that the more risk you take, the greater the potential for higher return.

Absolute return or Point to Point Returns: Absolute return is the increase or decrease that an investment achieves over a given period of time expressed in percentage terms. It's calculated as follows:

$$\text{Absolute returns} = 100 * (\text{Selling Price} - \text{Cost Price}) / (\text{Cost Price})$$

This measurement of return is the simplest and it does not consider time period. Most times it produces a large number so people are impressed!

Simple Annualized Return: The increase in value of an investment, expressed as a percentage per year.

$$\text{Simple Annualized Return} = \text{Absolute Returns} / \text{Time period.}$$

Average Annual Return (AAR)

Average annual return (AAR) is the arithmetic mean of a series of rates of return. The formula for AAR is:

$$\text{AAR} = (\text{Return in Period 1} + \text{Return in Period 2} + \text{Return in Period 3} + \dots \text{Return in Period N}) / \text{Number of Periods or N}$$

Table 1 Shows Average Annualised Return of Selected Infrastructure Mutual Fund Schemes:-

SN	Scheme Name	2013	2014	2015	2016	2017	Average Annualised Return(Rp)	Rank
1	Birla Sun Life Infrastructure Fund	-3.55	67.6 1	-1.43	1.6	52.71	23.38	5
2	BOI AXA Manufacturing & Infrastructure Fund	-7.25	54.1	0.33	1	55.9	20.81	8
3	Canara Robe co Infra. Fund - Regular Plan	-9.13	69.8 6	6.74	2.13	40.23	21.96	7
4	DSP Blackrock T.I.G.E.R. Fund - Regular Plan	-9.11	61.2 7	0.68	4.1	47.04	20.79	9
5	Escorts Infrastructure Fund	-11.51	56.6 9	-3.02	-5.51	52.23	17.77	19
6	Franklin Build India Fund	6.06	93.8	2.12	8.41	43.29	30.73	1
7	HDFC Infrastructure Fund	-14.43	73.9	-2.52	-1.92	43.31	19.66	13

8	HSBC Infrastructure Equity Fund	-19.05	85.4 6	-5.67	-1.78	53.9	22.57	6
9	ICICI Prudential Infra. Fund - Regular Plan	-5.03	56.1 9	-3.36	1.99	40.8	18.11	16
10	IDFC Infrastructure Fund- Regular Plan	-10.8	43.1 6	-0.16	10.71	58.67	20.31	11
11	Kotak Infrastructure and Economic Reform Fund - Standard Plan	-6.73	80.7 1	-0.21	9.24	45.27	25.65	3
12	L&T Infrastructure Fund	-6.96	65.5 3	6.78	8.56	61.1	27.00	2
13	LIC Nomura MF Infrastructure Fund	-3.57	49.5 7	-6.24	-2.17	42.2	15.95	21
14	Religare Invesco Infrastructure Fund	-4.06	83.6 3	-2.6	0.76	48.07	25.16	4
15	Sahara Infra. Fund - Fixed Pricing Option	-13.09	47.4 9	1.13	13.84	40.5	17.97	18
16	Sahara Infra. Fund - Variable Pricing Option	-12.23	48.8 5	2.9	16.16	43.64	19.86	12
17	SBI Infrastructure Fund	-11.87	48.0 6	2.7	9.27	41.74	17.98	17
18	Sundaram Infra. Advantage Fund - Regular Plan	-15.83	57.6 3	4.8	-0.52	55.53	20.32	10
19	Reliance ETF Infra Bees	-3.75	23	-8.42	-1.72	34.48	8.71	22
20	Tata Infrastructure Fund - Plan A	-12.92	63.1 2	-0.15	5.29	42.18	19.50	14
21	Taurus Infrastructure Fund - Regular Plan	-10.39	58.7 6	-5.35	8.13	44.99	19.22	15
22	UTI Infrastructure Fund	-11.46	60.1 2	-5.54	3.97	41.48	17.71	20

Source: - Own Calculation

Interpretation: - Table 1 depicts Performance in terms of Average Annualized returns of last 5 years i.e. from 2013 to 2017 of 22 Infrastructure Mutual Fund schemes & their ranking.

On analyzing schemes, it has been found that all the schemes generate positive average returns, none of them show negative return which is a good sign for the Industry as it increases investors confidence in Mutual fund investment especially it boost the investment in Infrastructure Mutual fund schemes. Schemes that take up top positions are Franklin Build India Fund, L&T Infrastructure Fund, Kotak Infrastructure and Economic Reform Fund - Standard Plan, Religare Invesco Infrastructure Fund, etc.

7.2. Risk Measures

Return alone should not be considered as the basis of measurement of the performance of a Mutual fund scheme, it should also include the risk taken by the Fund Manager because different funds will have different levels of risk attached to them.

Risk then, refers to the volatility - the up and down activity in the markets that occur constantly over a period of time. This volatility can be caused by a number of factors - interest rate changes, inflation or general economic conditions.

Measure of Risk Analysis:-

The risk is calculated on the basis of NAV. The following measures of risks associated with mutual funds have been for the study:

A) Beta (β): Beta is a fairly commonly used measure of risk. It basically indicates the level of volatility associated with the fund as compared to the benchmark. The success of beta is heavily dependent on the correlation between a fund and its benchmark. A beta that is greater than one means that fund is more volatile than the benchmark, while a beta of less than one means that the fund is less volatile than the index. A fund with a beta very close to 1 means the fund's performance closely matches the index or benchmark.

B) Standard Deviation (σ) *i.e.*, Variation in individual or portfolio return from its average return over a certain period of time has been measured by the Prominent Statistical tool called Standard Deviation.

In Mutual Funds, Standard deviation tells us how much the return on a fund is deviating from its average return based on its historical performance. In other words, its significance lays in the fact that sample is free from defects of sampling, it measures the absolute dispersion, the greater the SD; greater will be magnitude of the deviation of the values from their mean. Small SD means high degree of uniformity & homogeneity of a series. The total risk is measured in terms of standard deviation.

Table 2 bestow Standard Deviation & Beta of Selected Infrastructure Mutual Fund Schemes:-

SN	Scheme Name	Standard Deviation	Beta
1	Birla Sun Life Infrastructure Fund	30.4357	1.5879
2	BOI AXA Manufacturing & Infrastructure Fund	28.0669	1.5962
3	Canara Robe co Infrastructure Fund - Regular Plan	29.0505	1.2734
4	DSP Blackrock T.I.G.E.R. Fund - Regular Plan	27.9451	1.5234
5	Escorts Infrastructure Fund	30.1123	1.5269
6	Franklin Build India Fund	34.8163	1.6714
7	HDFC Infrastructure Fund	33.5293	1.7164
8	HSBC Infrastructure Equity Fund	40.1481	2.0706
9	ICICI Prudential Infrastructure Fund - Regular Plan	25.3818	1.3366
10	IDFC Infrastructure Fund- Regular Plan	26.3538	1.5503
11	Kotak Infrastructure and Economic Reform Fund - Standard Plan	32.8726	1.3583
12	L&T Infrastructure Fund	30.1646	1.5223
13	LIC Nomura MF Infrastructure Fund	24.5809	1.3465
14	Religare Invesco Infrastructure Fund	35.1095	1.5405
15	Sahara Infrastructure Fund - Fixed Pricing Option	22.9973	1.3528

16	Sahara Infrastructure Fund - Variable Pricing Option	23.3966	1.3763
17	SBI Infrastructure Fund	23.1071	1.2347
18	Sundaram Infrastructure Advantage Fund - Regular Plan	30.3768	1.4703
19	Reliance ETF Infra Bees	16.8865	0.9934
20	Tata Infrastructure Fund - Plan A	28.4822	1.4951
21	Taurus Infrastructure Fund - Regular Plan	27.68	1.4418
22	UTI Infrastructure Fund	28.085	1.5114

Source: - Own Calculation

Interpretation: - Table 2 shows the Standard Deviation & Systematic Risk (Beta) of selected 22 Infrastructure Mutual Fund schemes. Higher the value of standard deviation of the fund returns, greater will be the total risk carried by the fund.

Analysis of table 2 clearly reveals that HSBC Infrastructure Equity Mutual Fund scheme has clearly outperformed all the schemes with 40.1481 standard deviation followed by Religare Invesco Infrastructure Fund with 35.1095 standard deviation and Franklin Build India Fund with 34.8163 standard deviation. It indicates the relatively high volatility of the scheme and the high return per unit of risk.

Whereas Reliance ETF Infra Bees has clearly under performed with 16.8865 Standard deviation. It indicates the relatively low volatility of the Scheme and the low Return per unit of risk.

Beta value of higher than unity implies higher portfolio risk than the market portfolio and vice versa. Schemes namely HSBC Infrastructure Equity Fund (2.0706) followed by HDFC Infrastructure Fund (1.7164) and Franklin Build India Fund (1.6714) were found to be more risky (beta > 1.0) than the market. There is only one scheme with beta lower than the market i.e. Reliance ETF Infra Bees with beta of 0.9934.

The Capital Asset Pricing Model (CAPM)

A 'Capital Asset Pricing Model - CAPM' describes the relationship between risk and expected return and that is used in the pricing of risky securities. CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat our required return, the investment should not be undertaken. The commonly used formula to describe the CAPM relationship is as follows:

Required (or expected) Return = RF Rate + (Market Return - RF Rate)*Beta

Table 3 bestow Capital Asset Pricing Model (CAPM) of Selected Infrastructure Mutual Fund Schemes:-

SN	Scheme Name	Beta	Average Annualised Return (Rp)	Expected Rate of Return (CAPM)	Rp-CAPM	Performance	Rank
1	Birla Sun Life Infrastructure Fund	1.5879	23.38	9.05	14.32	Over performed	5
2	BOI AXA Manufacturing & Infrastructure Fund	1.5962	20.81	8.98	11.83	Over performed	9
3	Canara Robe co Infrastructure Fund - Regular Plan	1.2734	21.96	8.74	13.21	Over performed	6
4	DSP Blackrock T.I.G.E.R. Fund - Regular Plan	1.5234	20.79	8.86	11.93	Over performed	8
5	Escorts Infrastructure Fund	1.5269	17.77	9.08	8.68	Over performed	20
6	Franklin Build India Fund	1.6714	30.73	8.95	21.77	Over performed	1
7	HDFC Infrastructure Fund	1.7164	19.66	9.09	10.57	Over performed	14
8	HSBC Infrastructure Equity Fund	2.0706	22.57	9.57	12.99	Over performed	7
9	ICICI Prudential Infrastructure Fund - Regular Plan	1.3366	18.11	8.69	9.42	Over performed	18
10	IDFC Infrastructure Fund- Regular Plan	1.5503	20.31	8.86	11.44	Over performed	10
11	Kotak Infrastructure and Economic Reform Fund - Standard Plan	1.3583	25.65	9.00	16.65	Over performed	3
12	L&T Infrastructure Fund	1.5223	27.00	9.07	17.92	Over performed	2
13	LIC Nomura MF Infrastructure Fund	1.3465	15.95	8.70	7.25	Over performed	21
14	Religare INVESCO Infrastructure Fund	1.5405	25.16	9.18	15.97	Over performed	4
15	Sahara Infrastructure Fund - Fixed Pricing Option	1.3528	17.97	8.49	9.47	Over performed	16
16	Sahara Infrastructure Fund - Variable Pricing Option	1.3763	19.86	8.52	11.33	Over performed	11

17	SBI Infrastructure Fund	1.2347	17.98	8.53	9.44	Over performed	17
18	Sundaram Infra. Advantage Fund - Regular Plan	1.4703	20.32	9.06	11.26	Over performed	12
19	Reliance ETF Infra Bees	0.9934	8.71	8.23	0.48	Over performed	22
20	Tata Infrastructure Fund - Plan A	1.4951	19.50	8.82	10.68	Over performed	13
21	Taurus Infrastructure Fund - Regular Plan	1.4418	19.22	8.85	10.37	Over performed	15
22	UTI Infrastructure Fund	1.5114	17.71	8.84	8.86	Over performed	19

Source: - Own Calculation

Interpretation: - In the above table, we calculate the Expected rate of return of Infrastructure mutual fund schemes which is listed in the Fifth column of the table. The Fourth column of above table shows average annualised rate of return whereas the third column depicts beta. We have calculated & consider the annual rate of growth of market index, which is NSE's NIFTY, for the aforesaid period & it, is 8.2424% while the risk free rate of return, here we taken on an average rate of Interest on Bank Fixed deposit i.e. 7.0%. Hence, excess of Market return over risk free rate of return i.e. risk premium of 1.2424 % (8.2424%-7.0%).

Now, using the formula in above mentioned equation, we calculate the expected rate of return, the difference between the expected and actual rate of return (Rp-CAPM) would lead us to the conclusion. If the difference is positive i.e. if the actual rate of return is greater than the expected return, the asset lies above the Security market line. Consequently, we can say that the mutual fund scheme has over performed, and if the difference is negative, we can say that the mutual fund scheme has underperformed.

It has been observed that all schemes generate higher returns than the expected returns. Out of all, some schemes have enhanced values for example Franklin Build India Fund, L&T Infrastructure Fund, Kotak Infrastructure and Economic Reform Fund - Standard Plan occupies top three positions respectively.

8. Limitations of the Study:-

For the purpose of performance evaluation, those schemes have been selected which are in operation since last 5 years. Only open ended schemes have been considered for this purpose. The study has been conducted and analysed based on set of available information, which is governed by time factor .

9. Conclusion:-

After analyzing the data and evaluating the performance and risk of the selected Infrastructure Mutual Fund, following conclusions can be drawn:

- a) Schemes that generate comparatively higher returns are Franklin Build India Fund, L&T Infrastructure Fund, Plan, Kotak Infrastructure and Economic Reform Fund - Standard Plan with an average annualised return of

More than 25% whereas Scheme that is on lower ladder is Reliance ETF Infra Bees fund having an average portfolio return of less than 10% .

b) It is observed that the maximum deviation of funds return is shown by HSBC Infrastructure Equity Fund (40.1481) followed by Religare Invesco Infrastructure Fund (35.1095) and Franklin Build India Fund (34.8163) whereas Reliance ETF Infra Bees was least risky scheme with lowest standard deviation of 16.8865.

Almost all schemes hold higher risk as all schemes have Beta More than 1 but investment in HSBC Infrastructure Equity Fund seems to be more risky because the Beta of the fund is 2.07 followed by HDFC Infrastructure Fund with beta of 1.7164 and Franklin Build India Fund having beta of 1.6714 which is more than 1. The Reliance ETF Infra Bees is having minimum risk of 0.9934.

c) It is evident from Table 3 that the Actual performance of the selected Infrastructure Mutual Fund Schemes was quite higher than the Expected or required rate of return of Investors which we measured through Capital Asset Pricing Model. So schemes that generate high return and are on apex positions are again Franklin Build India Fund, L&T Infrastructure Fund, Plan, Kotak Infrastructure and Economic Reform Fund - Standard Plan.

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