Performance and Risk Analysis of Equity Mutual Funds: An Empirical study of Thematic-Infrastructure Mutual Fund schemes

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ABSTRACT: Presently, there are lots of Investment options provided by Indian Capital Market viz Stocks, bonds, debentures etc for investors with an intention that investors can invest in these options and earn excellent return on their investment. Mutual Funds came with this objective of providing attractive returns to investors as these funds invest wealth of investors in capital market instruments. Among various financial products, mutual fund ensures the minimum risks and maximum return to the investors. In this context, close monitoring and evaluation of mutual funds has become essential. Therefore, choosing profitable mutual funds for investment is a very important issue. This study, basically, deals with Infrastructure mutual funds that are offered for investment by the various fund houses in India.

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

Keywords: (mutual fund industry, equity mutual funds, statistical tools.)

1. INTRODUCTION

Mutual funds have become a widely popular and effective way for investors to participate in financial markets in an easy, low cost fashion, while muting risk features by spreading the investment across different types of securities, also called as diversification. Mutual funds have played important role in financial market in recent decade's .So, it is pertinent to study the performance of mutual funds along with the risk it carried.

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.

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 gauged using Arithmetic mean & Compounded Annual Growth Rate. Risk can be analyzed by finding out Standard Deviation, Beta while funds can also be compared with a benchmark, industry average, and analysis of volatility and return per unit to find out how well they are performing with respect to the market value by computing R-squared or Correlation.

2. Thematic Infrastructure Funds:-

A thematic fund is one where the funds objective is to deliver optimal returns by investing in stocks which qualify to belong within the particular theme that is considered the theme could vary from multi-sector, international exposure, commodity exposure etc., unlike a sector fund, theme funds have a broader spectrum to operate in. Theme based funds are often mistaken to be sector funds. Although one could draw some broad comparisons, the scope of a theme fund is typically wider.

2.1. Nuances of Thematic funds

As stated earlier, they have a broader spectrum when compared to sector funds, but is limited 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.

2.2. Infrastructure Thematic fund

Infrastructure thematic funds provide the opportunity to invest in essential public assets, such as toll roads, airports and rail facilities.

They are often attractive to investors looking for predictable returns, as infrastructure projects are typically characterised by low levels of competition and high barriers to entry. 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-orientated 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:-

Mutual funds industry is growing at a very fast rate in India. Various studies and research has been on this industry by experts.

Amitabh Gupta (2003) evaluated a sample of 73 mutual fund schemes with different objectives for the period 1994-99. Funds from both the public and private sector have been selected for the purposes of evaluation in terms of testing the market timing abilities of the Indian fund managers. He concluded that out of the 73 schemes, 38 schemes earned higher returns in comparison to the market returns, while the remaining 35 schemes generated lower returns than that of the market.

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.

Navdeep Aggarwal and Mohit Gupta (2007), "performance of Mutual funds in India - an empirical study". The study was conducted using CAPM and FAMA French model and concluded that the value addition of the fund depends on certain factors such as excess market returns, size factor, value factor and suggest that returns earned by Mutual funds were actually due to the exposure of these factors only and fund managers did not add any value.

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 found that Indian equity fund managers have not been able to beat their style benchmarks on the average and pointed out the weaknesses of fund managers.

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.

4. Objectives:-

1. To evaluate the performance of Thematic Infrastructure Mutual Fund Schemes in terms of their return and risk.
2. To gauge the return earned by Thematic Infrastructure Mutual Fund Schemes and make Comparison against its benchmark returns.
3. To examine the degree of correlation that exists between Thematic Infrastructure Mutual Fund and benchmark returns.

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 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. 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 till December 31st, 2017.

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. 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, correlation, Beta, 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:

Absolute returns = 100* (Selling Price – Cost Price)/ (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.

Simple Annualized Return= Absolute Returns/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:

AAR = (Return in Period 1 + Return in Period 2 + Return in Period 3 + …Return in Period N) / 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	Rank
1	Birla Sun Life Infrastructure Fund	-3.55	67.61	-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	69.86	6.74	2.13	40.23	21.96	7
4	DSP Blackrock T.I.G.E.R. Fund - Regular Plan	-9.11	61.27	0.68	4.1	47.04	20.79	9
5	Escorts Infrastructure Fund	-11.51	56.69	-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	85.46	-5.67	-1.78	53.9	22.57	6
9	ICICI Prudential Infra. Fund - Regular Plan	-5.03	56.19	-3.36	1.99	40.8	18.11	16
10	IDFC Infrastructure Fund- Regular Plan	-10.8	43.16	-0.16	10.71	58.67	20.31	11
11	Kotak Infrastructure and Economic Reform Fund - Standard Plan	-6.73	80.71	-0.21	9.24	45.27	25.65	3
12	L&T Infrastructure Fund	-6.96	65.53	6.78	8.56	61.1	27.00	2
13	LIC Nomura MF Infrastructure Fund	-3.57	49.57	-6.24	-2.17	42.2	15.95	21
14	Religare Invesco Infrastructure Fund	-4.06	83.63	-2.6	0.76	48.07	25.16	4
15	Sahara Infra. Fund - Fixed Pricing Option	-13.09	47.49	1.13	13.84	40.5	17.97	18
16	Sahara Infra. Fund - Variable Pricing Option	-12.23	48.85	2.9	16.16	43.64	19.86	12
17	SBI Infrastructure Fund	-11.87	48.06	2.7	9.27	41.74	17.98	17
18	Sundaram Infra. Advantage Fund - Regular Plan	-15.83	57.63	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	63.12	-0.15	5.29	42.18	19.50	14
21	Taurus Infrastructure Fund - Regular Plan	-10.39	58.76	-5.35	8.13	44.99	19.22	15
22	UTI Infrastructure Fund	-11.46	60.12	-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 occupy top positions are Franklin Build India Fund, L&T Infrastructure Fund, Kotak Infrastructure and Economic Reform Fund - Standard Plan, Religare Invesco Infrastructure Fund, etc.

B) Benchmark:-

Mutual fund schemes invest in the market for the benefit of unit holders. How well did a scheme perform this job? An approach to assess the performance is to pre-define a comparable - Benchmark against which the scheme can be compared.

To put it very simply, a benchmark gives a layman an opportunity to compare the performance of his/her investments with that of the broader market. At the same time, a fund house can also set target returns and strive to perform better than the benchmark index.

For this study, broad-100 shared base NSE CNX Infrastructure Index has been used as a proxy for market index this is because NSE CNX Infrastructure Index is comparatively appropriate than BSE Sensex and NSE Nifty. Hence it would cover the majority percentage of stocks of infrastructure based companies and therefore is expected to provide better performance benchmark.

Table 2 Shows Comparative Analysis of Average Annualised Return of Selected Infrastructure Mutual Fund Schemes with the Benchmark Index Return:-

SN	Scheme Name	Average Annualised Return (RP)	Average Benchmark Index Return(RM)	Excess of Portfolio Return over Market Return (RP-RM)	Rank
1	Birla Sun Life Infrastructure Fund	23.38	8.24	15.14	5
2	BOI AXA Manufacturing & Infrastructure Fund	20.81	8.24	12.57	8
3	Canara Robe co Infra. Fund - Regular Plan	21.96	8.24	13.72	7
4	DSP Blackrock T.I.G.E.R. Fund - Regular Plan	20.79	8.24	12.55	9
5	Escorts Infrastructure Fund	17.77	8.24	9.53	19
6	Franklin Build India Fund	30.73	8.24	22.49	1
7	HDFC Infrastructure Fund	19.66	8.24	11.42	13
8	HSBC Infrastructure Equity Fund	22.57	8.24	14.33	6
9	ICICI Prudential Infra. Fund - Regular Plan	18.11	8.24	9.87	16
10	IDFC Infrastructure Fund- Regular Plan	20.31	8.24	12.07	11
11	Kotak Infrastructure and Economic Reform Fund - Standard Plan	25.65	8.24	17.41	3
12	L&T Infrastructure Fund	27.00	8.24	18.76	2
13	LIC Nomura MF Infrastructure Fund	15.95	8.24	7.71	21
14	Religare Invesco Infrastructure Fund	25.16	8.24	16.92	4
15	Sahara Infra. Fund - Fixed Pricing Option	17.97	8.24	9.73	18
16	Sahara Infra. Fund - Variable Pricing Option	19.86	8.24	11.62	12
17	SBI Infrastructure Fund	17.98	8.24	9.74	17
18	Sundaram Infra. Advantage Fund - Regular Plan	20.32	8.24	12.08	10
19	Reliance ETF Infra Bees	8.71	8.24	0.47	22
20	Tata Infrastructure Fund - Plan A	19.50	8.24	11.26	14
21	Taurus Infrastructure Fund - Regular Plan	19.22	8.24	10.98	15
22	UTI Infrastructure Fund	17.71	8.24	9.47	20

Source: - Own Calculation

Interpretation:-It has been observed that all schemes generate higher returns than the benchmark 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 on comparison with NSE CNX Infrastructure Index**.**

These schemes were those which had out-performed the market index. Thus, the investors of these schemes have been rewarded well on their invested money.

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*): *i.e.*, fund's volatility as regard market index measuring the extent of co-movement of fund with that of the benchmark index. It is a measure of volatility, or systematic risk of portfolio or security in comparison to the market as a whole. A beta of 1 indicates that the securities price will move with the market. A beta of less than one means that the security will be less volatile than the market. A beta of greater than 1 indicates that the security price will be more volatile than the market.

B) Standard Deviation (б) *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, it can be said that it evaluates the volatility of the fund. It is a measure of the consistency of a mutual fund's returns. A higher Standard Deviation number indicates that the Net Asset Value (NAV) of the mutual fund is more volatile and, it is riskier than a fund with a lower Standard Deviation.

C) Co-efficient of Determination or R-squared (*R2*): R-squared measures the relationship between a portfolio and its benchmark. R-squared is not a measure of the performance of a portfolio. A great portfolio can have a very low R-squared. It is simply a measure of the correlation of the portfolio's returns to the benchmark's returns *i.e.*, the extent to which the movement in the fund can be explained by corresponding benchmark index (here, NSE CNX Infrastructure)

Table 3 bestow Standard Deviation, Beta & R-Squared values of Selected Infrastructure Mutual Fund Schemes:-

SN	Scheme Name	Standard Deviation	Beta	R-Squared
1	Birla Sun Life Infrastructure Fund	30.4357	1.5879	0.9223
2	BOI AXA Manufacturing & Infrastructure Fund	28.0669	1.5962	0.9667
3	Canara Robe co Infrastructure Fund - Regular Plan	29.0505	1.2734	0.8201
4	DSP Blackrock T.I.G.E.R. Fund - Regular Plan	27.9451	1.5234	0.9315
5	Escorts Infrastructure Fund	30.1123	1.5269	0.9096
6	Franklin Build India Fund	34.8163	1.6714	0.8468

7	HDFC Infrastructure Fund	33.5293	1.7164	0.9031
8	HSBC Infrastructure Equity Fund	40.1481	2.0706	0.8767
9	ICICI Prudential Infrastructure Fund - Regular Plan	25.3818	1.3366	0.9233
10	IDFC Infrastructure Fund- Regular Plan	26.3538	1.5503	0.9704
11	Kotak Infrastructure and Economic Reform Fund - Standard Plan	32.8726	1.3583	0.7802
12	L&T Infrastructure Fund	30.1646	1.5223	0.9043
13	LIC Nomura MF Infrastructure Fund	24.5809	1.3465	0.9543
14	Religare Invesco Infrastructure Fund	35.1095	1.5405	0.8248
15	Sahara Infrastructure Fund - Fixed Pricing Option	22.9973	1.3528	0.8909
16	Sahara Infrastructure Fund - Variable Pricing Option	23.3966	1.3763	0.8936
17	SBI Infrastructure Fund	23.1071	1.2347	0.9064
18	Sundaram Infrastructure Advantage Fund - Regular Plan	30.3768	1.4703	0.9033
19	Reliance ETF Infra Bees	16.8865	0.9934	0.9999
20	Tata Infrastructure Fund - Plan A	28.4822	1.4951	0.9006
21	Taurus Infrastructure Fund - Regular Plan	27.68	1.4418	0.9204
22	UTI Infrastructure Fund	28.085	1.5114	0.9040

Source: - Own Calculation

Interpretation: - Table 3 shows the Standard Deviation, Systematic Risk (Beta) and R-squared 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. 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.

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.

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:-

Infrastructure development is critical for economic development. It has a domino effect on the other sectors of the economy .A developing country like India has to invest in the infrastructure sector for future growth. The push of the present government in improving infrastructure is thus a step in the right direction. In India Infrastructure typically includes projects done in a host of sectors. It includes sectors like roads, railways, airports, ports, dams, electricity, irrigation, telecom, water supply, sanitation systems, cross country systems and inland waterways etc.

The government cannot meet the needs of this diverse sector alone. The critical element thus is engaging the private sector in the improvement of infrastructure, as the government spending alone will not be enough to meet India's diverse infrastructure challenges. It requires funds in the form of investment from public also.
Infrastructure base Mutual Funds provide a superior investment option for the investors who want to invest in infrastructure companies, at the same time these funds invest in diversified Infrastructure companies also with a motto to provide healthier return to the investors along with spreading the risk of investors.
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 has found that the Average rate of return of all Thematic Infrastructure Mutual Fund Schemes are higher when compared to its Benchmark i.e. NSE CNX Infrastructure. But amongst the top are again Franklin Build India Fund, L&T Infrastructure Fund, Plan, Kotak Infrastructure and Economic Reform Fund - Standard Plan. These schemes were those which had beaten the Benchmark index. Thus, these schemes are a better investment avenue to invest with.

c) 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.

d) 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.

10. Suggestions:-

a) Scheme such as Franklin Build India Fund has high average return of 30.73% and high risk of 34.81 and this type of funds is suitable for aggressive investors i.e., youths and also high income group of people. Hence, these investors can make their investment in such scheme whereas Reliance ETF Infra Bees fund is suitable for conservative investors because it gives lower return with lower risk.

b) HSBC Infrastructure Equity Fund, Religare Invesco Infrastructure Fund and Franklin Build India Fund have high Standard Deviation and Beta values indicate that these schemes are more volatile and risky at the same time. So, it has been suggested to Investors that before investing in any scheme, apart from analysing performance of scheme they have to give their attention on Risk measure i.e. analyse risk through measuring Standard Deviation & Beta of the scheme.

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