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ANALYSING THE PERFORMANCE OF INFRASTRUCTURE EQUITY FUNDS: AN EMPIRICAL STUDY IN THE INDIAN CONTEXT

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Abstract

Indian mutual fund industry has become one of the fastest growing sectors. Thematic funds deal with a particular theme and not a specific sector. Infrastructure equity theme funds have been around for a while in the Indian markets. The main objectives of the study are: (a) to observe the portfolio characteristics of the chosen funds; and (b) to examine the performance of the chosen funds in terms of risk-return parameters. The study is based on secondary data. The period of study is from September 2008 to September 2015. Here, nine funds which are in existence for more than seven years and have net assets of more than INR 150 crore as on 30th September, 2015 are selected. It is found that the chosen funds were heavily inclined towards equity. All the funds were defensive and outperformed the benchmark during the entire study period in terms of risk-adjusted return. Funds were adequately diversified. Further, fund managers had superior stock-picking skills.

Key Words: *Benchmark, Mutual Fund, Risk-Return Parameters, Thematic Funds*

JEL Code: *G11, G23*

1. Introduction and Background

In Indian financial market, mutual fund industry has become one of the fastest growing sectors. Mutual funds mobilise savings from the small Indian investors. The industry has witnessed several ups and downs in its journey, which enable it to absorb the shocks and build a strong foundation for further progress. In India, mutual fund industry has passed through several phases. From a single player monopoly in the form of UTI in 1964 the industry has come a long way to become a multi-player competitive one. It is observed that the quantitative growth of Indian mutual fund industry has been phenomenal since liberalisation in the early 1990s. Private sector mutual funds are ahead of their public counterparts with respect to Assets under Management (AUM).

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Thematic funds deal with a particular theme and not a specific sector. For instance, an infrastructure thematic fund invests in companies doing business with construction projects, steel, cement, and the like. Thematic funds are broader than sector funds, and thus offer more diversification than sector fund.

Infrastructure equity theme funds have been around for a while in the Indian markets. The theme gained momentum in the heydays of year 2006 and 2007, when these funds were delivering high-flying returns. Seeing these returns, investors drove in flocks to these funds, and mutual fund companies also capitalized on the frenzy by launching a number of these funds in 2007 and early 2008. The total assets managed by these funds stood at just around Rs. 5,000 crores at the end of 2006, and grew to almost Rs. 19,000 crores at the end of March 2008. However, as the financial crisis set in, the total assets of infrastructure funds fell sharply to Rs. 10,000 crores in late 2008 (Chatterji, 2013). Thereafter, these funds witnessed a continuous downside over the years. AUM of the funds has been consistently declining and the confidence of the investors has been shattered.

2. Review of Literature

There is no dearth of literature on different aspects of mutual fund. So far as performance analysis of mutual funds is concerned, the lion's share of literature concentrates on diversified equity fund. In the Indian context, there is real paucity of literature on infrastructure funds. Nevertheless, a brief review of related literature is presented below.

Abraham (2007) noticed that ICICI Prudential Infrastructure Fund outperformed the benchmark and the category as well over various time horizons because of smart stock picking. However, according to the author, the fund should not form part of one's core portfolio. But the fund is definitely in contention if one wants to add zing to one's bag. Kohli (2007) observed that DSPBR TIGER Fund performed better than other infrastructure funds and diversified funds as well. The rolling returns over the past two years of the fund were also found to be consistent. Kishore (2009) opined that investors with an eye on the infrastructure sector can look at Sundaram BNP Paribas Capex Opportunities Fund (now Sundaram Infrastructure Advantage Fund with effect from April 2014) as a second line of investment because of good performance of the fund. However, he also stated that thematic funds can deliver high returns though such funds come with high risk as well. As such, he suggested investors to venture into such funds only if they can handle volatility in their portfolio. Money Life Digital Team (2011) was surprised to see sugar and banking stocks in the portfolio of many infrastructure funds. The team observed that infrastructure funds have major holdings in Bharti Airtel, ICICI Bank, Reliance Industries and ONGC. Rego (2012) opined that it could be a herculean task for a novice investor to assess the right theme. Accordingly, it is best that they should stick to diversified equity mutual funds. Further, theme based funds should not be a part of one's core portfolio, the exposure should be categorically limited to 10% - 12% and one should add themes which complement the existing portfolio. Fernand (2014) opined that infrastructure funds did enjoy great times prior to 2008, but from 2008 the funds began to falter as their performance coincided with the down cycle in most sectors of the infrastructure segment. According to her, having a restrictive investment universe can be very rewarding at times, but also very risky given the cyclical nature of stocks in the portfolio. Her suggestion to investors was to stick to equity diversified funds and to ensure that such a fund does not form a core holding in one's portfolio. Ward (2014) cautioned investors that they should approach these funds with care because these funds can differ widely in strategy. Moreover, the stocks that such funds buy may also appear in other types of mutual funds and ETFs, raising questions about whether investors need dedicated infrastructure funds. Suresh (2014) asked investors to invest in infrastructure mutual funds because he felt that the new Union Government has top priority on infrastructure development which would provide enormous opportunities to companies engaged in infrastructure directly or indirectly. However, instead of lump sum investing, he suggested investors to invest in such funds through SIP mode. Adajania (2014) stated that sectoral and thematic funds are the riskiest of all mutual fund schemes. A sector fund is riskier than a thematic fund because the former's performance depends on the fortunes of just one to three sectors. Thematic fund is less risky comparatively as its fortune is dependent on many sectors. Chopra (2015) suggested that if someone wants to invest Rs 25000 per month, then he should divide this amount in five different SIPs and invest in five different funds. In these five funds, two should be of large cap shares, one should be of flexible cap, one from mid-cap and another should be infrastructure fund or any thematic fund. Singh (2015) was of the opinion that pure infrastructure fund should stick to sectors like capital goods, engineering, roads, shipping and power. The fund's benchmark will also give an indication of its nature. He stated that this sector can suffer a prolonged downturn, as has been witnessed over the past five years. In view of the risks, newcomers, conservative investors and small investors should avoid these funds and stick to diversified funds. Only seasoned investors, who already have a well-diversified portfolio, should invest in infrastructure funds.

3. Research Question

The present study addresses the following research questions:

(1) How are the portfolio characteristics of the funds?

(2) Do the funds outperform the benchmark in terms of risk-adjusted return?

(3) Are the funds aggressive / defensive with respect to the benchmark?

(4) How is the extent of diversification?

(5) Do fund managers have superior stock picking ability?

(6) How is the overall performance of the chosen infrastructure funds in India?

4. Objective of the Study

The main objectives of the study are (a) To observe the portfolio characteristics of the chosen funds; and (b) To examine the performance of the chosen funds in terms of risk-return parameters.

5. Data Source and Research Methodology

The study is based on secondary data which have been obtained from articles, books, magazines, and web materials. The period of study is from September 2008 to September 2015. Here, the criterion is to select such funds which are in existence for more than seven years and have AUM of more than INR 150 crore as on 30th September, 2015. Nine (9) funds satisfy the above norm. Accordingly, all of them are taken into consideration for the purpose of the study. "Growth" option of the chosen funds has been considered, and not the "dividend" option. The impact of entry load, exit load, brokerage, taxes, and inflation has not been taken into consideration. The month-end NAVs of the funds have been obtained from the official website of the AMCs and from bluechipindia.co.in. CNX Infrastructure has been chosen as the benchmark index. The month-end closing values of the benchmark have been obtained from the official websites of National Stock Exchange (NSE). The monthly returns of the funds (Rp) and that of the benchmark (Rb) have been computed as follows:

$$\mathbf{R_p = [(NAV_t - NAV_{t-1}) / NAV_{t-1}] *100}$$

$$\mathbf{R_b = [(Value_t - Value_{t-1}) / Value_{t-1}] *100}$$

Where, NAV_t = Closing NAV of the fund for month t, NAV_{t-1} = Closing NAV of the fund for the preceding month (t-1), Valuet = Closing Value of the Benchmark Index for month t, $Value_{t-1}$ = Closing Value of the Benchmark Index for the preceding month (t-1).

Averages of R_p and R_b are taken and annualised. Similarly, annualised Standard Deviation of the schemes (SD_p) and benchmark (SD_b) have been computed to measure total risk. Compounded Annual Growth Rate of the funds (CAGRp) and that of the Benchmark ($CAGR_b$) have been computed in the following way:

$$CAGRp = [(\text{Closing NAV} / \text{Opening NAV})^{(1 / \text{Number of years})} - 1] * 100$$

$$CAGRb = [(\text{Closing benchmark value} / \text{Opening benchmark value})^{(1 / \text{Number of years})} - 1] * 100$$

The average annualised risk-free rate is taken as 8.7% for the purpose of the study. It is the rate offered by Public Provident Fund (PPF) during the Financial Year 2015-16. Measures like Sharpe Ratio, R-squared (R^2), beta, and Jensen alpha have also been applied. For measuring the consistency in performance of the funds, the entire period of study has been broken down into different time periods of 1-year, 3-year, 5-year, and 7-year.

Further, the chosen funds are ranked under 5 (five) performance measures, namely, CAGR, annualized standard deviation, Sharpe Ratio, RSQ (R^2), and Jensen alpha, for 4 (four) different time periods of 1-year, 3-year, 5-year, and 7-year in order to have a clear understanding of consistency in overall performance of the funds. As such, we have 20 parameters (5 measures for 4 time periods = 5 * 4 = 20) for analysing the performance of the chosen funds. Funds are ranked according to their performance and the fund having the highest value under a measure is ranked 1, except under standard deviation, in which case the fund having the least value is ranked 1. Fund rankings under different measures are added to arrive at the total rank score of the funds and then average of total rank score has been taken. Finally, the fund with the lowest average rank score is ranked 1 and so on.

6. Results and Discussion

Portfolio characteristics of the chosen funds are presented in Table l, Table 2, and Table3.

Table 1: Portfolio Snapshot

Fund/Scheme	Launch Date	Net Assets* (in Rs. Crore)	Equity* (%)	Debt* (%)	Cash* (%)
Birla Sun Life Infrastructure Fund (BSLIF)	February 2006	700.3	98.39	1.18	0.42
DSP BlackRock T.I.G.E.R. Fund (DSPBRTF)	May 2004	1491.1	96.26	0.01	3.73
HDFC Infrastructure Fund (HDFCIF)	February 2008	1647.6	98.99	1.14	-0.13
ICICI Prudential Infrastructure Fund (ICICIPIF)	August 2005	1494.6	96.11	5.69	-1.80
L & T Infrastructure Fund (LTIF)	September 2007	198.8	97.05	0.04	2.91
SBI Infrastructure Fund (SBIIF)	June 2007	492.7	97.14	3.55	-0.69
Sundaram Infrastructure Advantage Fund (SIAF)	September 2005	652.1	98.30	0.18	1.52
Tata Infrastructure Fund (TIF)	December 2004	666.1	97.81	0	2.19
UTI Infrastructure Fund (UTIIF)	April 2004	1367.4	98.55	0.80	0.65

Source: valueresearchonline.com *as on 30th September 2015

It is observed from Table 1 that all the funds were tilted heavily towards equity. Exposure to equity component was more than 96% in all the funds. Debt component was negligible. ICICIPIF was the only fund having exposure to debt in excess of 5%. Cash component was also negligible.

Table 2 incorporates the top 5 stock holdings of the chosen funds.

Table 2: Top 5 Stock Holdings

Fund	Stock Holding (%)*				
	1	2	3	4	5
BSLIF	Cummins India (7.07)	L&T (6.24)	HDFC Bank (5.80)	Wabco India (5.00)	ICICI Bank (3.67)
DSPBRTF	HDFC Bank (8.30)	L&T (5.32)	BPCL (5.29)	ICICI Bank (4.97)	Ashoka Buildcon (3.80)
HDFCIF	SBI (8.26)	L&T (6.63)	ICICI Bank (5.91)	Bank of Baroda (5.07)	Infosys (4.63)
ICICIPIF	L&T (7.09)	SBI (6.77)	ICICI Bank (5.70)	Power Grid (5.69)	Cummins India (4.73)
LTIF	L&T (4.82)	Navkar Corporation (4.63)	Power Grid (4.39)	Techno Electric & Engineering (4.33)	Grasim Industries (3.68)
SBIIF	Bharti Airtel (7.56)	ITD Cementation (6.95)	L&T (6.46)	Power Grid (4.96)	Techno Electric & Engineering (4.91)
SIAF	L&T (6.07)	Indraprastha Gas (4.98)	Honeywell Automation (4.81)	Alstom T & D (4.50)	Cummins India (4.20)
TIF	Sadbhav Engineering (5.95)	HDFC Bank (5.34)	Axis Bank (4.46)	Ultratech Cement (4.02)	Cummins India (3.95)
UTIIF	Axis Bank (7.05)	Shree Cement (7.04)	SBI (6.26)	Cummins India (6.21)	L&T (6.18)

Source: valueresearchonline.com *as on 30th September 2015

It is revealed from Table 2 that the share of the top 5 holding varied between 21.85% (LTIF) and 32.74% (UTIIF). L&T is the only stock which found place in the top 5 holding of most of the funds (8 out of 9). Cummins India is another prominent stock in the top 5 holding of the funds (5 out of 9). It is also observed that no stock accounted for more than 10% in top 5 holding in the chosen funds.

Break-up of top 5 sector component is depicted in Table 3.

Table 3: Break-up of Top 5 Sector Component

Fund	Sector Holding (%)*				
	1	2	3	4	5
BSLIF	Financial (26.71)	Engineering (24.17)	Construction (16.14)	Automobile (9.25)	Energy (9.09)
DSPBRTF	Construction (26.32)	Financial (26.09)	Energy (12.94)	Engineering (11.00)	Services (8.03)
HDFCIF	Financial (23.58)	Engineering (21.56)	Construction (20.68)	Diversified (8.45)	Automobile (6.88)
ICICIPIF	Construction (22.19)	Engineering (19.47)	Energy (16.06)	Financial (14.37)	Diversified (7.09)
LTIF	Construction (27.01)	Services (18.59)	Engineering (18.54)	Diversified (8.50)	Energy (6.02)
SBIIF	Construction (30.06)	Energy (13.09)	Engineering (12.52)	Communication (11.21)	Services (11.03)
SIAF	Engineering (31.25)	Financial (19.57)	Construction (16.50)	Services (9.07)	Diversified (8.27)
TIF	Construction (35.78)	Engineering (21.71)	Financial (16.43)	Chemicals (7.68)	Services (5.32)
UTIIF	Construction (25.69)	Financial (23.75)	Engineering (21.30)	Diversified (6.18)	Services (5.59)

Source: valueresearchonline.com *as on 30th September 2015

It appears that top 5 sector accounted for more than 77% in the chosen funds. Exposure to the most favourite sector was more than 22% in all the funds. Construction and engineering sectors were the common sectors in the top 5 sector holding of all the funds. Financial sector found place in the top 5 sector holding of 8 out of 9 funds, the exception being SBIIF. Construction sector remained the most preferred sector in 6 out of 9 funds.

CAGR of the benchmark index and the chosen funds are shown in Table 4.

Table 4: CAGR (%)

Benchmark & Fund	1-yr	3-yr	5-yr	7-yr	Rank			
					1-yr	3-yr	5-yr	7-yr
Benchmark	**-6.48**	**3.80**	**-5.35**	**-1.69**				
BSLIF	9.35	17.86	5.65	12.45	5	1	1	1
DSPBRTF	12.77	15.86	5.04	11.20	2	3	2	2
HDFCIF	1.88	12.82	2.27	10.37	9	5	5	3
ICICIPIF	6.05	14.11	4.00	8.52	8	4	4	4
LTIF	10.71	17.72	4.80	5.79	4	2	3	7
SBIIF	6.51	9.44	-0.95	4.34	7	9	8	9
SIAF	11.37	10.15	-1.79	5.71	3	8	9	8
TIF	14.26	12.01	1.80	7.48	1	7	6	5
UTIIF	7.78	12.36	1.71	6.06	6	6	7	6
AVERAGE	8.96	13.59	2.50	7.99				
MAXIMUM	14.26	17.86	5.65	12.45				
MINIMUM	1.88	9.44	-1.79	4.34				

Source: Computed by the Researchers

Table 4 depicts that all the funds outperformed the benchmark index during the entire period of study in terms of CAGR. BSLIF remained the best performing fund in 3-year, 5-year, and 7-year period; while TIF stood first in 1-year CAGR. SBIIF remained the worst performer in 3-year and 7-year period. In 1-year period, HDFCIF was the worst performing fund; whereas SIAF remained the worst performer in 5-year period. Further, in 1-year, 3-year, and 7-year period all the funds exhibited positive CAGR. Only two funds (SBIIF and SIAF) generated negative CAGR during 5-year period. The performance of the benchmark was pathetic in the sense that it exhibited negative CAGR during1-year, 5-year, and 7-year period.

The total risk, expressed in terms of standard deviation, is presented in Table 5 below. It is revealed from the table that all the funds outperformed the benchmark index during 1-year period in terms of total risk. Eight (8) funds outperformed the benchmark in 3-year and 5-year period, the exception being HDFCIF. But in 7-year period, three (3) funds (HDFCIF, LTIF, and SIAF) underperformed the benchmark. Amongst the funds, HDFCIF remained the worst performing fund during the entire study period. TIF was the best performer in 3-year and 5-year period; ICICIPIF in 7-year period, and SBIIF in 1-year period.

Table 5: Annualised Standard Deviation

Benchmark & Fund	1-yr	3-yr	5-yr	7-yr	Rank			
Benchmark	**18.97**	**24.55**	**25.98**	**30.25**	**1-yr**	**3-yr**	**5-yr**	**7-yr**
BSLIF	14.31	22.36	23.04	29.50	2	4	5	6
DSPBRTF	14.39	22.96	23.28	27.32	3	5	7	4
HDFCIF	15.49	26.81	27.14	31.29	9	9	9	9
ICICIPIF	14.76	21.86	21.73	25.17	6	3	2	1
LTIF	14.79	23.36	23.24	31.25	7	8	6	8
SBIIF	12.65	23.08	22.40	28.15	1	6	3	5
SIAF	14.81	21.31	22.46	31.09	8	2	4	7
TIF	14.45	20.64	21.43	26.81	4	1	1	3
UTIIF	14.65	23.22	23.95	26.24	5	7	8	2
AVERAGE	14.48	22.84	23.19	28.54				
MAXIMUM	15.49	26.81	27.14	31.29				
MINIMUM	12.65	20.64	21.43	25.17				

Source: Computed by the Researchers

Sharpe Ratio (SR) measures the fund's additional return over and above the risk-free return and the total risk of the fund, measured in terms of SD. It is expressed as: **SRp= (Rp –R_f) / SDp** where, SRp = Sharpe Ratio of the fund, Rp = CAGR of the fund, Rf = Average annualised risk-free return, SDp = Annualised Standard Deviation of the fund. Similarly, the Sharpe Ratio of a benchmark (SR_b) is expressed as: **SRb= (Rb - R_f) / SD_b** where, SR_b = Sharpe Ratio of the benchmark, R_b = CAGR of the benchmark, Rf = Average annualised risk-free return, SD_b = Annualised Standard Deviation of the benchmark. The higher the Sharpe ratio, the better is a fund's risk-adjusted performance.

Table 6 below depicts the Sharpe Ratio of the chosen funds. It shows that all the funds outperformed the benchmark index during the entire period of study in terms of risk-adjusted return. BSLIF stood out as the best performer in 3-year, 5-year, and 7-year period; while TIF stood first in 1-year period. SBIIF remained the worst performer in 3-year and 7-year period. In 1-year period, HDFCIF was the worst performing fund; whereas SIAF remained the worst performer in 5-year period. Benchmark index exhibited a very poor performance in the sense that it was not successful in generating positive Sharpe Ratio during the entire period of study, which implies that it underperformed the risk-free rate of return throughout the study period. All the funds exhibited positive Sharpe Ratio in 3-year period. But in 5- year period, all the funds exhibited negative Sharpe Ratio. Five (5) funds (BSLIF, DCPBRIF, LTIF, SIAF, and TIF) had positive Sharpe Ratio in 1-year period; whereas only three (3) funds (BSLIF,

Table 6: Sharpe Ratio

Benchmark & Fund	1-yr	3-yr	5-yr	7-yr	Rank			
Benchmark	**-0.8001**	**-0.1995**	**-0.5408**	**-0.3435**	**1-yr**	**3-yr**	**5-yr**	**7-yr**
BSLIF	0.0453	0.4095	-0.1326	0.1271	5	1	1	1
DSPBRTF	0.2828	0.3117	-0.1570	0.0916	2	3	2	2
HDFCIF	-0.4403	0.1538	-0.2370	0.0533	9	7	5	3
ICICIPIF	-0.1798	0.2477	-0.2162	-0.0072	8	4	4	4
LTIF	0.1359	0.3860	-0.1680	-0.0931	4	2	3	6
SBIIF	-0.1733	0.0320	-0.4310	-0.1548	7	9	8	9
SIAF	0.1805	0.0682	-0.4673	-0.0961	3	8	9	7
TIF	0.3849	0.1604	-0.3221	-0.0453	1	5	7	5
UTIIF	-0.0626	0.1574	-0.2917	-0.1008	6	6	6	8
AVERAGE	0.0193	0.2141	-0.2692	-0.0250				
MAXIMUM	0.3849	0.4095	-0.1326	0.1271				
MINIMUM	-0.4403	0.0320	-0.4673	-0.1548				

Source: Computed by the Researchers

DCPBRIF, and HDFCIF) had positive Sharpe Ratio in 7-year period. Only two (2) funds (BSLIF, and DCPBRIF) exhibited positive Sharpe Ratio in 3 out of 4 periods, barring the 5-year period.

Beta measures the systematic risk associated with the fund. Beta > 1 signifies that the fund return is more volatile than the benchmark return. As such, the fund is said to be aggressive in relation to the benchmark. If Beta = 1, then volatility in fund return is identical with volatility in benchmark return. Further, 0 < Beta < 1 implies that fund return is positively associated with the benchmark return but it is less volatile than benchmark return. Here, the fund is treated as defensive or conservative in relation to the benchmark. The extent of diversification which reduces the degree of unsystematic risk is measured by RSQ. There exists an inverse relationship between the degree of diversification and the degree of unsystematic risk. The value of RSQ ranges between 0 and 1. It can never be negative. RSQ value of 1 implies completely diversified portfolio having zero unsystematic risk. On the other extreme, RSQ = 0 implies complete absence of diversification.

Table 7 below exhibits beta value of the funds. It reveals that all the chosen funds were defensive during the entire study period. Further, during 1-year period, all the funds remained more defensive in comparison to other periods. HDFCIF had the highest beta value in 3-year and 5-year period. ICICIPIF had the highest beta value in 1-year period; while LTIF had the highest beta value in 7-year period. SBIIF generated the lowest beta value in 1-year period,

Table 7: Beta Value of the Funds

Fund	1-yr	3-yr	5-yr	7-yr
BSLIF	0.5942	0.8254	0.8158	0.9145
DSPBRTF	0.5595	0.8518	0.8350	0.8562
HDFCIF	0.6187	0.9616	0.9452	0.9521
ICICIPIF	0.6721	0.8285	0.7867	0.7877
LTIF	0.6295	0.8589	0.8202	0.9650
SBIIF	0.5340	0.8749	0.8066	0.8794
SIAF	0.6176	0.7498	0.7703	0.9089
TIF	0.5572	0.7587	0.7637	0.8313
UTIIF	0.6470	0.8803	0.8747	0.8276
AVERAGE	0.6033	0.8433	0.8242	0.8803
MAXIMUM	0.6721	0.9616	0.9452	0.9650
MINIMUM	0.5340	0.7498	0.7637	0.7877

Source: Computed by the Researchers

SIAF in 3-year period, TIF in 5-year period, and ICICIPIF in 7-year period.

Table 8 incorporate data about R-squared (RSQ).

Table 8: RSQ (R^2) Value of the Funds

Fund	1-yr	3-yr	5-yr	7-yr	Rank			
					1-yr	3-yr	5-yr	7-yr
BSLIF	0.6204	0.8217	0.8466	0.8798	6	5	6	6
DSPBRTF	0.5444	0.8297	0.8682	0.8987	8	4	4	2
HDFCIF	0.5740	0.7751	0.8190	0.8472	7	8	8	8
ICICIPIF	0.7464	0.8658	0.8850	0.8968	1	3	2	3
LTIF	0.6519	0.8149	0.8410	0.8727	3	6	7	7
SBIIF	0.6415	0.8663	0.8757	0.8932	4	2	3	4
SIAF	0.6263	0.7463	0.7941	0.7824	5	9	9	9
TIF	0.5349	0.8145	0.8576	0.8801	9	7	5	5
UTIIF	0.7025	0.8665	0.9005	0.9106	2	1	1	1
AVERAGE	0.6269	0.8223	0.8542	0.8735				
MAXIMUM	0.7464	0.8665	0.9005	0.9106				
MINIMUM	0.5349	0.7463	0.7941	0.7824				

Source: Computed by the Researchers

It is clear from Table 8 that average RSQ value increased with time. All the funds had RSQ value in excess of 0.74 in 3-year, 5-year, and 7-year period. It implies that fund managers were successful in minimising the unsystematic risk to a great extent. In other words, it can be said that the chosen funds were adequately diversified. ICICIPIF was the only fund which exhibited RSQ value in excess of 0.74 in all the periods. UTIIF remained the best performer in 3-year, 5-year, and 7-year period; whereas it stood second in 1-year period just behind ICICIPIF.

Jensen Alpha is expressed as: Alpha = Rp - [R_f + Beta * (R_b – R_f)]

Where, Alpha = Differential return earned by the fund out of the ability of the fund manager in selecting correct stocks; Beta= Systematic risk of the fund.

This measure recognises the efficiency of the fund manager in superior stock picking. A positive alpha value signifies positive stock selection ability on the part of the fund manager; and a negative alpha value suggests poor stock picking by the fund manager. Alpha values of the chosen funds are presented in Table 9.

Table 9: Alpha of the Funds

Fund	1-yr	3-yr	5-yr	7-yr	Rank			
					1-yr	3-yr	5-yr	7-yr
BSLIF	1.0742	1.1199	0.8238	1.1188	5	1	1	1
DSPBRTF	1.3194	0.9733	0.7836	0.9969	2	3	2	2
HDFCIF	0.5061	0.7680	0.6585	0.9957	9	5	5	3
ICICIPIF	0.8549	0.8365	0.6622	0.7638	7	4	4	4
LTIF	1.1992	1.1082	0.7596	0.6654	4	2	3	6
SBIIF	0.8114	0.4807	0.2706	0.4698	8	9	8	9
SIAF	1.2435	0.5790	0.1978	0.6150	3	8	9	7
TIF	1.4299	0.7010	0.4760	0.7007	1	7	7	5
UTIIF	0.9790	0.7049	0.5347	0.5775	6	6	6	8
AVERAGE	1.0464	0.8079	0.5741	0.7671				
MAXIMUM	1.4299	1.1199	0.8238	1.1188				
MINIMUM	0.5061	0.4807	0.1978	0.4698				

Source: Computed by the Researchers

It is observed that all the funds generated positive alpha values during the entire period of study. It indicates that funds managers had superior stock-picking skills. BSLIF remained the best performing fund in 3-year, 5-year, and 7-year period; while TIF stood first in 1-year period. SBIIF remained the worst performer in 3-year and 7-year period. In 1-year period, HDFCIF was the worst performing fund; whereas SIAF remained the worst performer in 5-year period in terms of alpha value.

Table 10 shows the overall ranking of the funds on the basis of 20 parameters.

Table 10: Overall Ranking of Funds

Fund	Sum of Ranks	Average Sum of Ranks	Final Rank
(1)	**(2)**	**(3) [(2) / 20]**	**(4)**
Birla Sun Life Infrastructure Fund (BSLIF)	64	3.20	1
DSP BlackRock T.I.G.E.R. Fund (DSPBRTF)	64	3.20	1
ICICI Prudential Infrastructure Fund (ICICIPIF)	80	4.00	3
Tata Infrastructure Fund (TIF)	92	4.60	4
L & T Infrastructure Fund (LTIF)	98	4.90	5
UTI Infrastructure Fund (UTIIF)	104	5.20	6
SBI Infrastructure Fund (SBIIF)	128	6.40	7
HDFC Infrastructure Fund (HDFCIF)	135	6.75	8
Sundaram Infrastructure Advantage Fund (SIAF)	135	6.75	8

Source: Computed by the Researchers

Table 10 reveals that BSLIF and DSPBRIF jointly stood out as the best performing funds on the basis of overall performance. At the same time, HDFCIF and SIAF were the two lowest ranked funds.

7. Conclusion

Based on research questions, the findings can be summed up as follows:

1) Funds were heavily inclined towards equity (Table 1). L&T was the most preferred stock in the top 5 stock holding of most funds (Table 2). Construction sector found place in the top 5 sector holding of all the funds (Table 3).

2) All the funds outperformed the benchmark index during the entire period of study in terms of risk-adjusted return (Table 6).

3) All the funds remained conservative or defensive (having beta value less than 1) during the entire period of study (Table 7).

4) The fund managers were able to reduce the unsystematic risk to a great extent. As such, it can be said that the chosen funds were adequately diversified (Table 8).

5) All the funds generated positive alpha values during the entire period of study. It indicates that funds managers had superior stock-picking skills (Table 9).

6) BSLIF and DSPBRIF were the best performing funds on the basis of overall performance. On the other hand, HDFCIF and SIAF were the two lowest ranked funds (Table 10).

8. Significance of the Study

The present study has its own significance. The findings of the study should provide a platform for understanding the performance of the chosen infrastructure theme equity funds of different AMCs. Such an analysis will help the stakeholders associated with mutual fund industry in India to arrive at decisions.

9. Limitations of the Study

Like other studies, this study is not free from limitations. Some of the limitations are mentioned below.

(1) The period of study involves one year, three year, five year, and seven year time frame ending on 30th September, 2015 while many funds have been in existence for much more than the chosen time frame.

(2) Mergers and Acquisitions (M&A) between the schemes and the same between the fund houses are not taken into consideration.

(3) The effect of change in fund managers is not considered.

(4) The impact of entry load, exit load, brokerage, taxes, and inflation has not been taken into consideration.

10. Scope for Further Research

Due to time and resource constraints, many aspects of performance analysis of mutual funds could not be looked into elaborately. So, further research in the following areas could be considered as an extension of the present study.

- A study can be undertaken to investigate the effect of capital market scams on mutual fund investors.
- Research can be carried out on investor's perception towards investment in infrastructure equity funds.
- An in-depth analysis can be made on the impact of expense ratio on fund performance.
- A detailed study on investor behaviour and portfolio preference in metro/urban/semi-urban / rural area can be an area of research.
- Research may be carried out in the area of performance analysis of sector-specific funds in India.
- A study can be undertaken to compare the performance of diversified equity funds and infrastructure equity funds in the Indian context.

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