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EVALUATION OF THE PERFORMANCE OF SELECTED THEMATIC FUNDS OF INDIA DURING AND AFTER THE PANDEMIC

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Abstract

This paper aims to ascertain how some of the selected top-rated thematic funds of India have performed during and after the outbreak of the COVID-19 pandemic i.e., over the period of last two years. It also aims to evaluate the performance of these funds against the market benchmark. In this paper, the performance of the selected mutual fund schemes has been evaluated using different tools such as CAGR, Beta, R-Squared, Alpha, Sharpe Ratio, Treynor Ratio and Sortino Ratio. Further, the funds have been ranked based on these measures.

Keywords: Mutual Funds, thematic funds, covid 19, performance evaluation, pandemic, risk-return analysis, Sharpe, Treynor, Sortino, Alpha.

INTRODUCTION

A mutual fund is a mechanism where money is pooled by issuing units to the investors and the money so pooled is invested in the securities in accordance with objectives as disclosed in the offer document. Investments in securities are spread across a wide cross-section of industries and sectors and thus the risk is diversified because all stocks may not move in the same direction in the same proportion at the same time. Mutual funds issue units to the investors in accordance with the quantum of money invested by them. Investors of mutual funds are known as unitholders. The profits or losses are shared by investors in proportion to their investments.

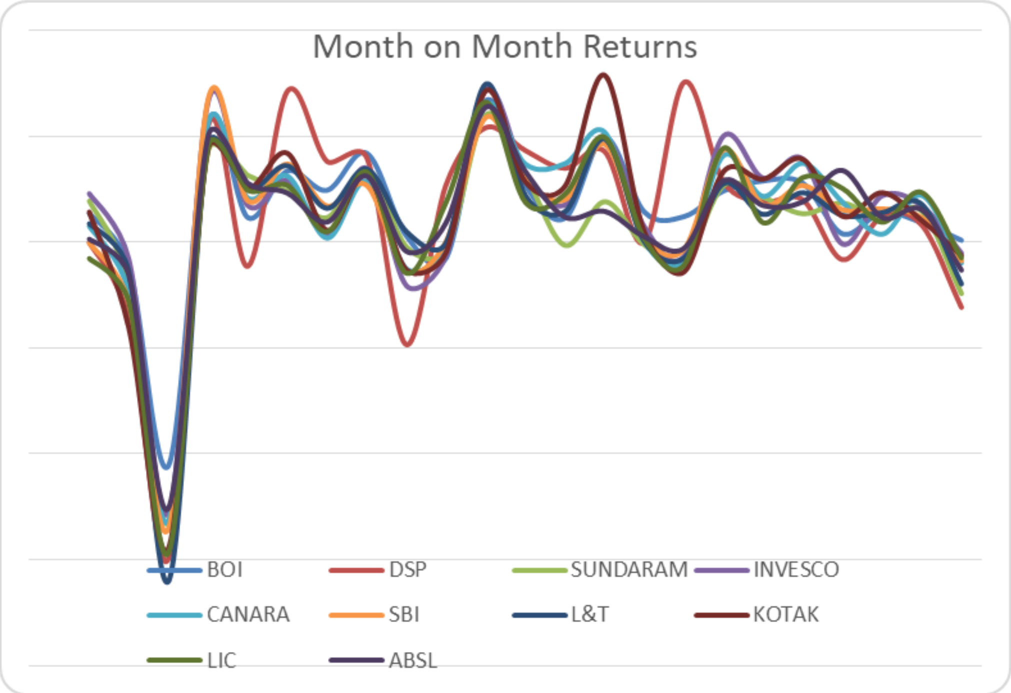
THEMATIC MUTUAL FUNDS

Thematic Mutual Funds are the investment vehicles that invest the funds raised from the investors into the companies which are associated with a particular well-defined theme such as infrastructure, green energy, chemical, banking, agriculture, rural consumption, mobility etc.

COVID AND MUTUAL FUND INDUSTRY

The mutual fund industry had been badly hit by the Covid-19 pandemic in the initial days as the country had come to standstill due to the nationwide curfews and lockdowns imposed by Central and State Governments which had, in turn, impacted the industry and the overall stock market. But this phase did not last too long as a Vshaped recovery was observed with the unprecedented bull run across the market fuelled by economic packages, foreign direct investments and optimistic outlook of the retails as well institutional investors.

The thematic funds were also seen doing pretty badly during the covid outbreak but have recovered since then and have been providing good returns on year on year basis.



The above graph shows that the thematic funds selected for the study had given returns as low as -32% on Month on Month basis during the nascent stages of the COVID-19 pandemic but due to the high liquidity ever since the returns have been climbing steadily with minor hiccups and jolts due to the second and third wave of the pandemic which is also visible as the returns have been falling on Month on Month basis since 1st November 2021. But overall the performance of these funds has been acceptable.

LITERATURE REVIEW

Treynor (1965) developed a methodology for performance evaluation of a mutual fund that is referred to as a reward to volatility measure, which is defined as the average excess return on the portfolio. This model has been used in detail later in the study to evaluate the performance. **Sharpe (1966)** in his pioneering work on the performance evaluation of mutual funds developed a composite measure to consider risk and return. The study measured the performance of 34 open-ended mutual funds for the study period 1944-63.

Jensen (1967) derived a risk-adjusted measure of portfolio performance (Jensen's alpha) that estimates how much a manager's forecasting ability contributes to the fund's returns. **Gupta ET. al (2015)** in their paper titled "COMPARATIVE STUDY ON PERFORMANCE EVALUATION OF SECTORAL MUTUAL FUND SCHEMES OF INDIAN COMPANIES" evaluated the performance of sectoral funds belonging to different sectors using relative performance index, risk-return analysis, Treynor's ratio, Sharp's ratio, Sharp's measure, Jensen's measure, and Fama's measure and found out that results of performance measures suggest that most of the mutual fund have given positive return during the period of the study.

DHUME AND RAMESH (2011) in the paper "Performance Analysis of Indian Mutual Funds with a Special Reference to Sector Funds" evaluated the performance of open-ended equity sector mutual funds using five approaches of performance measures viz, Sharpe Ratio, Treynor Ratio, Jensen's Measure, Information Ratio and M-squared measure. The sectors selected for the purpose of the study are the banking sector, FMCG sector, infrastructure sector, pharma sector & technology sector. All the schemes are selected from the respective sectors which were existing during the period of the study. The period adopted for the study is from 1s1April 2008 to 31st March 2011. **Sangisetti and Bondu (2020)** in their paper titled "Performance Evaluation of Mutual Funds before and during the Outbreak of Covid-19 Pandemic in India. (A Case Study Of Selected Companies)" performed a comparative performance analysis of the growth-oriented equity diversified schemes for 5 months prior to outbreak of Covid-19 and 5 months during Covid-19 on the basis of return and risk evaluation. The analysis was achieved by assessing various financial tests like Average Return, Sharpe Ratio, Treynor Ratio, Standard Deviation and Beta.

OBJECTIVES OF THE STUDY

- To evaluate the performance of sectoral funds during and after the COVID-19 pandemic with the help of performance evaluation models.
- To determine the risk-return relationship of funds belonging to different sectors in India.

RESEARCH METHODOLOGY

Source of Data: For this study, the data has been collected from different sources such as AMC websites, NSE website and other online sources such as Morningstar, valueresearch, moneycontrol, advisorkhoj and others.

Scope of Study: The mutual funds selected for the study are the top 10 funds from a total of 125 funds, having the best CRISIL rating.

Period of the Study: The monthly NAV of the mutual funds as well as the value of NIFTY have been taken on the first date of every month from Jan 2020 to December 2021.

PERFORMANCE MEASUREMENT TOOLS

Absolute Return: Average returns have been calculated based on the change in NAVs to evaluate the annual return as well as the risk of investment in different portfolios. $\mathbf{R_p = [NAV_t – NAV_{t-1}]/NAV_{t-1}}$

Standard Deviation (Total Risk Measure): To calculate the Standard deviation of the funds, firstly the standard deviation of monthly returns of funds has been calculated and then the monthly standard deviation of the fund is annualized by multiplying it by the square root of 12 to annualize the monthly Standard Deviation. $\boldsymbol{\sigma} = \{\sum (\boldsymbol{x} - \bar{\boldsymbol{x}})\ /N\}$ **^1/2**

Compound Annual Growth Rate (CAGR): Compound annual growth rate (CAGR) is the rate of return that would be required for an investment to grow from its beginning balance to its ending balance, assuming the profits were reinvested at the end of each year of the investment's lifespan. **CAGR = [(Ending Value/Beginning Value) ^1/n]-1**

Beta (Systematic Risk Measure): The systematic risk of a security is measured by a statistical measure called Beta. The input data required for the calculation of beta are the historical data of returns of the individual scheme as well as the returns of the representative stock market index which in this study are NIFTY Indices. Beta is calculated from the historical data of returns by the following formula: $\boldsymbol{\beta}$ **= COVm,f / VARm**

R-squared: In investing, R-squared is generally interpreted as the percentage of a fund or security's movements that can be explained by movements in a benchmark index. $\mathbf{R^2}$ **= 1-(Unexplained variation/ Total Variation)**

Jenson's Alpha: The Jensen's measure, or Jensen's alpha, is a risk-adjusted performance measure that represents the average return on a portfolio or investment, above or below that predicted by the capital asset pricing model (CAPM), given the portfolio's or investment's beta and the average market return. This metric is also commonly referred to as simply alpha. **$\alpha p = Rp-[Rf + \beta*(Rm - Rf)]$**

Sharpe Ratio: The Sharpe ratio uses standard deviation to measure a fund's risk-adjusted returns. This measure quantifies a fund's return in excess of our proxy for a risk-free, guaranteed investment relative to its standard deviation. **Sharpe Ratio = $(Rp-Rf)/ \sigma p$**

Treynor Ratio: The Treynor ratio, also known as the reward-to-volatility ratio, is a performance metric for determining how much excess return was generated for each unit of risk taken on by a portfolio. Excess return in this sense refers to the return earned above the return that could have been earned in a risk-free investment. **Treynor Ratio = $(Rp-Rf)/ \beta$**

Sortino Ratio: The Sortino ratio takes an asset or portfolio's return and subtracts the risk-free rate, and then divides that amount by the asset's downside deviation. **Sortino Ratio = $(Rp-Rf)/ \sigma_d$**

DATA ANALYSIS AND INTERPRETATION

Table 1: Cumulative Annual Growth Rate of Funds

FUND NAME	CAGR	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	38%	1
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	26%	5
Sundaram Rural and Consumption Fund - Direct Plan - Growth	17%	10
Invesco India Infrastructure Fund - Direct Plan - Growth	35%	2
Canara Robeco Infrastructure - Direct Plan - Growth	29%	3
SBI Infrastructure Fund - Direct Plan - Growth	26%	6
L&T Business Cycles Fund - Direct Plan - Growth	21%	9
Kotak Infrastructure and Economic Reform Fund - Direct Plan - Growth	28%	4
LIC MF Infrastructure Fund - Direct Plan - Growth	22%	8
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	24%	7

INTERPRETATION

The table 1 shows that among the funds taken for the study, the CAGR (Cumulative Annual Growth Rate) of BOI AXA Manufacturing & Infrastructure Fund is highest at 38% followed by Invesco India Infrastructure Fund (35%) and Canara Robeco Infrastructure (29%). However L&T Business Cycles Fund (21%) and Sundaram Rural and Consumption Fund (17%) have the least growth rate.

Table 2: Beta of Different Funds

FUND NAME	BETA	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	-0.16	7
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	-0.04	1
Sundaram Rural and Consumption Fund - Direct Plan - Growth	-0.21	8
Invesco India Infrastructure Fund - Direct Plan - Growth	- 0.25	10
Canara Robeco Infrastructure - Direct Plan - Growth	-0.14	5
SBI Infrastructure Fund - Direct Plan - Growth	-0.13	4
L&T Business Cycles Fund - Direct Plan - Growth	-0.23	9
Kotak Infrastructure and Economic Reform Fund - Direct Plan - Growth	-0.09	2
LIC MF Infrastructure Fund - Direct Plan - Growth	-0.10	3
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	-0.15	6

INTERPRETATION

Table 2, show the beta of the different funds selected for the study with respect to the selected benchmark i.e. NIFTY50. The table shows that the beta of all the funds is negative which means that the movement of funds is negatively related to that of the benchmark. Also, the DSP Natural Resource and New Energy Fund (-0.04) is the least among the lot followed by Kotak Infrastructure Fund (-0.09) which means that the performance of these funds is closest to the benchmark among the lot. The funds with the least BETA are L&T Business Cycle Fund (-0.23) and Invesco India Infrastructure Fund (-0.25).

Table 3: R-Squared Value of Funds

FUND NAME	R-Squared	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	0.036	4
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	0.001	10
Sundaram Rural and Consumption Fund - Direct Plan - Growth	0.047	2
Invesco India Infrastructure Fund - Direct Plan - Growth	0.058	1
Canara Robeco Infrastructure - Direct Plan - Growth	0.019	6

SBI Infrastructure Fund - Direct Plan - Growth	0.016	7
L&T Business Cycles Fund - Direct Plan - Growth	0.040	3
Kotak Infrastructure and Economic Reform Fund - Direct Plan - Growth	0.006	9
LIC MF Infrastructure Fund - Direct Plan - Growth	0.009	8
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	0.026	5

INTERPRETATION

Table 3 depicts the R-squared value of the selected funds. The R-squared is the tool that tells about the reliability of the beta when talking about its use for calculating the future returns based on the Benchmark performance. Also, as per the thumb rule, the R-squared value should be above 0.8. The R-squared can also help the investor to maintain the optimal diversification of the portfolio. From the above table, it can be inferred that all the funds have the R squared value way too lower than the accepted rule of thumb. And that the Beta of the funds is not very reliable.

Table 4: Standard Deviation of the Selected Funds

FUND NAME	Standard Deviation	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	22.72%	10
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	33.32%	1
Sundaram Rural and Consumption Fund - Direct Plan - Growth	25.27%	8
Invesco India Infrastructure Fund - Direct Plan - Growth	27.34%	5
Canara Robeco Infrastructure - Direct Plan - Growth	27.20%	7
SBI Infrastructure Fund - Direct Plan - Growth	27.28%	6
L&T Business Cycles Fund - Direct Plan - Growth	29.65%	3
Kotak Infrastructure and Economic Reform Fund - Direct Plan - Growth	30.26%	2
LIC MF Infrastructure Fund - Direct Plan - Growth	28.47%	4
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	24.37%	9

INTERPRETATION

Table 4 depicts the standard deviation of the monthly returns of the selected funds during the period of study. As per the table, the standard deviation of BOI AXA Manufacturing & Infrastructure Fund is least at 22.72% followed by Aditya Birla Sun Life India GenNext Fund at 24.37% which means that these funds have least total risk among the lot. And the standard deviation of DSP Natural Resources and New Energy Fund (33.32%) and Kotak Infrastructure and Economic Reform Fund (30.26%) are highest in the category.

Table 5: Alpha Generated by Funds

FUND NAME	Alpha	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	29.53%	2
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	25.17%	5
Sundaram Rural and Consumption Fund - Direct Plan - Growth	13.77%	10
Invesco India Infrastructure Fund - Direct Plan - Growth	31.09%	1
Canara Robeco Infrastructure - Direct Plan - Growth	27.13%	4
SBI Infrastructure Fund - Direct Plan - Growth	23.83%	6
L&T Business Cycles Fund - Direct Plan - Growth	17.94%	9
Kotak Infrastructure and Economic Reform Fund - Direct Plan - Growth	27.19%	3
LIC MF Infrastructure Fund - Direct Plan - Growth	20.36%	8
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	21.60%	7

INTERPRETATION

Table 5 represents the Alpha generated by mutual funds i.e. the returns generated by the funds in excess of the expected returns as per the CAPM model. As per the above table, the Invesco India Infrastructure Fund (31.09%) and BOI AXA Manufacturing & Infrastructure Fund (29.53%) have generated the highest alpha and L&T Business Cycles Fund (17.94%) and Sundaram Rural and Consumption Fund (13.77%) have the least alpha among the selected lot of funds.

Table 6: Sharpe Ratio of the Funds

FUND NAME	Sharpe	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	1.40	1
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	0.77	7
Sundaram Rural and Consumption Fund - Direct Plan - Growth	0.66	10
Invesco India Infrastructure Fund - Direct Plan - Growth	1.27	2
Canara Robeco Infrastructure - Direct Plan - Growth	1.07	3
SBI Infrastructure Fund - Direct Plan - Growth	0.94	5
L&T Business Cycles Fund - Direct Plan - Growth	0.71	9
Kotak Infrastructure and Economic Reform Fund - Direct Plan – Growth	0.94	6
LIC MF Infrastructure Fund - Direct Plan - Growth	0.77	8
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	0.97	4

INTERPRETATION 6

Table 6 represents the Sharpe ratio of the funds. Sharpe ratio is the ratio of return generated over the risk free rate to the standard deviation of the fund i.e. the return generated per unit the total risk taken. According to the table above, it can be inferred that BOI AXA Manufacturing & Infrastructure Fund has the highest return to total risk ratio of 1.40 followed by Invesco India Infrastructure Fund with that of 1.27. And the funds with least sharpe ratio are L&T Business Cycle Fund (0.71%) and Sundaram Rural and Consumption Fund (0.66)

Table 7: Treynor Ratio of Funds

FUND NAME	Treynor Ratio	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	1.94	3
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	4.90	1
Sundaram Rural and Consumption Fund - Direct Plan - Growth	0.49	10
Invesco India Infrastructure Fund - Direct Plan - Growth	1.12	8
Canara Robeco Infrastructure - Direct Plan - Growth	1.58	4
SBI Infrastructure Fund - Direct Plan - Growth	1.45	6
L&T Business Cycles Fund - Direct Plan - Growth	0.65	9
Kotak Infrastructure and Economic Reform Fund - Direct Plan - Growth	2.43	2
LIC MF Infrastructure Fund - Direct Plan - Growth	1.50	5
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	1.15	7

INTERPRETATION

Table 7 represents the Treynor Ratio of the selected funds. The Treynor ratio, also known as the reward-to-volatility ratio, is a performance metric for determining how much excess return was generated for each unit of risk taken on by a portfolio. . From the table it can be stated that DSP Natural Resources and New Energy Fund has highest Treynor ratio of 4.90 followed by Kotak Infrastructure and Economic Reform Fund ehich has Treynor ratio of 2.43. And L&T Business Cycles Fund and Sundaram Rural and Consumption Fund have the least Treynor Ratio of 0.65 and 0.49 respectively.

Table 8: Sortino Ration of Funds

FUND NAME	Sortino Ratio	Rank
BOI AXA Manufacturing & Infrastructure Fund - Direct Plan - Growth	2.09	1
DSP Natural Resources and New Energy Fund - Direct Plan - Growth	0.85	7
Sundaram Rural and Consumption Fund - Direct Plan - Growth	0.54	10
Invesco India Infrastructure Fund - Direct Plan - Growth	1.53	2
Canara Robeco Infrastructure - Direct Plan - Growth	1.20	3
SBI Infrastructure Fund - Direct Plan - Growth	0.98	5
L&T Business Cycles Fund - Direct Plan - Growth	0.64	9

Kotak Infrastructure and Economic Reform Fund - Direct Plan - Growth	1.04	4
LIC MF Infrastructure Fund - Direct Plan - Growth	0.73	8
Aditya Birla Sun Life India GenNext Fund - Direct Plan - Growth	0.96	6

INTERPRETATION

Table 8 represents the Sortino Ratio which is the ratio in which firstly the risk free return is subtracted from the fund return and then the result is divided by funds downside deviation of returns. This ratio is believed to provide better picture of the risk reward relationship because it only considers negative deviations which are undesirable and not the positive ones as they are desirable ones. The Sortino Ratio of BOI AXA Manufacturing & Infrastructure Fund is highest at 2.09 followed by Invesco India Infrastructure Fund at 1.53. Also the funds with lowest Sortino Ratio are L&T Business Cycles Fund (0.64) and Sundaram Rural and Consumption Fund (0.54).

FINDINGS

Following are the findings of the study

- All of the funds except one have a CAGR above the benchmark.
- The BETA of the funds is negative which means that the fund returns are inversely related to benchmark movement.
- Also, the R-Squared of the funds is too low, meaning thereby that the Beta can not be relied upon for future return estimations.
- The Standard Deviation of the funds is varying between 22%-34% which means that thematic funds are riskier than the Blue-chips which generally have the standard deviation of 9-10%.
- It can be said that all the thematic funds generate very high alpha owing to the fact that the Beta of these funds is mostly negative.
- The Sharpe, Treynor and Sortino Ratios of these funds are on the lower side as even though the returns are very high but the risk is also high and therefore return per unit risk tends to be very low.

CONCLUSION

Thematic funds are usually more volatile than other mutual funds because the level of concentration of investment in a particular industry/ theme is very high. Consecutively due to the lack of diversification, the risk is relatively high amongst these funds. It is due to this fact that these funds are amongst the worst performing funds when the economy is hit by an event as unpredictable as COVID-19. Although the performance of these funds was poor due to the large influx of liquidity in these funds still these funds managed to not only recoup the initial losses but also have rewarded investors handsomely during the post COVID recovery.

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