

Performance Evaluation of Selected Debt Funds – Empirical Evidence from India during COVID-19 Pandemic

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Abstract: Since the outbreak of the Coronavirus, the world has been facing significant challenges to maintain economic stability and counter the health crisis. The Indian economy is also a victim of the same and this paper makes an attempt to examine the performance of debt fund which are direct in nature and growth oriented on the basis of risk and return using daily data from 31 December, 2019 to 17 July, 2020 by applying beta analysis, Sharpe ratio and Treynor ratio. To accomplish the study, NAV, BSE SENSEX and 91 days Treasury bill rate data has been used. The beta analysis shows that funds are in low risk zone due to beta value lower than 1. Sharpe ratio indicates risk-free rate is greater than the portfolio's return or the portfolio's return is expected to be negative. According to Treynor ratio, only Axis Short Term Fund could generate excess portfolio returns per unit of systematic risk. Rest all the funds could not perform well as they have a negative ratio. Further, One sample t test was applied that indicates the statistical significance at 1 percent level of the fund performance measure. Kendal's coefficient of concordance suggests that the comparative performance measure is not significantly related or the methods do not show parallel results. It may be said that stalemate in money market, low duration of maturity and also the low risk appetite of the funds are the possible reasons behind such poor performance. Also, COVID-19 led to liquidity crisis among the investors leading to steady redemption. This also induces a crisis among the fund houses to pay the return from time to time leading to such poor performance. It is also significant to mention that the investors should judge the interest rate risk associated with the funds before investing.

Key Words: Debt Funds, COVID-19, Sharpe Ratio, Treynor Ratio, 91 days T-Bill, NAV, One Sample T Test, Kendal Test of Concordance.

1. INTRODUCTION:

A financial system plays a vital role in the economic growth of a country .It intermediates between the flow of funds belonging to those who save a part of their income and those who invest in productive assets. The mutual fund functions as a link between the investors and the securities market to generate returns. The Indian mutual fund industry is one of the fastest growing and most competitive segments of the financial sector. (Lohna, 2014)

Mutual fund is a special type of institution, which acts as an investment conduit. It is essentially a mechanism of pooling together the savings of a large number of investors for collective investments with an avowed objective of providing attractive yields and appreciation in their value. The mutual fund concept which is been popular in the western part of the world has gained popularities in developing countries including India, to bridge the gap between supply and demand of capital in market.

The Indian financial system in general and the mutual fund industry in particular have taken a turn-around during the first half of 1990s. The new government formed in 1991, declared a series of policy measures intending to make the financial sector more viable and efficient, and to bring it closer to international standards. As a first step, the government accorded statutory status to securities exchange board of India (SEBI). As an autonomous body through the enactment of SEBI Act, 1992 for the promotion and regulation of the capital market, later, through an ordinance on January 25, 1995 the government amended the SEBI Act, 1992 so as to arm the SEBI with additional powers for ensuring the orderly development of the capital market and to enhance its ability to protect the interest of investors. Under SEBI control and regulation, the financial sector was opened up for entry of private players, both domestic and foreign. To a greater extend, leaving the market forces to play, SEBI reformed to capital market and ensured fair and healthy competition in all segments of the capital market. A significant impact of such reforms was the entry of private sector institutions in treetop the mutual fund

industry in 1993. From the investors point of view, this brought in the much needed qualitative improvement in the services in the form of substantial reduction in the time involved in transactions with the funds, information provision, transparency etc. the phase of growth in the private sector has also been faster than the public sector. (Swaminathan, 2011)

Investment is the sacrifice of certain present value for some uncertain future reward. In other words an investment can be defined as commitment of funds to one or more assets that will be held over some future time period. Broadly, an investment decision is a tradeoff between risk and return. A mutual fund is a special type of institution that acts as an investment instrument. Apart from the many advantages that investing in mutual funds provide like diversification, professional management, the ease of investment process has proved to be a major enabling factor. (Chaudhary & Chawla, 2014)

However, with the introduction of innovative products, the world of mutual funds nowadays has a lot to offer to its investors. A mutual fund is a pure intermediary that performs a basic function of buying and selling securities on behalf of its unit holders. Mutual fund is a body corporate which pools up the money from different types of investors and invests those funds on behalf of the investors in diversified securities. In other words, a mutual fund allows an investor to take a position indirectly in a basket of assets.

According to Association of Mutual Funds in India (AMFI), “A mutual fund is a trust that pools the savings of a number of investors who share common financial goal. Anybody with an investible surplus of as little as a few thousand rupees can invest in mutual funds. This investor buys units of a particular mutual fund scheme that has a defined investment objective and strategy.”

Since the lockdown was imposed in India to contain the spread of novel coronavirus, weak liquidity of underlying assets and redemption pressures has been a risk to the debt mutual funds. India Ratings & Research believes that in the absence of market normalcy and stability, debt mutual funds may continue to face multiple headwinds.

Last month Franklin Templeton Mutual Fund closed its six debt schemes due to significantly reduced liquidity in the Indian bond markets for most debt securities and unprecedented levels of redemptions following the novel coronavirus outbreak and lockdown.

Some of the debt fund categories have been witnessing fall in assets under management (AUM) since 2019, followed by a period of weak growth. The rating agency was of the view that the redemptions were largely a consequence of the weak balance sheet liquidity of corporates which has aggravated during the lockdown. The contributions from corporates in liquid funds and credit funds have dried up.

The data from Association of Mutual Funds in India (AMFI) shows that liquid funds have seen net outflows of Rs 25,332.19 crore in the first four months of the current calendar year. In March, liquid funds had seen sharp outflows to the tune of Rs 1.10 crore. While credit risk funds saw net outflows of Rs 19,238.98 crore in April as investors pulled out money after the Franklin Templeton MF closed its debt schemes. The net AUM of credit risk funds as on April, 2020 stood at Rs 35,222.36 crore compared to Rs 79,643.89 crore in April last year, a fall of Rs 44,421.53 crore.

Activities in the secondary market have been severely impacted, because non-banking financial companies (NBFCs) and housing finance companies (HFCs) as issuers have been large contributors to the commercial papers (CP) market. According to rating agency the daily CP trades in the secondary markets is less than 1% of the total outstanding amount and around 1% of the total exposure of debt mutual funds in CPs. A diminished secondary market activity is a major worry for open-ended debt mutual funds.

Due to redemption pressure, fund managers may be forced to sell the best quality investments, and this may leave the portfolio with relatively illiquid and weaker quality assets. The challenging secondary market operating environment coupled with bouts of redemption pressure could sharply deteriorate the portfolio quality. “These challenges could be aggravated amid further deterioration in macro-conditions and any idiosyncratic credit event,” added India Ratings & Research. (www.financialexpress.com)

2. LITERATURE REVIEW:

Following research papers from both national and international scenario has been studied with some interesting outcomes:

- **Dhandayuthapani & Arunpratheep (2018)** “A Study on Performance Evaluation of Select Mutual Fund Schemes in HDFC” showed that the purpose of conducting their study open ended Mutual fund schemes in HDFC have been studied over the period of 1 year data which is from 4th April 2017 to 3rd April 2018. The analysis has been made on the basis of Sharpe ratio, Treynor ratio and Jensen’s alpha ratio. The data has been taken from various websites of mutual fund. The analysis depicts that most of the funds selected for learn have outperformed below Sharpe Ratio as well as Treynor Ratio and Jensen’s alpha ratio.

- **Sridevi, O.V.A.M. (2018)** “Performance Analysis of Mutual Funds-A Study on Selected Mid Cap and Small Cap Funds” said that Mutual fund is a vehicle to pool small savings from middle class earners and give taste of capital Market by using this gateway. She also analyzed the performance by using financial test like Average Return, Sharpe Ratio, Treynor Ratio, Jensen’s Ration, Standard Deviation, Beta and Alpha. The analysis has reported diversified and varied results Researcher used her analytical work on selected Mid cap and small cap Funds.
- **Nandhini & Rathnamani (2017)** said her opinion through by her article named “A Study on the Performance of Equity Mutual Funds (With special reference to equity large cap and mid cap mutual funds)” that performance of select equity large and small cap mutual funds and it was analyzed with risk return measurement tools such as alpha, beta, standard deviation and Sharpe ratio.
- **Pandow, B. A. (2017)** has said on his article named “Performance of Mutual Funds in India” that the mutual fund industry has recorded significant progress on all fronts yet it has not been able to utilize its potential fully. On almost on all parameters it is far behind the developed economics and even most of the emerging economics of the world. The industry is confronted with number of challenges like low penetration ratio, lack of product differentiation, lack of investor awareness and ability to communicate value to customers, lack of interest of retail investors towards mutual funds and evolving nature of the industry. Based on the analysis the study suggests that if the industry has to utilize its potential fully, it has to address these challenges.
- **Chaudhary & Chawla (2014)** “Performance Evaluation of Mutual Funds: A Study of Selected Diversified Equity Mutual Funds in India” expressed their views regarding the performance selected the diversified equity Mutual fund and they measured the performance by using Sharpe Ratio and Treynor ratio.
- **Jain, Singal & Dwivedi (2014)** has said on their research paper “Performance Evaluation of Mutual Funds: A study of Selected Researches” regarding the performance of Mutual fund within a stipulated period of time between 1965-2012 and their main purpose was to find the various studies conducted on Mutual fund in India and outside India.
- **Kumar & Devi (2011)** “Performance evaluation of private and public sponsored mutual funds in India” expressed their thoughts that 340 mutual funds belonging to four categories - Money market category funds, Debt Category Funds, Equity category funds and balanced category funds. These are further classified into private and public mutual funds. The performance of selected funds is evaluated using average rate of return of fund, standard deviation, Risk/Return, Sharpe Ratio, Treynor ratio and Jensen ratio. Benchmark comparison is also made as it indicates to what extent the fund managers were able to produce better performance of managed portfolio compared to the market or index portfolios.

3. RESEARCH GAP:

Following research gaps could be identified after studying the existing literatures:

- Performance of mutual funds has not been analyzed using daily data
- Research work using short duration debt fund could not be found
- Performance analysis of mutual funds during the presence of COVID-19 do not exist
- Application of different statistical test along with performance analysis tools are rarely found

4. OBJECTIVES OF THE STUDY:

On the basis of the above mentioned research gaps and in the light of COVID-19, following objectives has been finalized:

- To measure the risk associated with selected sample debt funds during COVID-19
- To determine the reward per unit of total risk connected with selected sample debt funds during COVID-19
- To evaluate the reward-to-volatility linked with selected sample debt funds during COVID-19

5. RESEARCH METHODOLOGY:

5.1 Type of Research

The study is empirical in character with secondary data. The study also includes theoretical learning which is included for the part of going through the existing research works for identification of research gap and finalisation of the objectives.

5.2 Sample Period

In this research work, we have considered the time frame to be from 31 December, 2019 to 17 July, 2020 in order to ensure that the study can be conducted during the COVID-19 pandemic.

5.3 Sample

Initially we considered top 10 debt fund schemes according to the rankings of CRISIL as on 31 March, 2020 which are short duration in nature with growth option. They are also direct in nature as the intermediary role of fund managers or brokers or advisors are absent and the investors invest directly in the funds issued by the mutual fund houses. After going through the data screening process, the sample size was finalised at 9 with 139 observations which are converted into log natural.

5.4 Data and its Source

To conduct this study, we have collected NAV data of the samples from the website of AMFI, 364 Treasury bill rate's data has been collected from RBI website and BSE SENSEX data has been collected from BSE India website. We have taken the NAV values as the proxy to rate of return on portfolio i.e. fund returns (R_p), 91 days Treasury bill rates as the proxy to risk free rate of return (R_f) and BSE SENSEX as the proxy to the market rate of return (R_m).

5.5 Tools Used

To conduct the empirical study, following tools have been used:

- Beta Analysis
- Sharpe Model
- Treynor Model

We have also applied descriptive statistics, one sample t test and Kendall's coefficient of concordance additionally to analyze the data. The entire analysis has been done using Microsoft excel and SPSS 20.0.

6. RATIONALE OF THE STUDY:

The entire world is passing through a tough time and India also fighting against the pandemic, at this crucial time this paper looks forward to cater with innovative findings to students, teachers, researchers, academicians and others related with mutual fund market during the presence of COVID-19. This paper also provides with the performance of mutual fund market with focus on short duration debt fund which are direct and growth oriented during this pandemic. We hope that this research work will enable the prospective investors to adopt proper investment decision in debt funds during this time and also to decide the fund houses to invest in.

7. EMPIRICAL DATA ANALYSIS AND FINDINGS:

7.1 Descriptive Statistics

Descriptive Statistics									
Debt Funds - Direct Plans - Growth	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
L&T Low Duration Fund	139	32.89	34.24	33.5284	.43933	.177	.206	-1.424	.408
Kotak Mahindra Mutual Fund	139	2532.53	2676.45	2590.4350	41.4663	.613	.206	-.759	.408
SBI Magnum Low Duration Fund	139	2585.22	2715.71	2641.2154	39.5571	.379	.206	-1.160	.408
HDFC Short Term Debt Fund	139	22.27	24.07	22.9859	.48256	.632	.206	-.524	.408

IDFC Low Duration Fund	139	28.38	29.82	28.9890	.42729	.422	.206	-1.018	.408
Tata Short Term Bond Fund	139	36.29	39.40	37.6022	.84593	.555	.206	-.724	.408
Invesco India Short Term Fund	139	2730.46	2957.22	2826.1119	62.3916	.505	.206	-.771	.408
Axis Short Term Fund	139	22.73	24.56	23.4995	.51212	.512	.206	-.848	.408
ICICI Prudential Short Term Fund	139	43.35	46.78	44.6583	.96007	.613	.206	-.675	.408
91 Days Treasury Bill Rate	139	3.14	5.28	4.2378	0.8163	-.120	.206	-1.769	.408
BSE SENSEX	139	25981.24	41952.63	35253.9898	4530.0392	.103	.206	-1.293	.408
Valid N (listwise)	139								

Source: Computed through SPSS 20.0

The above table portrays the results of descriptive statistics. It is found that the NAV of L&T Low Duration Fund increased to 34.24 and came down to 32.89 with a mean value of 33.5284 during the study period. Similarly, Kotak Mahindra Mutual Fund increased to 2676.45 and came down to 2532.53 with a mean value of 2590.4350, SBI Magnum Low Duration Fund increased to 2715.71 and came down to 2585.22 with a mean value of 2641.2154, HDFC Short Term Debt Fund increased to 24.07 and came down to 22.27 with a mean value of 22.9859, IDFC Low Duration Fund increased to 29.82 and came down to 28.38 with a mean value of 28.9890, Tata Short Term Bond Fund increased to 39.40 and came down to 36.29 with a mean value of 37.6022, Invesco India Short Term Fund increased to 2957.22 and came down to 2730.46 with a mean value of 2826.1119, Axis Short Term Fund increased to 24.56 and came down to 22.73 with a mean value of 23.4995 and ICICI Prudential Short Term Fund increased to 46.78 and came down to 43.35 with a mean value of 44.6583. 91 days Treasury Bill Rate increased to 5.28 percent and came down to 3.14 percent with a mean percent of 4.2378 during the study period. BSE SENSEX increased to 41952.63 points and came down to 25981.24 points with a mean point of 35253.9898 during the study period. Results of skewness show that Kotak Mahindra Mutual Fund, HDFC Short Term Debt Fund, Tata Short Term Bond Fund, Invesco India Short Term Fund, Axis Short Term Fund, ICICI Prudential Short Term Fund and 91 days Treasury Bill Rate are moderately skewed. L&T Low Duration Fund, SBI Magnum Low Duration Fund, IDFC Low Duration Fund and BSE SENSEX are fairly skewed in nature. The values of kurtosis show that the distribution is flat and has thin tails indicating platykurtic distributions.

7.2 Beta Analysis

Sl. No.	Debt Funds - Direct Plans - Growth	Sensitivity of the Portfolio
1	L&T Low Duration Fund	0.0052
2	Kotak Mahindra Mutual Fund	0.0065
3	SBI Magnum Low Duration Fund	0.0081
4	HDFC Short Term Debt Fund	0.0147
5	IDFC Low Duration Fund	0.0076
6	Tata Short Term Bond Fund	0.0183
7	Invesco India Short Term Fund	0.0158

8	Axis Short Term Fund	-0.0195
9	ICICI Prudential Short Term Fund	0.0144

Source: Computed through Microsoft Excel

The sensitivity of the portfolio (β_p) indicates that all the funds are in low risk zone due to value lower than 1. Hence, we can say that the funds are less volatile.

7.3 Sharpe Model

The Sharpe ratio is calculated as follows:

$Sharpe\ Ratio = \frac{R_p - R_f}{\sigma_p}$ Where: R_p = return on portfolio, R_f = risk free rate of return, σ_p = standard deviation of the portfolio's excess return.

Sl. No.	Debt Funds - Direct Plans - Growth	Sharpe Ratio	Ranks
1	L&T Low Duration Fund	-39.4148315	9
2	Kotak Mahindra Mutual Fund	-26.7540461	6
3	SBI Magnum Low Duration Fund	-31.3234337	8
4	HDFC Short Term Debt Fund	-15.9711093	4
5	IDFC Low Duration Fund	-29.9536117	7
6	Tata Short Term Bond Fund	-15.090589	1
7	Invesco India Short Term Fund	-15.2408073	2
8	Axis Short Term Fund	-15.9195555	3
9	ICICI Prudential Short Term Fund	-17.0742094	5

Source: Computed through Microsoft Excel

The Sharpe ratio measures the ratio of returns generated by the fund more than risk free rate of return and the total risk connected with it. So, reward per unit of total risk is generated. The above table shows Sharpe ratio of all the funds are negative indicating risk-free rate is greater than the portfolio's return or the portfolio's return is expected to be negative. The ranks are made on the basis of the ratio to indicate the position of the funds.

7.4 Treynor Model

The Treynor ratio is calculated as follows:

$Treynor\ Ratio = \frac{R_p - R_f}{\beta_p}$ Where: R_p = return on portfolio, R_f = risk free rate of return, β_p = the sensitivity of the portfolio

towards movement of the underlying benchmark.

Sl. No.	Debt Funds - Direct Plans - Growth	Treynor Ratio	Ranks
1	L&T Low Duration Fund	-8.154124956	9
2	Kotak Mahindra Mutual Fund	-6.448565515	8
3	SBI Magnum Low Duration Fund	-5.151436612	6
4	HDFC Short Term Debt Fund	-2.83922952	4
5	IDFC Low Duration Fund	-5.553609149	7
6	Tata Short Term Bond Fund	-2.281087655	2
7	Invesco India Short Term Fund	-2.65121062	3

8	Axis Short Term Fund	2.144306075	1
9	ICICI Prudential Short Term Fund	-2.909577432	5

Source: Computed through Microsoft Excel

The Treynor ratio is a reward-to-volatility ratio which states the performance for determining excess return for each unit of risk beared by a portfolio. The above table shows that only Axis Short Term Fund could generate excess portfolio returns per unit of systematic risk. Rest all the funds could not perform well as they have a negative ratio. The ranks are made on the basis of the ratio to indicate the position of the funds.

7.5 One Sample T Test

	Sharpe Model	Treynor Model
Mean Value	-22.9714	-3.7605
p Value	0	0.005

Source: Computed through SPSS 20.0

The results show that the fund performance measure is statistically significant at 1% level.

7.6 Kendal's coefficient of Concordance

N	9
Kendall's W ^a	0.022
Chi-Square	0.2
Df	1
Asymp. Sig.	0.655
a. Kendall's Coefficient of Concordance	

Source: Computed through SPSS 20.0

The W value is not significant. Thus the ranks of the funds based on performance measure are not at all associated but independent. In other words, the correspondence or no correspondence in the comparative performance measure is not significantly related or the methods do not show parallel results.

8. LIMITATIONS OF THE STUDY:

Our study suffers from the following limitations:

- We have considered our study till 17 July, 2020
- The COVID-19 graph is rising day by day and hence the impact is also present beyond our end date of the study
- Study is confined to only top 9 funds on the basis of CRISIL rankings
- Study is confined to debt funds which are direct in nature and growth oriented
- The inherent limitations of Sharpe ratio and Treynor ratio are also there

9. FURTHER SCOPE OF THE STUDY:

The study can be further extended on the basis of pre-COVID era, COVID era and post- COVID era. Different other tools like Jensen's Alpha, Information ratio, Sortino ratio can also be used for analysis work. There are also other categories of funds like gilt funds, money market funds, sectoral funds and many more where research can take place. Studies can also be conducted using monthly or annual data and also using primary data.

10. CONCLUDING REMARKS:

The results from the analysis shows that all the funds are in low risk zone due to beta value lower than 1. Hence, we can say that the funds are less volatile. Sharpe ratio indicates risk-free rate is greater than the portfolio's return or the portfolio's return is expected to be negative. According to Treynor ratio, only Axis Short Term Fund could generate excess portfolio returns per unit of systematic risk. Rest all the funds could not perform well as they have a negative ratio. One sample t test indicates the statistical significance at 1 percent level of the fund performance measure. Kendal's coefficient

of concordance suggests that correspondence or no correspondence in the comparative performance measure is not significantly related or the methods do not show parallel results. These results help us to infer that the low duration debt funds which are direct in nature and growth oriented though persists at low risk zone, but still the minimum risk which they bears does not enable them to reap return greater than risk free rate during the presence of COVID-19. Only Axis Short Term Fund could make excess portfolio returns per unit of systematic risk. The reason behind such poor performance could be stalemate in money market, low duration of maturity and also the low risk appetite of the funds. In addition to it, during the presence of COVID-19, most of the investors are selling their investment to maintain their liquidity. As a result, the exposure to risk by the remaining investors is turning out to be significant. The fund houses also may fail to provide return from time to time due to dearth of finance as a result of high redemption. Hence, the investors before investing should judge the interest rate risk associated with the fund.

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