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## PERFORMANCE EVALUATION OF DEBT MUTUAL FUNDS IN INDIA

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### ABSTRACT

Mutual funds are the ideal investment vehicles for today's complex and modern financial scenario. Mutual funds which have been operating for greater than five years and performing during the period of study (i.e. 2003 - 2007) are selected for the present research. The sample for the study consists of 137 debt mutual funds classified into five investment styles. 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.

**Keywords:** Sharpe Ratio, Treynor ratio and Jensen ratio.

### INTRODUCTION

With the growth of the economy and the capital market in India, the size of investors has also increased rapidly. In fact, small investors in India have regularly invested in public issues to finance big and small green-field project of known promoters. They have been benefited from such investments in the past. As the stock market crumbled later on and new issues flopped, small investors again began looking for a good opportunity. In this situation, mutual funds proved that they are able to deliver the goods.

A mutual fund is the ideal investment vehicle for today's complex and modern financial scenario. Markets for equity shares, bonds and other fixed income instruments, real estate, derivatives and other assets have become mature and information driven. Price changes in these assets are driven by global events occurring in faraway places. Small investors face a lot of problems in the share market due to lack of professional advice and lack of information. Mutual funds have come as a much needed help to these investors.

Mutual Fund industry today, is one of the most preferred investment avenues in India. However, with a plethora of schemes to choose from, the retail investor faces problems in selecting funds. Factors such as investment strategy and management style are qualitative, but the funds record is an important indicator too. Though past performance alone cannot be indicative of future performance, it is, frankly, the only quantitative way to judge how good a fund is at present.

**Need and Significance of the study:** The impressive growth of mutual funds in India has attracted the attention of Indian

researchers, individuals and institutional investors during past ten years. The Indian mutual fund industry is currently in the phase of consolidation and growth stage of the product life cycle. The competition would intensify in the coming years as it happened in other industries. Hence, it is appropriate, relevant and topical to focus our attention as to how the Indian mutual industry would emerge in the coming few years to ascertain what kind of products (mutual fund schemes) would be able to win the investors' confidence and survive in the market place.

**Objectives of the Study:** The following objectives are formulated for the present study:

1. To evaluate performance of different debt mutual funds schemes on the basis of risk-return parameters and compare with benchmark indices.
2. To appraise performance of debt mutual funds on risk adjusted measures as suggested by Sharpe, Treynor, and Jensen.

### Hypothesis of the Study:

There is no significant difference between the returns of different debt mutual fund schemes of an investment style.

### RESEARCH METHODOLOGY

**Funds Selected For the Study:** Debt Mutual funds which have been operating for greater than five years and performing during the period of study (i.e. 2003 - 2007) were selected for the present research. The sample consists of 137 debt mutual funds classified into five investment styles. This include 11 debt institutional funds, 47 debt short term funds, seven debt specialty funds, 60 debt long term funds

and 12 debt floating rate funds.

**Data Collection:** The Research Study has been based on Secondary Data. To gain an overview of the current performance trends of the Indian mutual fund industry secondary data has been an important source and was collected from the fact sheets, newspapers, journals, books, periodicals, websites, etc. The data was collected from various websites of AMCs, AMFI, value research online, moneycontrol.com, etc. 364 Days Treasury bill values were taken for computing market returns for debt institutional, debt short term, debt speciality, debt long term and debt floating rate funds.

**Performance Measures Used in the Study:** 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. 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 associated with a fund, in a general, can be defined as variability or fluctuations in the returns generated by it. The higher the fluctuations in the returns of a fund during a given period, higher will be the risk associated with it. Standard deviation is a statistical measure of the range of a fund's performance, and is reported as an annual number. When a fund has a high standard deviation, its range of performance has been very wide, indicating that there is a greater potential for volatility. The most common measures that combines both risk and reward are Sharpe Ratio, Treynor ratio and Jensen ratio.

$$\text{Treynor's index} = (R_p - R_f) \div \beta_p$$

Where,

$R_p$  = Portfolio return over a period

$R_f$  = Risk-free return over a period

$\beta_p$  = Market-risk, beta coefficient Higher value of Treynor's index indicates better performance of portfolio and vice versa. The Treynor's measure of portfolio performance is relative measure that ranks the funds in terms of risk (market risk) and return. The index is also termed as reward to volatility ratio.

$$\text{Sharpe's index} = (R_p - R_f) \div \sigma_p$$

$R_p$  = Portfolio return over a period

$R_f$  = Risk-free return over a period

$\sigma_p$  = Total risk, standard deviation of portfolio return Higher value of Sharpe's index indicates better performance of portfolio and vice versa. The Sharpe's measure of portfolio performance is also relative measure that ranks the funds in terms of risk (total risk) and return. The ratio is also termed as reward to variability ratio.

**Jensen's Measure** is a risk-adjusted performance measure that represents the average return on a portfolio over and above that predicted by the capital asset pricing model (CAPM), given the portfolio's beta and the average market return. This is the portfolio's alpha. In fact, the concept is sometimes referred to as "Jensen's alpha."

**Jensen's Measure is calculated as:**

$$\alpha_p = \bar{r}_p - [\bar{r}_f + \beta_p (r_m - r_f)]$$

Where,

$\bar{r}_p$  = Expected total portfolio return

$r_f$  = Risk free rate

$\beta_p$  = Beta of the portfolio

$\bar{r}_m$  = Expected market return

Jensen's measure is one of the ways to help determine if a portfolio is earning the proper return for its level of risk. If the value is positive, then the portfolio is earning excess returns. In other words, a positive value for Jensen's alpha means a fund manager has "beat the market" with his or her stock picking skills. The Jensen ratio measures how much of the portfolio's rate of return is attributable to the manager's ability to deliver above-average returns, adjusted for market risk. The higher the ratio, the better the risk-adjusted returns. A portfolio with a consistently positive excess return will have a positive alpha, while a portfolio with a consistently negative excess return will have a negative alpha.

## RESULTS AND DISCUSSION

The performance of mutual funds in terms of annualized compounded returns, annualized standard deviation and Risk - Return Profile was computed for the period and is presented in tables 1 - 7.

Performance of Debt Institutional Funds: Table 1 reveals that 18% of Debt Institutional Funds i.e. two funds - ICICI Pru Short Term Institutional Plan and ICICI Pru Income Institutional Plan have generated greater returns than the market returns of 5.97%. The average risk per unit return

Table 1: Debt Institutional Funds

S. No	Debt Institutional	Returns (%)	Risk	Risk/Return	Sharpe	Treynor	Jensen
1	ICICI Pru Short Term Plan - Institutional Plan	6.80	1.72	0.25	0.48	0.62	0.83
2	ICICI Pru Income Plan - Institutional Plan	6.36	3.76	0.59	0.10	0.25	0.39
3	Birla Sun Life Liquid Plus Fund - Institutional (Plan C)	5.96	1.57	0.26	-0.01	-0.01	-0.01
4	Principal Income STP - Institutional Plan	5.80	1.71	0.30	-0.10	-0.12	-0.17
5	Principal Income Fund - Institutional Plan	5.64	2.73	0.48	-0.12	-0.16	-0.33
6	ING Income Fund - Institutional Option	5.20	3.03	0.58	-0.25	-0.38	-0.77
7	IDFC Liquid Plus Fund - Treasury Plan - Institutional Plan B	4.86	1.54	0.32	-0.72	-1.10	-1.11
8	HSBC Income Fund - Investment Plan - Inst. Plan	4.74	3.04	0.64	-0.40	-0.48	-1.23
9	JM Short Term Plan - Institutional Plan	0.78	10.30	13.20	-0.50	0.81	-5.19
10	HSBC Income Fund - STP - Institutional Plan	0.14	9.70	69.26	-0.60	1.07	-5.83
11	DBS Chola Freedom Income - STF Institutional Plan	-3.64	21.54	-5.92	-0.45	-0.90	-9.61
	Mean Return	3.88					
	Standard Deviation of Returns		3.31				
	Market Return (364 Days T Bill)	5.97					
<p>The average risk per unit return (coefficient of Variation) works out to be <math>3.31/3.88 = 0.85</math></p>							
<p>2 Debt Institutional funds have generated greater returns than the market returns.</p>							

(coefficient of Variation) works out to be 0.85.

The returns for Debt Institutional Funds range from -3.64% to 6.80%. The returns are highest for ICICI Pru Short Term Plan - Institutional Plan followed by ICICI Pru Income Plan - Institutional Plan whereas DBS Chola Freedom Income - STF Institutional Plan has the lowest returns that too negative returns. The risk ranges from 1.54 to 21.54 for Debt Institutional Funds. DBS Chola Freedom Income - STF Institutional Plan has the highest risk and IDFC Liquid Plus Fund - Treasury Plan - Institutional Plan B has the lowest risk.

The risk per unit return for Debt Institutional Mutual Funds ranges from 0.25 to 69.26. HSBC Income Fund - STP - Institutional Plan has the highest ratio indicating high risk per unit of return and ICICI Pru Short Term Plan - Institutional Plan has the lowest ratio indicating low risk per unit return. The risk return ratio of DBS Chola Freedom Income - STF Institutional Plan is negative with -5.92 as its return is negative.

Sharpe ratio for eleven Debt Institutional funds has been computed and the range of excess returns over risk free return per unit of total risk is from -0.72 to 0.48. Based on Sharpe ratio, ICICI Pru Short Term Institutional Plan is the better performing fund and the least performing fund is IDFC Liquid Plus Fund- Treasury plan- Institutional Plan B. Treynor ratio has been computed and the performance of Debt Institutional funds ranges from -1.10 to 1.07. HSBC Income fund STP institutional Plan has the highest Treynor ratio and IDFC liquid plus fund Treasury plan institutional Plan B has the least ratio. Jensen performance measure has been computed for Debt Institutional funds and it is found that only ICICI Pru Short Term Institutional Plan with Jensen ratio of 0.83 and ICICI Pru Income Institutional Plan with Jensen ratio of 0.39 are the funds that have superior performance and all other funds have inferior performance. The Jensen ratio for Debt Institutional funds ranges from -9.61 to 0.83. DBS Chola Freedom Income STF Institutional Plan has the least Jensen ratio of -9.61.

**Performance of Debt Short Term Funds:** Table 2 portrays that 25% of Debt Short Term Funds i.e. twelve debt mutual funds comprising Reliance, ING, Tata, ICICI Pru, Kotak Bond, JM, Birla Sun Life, Kotak Bond (Regular Plan),

HDFC High Interest Fund, Principal Income Fund, Birla Sun Life Gilt Fund (Liquid Plan) and Birla Sun Life Liquid Plus Fund Retail Plan B funds have generated greater returns than the market returns of 5.79%. The average risk per unit return (coefficient of Variation) for Debt Short Term Category Funds works out to be 0.162.

The returns for Debt Short Term Funds range from 3.12 to 7.00. Returns are highest for Reliance Short Term followed by ING Short Term Income Fund and lowest for DBS Chola Triple Ace. The risk is highest for Tata Income Fund with 4.45 and lowest for Kotak Gilt Savings Plan with 0.29.

The risk per unit return for Debt Short Term Mutual funds ranges from 0.06 to 0.89. DBS Chola Triple Ace funds has the highest ratio indicating high risk per unit return and Kotak Gilt Savings Plan has the lowest ratio indicating low risk per unit return.

The Sharpe performance ratio is computed for 47 debt short term funds and the range of excess returns over risk free return per unit of total risk ranges from -2.68 to 0.60. The better performing fund is Reliance Short Term Plan fund and the least performing fund is ING Gilt Fund - Regular Plan. Treynor ratio for debt short term funds ranges from -78.17 to 10.87. DBS Chola triple Ace has the highest Treynor ratio and ING gilt fund regular plan has the least Treynor ratio. Jensen ratio for Debt Short Term ranges from -2.85 to 1.03. 12 Debt Short Term funds have Superior performance and among these funds Reliance Short Term Plan has the highest Jensen ratio and DBS Chola Triple Ace has the least Jensen ratio.

**Performance of Debt Specialty Funds:** It is clear from Table 3 that all the Debt Speciality Funds have generated greater returns than the market returns of 5.79%. The average risk per unit return (coefficient of Variation) works out to be 0.21.

The returns for Debt Speciality Funds range from 8.46% to 15.72%. LIC MF Childrens Fund has the highest returns followed by Canara Robeco CIGO and lowest returns for UTI Monthly Income Scheme. It can be noted that when compared to other Debt Category Funds majority of Debt Speciality Funds have generated greater returns than 10%. The risk for Debt Speciality Funds ranges from 3.70 to

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Table 2: Debt Short Term Funds

S. No	Debt Short Term	Returns (%)	Risk	Risk/Return	Sharpe	Treynor	Jensen
1	Reliance Short Term Plan	7.00	1.73	0.25	0.60	0.89	1.03
2	ING Short Term Income Fund	6.76	1.80	0.27	0.44	0.62	0.79
3	Tata Short Term Bond Fund	6.56	1.84	0.28	0.32	0.44	0.59
4	ICICI Pru Short Term Plan	6.52	1.69	0.26	0.33	0.43	0.55
5	Kotak Bond - Short Term Plan	6.46	1.74	0.27	0.28	0.37	0.49
6	JM Short Term Plan	6.36	1.65	0.26	0.24	0.36	0.39
7	Birla Sun Life Short Term Fund	6.26	2.28	0.36	0.13	0.17	0.29
8	Kotak Bond (Regular Plan)	6.20	3.02	0.49	0.08	0.15	0.23
9	HDFC High Interest Fund - Short Term Plan	6.18	2.31	0.37	0.09	0.12	0.21
10	Principal Income Fund - Short Term Plan	6.16	1.15	0.19	0.17	0.21	0.19
11	Birla Sun Life Gilt Plus (Liquid Plan)	6.10	1.81	0.30	0.07	-1.06	0.13
12	Birla Sun Life Liquid Plus Fund - Retail (Plan B)	6.04	1.35	0.22	0.05	0.07	0.07
13	IDFC Dynamic Bond Fund	5.92	3.49	0.59	-0.01	-0.03	-0.05
14	Tata Income Fund	5.90	4.45	0.75	-0.02	-0.09	-0.07
15	HDFC Short Term Plan	5.88	1.95	0.33	-0.05	-0.06	-0.09
16	DWS Insta Cash Plus Fund	5.84	1.38	0.24	-0.09	-0.11	-0.13
17	IDFC Liquid Plus Fund - Treasury Plan A	5.80	0.95	0.16	-0.18	-0.23	-0.17
18	DBS Chola Freedom Income - Short Term Fund	5.78	1.68	0.29	-0.11	-0.19	-0.19
19	Canara Robeco Liquid Plus - Retail Plan	5.76	3.33	0.58	-0.06	-0.10	-0.21
20	Canara Robeco Income	5.76	2.74	0.48	-0.08	-0.37	-0.21
21	DSP-ML Short Term Fund	5.76	1.13	0.20	-0.18	-0.37	-0.21
22	Principal Income Fund	5.74	3.12	0.54	-0.07	-0.15	-0.23
23	HSBC Income Fund - Short Term Plan	5.74	1.43	0.25	-0.16	-0.24	-0.23
24	SBI Magnum Gilt - Short Term Plan	5.54	3.42	0.62	-0.13	-0.26	-0.43
25	Templeton India Govt Sec - Treasury Plan	5.40	1.50	0.28	-0.38	-9.74	-0.57
26	Kotak Bond (Deposit Plan)	5.24	2.63	0.50	-0.28	-0.67	-0.73
27	Kotak Gilt Savings Plan	5.20	0.29	0.06	-2.64	-3.31	-0.77
28	DSP-ML Govt. Sec. Fund - Plan B	5.10	1.19	0.23	-0.73	-2.51	-0.87
29	Tata Dynamic Bond Fund - Plan A	5.04	2.49	0.49	-0.37	-0.52	-0.93
30	Tata Dynamic Bond Fund - Plan B	5.02	2.40	0.48	-0.40	-0.55	-0.95
31	Tata Income Plus Fund - Plan B	4.96	3.34	0.67	-0.30	-4.04	-1.01
32	Tata Gilt Securities - Short Maturity Fund	4.96	1.73	0.35	-0.58	-1.32	-1.01
33	Sahara Income Fund	4.94	3.01	0.61	-0.34	-0.64	-1.03
34	IDFC G-Sec. Fund - Investment Plan	4.92	4.24	0.86	-0.25	-0.79	-1.05
35	Tata Income Plus Fund - Plan A	4.90	3.25	0.66	-0.33	-3.49	-1.07
36	IDFC Super Saver Income Fund - Medium Term Plan - A	4.62	2.45	0.53	-0.55	-0.69	-1.35
37	LIC MF Short Term Plan	4.62	1.00	0.22	-1.35	-1.58	-1.35
38	ING Income Fund	4.50	3.19	0.71	-0.46	-0.90	-1.47
39	Principal Govt Sec. Fund - Savings Plan	4.44	1.46	0.33	-1.05	-13.83	-1.53
40	BOB Income Fund	4.44	0.80	0.18	-1.91	6.22	-1.53
41	IDFC G-Sec. Fund - Short Term Plan	4.36	3.19	0.73	-0.50	-2.28	-1.61
42	UTI Liquid Plus Fund - Retail Plan	4.32	3.00	0.70	-0.55	-2.29	-1.65
43	DSP-ML Bond Fund - Retail Plan	4.32	2.77	0.64	-0.60	-2.92	-1.65
44	Birla Sun Life G-Sec. Fund - Short Term	4.10	3.14	0.77	-0.59	-1.20	-1.87
45	Reliance Gilt Securities Fund- Short Term Plan	3.90	1.93	0.49	-1.07	-1.57	-2.07
46	ING Gilt Fund - Regular Plan	3.78	0.82	0.22	-2.68	-78.17	-2.19
47	DBS Chola Triple Ace	3.12	2.77	0.89	-1.03	10.87	-2.85
Mean Return		5.37					
Standard Deviation of Returns			0.87				
Market Return (364 Days T Bill)		5.97					
The average risk per unit return (coefficient of Variation) works out to be $0.87/5.37 = 0.16$							

Table 3: Debt Speciality Funds

S. No	Debt Speciality	Returns (%)	Risk	Risk/Return	Sharpe	Treynor	Jensen
1	LIC MF Childrens Fund	15.72	19.95	1.27	0.49	0.66	9.75
2	Canara Robeco CIGO	15.10	6.88	0.46	1.33	1.92	9.13
3	ICICI Pru Child Care Plan - Study Plan	14.70	5.97	0.41	1.46	12.21	8.73
4	SBI Magnum Childrens Benefit Plan	11.76	6.27	0.53	0.92	-6.42	5.79
5	HDFC Childrens Gift Fund - Savings Plan	11.44	7.49	0.65	0.73	-5.10	5.47
6	DSP-ML Saving Plus Fund - Moderate	10.80	3.70	0.34	1.31	-11.04	4.83
7	UTI Monthly Income Scheme	8.46	3.78	0.45	0.66	1.03	2.49
Mean Return		12.57					
Standard Deviation of Returns			2.67				
Market Return (364 Days T Bill)		5.97					
The average risk per unit return (coefficient of Variation) works out to be $2.67/12.6 = 0.21$							
The entire Debt Speciality funds have generated greater returns than the market returns.							

19.95 and risk is highest for LIC MF Childrens Fund and lowest for DSP-ML Saving Plus Fund - Moderate.

The risk per unit return ranges from 0.34 to 1.27 for Debt Speciality Mutual Funds. The ratio is highest for LIC MF Childrens Fund indicating high risk per unit return and DSP-ML Saving Plus Fund - Moderate has the lowest ratio indicating low risk per unit return.

The Sharpe ratio for debt speciality ranges from 0.49 to 1.46. All the funds in this category have positive performance and ICICI Pru child Care Plan - Study Plan has the highest ratio with 1.46 and LIC MF Childrens Fund has the lowest ratio with 0.49. Treynor ratio for debt speciality ranges from -11.04 to 12.21. ICICI Pru Child care plan study plan is the better performing fund with Treynor ratio 12.21 and DSP ML saving plus fund moderate is the least performing fund with Treynor ratio -11.04. Jensen ratio has been computed for Debt Speciality and all the funds have a positive ratio and it indicates that they have superior performance. LIC MF Childrens Fund has the highest Jensen ratio 9.75 and UTI Monthly Income Scheme has the least Jensen ratio 2.49.

**Performance of Debt Long Term Funds:** Table 4 reveals that 22% of Debt Speciality Funds i.e., thirteen funds including ICICI Pru, Templeton India Govt. Sec, Escorts, Birla Sun Life, Reliance Gilt Securities Fund, Templeton Indian Short Term Income, Birla Sun Life short Term Income, ICICI Pru Flexible Income, DWS Short Maturity Fund, ICICI Pru Gilt Treasury Plan, Reliance Income Fund,

IDFC Super Saver Income Fund and UTI Gilt Advantage funds have outperformed the market returns of 5.79%. The average risk per unit return (coefficient of Variation) works out to be 0.31.

The returns for Debt Long Term Funds range from -0.52% to 7.72%. ICICI Pru Long Term Plan has the highest returns followed by Templeton India Govt. Sec. - Long Term Plan and lowest for Franklin Indian International Fund with negative returns. The risk for Debt Long Term Funds ranges from 0.72 to 5.31 and risk is highest for Tata Gilt Securities Fund B (App) and lowest for Reliance Gilt Securities Fund - Long Term Plan.

The risk per unit return for Debt Long Term Mutual Funds ranges from 0.11 to 1.82. Tata Gilt Retirement Plan (28/02/25 Maturity) has the highest ratio indicating high risk per unit return and Reliance Gilt Securities Fund - Long Term Plan fund has the lowest ratio representing low risk per unit return. Franklin Indian International Fund risk return ratio is negative i.e. -8.17 as its returns are negative.

Risk adjusted performance measure for 60 debt long term funds using Sharpe ratio is computed and the range of excess returns over risk free return per unit of total risk ranges from -1.53 to 2.03. The least performer is Franklin Indian International fund with Sharpe ratio of -1.53 and ICICI Pru Long Term Plan has the highest ratio of 2.03. Treynor ratio for the debt long term funds ranges from -44.77 to 14.59. Templeton India govt sec composite plan with Treynor ratio of 14.59 and ICICI Pru long term plan with Treynor ratio of

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Table 4: Debt Long Term Funds

S. No	Debt Long Term	Returns (%)	Risk	Risk/Return	Sharpe	Treynor	Jensen
1	ICICI Pru Long Term Plan	7.72	0.86	0.11	2.03	-44.77	1.75
2	Templeton India Govt. Sec. - Long Term Plan	6.70	5.02	0.75	0.15	-0.84	0.73
3	Escorts Income Plan	6.62	2.90	0.44	0.22	-2.08	0.65
4	Birla Sun Life Income Fund	6.54	4.66	0.71	0.12	0.19	0.57
5	Reliance Gilt Securities Fund - Long Term Plan	6.50	0.72	0.11	0.73	1.44	0.53
6	Templeton India Short Term Income Plan	6.44	2.18	0.34	0.22	0.29	0.47
7	Birla Sun Life Gilt Plus (Regular Plan)	6.28	4.95	0.79	0.06	0.22	0.31
8	ICICI Pru Flexible Income Plan	6.12	3.18	0.52	0.05	0.13	0.15
9	DWS Short Maturity Fund	6.06	1.51	0.25	0.06	0.09	0.09
10	ICICI Pru Gilt - Treasury Plan	6.04	1.97	0.33	0.04	0.17	0.07
11	Reliance Income Fund	6.02	2.61	0.43	0.02	0.04	0.05
12	IDFC Super Saver Income Fund - STP	6.00	2.09	0.35	0.02	0.02	0.03
13	UTI Gilt Advantage Fund - Long Term Plan	5.98	5.20	0.87	0.00	-0.03	0.01
14	ICICI Pru Gilt - Investment Plan	5.94	3.76	0.63	-0.01	-0.02	-0.03
15	UTI Bond Fund	5.80	3.11	0.54	-0.05	-0.12	-0.17
16	Birla Sun Life Income Plus - Retail (Plan B)	5.70	4.94	0.87	-0.05	-0.09	-0.27
17	Principal Govt. Sec. Fund - Investment Plan	5.64	4.00	0.71	-0.08	-0.51	-0.33
18	DWS Premier Bond Fund - Regular Plan	5.48	4.12	0.75	-0.12	0.60	-0.49
19	ICICI Pru Income Plan	5.40	3.62	0.67	-0.16	-0.31	-0.57
20	HSBC Income Fund - Investment Plan	5.40	3.48	0.64	-0.16	-0.51	-0.57
21	Birla Sun Life Gilt Plus (PF Plan)	5.22	4.91	0.94	-0.15	-1.52	-0.75
22	Kotak Gilt Investment Plan Regular	5.14	3.87	0.75	-0.21	1.33	-0.83
23	Templeton India Income Fund	5.14	3.86	0.75	-0.21	-0.47	-0.83
24	Templeton India Govt Sec - Composite Plan	5.10	4.20	0.82	-0.21	14.59	-0.87
25	DSP-ML Govt. Sec. Fund - Plan A	5.08	3.60	0.71	-0.25	-8.10	-0.89
26	LIC MF Bond Fund	5.06	2.80	0.55	-0.32	-0.63	-0.91
27	IDFC Super Saver Income Fund	4.82	4.00	0.83	-0.29	-0.63	-1.15
28	DBS Chola Gilt - Investment Plan	4.64	5.13	1.11	-0.26	1.33	-1.33
29	Birla Sun Life G-Sec. Fund - Long Term	4.64	4.97	1.07	-0.27	5.68	-1.33
30	JM G-Sec Fund - PF Plan	4.62	3.73	0.81	-0.36	1.74	-1.35
31	HDFC Income Fund	4.60	3.60	0.78	-0.38	-1.67	-1.37
32	Reliance Medium Term Fund	4.60	2.47	0.54	-0.55	-1.09	-1.37
33	HDFC Gilt Fund - Short Term Plan	4.56	1.53	0.34	-0.92	-3.24	-1.41
34	UTI G-Sec Fund	4.50	4.37	0.97	-0.34	-2.38	-1.47
35	SBI Magnum Gilt - Long Term Plan	4.44	3.95	0.89	-0.39	-1.37	-1.53
36	Templeton India Income Builder Account	4.42	3.41	0.77	-0.45	-1.39	-1.55
37	Tata Gilt Securities Fund B (App)	4.40	5.31	1.21	-0.30	-2.32	-1.57
38	Taurus Libra Bond	4.34	4.80	1.11	-0.34	2.87	-1.63
39	JM Income Fund	4.32	2.86	0.66	-0.58	-5.05	-1.65
40	HDFC High Interest Fund	4.20	3.33	0.79	-0.53	-2.35	-1.77
41	Escorts Gilt Fund	4.20	2.80	0.67	-0.63	-5.81	-1.77
42	Canara Robeco Gilt PGS	4.18	3.43	0.82	-0.52	-1.18	-1.79
43	SBI Magnum Income Fund	4.18	3.24	0.77	-0.55	-1.65	-1.79
44	JM G-Sec Fund (RP)	4.16	3.31	0.80	-0.55	7.30	-1.81
45	LIC MF Govt. Sec. Fund	4.16	3.07	0.74	-0.59	-2.18	-1.81
46	Sundaram BNP Paribas Bond Saver	4.00	3.29	0.82	-0.60	-1.77	-1.97
47	HDFC Gilt Fund - Long Term Plan	3.92	4.74	1.21	-0.43	-4.66	-2.05



48	Birla Sun Life Short Term Opportunities Fund - Retail Plan	3.86	2.84	0.74	-0.74	-1.60	-2.11
49	UTI Gilt Advantage Fund - LTP - PF	3.12	3.22	1.03	-0.89	-1.23	-2.85
50	Tata Gilt High Fund	3.10	3.69	1.19	-0.78	-1.52	-2.87
51	UTI Gilt Advantage Fund - LTP- PF	3.10	3.24	1.05	-0.88	-1.23	-2.87
52	Sahara Gilt Fund	3.08	2.89	0.94	-1.00	-1.56	-2.89
53	Taurus Libra Gilt	3.06	4.40	1.44	-0.66	1.79	-2.91
54	BOB Gilt Fund	2.82	3.44	1.22	-0.91	-2.04	-3.15
55	Tata Gilt Retirement Plan (28/02/13 Maturity)	2.50	3.62	1.45	-0.96	-1.37	-3.47
56	Tata Gilt Retirement Plan (28/02/09 Maturity)	2.40	3.57	1.49	-1.00	-1.40	-3.57
57	Tata Gilt Retirement Plan (28/02/11 Maturity)	2.36	3.60	1.52	-1.00	-1.39	-3.61
58	Tata Gilt Retirement Plan (28/02/10 Maturity)	2.30	3.62	1.58	-1.01	-1.38	-3.67
59	Tata Gilt Retirement Plan (28/02/25 Maturity)	2.06	3.75	1.82	-1.04	-1.36	-3.91
60	Franklin Indian International Fund	-0.52	4.25	-8.17	-1.53	8.89	-6.49
<b>Mean Return</b>		<b>4.64</b>					
<b>Standard Deviation of Returns</b>			<b>1.44</b>				
<b>Market Return (364 Days T Bill)</b>		<b>5.97</b>					
<b>The average risk per unit return (coefficient of Variation) works out to be 1.44/4.64 = 0.31</b>							
<b>13 Debt Long Term funds have generated greater returns than the market returns.</b>							

-44.77 are the highest and least performing funds in debt long term funds respectively. Jensen ratio for Debt Long Term Funds has been computed and 13 funds in this category have positive ratio indicating superior performance. Among them ICICI Pru Long Term Plan has

the highest Jensen ratio 1.75 and Franklin Indian International fund has the least Jensen ratio -6.49.

**Performance of Debt Floating Rate Funds:** Table 5 shows that 17% of Debt Floating Rate Funds i.e. two debt funds -

**Table 5: Debt Floating Rate Funds**

S. No	Debt Floating Rate	Returns (%)	Risk	Risk/Return	Sharpe	Treynor	Jensen
1	Templeton Floating Rate Income Fund - STP	6.08	1.46	0.24	0.08	0.10	0.11
2	Templeton Floating Rate Income Fund - LTP	6.02	1.32	0.22	0.04	0.05	0.05
3	HDFC Floating Rate Income Fund - STP - Retail Plan	5.94	1.47	0.25	-0.02	-0.02	-0.03
4	ICICI Pru Floating Rate Plan B	5.80	1.77	0.31	-0.10	-0.11	-0.17
5	Birla Floating Rate Fund - Long Term Plan	5.56	1.99	0.36	-0.20	-0.26	-0.41
6	HDFC Floating Rate Income Fund - LTP	5.52	1.37	0.25	-0.33	-0.38	-0.45
7	Kotak Floater Short Term Plan	5.44	2.12	0.39	-0.25	-0.32	-0.53
8	Birla Floating Rate Fund - Short Term Plan	5.40	1.83	0.34	-0.31	-0.40	-0.57
9	JM Floater Fund - Short Term Plan	5.38	1.82	0.34	-0.32	-0.45	-0.59
10	UTI Floating Rate Fund - STP	4.94	2.09	0.42	-0.49	-0.81	-1.03
11	DSP-ML Floating Rate Fund - Regular Plan A	4.94	1.10	0.22	-0.93	-2.04	-1.03
12	JM Liquid Plus Fund - Regular Plan	4.82	2.07	0.43	-0.56	-0.72	-1.15
<b>Mean Return</b>		<b>5.49</b>					
<b>Standard Deviation of Returns</b>			<b>0.43</b>				
<b>Market Return (364 Days T Bill)</b>		<b>5.97</b>					
<b>The average risk per unit return (coefficient of Variation) works out to be 0.43/5.49 = 0.08</b>							
<b>2 Debt Floating Rate funds have generated greater returns than the market returns.</b>							

Templeton Floating Rate Income Fund STP & LTP have generated greater returns than the market returns of 5.79%. The average risk per unit return (coefficient of Variation) for Debt Floating Rate Category Funds works out to be 0.08.

Templeton Floating Rate Income Fund - STP has the highest returns of 6.08% followed by Templeton Floating Rate Income Fund - LTP and JM Liquid Plus Fund - Regular Plan has the lowest returns of 4.82%. The risk for Debt Floating Rate ranges from 1.10 to 2.12 and highest for Kotak Floater

PERFORMANCE EVALUATION OF DEBT MUTUAL FUNDS IN INDIA

Short Term Plan and lowest for DSP-ML Floating Rate Fund - Regular Plan A.

The risk per unit ratio ranges from 0.22 to 0.43 for Debt Floating Rate Mutual Funds. JM Liquid Plus Fund - Regular Plan has the highest ratio signifying high risk per unit return and Templeton Floating Rate Income Fund - LTP has the lowest ratio signifying low risk per unit return.

The Risk adjusted Sharpe ratio performance measure is computed for the twelve debt floating rate funds and the range of performance in debt floating rate funds is from - 0.93 to 0.08. The highest and least performing funds are Templeton floating rate income fund - STP sharpe ratio and

DSP ML floating rate fund - Regular plan A respectively. Treynor ratio for debt floating rate ranges from -2.04 to 0.10. Jensen performance measure for Debt Floating Rate has been computed. Only Templeton Floating Rate Income Fund STP with 0.11 and Templeton Floating Rate Income Fund LTP with 0.05 have positive ratio and it indicates that these two funds have superior performance. Templeton Floating Rate Income Fund STP has the highest Jensen ratio 0.11 and JM Liquid Plus Fund Regular Plan has the least Jensen ratio -1.15.

**Return and Risk Parameters for different Debt Funds:**  
The return, risk and coefficient of variation are calculated for different investment styles and presented in table 6. The debt

Table 6: Return and Risk Parameters for different debt funds

S. No	Investment Style	Return (%)	Risk	Coefficient of Variation
1	Debt Floating Rate	5.49	0.43	0.08
2	Debt Institutional	3.88	3.31	0.85
2	Debt Long Term	4.64	1.44	0.31
4	Debt Short Term	5.37	0.87	0.16
5	Debt Speciality	12.57	2.67	0.21

Table 7: ANOVA between Returns of Various debt mutual funds of an investment style

S. No	Investment Style	F Value	Table Values
1	Debt Floating Rate	3.29*	2.49
2	Debt Institutional	1.19 <sup>NS</sup>	2.62
3	Debt Long Term	1.29 <sup>NS</sup>	1.40
4	Debt Short Term	1.53 <sup>NS</sup>	1.55
5	Debt Speciality	2.42 <sup>NS</sup>	3.81

Note: \* P < 0.05 NS - Not Significant

specialty fund is the topper in returns followed by floating rate fund. Debt Institutional funds have the least average returns and highest risk due to which coefficient of variation is also high for this investment style. Debt floating rate fund has the least coefficient of variation. It implies that the investors of this fund assume less risk per unit of return.

**TESTING OF HYPOTHESIS**

**Hypothesis:** There is no significant difference between the returns of different debt mutual fund schemes of an investment style.

To test the hypothesis ANOVA is calculated. From Table 7 it can be observed that only for Debt Floating Rate funds, the

calculated value is greater than the table value. Therefore the null hypothesis that there is no significant difference between the returns of chosen mutual fund schemes of an investment style is rejected and the alternative hypothesis that there is significant difference between the returns of chosen mutual fund schemes of an investment style is accepted. It implies that returns of mutual fund schemes significantly differ from one another only for Debt Floating Rate funds whereas there is no significant difference in the returns of debt mutual funds schemes of other investment styles.

**CONCLUSION**

The tremendous success the fund industry has enjoyed is due

to the fact that, it has done more than any other financial services industry to offer investors solid products tailored to meet real financial needs, and marketed those products responsibly. But it cannot be ignored that rapid changes and market pressures are challenging. It cannot be afforded to remain "pigeonholed" by outdated thinking or antiquated business practices. If the long-term health of the industry and investor protection is maintained, the record of success can be maintained in the future.

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