Performance of Selected Debt Oriented Mutual Fund Schemes in India: A Study In Comparison With the Market Portfolio Returns

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Abstract: *The majority investors of India belong to middle class families who want to yield the maximum returns on their investment by taking the less risk. In banks and post offices investment is safe but due to lower interest rates it is less attractive while in mutual funds through professional and sound portfolio management, it reduces the risk and yield the higher rate of return on the investment. In this paper an attempt has been made to evaluate the performance of mutual fund schemes is to see whether the mutual fund schemes are outperforming or underperforming than NSE G-Sec Composite Index and to see the competency of schemes to make out a strong case for investment. The study covers the period between April 1996 and March 2011 and evaluates the performance of 40 debt oriented open ended schemes having corresponding growth and dividend options. The empirical results reported that the variance of only 17.5 percent of total schemes was explained completely by the market and in overall, NSE G-Sec Composite Index outperformed the scheme returns. The study concludes there was no significant difference exists between Schemes Returns and NSE G-Sec Composite Index Returns.*
Keywords: *Debt schemes, Mutual funds, Performance evaluation, Ranks, Risk-return.*

I. Introduction

Unprecedented global and national events have brought in considerable changes in the securities market. Markets for equity shares, real estate, derivatives and other assets have become highly dynamic and volatile. In this dynamic scenario, investment in corporate securities demands investors to understand the complexities of market, to keep track of market movements and to make precise investment decisions. Globally mutual funds as an intermediation mechanism have a unique role in the economy and capital market. The financial savings of households and private corporate sector forms the main source of suppliers for mutual fund industry in India. The Indian mutual fund industry started a new era in 1993 with the entry of private sector mutual funds offering wide range of choices to the investors resulted into growing competition in the industry. Further, the industry has reached a new height with the introduction of SEBI (Mutual Funds) Regulations 1996. India has been among the fastest growing markets for mutual funds since 2004; during the five-year period from 2004 to 2008, the Indian mutual fund industry reported a compounded annual growth rate (CAGR) of 29 per cent. In 2008–09, impacted by the global crisis, India's GDP grew by 6.7 percent.

Historically, mutual funds have been dominant investors in the debt market than equity markets and it is expected that debt oriented schemes will continue to dominate the mutual fund industry satisfying the needs of yield, security and liquidity fairly well besides being attractive from the tax point of view.

Investors expect good returns from investment managers because of their stock selection ability, risk bearing activities, diversification, performance and market timing skills. But, by nature, mutual fund investments are subject to market risks and risks is generally defined as deviation of actual from the anticipated results. The proportion of such risks varies from scheme to scheme depending upon the composition of portfolio. The returns generated by the mutual funds are risky as their returns are market-linked and therefore, while evaluating the performance of mutual funds, return of the individual scheme should be compared with broad-based market return so as to understand the deviation (if any) and considering that deviation, appropriate measures can be undertaken to minimize the risk through diversification and it is also suggested by **Lehman and Modest (1987)** that, the choice of benchmark portfolio is imperative for measuring the performance of managed portfolios [3].

With the growing popularity of mutual funds, performance evaluation of mutual fund schemes has become an important issue for both professionals and academicians and accordingly, a good number of studies have been conducted by the researchers like **Jayadev (1996)** in his study found that, funds are not outperformer in terms of total risk and are also not offering diversification and professionalism to the investors [2]. In their study, **Bhunaneswari and Selvam (2011)** indicated that, the performances of majority of the sample equity schemes of dividend options were not significantly related to their market movements during the study period [1]. **Loomba (2011)** reported in his study that, market returns outperformed all the four schemes according to

Mann Whitney-U test but it was evident from Kruskal-Walis H-test that, the returns of the schemes do not differ significantly. Also the results of the study carried out by **Swaminathan and Ananth (2011)** exhibit that, there is a low positive relationship (11.9%) exists between Mutual Fund flow and NSE-Nifty and the R^2 value indicates that when the mutual fund flow increases one unit the Nifty will change by 1.40% [7]. In another study, **Prajapati and Patel (2012)** revealed that, all selected mutual fund companies have positive return during the study period and beta is less than one to all selected mutual fund companies which means the funds are less volatile than the Index [6]. The findings of the study carried out recently by **Lohana (2013)** on the basis of risk-return relationship models revealed that, returns of all funds are more than market index returns [4].

It is found from the past studies that, majority of Indian studies have been carried out to evaluate the equity-based mutual funds schemes in general. A few studies have evaluated the performance of mutual fund schemes concerning debt-oriented schemes. However, the issue of style analysis pertaining to frequency of Growth and Dividend options of debt oriented mutual fund schemes have not been explored. This gap has been filled in present study to analyse the performance in terms of style such as growth and dividend options.

The need for evaluating the performance of mutual fund schemes is to see whether the mutual fund schemes are outperforming or underperforming than the benchmark and to see the competency of schemes to make out a strong case for investment. This paper attempts **to examine the return generated by the debt oriented mutual funds schemes in comparison with the market portfolio returns** (NSE G-Sec Composite Index) in terms of return, total risk, covariance, correlation coefficient and coefficient of determination so as to know whether the fund is doing well in comparison to broad-based market.

II.   Objectives Of The Study

In order to capture the investors' attention, mutual fund companies are offering wide variety of schemes with multiple options so as to fit the investors' investment motive. As on 31st March, 2011, mutual fund companies have floated 1,131 schemes (SEBI, Annual Report, 2011). Because of the large number of mutual fund companies with plethora of schemes, retail investors are facing problems in selecting right funds. Also, it is of paramount importance for policymakers, governing bodies and mutual fund companies to analyze as which schemes are performing well. Therefore, to study about the performance of mutual funds in terms of return with their relative risk is of crucial importance.

The idea behind performance evaluation is to assess the historical returns generated by the individual schemes and their associated risk at which they have delivered in comparison with the market so as to distinguish performers from the laggards. Also to examine the movement of the scheme returns vis-à-vis market portfolio returns.

III.   Data And Methodology

3.1 Type of Research: Empirical

3.2 Nature and Sources of Data collection: The study relied on secondary data source. Data have been extracted from journals, dailies, periodicals, e-resources such as websites of concerned fund houses, financial database, various issues of annual report and bulletin published by Securities & Exchange Board of India (SEBI), handbook of statistics published by Reserve Bank of India (RBI), fact-sheets of fund houses, Association of Mutual Fund Industry (AMFI) updates etc.

3.3 Period of the study   : 1997-2011
3.4 Sampling Procedure and sample framework: Multi-stage
Population 1   : 114 Open-ended Debt-oriented Growth options
Size of Sample   : 20 Open-ended Debt-oriented Growth options
Population 2   : 48 Open-ended Debt-oriented Dividend options
Size of Sample   : 20 Open-ended Debt-oriented Growth options

In this study, for selecting representative sample, all 21 Asset Management Companies (AMCs) registered under SEBI before 31st March 1997 have been ranked according to AUM as on 31st March 2011 and out of that, top five AMCs as per AUM is selected. The total **open-ended debt oriented schemes** floated by these selected AMCs as on 31st March 2011 are 395 (obtained from Capitaline NAV India database, accessed on 08/06/2014), which have been classified for analysing the nature of returns provided by the schemes according to investment options such as Div- half yearly, Div- quarterly, Div- annually, Div- daily, Div- weekly, Div- monthly, dividend, growth, cash, appreciation etc.

Further, the study focused on two dominant investment options, i.e. growth and dividend plans, which together constitute 41% of the total number of open-ended debt schemes, which are again categorized according to minimum investment offered against schemes.

A representative sample of **40** schemes has been selected for evaluating performance. While selecting schemes, five factors have been kept in mind: the operation of the schemes is open-ended, only schemes

offering corresponding dividend and growth options are considered, schemes having more than one year fund age as on end of the study period, availability of sufficient data and avoidance of survivorship bias. Again care has been taken to bring parity in comparison and thus schemes offering minimum investment Rs. 5,000/- have been selected apart from all other choices. The list of sample schemes has been presented below:

Table-1: Sample Schemes

Name of the Scheme	Category	Option	Type	Minimum Investment (Rs.)	Period	Number of Observations*
Reliance Mutual Fund						
Reliance Dynamic Bond Fund (D)	Income Funds	Dividend	Open	5000	November'04 to March'2011	77
Reliance Dynamic Bond Fund (G)	Income Funds	Growth	Open	5000	November'04 to March'2011	77
Reliance Gilt Sec Fund - (D)	Gilt Funds- Short term	Dividend	Open	5000	August'08 to March'11	32
Reliance Gilt Sec Fund - (G)	Gilt Funds- Short term	Growth	Open	5000	July'03 to March'11	93
ICICI Prudential Mutual Funds						
ICICI Pru Income Plan - (D)	Income Funds	Dividend	Open	5000	July'99 to March'11	141
ICICI Pru Income Plan - (G)	Income Funds	Growth	Open	5000	June'98 to March'11	154
ICICI Pru Short Term Plan (D)	Short Term Income Funds	Dividend	Open	5000	December'01 to March'11	112
ICICI Pru Short Term Plan (G)	Short Term Income Funds	Growth	Open	5000	October'01 to March '11	114
ICICI Pru Short Term Gilt Fund (D)	Gilt Funds - Short Term	Dividend	Open	5000	November'99 to March'2011	137
ICICI Pru Short Term Gilt Fund (G)	Gilt Funds - Short Term	Growth	Open	5000	August'99 to March'11	140
ICICI Pru Long Term Gilt Fund (D)	Gilt Funds - Medium & Long Term	Dividend	Open	5000	February'00 to March'11	134
ICICI Pru Long Term Gilt Fund (G)	Gilt Funds - Medium & Long Term	Growth	Open	5000	August'99 to March'11	140
Birla Sunlife Mutual Fund						
Birla Sun Life Medium Term Plan (D)	Income Funds	Dividend	Open	5000	April'09 to March'11	24
Birla Sun Life Medium Term Plan (G)	Income Funds	Growth	Open	5000	April'09 to March'11	24
Birla Sun Life Short Term Opportunities (D)	Short term Income Funds	Dividend	Open	5000	May'03 to March'11	95
Birla Sun Life Short Term Opportunities (G)	Short term Income Funds	Growth	Open	5000	April'03 to March'11	96
Birla Sun Life Govt Sec - Short Term (D)	Gilt Funds - Short Term	Dividend	Open	5000	Dec'99 to March'11	136
Birla Sun Life Govt Sec - Short Term (G)	Gilt Funds - Short Term	Growth	Open	5000	Oct'99 to March'11	138
Birla Sun Life Govt Sec - Long Term (D)	Gilt Funds - Medium & Long Term	Dividend	Open	5000	Nov'99 to March'11	137
Birla Sun Life Govt Sec - Long Term (G)	Gilt Funds - Medium & Long Term	Growth	Open	5000	Oct'99 to March'11	138
SBI Mutual Fund						
SBI Regular Savings Fund (D)	Monthly Income Plans - Short Term	Dividend	Open	5000	November'03 to March'11	89
SBI Regular Savings Fund (G)	Monthly Income Plans - Short Term	Growth	Open	5000	November'03 to March'11	89
SBI Dynamic Bond Fund (D)	Income Funds	Dividend	Open	5000	February'03 to March'11	86
SBI Dynamic Bond Fund (G)	Income Funds	Growth	Open	5000	February'03 to March'11	86
SBI Magnum Income Fund - (D)	Income Funds	Dividend	Open	5000	November'98 to March'2011	147

SBI Magnum Income Fund - (G)	Income Funds	Growth	Open	5000	November'98 to March'2011	147
SBI Magnum Floating Rate Plan-LTP (D)	Floating Rate Funds - Long Term	Dividend	Open	5000	July'04 to March'11	81
SBI Magnum Floating Rate Plan-LTP (G)	Floating Rate Funds - Long Term	Growth	Open	5000	July'04 to March'11	81
SBI Magnum Income FRP - Savings Plus Bond (D)	Floating Rate Funds - Short Term	Dividend	Open	5000	July'04 to March'11	81
SBI Magnum Income FRP - Savings Plus Bond (G)	Floating Rate Funds - Short Term	Growth	Open	5000	July'04 to March'11	81
SBI Magnum Instacash - Liquid Floater Plan (D)	Floating Rate Funds - Short Term	Dividend	Open	5000	May'03 to March'11	95
SBI Magnum InstaCash - Liquid Floater Plan (G)	Floating Rate Funds - Short Term	Growth	Open	5000	October'02 to March'11	102
SBI Magnum Gilt Fund - Short Term (D)	Gilt Funds - Short Term	Dividend	Open	5000	December'00 to March'11	124
SBI Magnum Gilt Fund - Short Term (G)	Gilt Funds - Short Term	Growth	Open	5000	December'00 to March'11	124
SBI Magnum Gilt Fund - Long Term (D)	Gilt Funds - Medium & Long Term	Dividend	Open	5000	December'00 to March'11	124
SBI Magnum Gilt Fund - Long term (G)	Gilt Funds - Medium & Long Term	Growth	Open	5000	December'00 to March'11	124
Franklin Templeton Mutual Fund						
Templeton India Income Opportunities Fund (D)	Income Funds	Dividend	Open	5000	Dec' 09 to March'11	16
Templeton India Income Opportunities Fund (G)	Income Funds	Growth	Open	5000	Dec' 09 to March'11	16
Templeton India G-Sec Fund - Treasury Plan (D)	Gilt-Funds-Short term	Dividend	Open	5000	Feb'02 to March'11	110
Templeton India G-Sec Fund - Treasury Plan (G)	Gilt-Funds-Short term	Growth	Open	5000	Feb'02 to March'11	110

Source: capitaline NAV India database

3.5 Exploration of Documents
3.5.1 Net Asset Value (NAV): The data required for the study relates information pertaining to month opening and closing adjusted NAV figures of selected schemes for the period study period have been obtained from respective websites of concerned fund houses, websites of industry aggregate such as AMFI, mutualfundsindia.com and capitaline NAV India database.

NAV has been used to determine schemes' monthly returns.

The commonly method of calculating average is arithmetic mean also known as simple average. However, for determining average return on investment, which are reinvested to generate earnings from previous earnings that are compounded, simple average or arithmetic mean is an inappropriate tool and hence, compounded average also known as geometric mean is more appropriate. Thus, in this study, the monthly return so obtained for different single periods have been compounded to get compounded monthly rate of return using following expression:

$R = [(1+R_{S1}) X (1+R_{S2}) X (1+R_{S2}) X ………. X (1+R_{Sn})]^{1/n} – 1$ …………………….. (1)

R = Compounded monthly rate of return on scheme `s'

R_{Sn} = Monthly rate of return on scheme `s' for n^{th} month

n = Number of months

3.5.2 Benchmark Index: NSE G-Sec Composite Index has been used as benchmark index to relate the performance of the selected debt-oriented schemes with this index. The relevant monthly data concerning NSE G-Sec Composite Index have been sourced from website of NSE.

NSE G-Sec Composite Index is used to determine market return using geometric mean stated in eq. (1).

3.5.3 Risk-free Asset: Data pertaining to yield on Government dated for 3-years maturity period is obtained from Reserve Bank of India's (RBI) website. This is used to determine risk-free return.

3.6 Analytical Tools

Returns of schemes have been compared against broad-based market in order to identify whether the schemes have earned sufficient than the market return or not. Analysis of total risk will enable us to understand how far the scheme is risky or not than the market.

The study of interactive risk or covariance between sample schemes' returns and market returns helps us to discern whether they move in same direction or opposite direction. If the covariance between the two is zero it signifies that the scheme is independent of the market.

In order to describe the degree of linear relationship and the strength of relationship between schemes' returns and market returns, correlation of coefficient is studied. Correlation coefficient measures the extent of association ship between the variables. The square of the correlation, called the coefficient of determination (R^2) is used to denote the degree of diversification. The potential advantage of mutual fund investment is the diversification of portfolio. R^2 expresses the percentage of variance of the schemes' returns that is explained by the variation of returns on the market.

To test the significance of the relationship between the Market portfolio and schemes return, Mann-Whitney U-Test at 5 percent level of significance is conducted.

IV. Empirical Findings

4.1 Risk-return analysis: mutual fund schemes vs. market portfolio

In this section, the researcher attempts to exhibit the performance of the schemes in comparison to market portfolio on the basis of actual return realized by the schemes as well as market portfolio so as to indicate whether the schemes have generated excess return or not and on the basis of standard deviation of schemes and standard deviation of market portfolio so as to discern whether the schemes are risky or not. This analysis of selected schemes vs. market index for the overall study period has been presented below:

Table- 2						
Risk-Return Analysis: Mutual Funds Schemes vs. Market Index for the period 1998-99 to 2010-11						
Mutual Fund Schemes	r_s	σ_s	r_m	σ_m	r_s - r_m	σ_s - σ_m
Birla Sun Life Govt Sec - Long Term (D)	0.0052	0.0031	0.0066	0.0055	-0.0014	-0.0023
Birla Sun Life Govt Sec - Long Term (G)	0.0071	0.0053	0.0066	0.0054	0.0005	-0.0001
Birla Sun Life Govt Sec - Short Term (D)	0.0171	0.0253	0.0068	0.0056	0.0103	0.0197
Birla Sun Life Govt Sec - Short Term (G)	0.0048	0.0028	0.0066	0.0054	-0.0018	-0.0026
Birla Sun Life Medium Term Plan (D)	0.0050	0.0006	0.0050	0.0017	0.0000	-0.0011
Birla Sun Life Medium Term Plan (G)	0.0140	0.0127	0.0050	0.0017	0.0090	0.0111
Birla Sun Life Short Term Opportunities (D)	0.0042	0.0024	0.0045	0.0044	-0.0003	-0.0020
Birla Sun Life Short Term Opportunities (G)	0.0041	0.0023	0.0047	0.0046	-0.0006	-0.0023
ICICI Pru Income Plan - (D)	0.0064	0.0037	0.0066	0.0055	-0.0002	-0.0018
ICICI Pru Income Plan - (G)	0.0070	0.0038	0.0066	0.0052	0.0004	-0.0014
ICICI Pru Long Term Gilt Fund (D)	0.0068	0.0063	0.0067	0.0055	0.0001	0.0007
ICICI Pru Long Term Gilt Fund (G)	0.0079	0.0058	0.0066	0.0054	0.0013	0.0003
ICICI Pru Short Term Gilt Fund (D)	0.0059	0.0033	0.0066	0.0055	-0.0007	-0.0022
ICICI Pru Short Term Gilt Fund (G)	0.0063	0.0034	0.0066	0.0054	-0.0003	-0.0021
ICICI Pru Short Term Plan (D)	0.0063	0.0023	0.0055	0.0049	0.0008	-0.0026
ICICI Pru Short Term Plan (G)	0.0057	0.0022	0.0062	0.0063	-0.0005	-0.0041
Reliance Dynamic Bond Fund (D)	0.0025	0.0023	0.0051	0.0030	-0.0026	-0.0007
Reliance Dynamic Bond Fund (G)	0.0028	0.0016	0.0051	0.0030	-0.0023	-0.0014
Reliance Gilt Sec Fund - (D)	0.0066	0.0054	0.0114	0.0111	-0.0047	-0.0057
Reliance Gilt Sec Fund - (G)	0.0018	0.0041	0.0044	0.0044	-0.0026	-0.0003
SBI Dynamic Bond Fund (D)	0.0022	0.0027	0.0051	0.0052	-0.0029	-0.0025
SBI Dynamic Bond Fund (G)	0.0021	0.0025	0.0051	0.0052	-0.0030	-0.0027
SBI Magnum Floating Rate Plan-LTP (D)	0.0056	0.0029	0.0044	0.0037	0.0012	-0.0008
SBI Magnum Floating Rate Plan-LTP (G)	0.0045	0.0010	0.0044	0.0037	0.0001	-0.0028
SBI Magnum Gilt Fund - Long Term (D)	0.0054	0.0056	0.0069	0.0063	-0.0015	-0.0007
SBI Magnum Gilt Fund - Long term (G)	0.0057	0.0057	0.0069	0.0063	-0.0012	-0.0006
SBI Magnum Gilt Fund - Short Term (D)	0.0058	0.0025	0.0069	0.0063	-0.0011	-0.0038
SBI Magnum Gilt Fund - Short Term (G)	0.0052	0.0026	0.0069	0.0063	-0.0017	-0.0037
SBI Magnum Income FRP - Savings Plus Bond (D)	0.0050	0.0015	0.0044	0.0037	0.0006	-0.0022
SBI Magnum Income FRP - Savings Plus Bond (G)	0.0047	0.0011	0.0044	0.0037	0.0002	-0.0026
SBI Magnum Income Fund - (D)	0.0051	0.0037	0.0065	0.0053	-0.0015	-0.0016
SBI Magnum Income Fund - (G)	0.0064	0.0061	0.0065	0.0053	-0.0001	0.0008
SBI Magnum Instacash - Liquid Floater Plan (D)	0.0048	0.0014	0.0045	0.0044	0.0002	-0.0030
SBI Magnum InstaCash - Liquid Floater Plan (G)	0.0050	0.0013	0.0047	0.0043	0.0002	-0.0030
SBI Regular Savings Fund (D)	0.0084	0.0085	0.0041	0.0042	0.0043	0.0044

SBI Regular Savings Fund (G)	0.0066	0.0053	0.0041	0.0042	0.0025	0.0012
Templeton India G-Sec Fund - Treasury Plan (D)	0.0042	0.0029	0.0058	0.0055	-0.0016	-0.0026
Templeton India G-Sec Fund - Treasury Plan (G)	0.0041	0.0023	0.0058	0.0055	-0.0017	-0.0032
Templeton India Income Opportunities Fund (D)	0.0600	0.0201	0.0027	0.0049	**0.0573**	0.0152
Templeton India Income Opportunities Fund (G)	0.0600	0.0201	0.0027	0.0049	**0.0573**	0.0152

Source: computed by the author

It can be viewed from the table that, on an average all the schemes have provided positive returns and the returns of the schemes lies in 0.0018 to 0.0600. Accordingly, highest return (0.0600) has been registered equally by both the options of Templeton India Income Opportunities Fund schemes and the lowest return (0.0018) has been provided by Reliance Gilt Sec Fund – (G) scheme. Although, all the schemes have generated positive returns during the study period but majority of the schemes have failed to earn excess returns in contrast to market returns. Seventeen out of forty schemes (i.e. 42.5 percent) have generated excess scheme returns compared to their market returns and hence outperformed the market. While, other 23 schemes have performed below the market and thus indicating investors' expectation is not satisfied. The highest excess return (0.0573) has been registered equally by both the options of Templeton India Income Opportunities Fund schemes with moderately high risks (0.0197). On the basis of excess of schemes risks over market risks, nine out of forty schemes (i.e. 22.5 percent) have shown risks higher than the market and Birla Sun Life Govt Sec - Short Term-(D) scheme is the highly risky fund.

Based on risk-return characteristics of the schemes in contrast to the market benchmark during the entire study period, following grid has been developed to indicate whether the schemes returns are higher than the market returns or not and whether the schemes risks are less than market or not. This has been presented below by categorizing the schemes into quadrant containing- high return and low risk; high return and high risk; low return and low risk; and low return and high risk:

Fig. – 1: Risk-Return Grid of Sample Mutual Fund Schemes

Low Return and Low Risk Schemes (Rs < Rm ; σs < σm) Growth options = 10, Dividend options = 12	Low Return and High Risk Schemes (Rs < Rm ; σs > σm) Growth options = 1, Dividend options = 0
Birla Sun Life Govt Sec - Short Term (G) Birla Sun Life Short Term Opportunities (G) ICICI Pru Short Term Gilt Fund (G) ICICI Pru Short Term Plan (G) Reliance Dynamic Bond Fund (G) Reliance Gilt Sec Fund - (G) SBI Dynamic Bond Fund (G) SBI Magnum Gilt Fund - Long term (G) SBI Magnum Gilt Fund - Short Term (G) Templeton India G-Sec Fund - Treasury Plan (G) **(Quadrant I)** Birla Sun Life Govt Sec - Long Term (D) Birla Sun Life Medium Term Plan (D) Birla Sun Life Short Term Opportunities (D) ICICI Pru Income Plan - (D) ICICI Pru Short Term Gilt Fund (D) Reliance Dynamic Bond Fund (D) Reliance Gilt Sec Fund - (D) SBI Dynamic Bond Fund (D) SBI Magnum Gilt Fund - Long Term (D) SBI Magnum Gilt Fund - Short Term (D) SBI Magnum Income Fund - (D) Templeton India G-Sec Fund - Treasury Plan (D)	SBI Magnum Income Fund - (G) **(Quadrant II)**
Birla Sun Life Medium Term Plan (G) ICICI Pru Long Term Gilt Fund (G) SBI Regular Savings Fund (G) Templeton India Income Opportunities Fund (D) **(Quadrant IV)** Birla Sun Life Govt Sec - Short Term (D) ICICI Pru Long Term Gilt Fund (D) SBI Regular Savings Fund (D) Templeton India Income Opportunities Fund (G)	Birla Sun Life Govt Sec - Long Term (G) ICICI Pru Income Plan - (G) SBI Magnum Floating Rate Plan-LTP (G) SBI Magnum Income FRP - Savings Plus Bond (G) **(Quadrant III)** SBI Magnum InstaCash - Liquid Floater Plan (G) ICICI Pru Short Term Plan (D) SBI Magnum Floating Rate Plan-LTP (D) SBI Magnum Income FRP - Savings Plus Bond (D) SBI Magnum Instacash - Liquid Floater Plan (D)
High Return and High Risk Schemes (Rs > Rm ; σs > σm) Growth options = 4, Dividend options = 4	**High Return and Low Risk Schemes (Rs > Rm ; σs < σm)** Growth options = 5, Dividend options = 4

Source: prepared by author

Quadrant I (Low return and low risk): This quadrant is characterized by schemes having risks lower than the Market index as well as their realized return is also lower than the Market index. In this category, only ten growth options and twelve dividend options schemes are found.

Quadrant II (Low Return and High Risk): This quadrant contains the schemes whose average returns are lower than average Market index returns but their risks remain higher than the Market index. Only one scheme belonging to growth option is fitted in this category.

Quadrant III (High Return and Low Risk): This quadrant contains the schemes whose average returns are higher than average Market index returns but their risks remain lower than the Market index. There are five growth options and four dividend options schemes fall in this category. The schemes belonging to this category are highly preferred by the common investors.

Quadrant IV (High Return and High Risk): This quadrant includes those schemes whose returns as well as risk (standard deviations) are higher than that of the Market portfolio. There are only four growth options and four dividend options schemes belong to this category.

4.2 Impact of market portfolio on the performance of sample schemes
In this section, the relationship between the mutual fund schemes and the market portfolio has been studied using covariance, correlation and coefficient of determination. Covariance has been studied to understand the movement of schemes in connection with market portfolio i.e. to indicate whether the schemes are moving in the same direction with market portfolio or not, correlation has been analysed to indicate the relationship between the two so as to find whether there exists positive relation between schemes and market portfolio or not while, coefficient of determination has been studied to recognize the magnitude of diversification in undertaking the investment decision. The relationship between mutual schemes and market portfolio has been exhibited in the following table:

Table- 3: Impact of market portfolio on the performance of sample schemes

Mutual Fund Schemes	Covariance	Correlation	Coefficient of determination
Birla Sun Life Govt Sec - Long Term (D)	**0.1727**	0.9999	0.9999
Birla Sun Life Govt Sec - Long Term (G)	0.0000	0.7613	0.5795
Birla Sun Life Govt Sec - Short Term (D)	0.1650	0.8351	0.6974
Birla Sun Life Govt Sec - Short Term (G)	0.0000	0.6511	0.4240
Birla Sun Life Medium Term Plan (D)	0.0000	1.0000	**1.0000**
Birla Sun Life Medium Term Plan (G)	0.0000	-1.0000	**1.0000**
Birla Sun Life Short Term Opportunities (D)	0.0000	0.8853	0.7838
Birla Sun Life Short Term Opportunities (G)	0.0000	0.8822	0.7782
ICICI Pru Income Plan - (D)	0.0014	0.7758	0.6019
ICICI Pru Income Plan - (G)	0.0000	0.8551	0.7311
ICICI Pru Long Term Gilt Fund (D)	0.0592	0.5595	0.3131
ICICI Pru Long Term Gilt Fund (G)	0.0000	0.9015	0.8127
ICICI Pru Short Term Gilt Fund (D)	0.0002	0.1484	0.0220
ICICI Pru Short Term Gilt Fund (G)	0.0000	0.7046	0.4965
ICICI Pru Short Term Plan (D)	-0.0006	-0.4542	0.2063
ICICI Pru Short Term Plan (G)	0.0000	0.3750	0.1406
Reliance Dynamic Bond Fund (D)	**-0.0009**	-0.6499	0.4223
Reliance Dynamic Bond Fund (G)	0.0000	0.3750	0.1406
Reliance Gilt Sec Fund - (D)	0.0005	0.9959	0.9918
Reliance Gilt Sec Fund - (G)	0.0000	0.7046	0.4965
SBI Dynamic Bond Fund (D)	-0.0008	-0.5073	0.2574
SBI Dynamic Bond Fund (G)	0.0000	0.7046	0.4965
SBI Magnum Floating Rate Plan-LTP (D)	0.0001	1.0000	**1.0000**
SBI Magnum Floating Rate Plan-LTP (G)	0.0000	0.7234	0.5233
SBI Magnum Gilt Fund - Long Term (D)	0.0017	0.8397	0.7051
SBI Magnum Gilt Fund - Long term (G)	0.0000	0.7150	0.5113
SBI Magnum Gilt Fund - Short Term (D)	0.0017	0.8397	0.7051
SBI Magnum Gilt Fund - Short Term (G)	0.0000	0.7924	0.6279
SBI Magnum Income FRP - Savings Plus Bond (D)	0.0002	1.0000	**1.0000**
SBI Magnum Income FRP - Savings Plus Bond (G)	0.0000	0.8137	0.6621
SBI Magnum Income Fund - (D)	0.0005	0.1330	0.0177
SBI Magnum Income Fund - (G)	0.0000	0.5849	0.3421
SBI Magnum Instacash - Liquid Floater Plan (D)	0.0001	1.0000	**1.0000**
SBI Magnum InstaCash - Liquid Floater Plan (G)	0.0000	0.7002	0.4903
SBI Regular Savings Fund (D)	0.0020	0.5513	0.3040

SBI Regular Savings Fund (G)	0.0000	-0.4465	0.1993
Templeton India G-Sec Fund - Treasury Plan (D)	0.0000	-0.0553	0.0031
Templeton India G-Sec Fund - Treasury Plan (G)	0.0000	0.0313	**0.0010**
Templeton India Income Opportunities Fund (D)	0.0000	-1.0000	**1.0000**
Templeton India Income Opportunities Fund (G)	0.0000	-1.0000	**1.0000**

Source: computed by the author

The above **table** signifies that, out of forty schemes, thirteen schemes (i.e. 32.5 percent) have registered positive covariance indicating thereby, the scheme is moving in the same direction as that of market portfolio, twenty four schemes (i.e. 60 percent) have registered zero covariance indicating that they are independent of the market while, only three schemes (i.e. 7.5 percent) have provided negative covariance indicating thereby, these are moving in opposite direction than that of market portfolio. The highest (0.1727) covariance was registered by Birla Sun Life Govt Sec - Long Term – (D) and the lowest (-0.0009) in case of Reliance Dynamic Bond Fund- (D).

Further, in examining the magnitude of diversification it is observed that, seven schemes (i.e. 17.5 percent) viz. Birla Sun Life Medium Term Plan- (D), Birla Sun Life Medium Term Plan- (G), SBI Magnum Floating Rate Plan-LTP- (D), SBI Magnum Income FRP - Savings Plus Bond- (D), SBI Magnum Instacash - Liquid Floater Plan- (D), Templeton India Income Opportunities Fund- (D) and Templeton India Income Opportunities Fund- (G) have shown 100 percent diversification signifying thereby, the scheme's performance patterns have been in line with the portfolio and the movement was completely explained while, Templeton India G-Sec Fund - Treasury Plan- (G) had the lowest 10 percent explained by the variation in the market return.

4.3 Hypothesis testing
The performance of individual scheme returns against market portfolio returns has been tested with the help of Mann-Whitney U-Test in order to find out the differences in the performance of schemes returns and market portfolio returns.

Formulation of Hypothesis:
H_0: μ= No significant difference exists between Schemes Returns and NSE G-Sec Composite Index Returns

The results of the hypothesis about all the forty schemes have been indicated below:

Table- 4: Summary of Mann-Whitney's U-test

H_0	Testing Hypothesis	N	Result of Ranks	Interpretation of Hypothesis
1	No significant difference exists between Birla Sunlife Life Govt Sec - Long Term (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 137 2 - 137	NSE G-Sec Index Returns (144.16) > Scheme Returns (130.84)	H_0 is accepted (Z = -1.391, P = 0.164)
2	No significant difference exists between Birla Sunlife Life Govt Sec - Long Term (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 138 2 - 138	NSE G-Sec Index Returns (138.96) > Scheme Returns (138.04)	H_0 is accepted (Z = -0.097, P = 0.923)
3	No significant difference exists between Birla Sunlife Life Govt Sec - Short Term (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 136 2 - 136	Scheme Returns (138.04) > NSE G-Sec Index Returns (141.05)	H_0 is accepted (Z = -0.954, P = 0.340)
4	No significant difference exists between Birla Sunlife Life Govt Sec - Short Term (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 138 2 - 138	NSE G-Sec Index Returns (146.80) > Scheme Returns (130.20)	H_0 is accepted (Z = -1.728, P = 0.084)
5	No significant difference exists between Birla Sunlife Medium Term Plan- (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 24 2 – 24	**Scheme Returns (25.25) > NSE G-Sec Index Returns (23.75)**	H_0 is accepted (Z = -0.371, P = 0.710)
6	No significant difference exists between Birla Sunlife Medium Term Plan- (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 24 2 - 24	**Scheme Returns (26.81) > NSE G-Sec Index Returns (22.19)**	H_0 is accepted (Z = -1.145, P = 0.252)
7	No significant difference exists between Birla Sun Life Short Term Opportunities (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 95 2 - 95	**Scheme Returns (96.35) > NSE G-Sec Index Returns (94.65)**	H_0 is accepted (Z = -0.212, P = 0.832)
8	No significant difference exists between Birla Sun Life Short Term Opportunities (G) Scheme Returns and NSE G-Sec	1 – 96 2 - 96	**Scheme Returns (96.56) > NSE G-Sec Index Returns (96.44)**	H_0 is accepted (Z = -0.016, P = 0.988)

	Composite Index Returns			
9	No significant difference exists between Reliance Dynamic Bond Fund (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 77 2 - 77	NSE G-Sec Index Returns (79.92) > Scheme Returns (75.08)	H_0 is accepted (Z = -0.674, P = 0.500)
10	No significant difference exists between Reliance Dynamic Bond Fund (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 77 2 - 77	NSE G-Sec Index Returns (80.49) > Scheme Returns (74.51)	H_0 is accepted (Z = -0.833, P = 0.405)
11	No significant difference exists between Reliance Gilt Sec Fund - (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 32 2 - 32	NSE G-Sec Index Returns (34.53) > Scheme Returns (30.47)	H_0 is accepted (Z = -0.873, P = 0.383)
12	No significant difference exists between Reliance Gilt Sec Fund - (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 93 2 - 93	NSE G-Sec Index Returns (96.68) > Scheme Returns (90.32)	H_0 is accepted (Z = -0.805, P = 0.421)
13	No significant difference exists between SBI Dynamic Bond Fund (D) and NSE G-Sec Composite Index Returns	1 – 86 2 - 86	NSE G-Sec Index Returns (90.28) > Scheme Returns (82.72)	H_0 is accepted (Z = -0.995, P = 0.320)
14	No significant difference exists between SBI Dynamic Bond Fund (G) and NSE G-Sec Composite Index Returns	1 – 86 2 – 86	NSE G-Sec Index Returns (90.42) > Scheme Returns (82.58)	H_0 is accepted (Z = -1.032, P = 0.302)
15	No significant difference exists between SBI Magnum Floating Rate Plan-LTP (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 81 2 – 81	**Scheme Returns (84.26) > NSE G-Sec Index Returns (78.74)**	H_0 is accepted (Z = -0.749, P = 0.454)
16	No significant difference exists between SBI Magnum Floating Rate Plan-LTP (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 81 2 – 81	**Scheme Returns (83.86) > NSE G-Sec Index Returns (79.14)**	H_0 is accepted (Z = -0.642, P = 0.521)
17	No significant difference exists between SBI Magnum Gilt Fund - Long Term (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 124 2 – 124	NSE G-Sec Index Returns (128.12) > Scheme Returns (120.88)	H_0 is accepted (Z = -0.795, P = 0.427)
18	No significant difference exists between SBI Magnum Gilt Fund - Long Term (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 124 2 - 124	NSE G-Sec Index Returns (127.35) > Scheme Returns (121.65)	H_0 is accepted (Z = -0.627, P = 0.531)
19	No significant difference exists between SBI Magnum Gilt Fund - Short Term (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 124 2 - 124	NSE G-Sec Index Returns (127.21) > Scheme Returns (121.79)	H_0 is accepted (Z = -0.595, P = 0.552)
20	No significant difference exists between SBI Magnum Gilt Fund - Short Term (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 124 2 – 124	NSE G-Sec Index Returns (129.73) > Scheme Returns (120.27)	H_0 is accepted (Z = -1.031, P = 0.302)
21	No significant difference exists between SBI Magnum Income FRP - Savings Plus Bond (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 81 2 – 81	**Scheme Returns (84.62) > NSE G-Sec Index Returns (78.38)**	H_0 is accepted (Z = -0.846, P = 0.398)
22	No significant difference exists between SBI Magnum Income FRP - Savings Plus Bond (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 81 2 – 81	**Scheme Returns (84.11) > NSE G-Sec Index Returns (78.89)**	H_0 is accepted (Z = -0.709, P = 0.479)
23	$H_0$23: No significant difference exists between SBI Magnum Income Fund - (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 147 2 – 147	NSE G-Sec Index Returns (153.94) > Scheme Returns (141.06)	H_0 is accepted (Z = -1.299, P = 0.194)
24	No significant difference exists between SBI Magnum Income Fund - (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 147 2 – 147	NSE G-Sec Index Returns (153.02) > Scheme Returns (141.98)	H_0 is accepted (Z = -1.113, P = 0.266)
25	No significant difference exists between SBI Magnum Instacash - Liquid Floater Plan (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 95 2 – 95	**Scheme Returns (105.27) > NSE G-Sec Index Returns (92.58)**	H_0 is accepted (Z = -.732, P = 0.464)
26	No significant difference exists between SBI Magnum Instacash - Liquid Floater Plan (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 102 2 – 102	**Scheme Returns (98.42) > NSE G-Sec Index Returns (99.73)**	H_0 is accepted (Z = -.671, P = 0.502)
27	No significant difference exists between SBI Regular Savings Fund (D) Scheme	1 – 89	**Scheme Returns (96.03) > NSE G-Sec Index Returns (82.97)**	H_0 is accepted (Z = -1.692, P = 0.091)

	Returns and NSE G-Sec Composite Index Returns	2 – 89		
28	No significant difference exists between SBI Regular Savings Fund (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 89 2 - 89	**Scheme Returns (93.62) > NSE G-Sec Index Returns (85.38)**	H_0 is accepted (Z = -1.066, P = 0.286)
29	No significant difference exists between Templeton India G-Sec Fund - Treasury Plan (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 110 2 - 110	NSE G-Sec Index Returns (112.86) > Scheme Returns (108.14)	H_0 is accepted (Z = -0.551, P = 0.582)
30	No significant difference exists between Templeton India G-Sec Fund - Treasury Plan (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 110 2 - 110	NSE G-Sec Index Returns (111.71) > Scheme Returns (109.29)	H_0 is accepted (Z = -0.283, P = 0.777)
31	No significant difference exists between Templeton India Income Opportunities Fund (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 - 16 2 - 16	**Scheme Returns (23.00) > NSE G-Sec Index Returns (10.00)**	H_0 is accepted (Z = -3.925, P = 0.000)
32	No significant difference exists between Templeton India Income Opportunities Fund (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 - 16 2 - 16	**Scheme Returns (16.96) > NSE G-Sec Index Returns (16.06)**	H_0 is accepted (Z = -264, P = 0.792)
33	No significant difference exists between ICICI Pru Short Term Plan (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 112 2 - 112	**Scheme Returns (115.05) > NSE G-Sec Index Returns (109.95)**	H_0 is accepted (Z = -590, P = 0.555)
34	No significant difference exists between ICICI Pru Short Term Plan (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 114 2 - 114	**Scheme Returns (115.07) > NSE G-Sec Index Returns (113.93)**	H_0 is accepted (Z = -131, P = 0.896)
35	No significant difference exists between ICICI Pru Long Term Gilt Fund (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 134 2 - 134	**Scheme Returns (134.90) > NSE G-Sec Index Returns (134.10)**	H_0 is accepted (Z = -085, P = 0.932)
36	No significant difference exists between ICICI Pru Long Term Gilt Fund (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 140 2 - 140	**Scheme Returns (141.20) > NSE G-Sec Index Returns (139.80)**	H_0 is accepted (Z = -145, P = 0.885)
37	No significant difference exists between ICICI Pru Short Term Gilt Fund (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 137 2 - 137	NSE G-Sec Index Returns (142.23) > Scheme Returns (132.77)	H_0 is accepted (Z = -987, P = 0.323)
38	No significant difference exists between ICICI Pru Short Term Gilt Fund (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 140 2 - 140	NSE G-Sec Index Returns (144.81) > Scheme Returns (136.19)	H_0 is accepted (Z = -892, P = 0.373)
39	No significant difference exists between ICICI Pru Income Plan - (D) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 141 2 - 141	NSE G-Sec Index Returns (145.39) > Scheme Returns (137.61)	H_0 is accepted (Z = -801, P = 0.423)
40	No significant difference exists between ICICI Pru Income Plan - (G) Scheme Returns and NSE G-Sec Composite Index Returns	1 – 154 1 - 154	NSE G-Sec Index Returns (157.34) > Scheme Returns (151.66)	H_0 is accepted (Z = -559, P = 0.576)

Source: computed by author

Summarising the result, statistically it is found that, eighteen out of forty schemes i.e. 45 percent (indicated in bold font) have shown higher ranks than the NSE G-Sec Composite Index indicating outperformed the benchmark index. Further, statistically it is found that, there is no significant difference exists between Schemes Returns and NSE G-Sec Composite Index Returns and hence null hypothesis is accepted.

V. Conclusion

This research work evaluates the performance of debt oriented mutual fund schemes of the Indian mutual fund industry and performance evaluation is restricted to 40 (forty) open ended schemes of top five AMCs registered with SEBI before 31st March 1997. The study has been carried out in the point of view of style analysis focusing on prominent style growth and dividend. Performance of the schemes have been analysed only in terms of NAVs in comparison with the NSE G-Sec Composite Index (benchmark). During the study period, majority of the sample schemes have underperformed the market portfolio in terms of absolute returns. The risk-return analysis of the overall study period outlines that 42.5 percent of the total schemes have outperformed the

market portfolio in terms of return and 55 percent of the total schemes belong to low return low risk profile, followed by 22.5 percent of total schemes belong to high return low risk profile.

The study also indicates scope of diversification which may be considered for further construction of the portfolio. The performance of 32.5 percent of the total schemes were moving in the same direction as that of market portfolio as evident from the positive covariance while, 60 percent of the total schemes' movement were found independent of the market. The variance explained completely by the market was found 100 percent in case of 17.5 percent of total schemes.

It is evident from the statistical result of the schemes returns and market portfolio returns that, majority of the schemes i.e. 55 percent of total schemes were unable to realize higher ranks than that of market portfolio indicating underperformed the market and also, statistically it is found that, there was no significant difference exists between Schemes Returns and NSE G-Sec Composite Index Returns and hence null hypothesis has accepted.

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