



Performance of Gilt Mutual Funds



ICRA Online Limited



Executive Summary

The research paper attempts to understand the performance of Gilt mutual funds by analyzing the returns using statistical models. We focus on the statistical relationship of returns with risk, average maturity, repo rate and the 10-year benchmark rate.

The paper uses regression models to study the relation between the performance of Gilt funds against the changing interest rate scenario. The study was conducted taking monthly data from 2008 to 2013 from Thomson Reuters Eikon, MFI Explorer (a proprietary Mutual Fund database from ICRA Online Limited), Reserve Bank of India (RBI), and Association of Mutual Funds of India (AMFI). This study provides a high-level overview on how exploring past data can give incisive insights for prudent investment strategies in future.



Project Brief

Gilt funds are mutual funds that invest in Government securities. Since they come with a sovereign guarantee, the risk of default of these securities is low. This makes them attractive to investors whose appetite for risk is low. However, these securities are subject to interest rate risk. Interest rate risk is the risk that a security with low interest rate will sell at a lower rate in the market since other comparable securities are giving a higher interest rate. Thus Gilt funds investing in Government securities also face the risk in their value when interest rates change. For our analysis we included both short-term repo rate and the 10-year benchmark rate to assess the impact of each, on the funds' returns.



Methodology

We first visualized the returns and corresponding risk (standard deviation of returns) on an annualized basis for all the open-ended Gilt funds on a series of box plots as presented in the figure below. The rectangular box represents the returns falling between the 25th and 75th percentile while the vertical line shows the span of return. Smaller box will imply that the distance between 25th and 75th percentile is short and the range of return in that year is short. For instance, the distance between the 25th and 75th percentile in 2008 was 14.4% while the corresponding number was 1.7% bps in 2010 signifying that the variation of returns (a measure of the riskiness) was higher in 2008 as compared to 2010.

Thus while average returns were much higher in 2008 (shown by the bold line in the box),



the corresponding increase in variability was probably driven by the upheaval seen in the financial markets in that year. Interestingly, we see a similar rise in variability in 2013 as well. We also see that the median returns (at 50th percentile) for these Gilt funds generally varied from 3% to 7% except only in 2004 when a small negative median return was seen.

Phases in risk-return trade-off

While Gilt funds adhere to the high risk- high return phenomenon , we find stark changes in the risk-return trade-off during certain periods which can be explained by the impact of external factors, rather than a mere movement of interest rates.

The abnormal years: FY08-09 and FY13-14: While FY08-09 proved to be a good year for Gilt funds, the uncertainty in the economy rendered a risk-return trade-off which was different from the trend observed in other years. In essence the returns and risk were widely dispersed. The first nine months of FY13-14 bear a return to FY08-09. In FY13-14, the U.S. stimulus tapering along with high supply of Government securities kept the markets edgy. As a result we once again witness a large dispersion in performance. Here again, whilst returns were high, volatility was higher.

The normal years: FY09-10 marked a return to a more normal risk weight of Gilt funds, and by FY10-11 we see an absolute return to normalcy (below graph) with almost all funds within 5% of standard deviation. Moreover, the increase in returns for incremental risk assumed in the more normal years of FY10-11, FY11-12 and FY12-13 has been encouraging. Performance improved in FY11-12 and continued to do so in FY12-13.

Regressing Return on Benchmark Interest

A more formal regression modeling approach was considered to understand how Gilt fund returns may be explained using the return on the Government of India 10-year Benchmark bond (10-year GOI BM) and average maturity of Gilt funds.

A regression is an equation that when solved for inputs (x1, x2,..) gives the value of y, the return from Gilt fund in our case. We used the returns from 10-year GOI BM bond and average maturity of Gilt funds as x1 and x2 and try to fit an equation (using software) that will solve for y. The accuracy of the regression is measured by a metric called R2 and higher the value, the better is the model.



The linear regression model run on six years data found that the 10-year GOI BM return is a significant predictor for the fund return with a high adjusted R2 (=41.5%). When we added average maturity to the mix, we found that both the factors combined together to explain about 62% of the variability in returns of the fund (adjusted R2 of 62%).

To visually understand how the fund returns changed with 10-year GOI BM return we plotted various fund returns (on Y-Axis) against 10-year GOI BM return (on X-Axis). To further understand how this relationship is affected with average maturity, we divided average maturity into different buckets from 0.85 yrs (in red) to greater than 8.1 yrs (in green) In particular, we grouped the average maturity values into four quartiles and used four different colors to indicate the average maturity groups. We see the following results from the graph

◆ Significant positive linear relationship of 10-year GOI BM returns with Gilt fund returns



Conclusion

This study provides a quick overview on how exploring past data on Gilt funds with incisive statistical techniques can give us useful directions for prudent investment strategies in future. All related analysis techniques considered here are exploratory in nature and results may be sensitive to various market assumptions, particularly to pure interest rates.

In a nutshell our study found that performance of Gilt funds can be explained to a large extent by the movements in the 10-year GOI BM, rather than only event specific interest rate changes in the economy. This coupled with the duration strategies adopted by funds explains the direction of returns in Gilt funds. Furthermore, in predicting Gilt mutual fund returns, there is inherent stability in performance, unless the direction of interest rate movement changes. In uncertain market environments such as 2008 and 2013 there were clear deviations from normal trends.



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Gilts/Government Securities

Securities created and issued by the Central Government and/or a State Government, and may include securities unconditionally guaranteed by the Government



Gilt funds

Funds that invest only in government securities of different maturities. They offer lower returns as the credit risk is virtually absent and there are no chances of government defaulting on its payment obligations. This effectively reduces the yield on them.

Risk Adjusted Returns

The expected returns from an investment depend upon the risk involved in the investment. For the purpose of comparing returns from investments involving varying levels of risk, the returns are adjusted for the level of risk before comparison. Such returns (reduced for the level of risk involved) are called risk-adjusted returns.

Percentile

A percentile (or a centile) is a measure used in statistics indicating the value below which a given percentage of observations in a group of observations fall. For example, the 20th percentile is the value (or score) below which 20 percent of the observations may be found.

