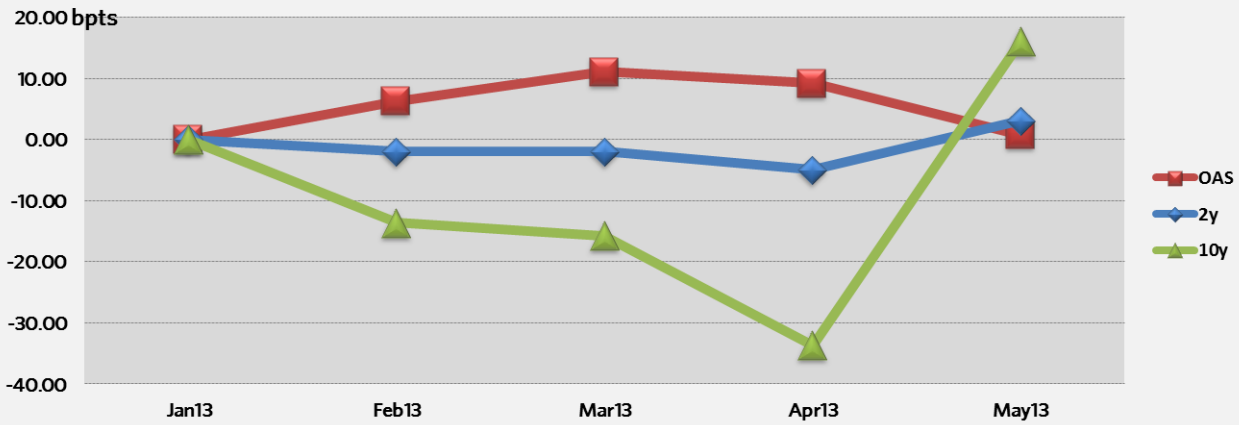
Return Attribution of a Portfolio (January to May)

The month of May saw a significant rise in the long rate, or the yield curve has steepened a lot, as depicted by Figure 1. The results show that the 10 year rate has dropped 30 bpts from January to April. But the rate rose 50 bpts in the month of May. The 2 year has not changed significantly. Based on a sample portfolio, the weighted average OAS of the bonds rose in the first three months but then fell last month, resulting in negligible OAS change over the four months. How do these market factors impact our bond portfolio performance? If we expect market rates continue to rise, then how should we manage our portfolio? Using return attributions, we can gain some insight into answering these questions.

The performance of a bond portfolio is affected by many other factors, such as the change in the level of yield curve, the option adjusted spreads, riding down the curve and many others. In fact, the THC model uses 11 components to provide traders and portfolio managers to identify the sources of total returns of the portfolio. Using return attribution to identify the key sources of returns, we do find something that gives us some insights: in recent month, with the Fed's impact on the shape of the yield curve, there are several major contributors to the total return of a bond portfolio.

Figure 1 | Market Factors



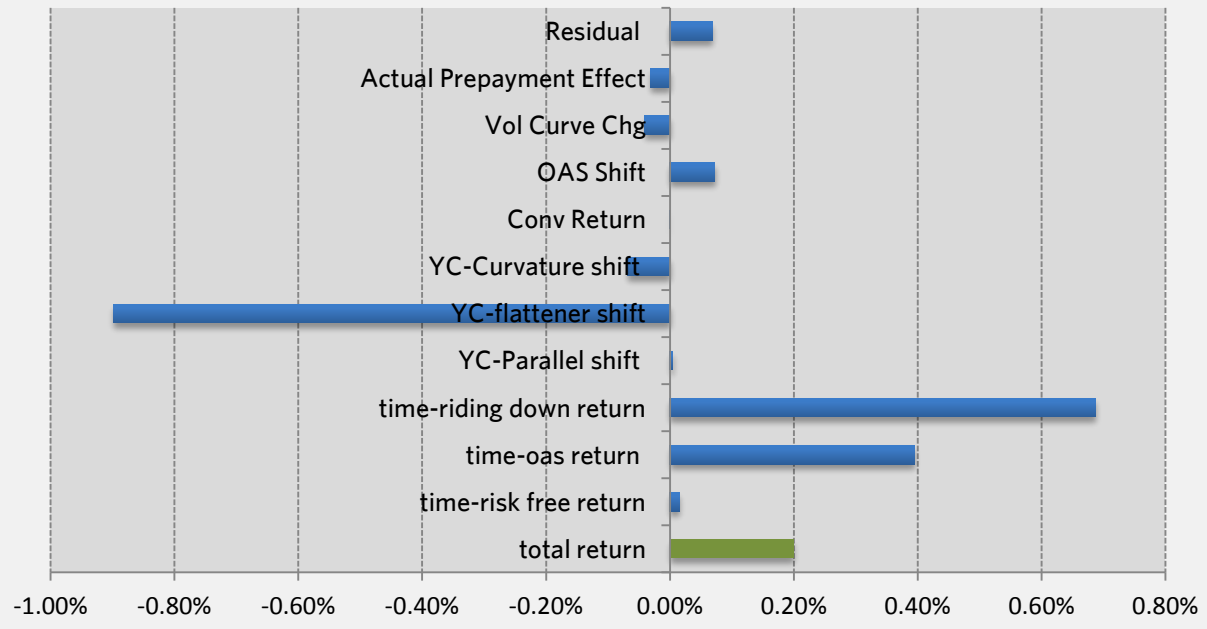
We consider a fixed income portfolio that has bullet and structured agency bonds, corporate bonds, municipals, and MBS. A summary description of the portfolio is given below in Table 1.

Table 1 | Portfoilo Descriptions

CUSIP	Coupon Rate(%)	Maturity (year)	Face Value	Market Price	YTM (%)	Yield to Worst	Spread (%)	OAS (%)	OAS Duration	WAL (year)	Eff. Dur	Eff. Conv
Portfolio	3.24	15.46	76,000	101.88	2.94	2.88	1.17	1.13	6.05	8.65	5.7	-0.51
Agency												
Bullet	1.28	5.62	10,000	100.4	1.17	1.17	0.19	0.13	5.32	5.38	5.32	0.35
Structured	1.96	10.1	10,000	99.22	2.04	2.03	0.23	-0.11	2.91	8.84	3.52	-5.45
Munis												
Tax Exempt	4.62	23.33	10,000	100.85	4.38	4.25	1.73	1.62	9.24	16.71	9.98	0.84
Taxable	3.34	10.58	8,000	102.7	2.94	2.94	1.18	1.32	7.47	8.61	7.47	0.87
Corporate												
Investment	2.63	13.86	9,000	99.3	2.61	2.33	0.46	0.74	8.28	10.9	8.28	1.55
High yield	6.08	9.94	10,000	101.81	5.76	5.7	4.15	4.11	6.32	7.96	6.46	0.74
MBS												
Fixed MBS	3.28	24	9,000	105.23	2.29	2.29	1.14	0.53	4.92	6.02	4.43	-1.6
ARM	2.61	25.22	10,000	105.78	2.23	2.23	1.36	0.63	4.4	4.94	0.84	-1.05

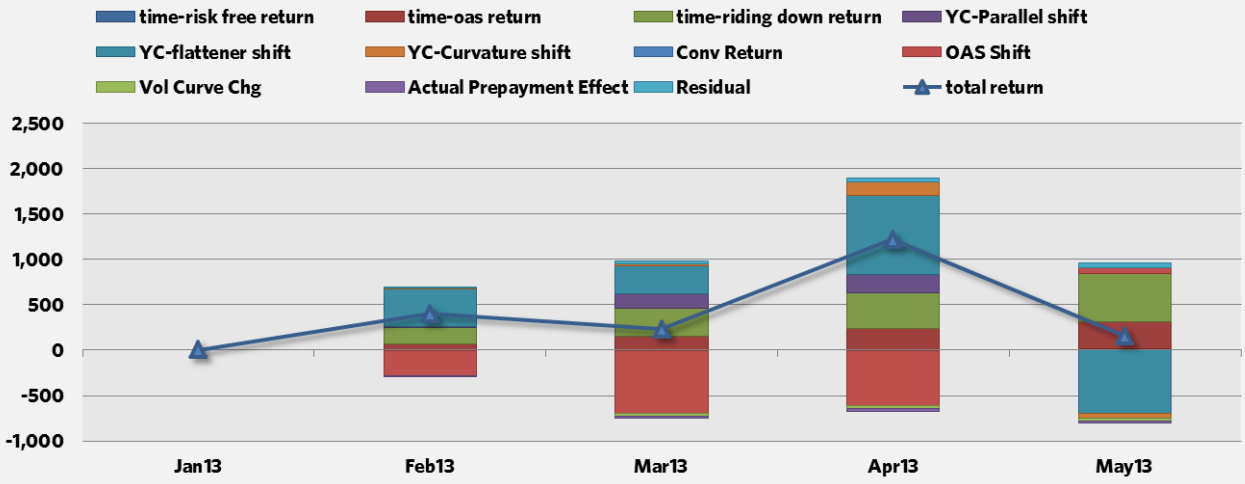
The total return of the portfolio over the four months is 0.20%. Figure 2 below presents the contributors of returns, where the sum of all the components must equal the total return of the portfolio. The results show that among the 11 components, there are only three main contributors: yield curve flattener, OAS shift and riding down the curve. As we mention above, the yield curve has steepened and therefore the "flattener" component shows a loss of 0.90%. While the shift of OAS has not affected the portfolio performance, the OAS over time has released over 0.38% return. More importantly, because of the Fed's quantitative easing program, the market yield curve has remained steep. For this reason, portfolio managers can accrue returns by riding down the yield curve, and that has contributed significantly to the portfolio performance. The riding down the curve has contributed 0.66% returns to the 0.20% of the total return over the four month period.

Figure 2 | Jan-May Return Attribution



As we need to balance risk and returns, we need to analyze the risk of these components. Figure 3 below provides us some insights. Figure 3 presents the cumulative returns of each component over the period of analysis. The result clearly shows that the two components (1) release of returns from option-adjusted spreads (OAS) and (2) riding down the curve provide steady returns of the portfolio while the yield curve risk poses significant total return uncertainty.

Figure 3 | Return Attribution



Implications of these results are clear. As long as the Fed keeps the short term rates low, then riding down the curve and investing in cheap sectors or bonds (as measured by OAS) can enhance a bond portfolio performance. Also based on these observations, there are other strategies that a portfolio manager can implement. For example, exploiting mean reversion of OAS, controlling the yield curve risk and more.

To construct a portfolio strategy, we need to understand the return attribution of each sector or bond type. For example, what is the return attribution of a step-up coupon callable agency bond, where the callability significantly affects the components of the total returns? Similarly, premium hybrid 3-1 ARMs prepayment risk also affects the riding down the curve as well as yield curve risk components. We will analyze these issues in our following bulletins.