

## KEY RATES ::

Fed Funds Target	0.25%
Discount Rate	0.75%
Prime Rate	3.25%
3-mo LIBOR	0.23%
2-yr Treasury	0.45%
3-yr Treasury	0.93%
5-yr Treasury	1.67%
10-yr Treasury	2.60%
2-yr Swap	0.61%
5-yr Swap	1.77%
10-yr Swap	2.69%
5-yr A Corp Yield	2.12%
5-yr A BQ Muni Yield*	2.55%

\* Tax Equivalent Yield

## ECONOMIC DATA ::

Q1 GDP Growth	-1.0%
February CPI YoY	2.1%
Unemployment Rate	6.3%

## UPCOMING EVENTS ::

June 25 - Next Revision to Q1 GDP

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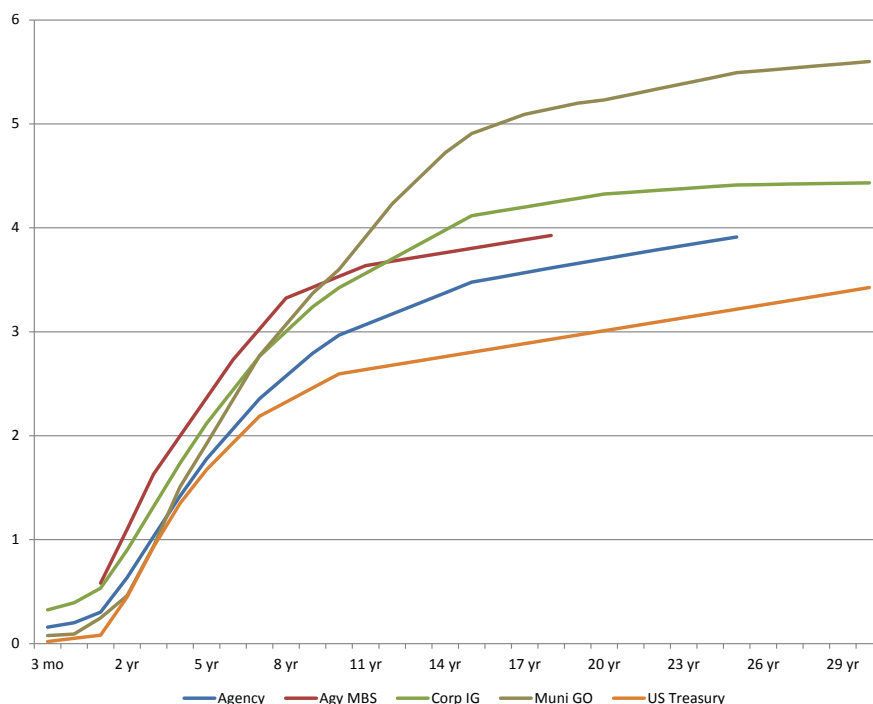
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## Yield Curve



All data as of 6/19/2014

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## Remember The Taper Tantrum? | Cliff Reynolds, CFA

It's hard to believe that a year has passed since the emergence of the most popular term in finance since quantitative easing – “Taper Tantrum”. Intermediate and long-term bond yields rose quickly following the May 1st FOMC meeting and continued in that direction for the majority of the year before ending the year at the highest levels since July 2011.

The expected “Taper”, or the slowing of growth in the Federal Reserve’s balance sheet, has been initiated and at the current pace the Fed will be finished buying US Treasury bonds and Agency mortgage-backed securities by the end of 2014. Given the move toward less accommodative policy and move up in rates in 2013, opinions in the financial media were heavily biased toward the expectation that this year was going to be as bad if not worse for fixed income investors.

“The Taper: The Next Step In a Continuing Crisis”

“Time for Investors To Take Some Chips Off the Table”

“Afraid of the Taper? Here’s How You Can Beat It”

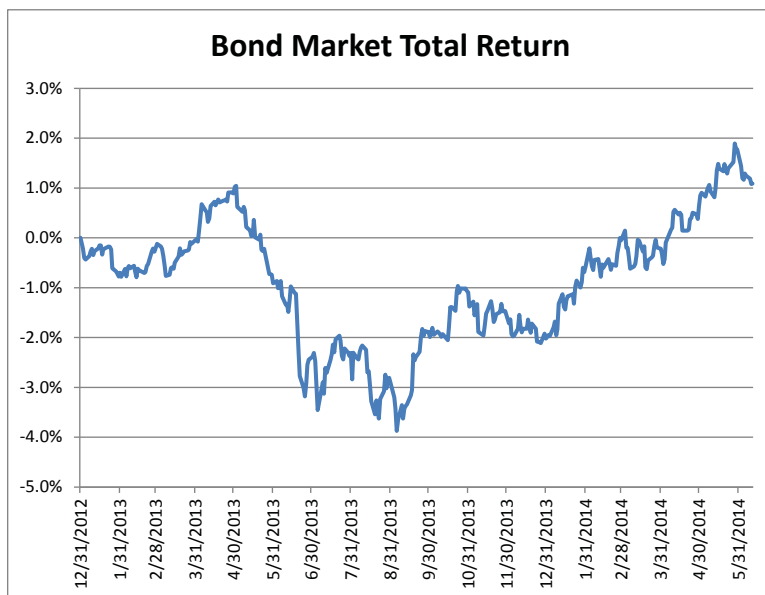
“Ben Bernanke v. Janet Yellen: A Spooky Outlook?”

All of these headlines were from articles published in December 2013. The consensus among those making predictions on the future direction of rates was that 2013 was a warning shot and a 5% or higher ten-year Treasury yield was coming soon.

Fast forward to now. After bottoming out at 2.44% at the end of May, the ten-year is back up to 2.60% - still a full 40 bps under where it began the year – a year where higher rates seemed guaranteed to go higher. You may have an idea where I’m going with this now.

Two things are immediately noticeable if you look at bond market performance since the beginning of 2013.

First – The “Taper Tantrum” was a very real thing. In a five month period from April through August, cumulative total return for the market went from +1% to -4% - volatility the market had not seen since the beginning of the credit crisis – when the selloff was caused by a rapid widening of credit spreads. The market knew that \$85 billion in QE every month couldn’t last forever, and when the Fed first hinted at less QE going forward the market adjusted to the new information quickly.



Second – The recovery from the bottom has been strong and steady. Bond prices have recovered some, but rates on the longer end are still about 100 bps higher than the lows set in 2012. Despite that, interest payments that are included in the total return reflected in the chart have helped the recovery. Because the curve is so steep, adjusting a portfolio to a shorter duration after the selloff would have had a negative effect on the total return. As a result of a rebalancing to a lower duration portfolio, prices wouldn’t have recovered as rates fell in the first part of this year

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and interest income would have been cut with shorter duration assets added to the portfolio.

The call for 2014 to be a continuation of the bear market in bonds could have been correct. Heck – it's only June so there is plenty of time for things to change. So far, doing nothing and just riding out the turbulence has turned out to be a pretty good result so far. Investing in fixed income has its risks and years like 2013 have happened before and they will definitely happen again. Timing the entry and exit trades correctly is a tall order, and in more cases than not, trying to do so is likely to introduce unnecessary risks to the portfolio. However, adjusting the portfolio as the tolerance for risk changes assures the portfolio is fulfilling its true role.

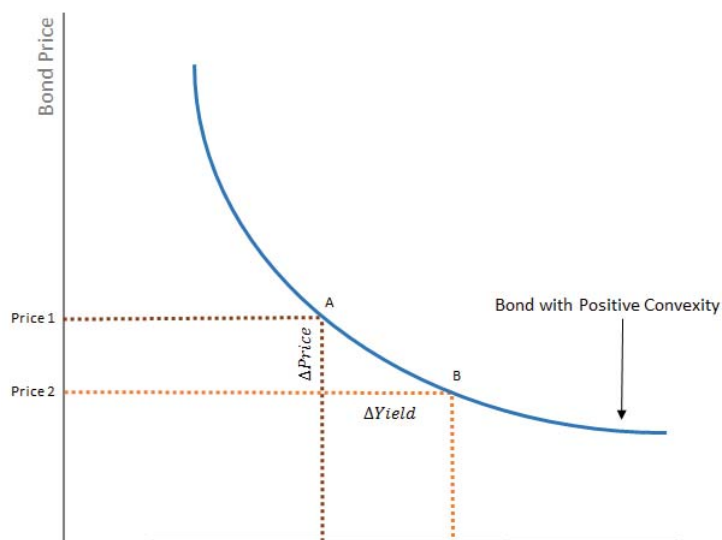
## What's My Duration? | Ryan Craft, CFA

Duration and convexity are the foundational tools used to measure interest rate risk. These concepts are often quoted, yet widely misunderstood in the context of portfolio risk and valuation. To effectively manage a fixed income portfolio and assess the risk of individual bonds requires a firm understanding of what these numbers mean.

Duration is a measurement of pricing sensitivity for a bond or portfolio of bonds. For those who remember calculus class, it is the first derivative of the price-yield relationship. This simply means that it is the rate of change in price for a given change in yield.

$$Duration = - \frac{\Delta Price}{\Delta Yield}$$

Consider the nearby chart. As the yield of the bond moves from Yield 1 to Yield 2, the price of the bond decreases. If a line were drawn from point A to point B, the rate of change in the price would be defined as the slope of this line. This is also the duration.



However, the relationship between yields and prices is not linear. The price of a bond is simply the present value of all future cash flows. As the yield changes, the discount rate changes, causing the price to change at a different rate depending upon the yield. This is why the blue curve depicting the real price to yield relationship of a bond is curved in a convex fashion. This means that duration is only a good estimate of price sensitivity on small movements in interest rates. As rates move in larger magnitude, the duration of the bond may change significantly too. This is where convexity fits in.

Convexity measures the rate of change of duration (basically, it tells us how curved is the blue line). This makes it the second derivative. By combining convexity with duration, a more accurate estimate can be made of a bond's value for a given change in interest rates. While this may seem like a long, winding process to value a single bond

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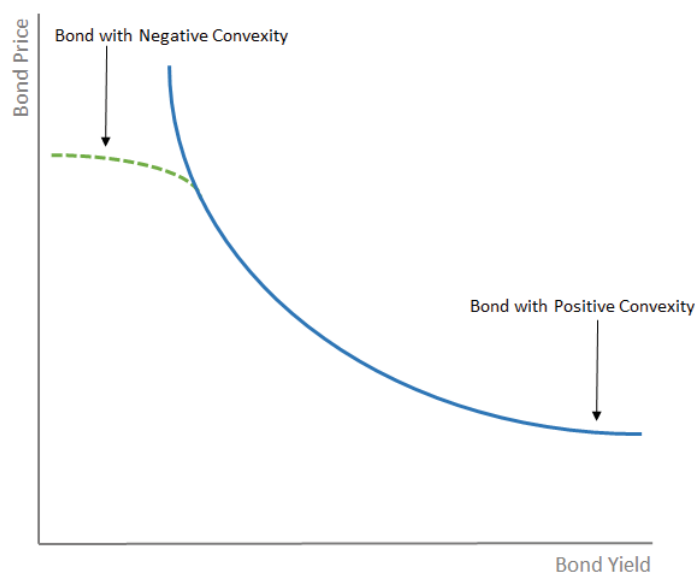
when you could just run the pricing calculations on Bloomberg, it can be very helpful in estimating the impact of changing rates on an entire bond portfolio.

$$\Delta Price = \left( Duration - \frac{1}{2} (Convexity * \Delta Yield) \right) * \Delta Yield$$

Looking at that equation, it is evident that convexity is good for a bondholder as long as it is a positive number. Many bank portfolios, however, have negative convexity. Negative convexity is a result of callable bonds. Bonds with embedded call options (ie. Callable Agencies, MBS, etc) in effect sell call options to the bondholder in exchange for a higher interest rate. When rates fall, the call option is likely to be exercised, resulting in the bond being called at par. This effectively puts a cap on the price of the bond.

As illustrated by the green dotted line in the next chart, this results in prices increasing at a decreasing rate as yields fall. The bondholder sells the potential for price appreciation in exchange for higher current yield. This is not necessarily a bad thing in itself, but it does present a special set of risks that must be accounted for.

For example, many investors have a bias towards rates rising in the future. This would cause an investor to buy callable bonds as a way to boost yield – with the assumption that the call will likely expire worthless as rates move higher. While this may seem like an obvious way to increase yield, it is not without risk. If rates fall from here, or even if rates just remain the same, these bonds will likely be called at some point in the future. Since the yield curve is steep, a similar non-callable bond would appreciate in value in a down or even flat rate environment.



Understanding the duration and convexity of a portfolio is very important in illustrating the underlying risk in a bond portfolio. Without knowing convexity, duration on its own can be misleading. This is especially true as larger interest rate shocks are modeled. Two portfolios with the same static duration may perform much differently if rates change 100 bps or more.

For banks, this is important in several different ways. The most obvious is the market risk in the bond portfolio and its effect on liquidity, capital and earnings. It also is important to measure when accounting for the net interest rate risk in the balance sheet. If convexity alters the duration of a bank's assets significantly, then this must be offset in the way the bank structures its liabilities. This is impossible to do without a reasonable estimation of duration and convexity – not only of the bond portfolio, but also of loans and deposits.

Another important use for a bank is when considering any sort of hedging activity. Over the past year, many banks have been discussing ways to insulate their portfolio from further declines in value. Many of these strategies include derivatives that can be marked to market, such as swaps, whose value will move in the opposite direction of the portfolio. Many of these strategies look great on paper when applying parallel rate shocks and assuming static portfolio durations. However, often times the hedge has positive convexity, yet the portfolio displays negative

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convexity. If interest rates fall, or even remain flat, the convexity difference causes the hedge and the portfolio market values to behave differently. This presents the risk of accepting net losses in a down rate environment; rates fall from these levels causing the hedge to fall in value and the portfolio fails to appreciate a reciprocal amount.

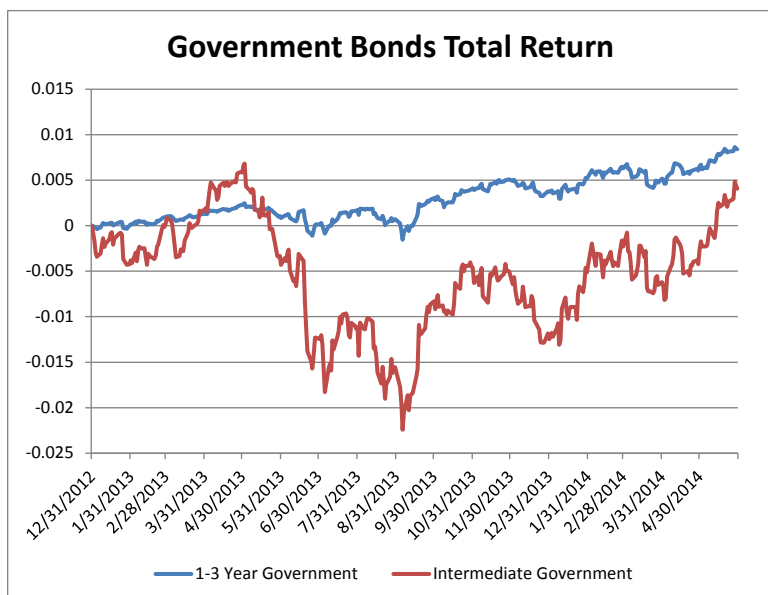
There is an optimal duration and convexity profile for each portfolio... but that level depends on the goals of the institution. Duration and convexity are sources of risk, but they are also sources of return. Therefore, a bank should determine its tolerance for volatility first, then maximize yield within that constraint.

## Bond Sector Performance | Cliff Reynolds, CFA

Back in March of 2013 I wrote an article stressing the role that portfolio construction can play in boosting risk adjusted returns of a portfolio. It's been a while since then so I thought now might be good time to revisit the various sectors of the bond market. This go around - instead of constructing imaginary portfolios and then looking at how characteristics can differ, I will look at how different sectors of the bond portfolio have performed recently.

### Government Bonds

The last 18 months have been a volatile period for rates. The move from 1.60% to 3.00% on the ten-year happened quickly, and due to the extremely low interest rate environment total returns for most sectors of the bond market were negative for 2013. While the selloff was broad based, longer rates were more affected by market's speculation around the Fed's taper - which the Fed continues to stress should not be considered a signal of higher short-term coming soon. The curve steepened quite a bit and the longer parts of the curve underperformed.



The steepness of the curve peaked at the end of the year, when the spread between the 10-year and the 2-year was 2.64%. Since then the curve has flattened about 50 basis points. As you can tell from the total return graph below, the longer end of the curve has outperformed the short end so far in 2014 and has almost made up the entire gap created last year.

There are many factors at work in the latest move in rates. The largest being the weak economic data in Q1 in 2014 and the less than thrilling rebound since. The market's reaction to the data that showed the US economy shrank in first quarter fell short of a panic, mostly due to the consensus belief that an abnormally harsh winter was to blame. Now that we have a good sample of data from Q2 I think it's safe

to say that the weather had some impact, but there was probably more true weakness involved than the market initially thought. The next step for the Federal Reserve will hinge on inflation - more specifically Core PCE, which is currently running at 1.2% - well below the FOMC's 2% threshold that goes back to before Fed Chair Yellen's tenure.

I think the rally in longer term bonds can be attributed to a green light that investors are seeing from the FOMC. I think a small percentage of the market saw 3% on the ten-year as a good long-term entry point, but in my opinion

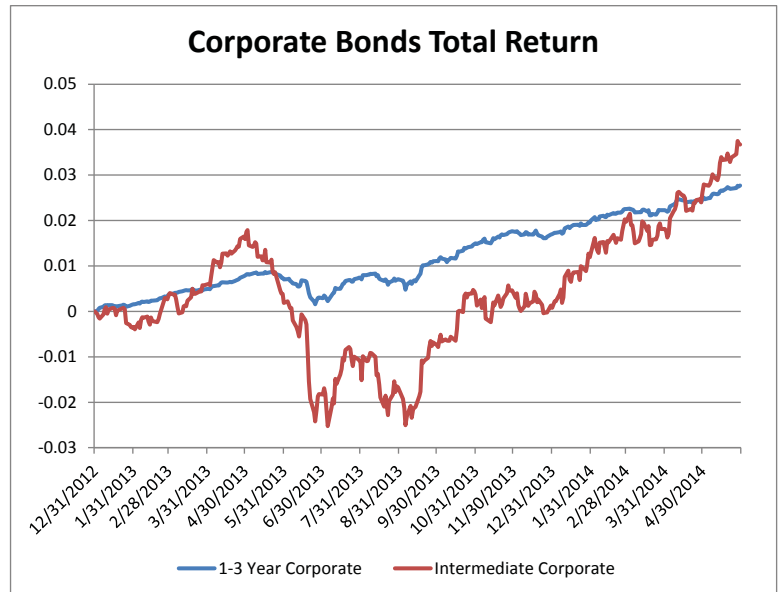
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a larger percentage are just using the Fed’s signals for short-term trading – a risky position given how fast shifts in policy are being priced into the market these days.

### Credit – Corporate & Municipal Bonds

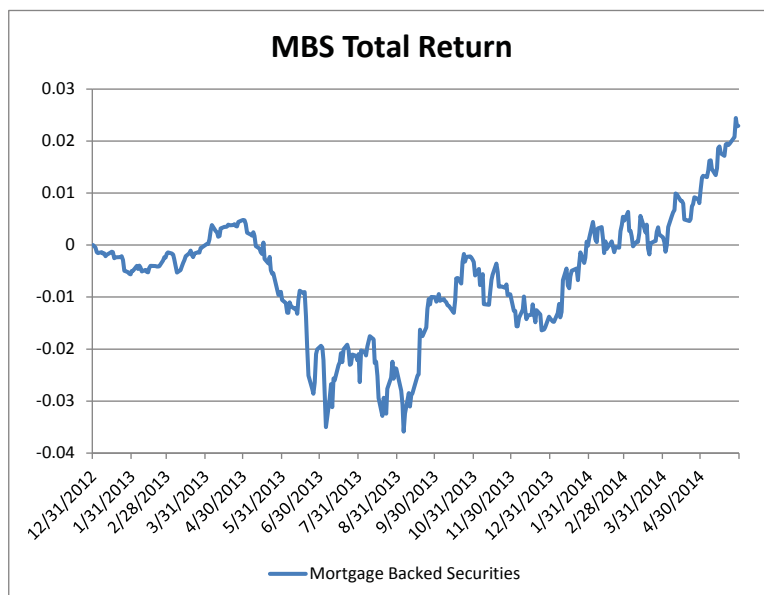
While a large component of returns in the credit sensitive sectors of the investment grade bond market are determined by shifts in the yield curve, credit spreads tightened during the last 18 months – lessening the effect rising rates had on corporate and municipal bonds.

While longer-duration government bonds have recovered a lot, they have still underperformed the shorter end of that sector. You can see the effect spreads have had on the performance of credit sectors by looking at the graph below. The longer-end of both the corporate and municipal market have eclipsed the short end on a total return basis. A result of both the extra carry from a steep interest rate curve in that market and the considerable tightening of credit spreads over the period to a level not seen since before the credit crisis.



### Mortgage Backed Securities

For most portfolios, mortgage-backed securities were the most volatile sector. The combination of rising market yields and duration extension resulted in a higher level of realized price volatility than the standard dollar duration calculation might have led some to expect.



The mortgage-backed securities market is fragmented, but to get a sense of the overall market I’m just using the market index. During the period where the return on the index was about -3.5%, the duration of the index went from 3.18 years to 5.86 years. Not only did the price adjust for higher rates, but prices of mortgage-backed securities became more interest rate sensitive at the same time the direction of rates was hurting prices – a tough combination that is expected in most parts of the mortgage-backed securities market.

Portfolios with a higher allocation to lower coupon 30-year pass-throughs saw more of this volatility than say, an MBS portfolio of shorter 15-year paper or well-structured CMO’s. The parts of the market

hardest hit by the selloff have seen a recovery – providing relief for some investors who may not have been prepared for the volatility. As a result some investors have revisited this part of their portfolio – reconsidering whether they can stomach such volatility.

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