Understanding Fixed Income Returns: Past, Present and Future

by Stephen Kroah, CFA

In today’s economic environment, much discussion is centered around the impact of rising interest rates on fixed income portfolios. This paper will look at how bond portfolios have performed over the years, the current interest rate environment and provide a framework for forecasting returns given the concern of rising interest rates in the future. To assist in this study, this paper will focus on the returns of the Barclays Capital Aggregate Bond Index, a widely accepted proxy for a diversified bond portfolio, and the ten-year U.S. treasury yield, the most commonly referenced measure of the level of interest rates.

The Past

The U.S. Treasury market can trace its roots back to 1790, but this analysis will concentrate on the period starting in 1926. As can be seen in Chart 1, through the 30s and 40s yields were not too dissimilar from those seen today. The ten-year yield attained a prior low in 1940 at 2.01%. In 1949, yields reached another low—2.19%—that wasn’t seen again until 2008. From that 1949 low point, yields moved upward until peaking in 1981 at 13.72%.

According to “Ibbotson SBBI (Stocks, Bonds, Bills and Inflation) 2013 Classic Yearbook”, intermediate treasury bonds (defined as 3- to ten-year maturities) from 1926 until today have posted a negative annual return only seven times. Taking this into context, over an 88-year period, the average return for intermediate treasury bonds was 5.1%.

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period, intermediate treasury bonds have had a positive annual return 92% of the time. From 1926, the average annual rate of return on intermediate treasuries has been 5.4%, with an average yield for the ten-year treasury of 5.10%.

The yield peaked in the early 1980s and just recently experienced an all-time low. The prices of bonds and interest rates have an inverted relationship. As yields go down, the prices of bonds go up and vice versa. We can see over the last 30 years the yields of bonds have moved down in a fairly linear fashion. This has led to a long period of positive returns for bonds and has been called the 33-year bond bull market.

U.S. treasury bonds are only a part of the investable fixed income universe. A better measure of bond market performance is a broader index that includes U.S. treasury bonds as well as other types of bonds. The Barclays Capital Aggregate bond index was created in 1976 and was known as the Lehman Aggregate Bond Index prior to Barclays Capital’s purchase of the Lehman Brothers bond index business. This index is a combination of most of the investment-grade high-quality investable U.S. dollar bond universe, which includes treasuries, agency debt, corporate debt, as well as mortgages and other structured securities. Below is a chart (Chart 2) of the returns of this index since inception. The average return over this period is 8.4%.

There have only been three years that produced negative returns: 1994, 1999 and 2013. 1994, referred to as the “Great Bond Massacre”, was the worst year on record for bond market returns. With inflation, as measured by the Consumer Price Index, below 3% at the end of 1993 and into early 1994, the bond market was surprised when the Federal Reserve, under the leadership of Chairman Alan Greenspan, started raising short-term interest rates. The 1999 losses were associated with the Federal Reserve raising the Fed Funds rate by 175 basis points from May 1999 to May 2000. This was a reversal of Fed lowering interest rates in 1998 to protect the U.S. economy from adverse consequences resulting from the Asia Financial Crisis.

The Present

How does the past relate to the present day market? As Chart 2 shows, 2013 was the third negative return year since inception for the Barclays Capital Aggregate Bond index. Events in 2013 were similar to the events that took place in 1994, the “Great Bond Massacre”. Unanticipated actions by the Federal Reserve impacted interest rates, bond yields, and returns. In 1994, the markets did not expect the Federal Reserve to raise short-term interest rates. Last year, unexpected “tapering” comments of Federal Reserve Chairman Ben Bernanke adversely impacted bond prices. The “tapering” comments refer to the Federal Reserve slowing down or discontinuing its bond purchasing known as quantitative easing or “QE”. At that time, the Fed had been purchasing $85 billion a month in debt to try to stimulate the economy by keeping long-term interest rates low. On July 24, 2012 the ten-year treasury yield reached an all-time low of 1.39%. Following Bernanke’s comments earlier in 2013, the ten-year treasury yield spiked to 3.00%, an increase of 161 basis points in less than a year. This quick jump in interest rates caused the Barclays Aggregate Bond Index to significantly decline and end 2013 with its third negative year since its inception. After the Federal Reserve decided in September not to begin tapering, ten-year treasury yields returned to lower levels and fluctuated
between 2.50% and 3.00%. In December 2013, the Federal Reserve finally decided to reduce its bond purchases from $85 billion to $75 billion per month and the ten-year treasury yield rose to 2.98% by the end of the year.

The Future
With bonds yields already having risen significantly from the historical lows of July 2012, the question many investors are asking is, “How will fixed income investments perform if interest rates continue to rise?”

Bonds differ from many other investment options, such as stocks, in that the total return over the life of the bond is known at the time of investment. A stock is a purchase in the ownership of a company. A stock exists in perpetuity unless the company is sold or otherwise ceases to exist. A bond is essentially a loan and will have a stated maturity and coupon (interest) at issuance. As long as the company borrowing the money fulfills its obligations to repay debt holders, we know the expected cash flows of that security. For example the U.S. Treasury will issue different maturity bonds that an investor can purchase in $1,000 increments. If an investor purchases a two-year treasury note with a coupon of 2%, the U.S. Treasury will pay the investor $10 every six months and $1,000 upon maturity in two years. The market price of that bond will change during those two years, but if the investor held the bond until maturity he would have received $1,040 or a 2% annualized yield on his investment regardless of price fluctuations during the two years. If the investor had owned a stock over the same period, its return could not have been predicted. He could have made money, lost money or had no change at all.

But what if the investor sells the bond before it matures? A measure called duration allows us to assess a bond’s interest rate sensitivity. If a bond has a duration of five, then a 1% increase in yields would cause the price of the bond to decline by 5%. Using our previous example, the investor purchased a two-year, 2% coupon note at the issuance price of 100 or par. For clarity, bond prices are quoted in percentages. So a price of 100 equals 100% of the amount purchased, which in this example is $1,000. In one year, interest rates increased by 100 basis points from 2% to 3%. The duration of the bond in one year will be 0.995 resulting in a price of 99.02. The investor sells the bond, realizing a 1% loss and purchases another bond that was issued four years ago with a coupon of 6% but matures on the same day as the original bond. The price of this bond would be 102.93. At maturity the investor has a return of his investment of approximately 2%. Even though the investor lost $39.12 ($990.22 - $1,029.34) selling the first bond to buy the second bond, the investor made $40 in additional income from the higher coupon payments over the last year.

The mechanics behind this have to do with the relationship between interest rates and bond prices. As interest rates go up, the price of the bond will go down. Even though the bond will be sold at a lower price, the investor can reinvest the proceeds in a higher yielding bond since yields have gone up. Though the investor realized an immediate loss; the proceeds from the higher yielding bond will make up the difference in the long term. As mentioned before, if the investor bought a bond with the same maturity, he would realize the original yield upon the first purchase, which in this example was 2%. There may be short term gains and losses, but the long term compounded return will be the same at maturity. Long term returns will not be impacted as long as investors maintain discipline in light of volatile short term returns.

A closer analysis of Charts 1 and 2 illustrates the point more clearly. As shown by the yields on Chart 1 and the returns over time on Chart 2, yields and annual returns have declined since 1981. The blue lines on Charts 1 and 2 highlight this fact. There is volatility around the returns over the years, but the returns tend to follow yields with a slight lag in time.

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A useful tool for forecasting future returns is a table of forward rates. A forward rate is the expected yield of a certain maturity bond at a given point in the future. The table at right (Table 1) of treasury forward rates shows that in three years the yield of the ten-year treasury (highlighted in yellow) is expected to increase by approximately 100 basis points (as shown by the blue arrow).

Another interesting observation from the table is how the yield curve is expected to change over time. Based on November 2013 one month forward rates, the rates for shorter maturity treasuries do not start to rise until the end of 2014, implying that this is when the market believes the Federal Reserve will start to raise the Fed Funds rate. From years 2-10, the yield curve flattens fairly dramatically as the Federal Reserve is expected to increase rates from their current artificial lows.

Another use of the forward rate curve is to calculate an approximation of the short-term impact on returns due to changes in the interest rate. The table on page 5 (Table 2) calculates approximate future returns using forward rates. This table looks at the Fixed Income Fund’s benchmark, the Barclays Capital U.S. Universal ex MBS.

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<th>Maturity</th>
<th>Nov 13</th>
<th>3MO</th>
<th>6MO</th>
<th>1YR</th>
<th>2YR</th>
<th>3YR</th>
<th>4YR</th>
<th>5YR</th>
<th>10YR</th>
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<td>0.11</td>
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<tr>
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Source: Bloomberg

Table 2 was calculated using the forward rates for U.S. Swaps rather than treasuries. Swap rates are a good proxy for evaluating a diverse bond portfolio because they account for credit risk. By examining swap rates, we are able to capture both the expected changes in treasury yields as well as changes to credit spreads. The blue column shows Key Rate Durations

Key Rate Durations (KRD)

KRD measures the duration of the bond in segments at different parts of the yield curve by maturity. The KRD for each of the segments of a bond will sum up to the overall duration of the bond. Since the yield curve does not generally move in a parallel fashion, KRD highlights the effects of changes in interest rates on different maturity bonds. Referring to the graph at right of the U.S. Treasury yield curve from the end of 2012 to 2013, you can see that different points along the curve moved by different amounts. A steepening yield curve, where the difference between long-term rates and short-term rates is greater, or a flattening yield curve, where this difference narrows, will impact fixed income portfolios differently. This is important when looking at events such as the Federal Reserve raising short-term rates which would cause the curve to flatten if long-term rates are unchanged. A simple way to think about this is to compare the results when an investor holds a portfolio of all five-year maturity bonds to the results of holding two-year and ten-year bonds. The portfolios might have the same duration, but their KRD’s would be different. Thus, the price impact of the move seen in the graph would result in diverging returns.

Source: Bloomberg
The numbers along each row capture the price change to the portfolio for each maturity. For example, in 2014 the five-year notes are estimated to lose 116 basis points of value based on the current forward rates for U.S. Swaps.

The return for any given year for a bond is the change in the price plus any accrued and realized income from the coupon of the bond. Investors can calculate estimated future returns, in two steps, using forward rates to estimate changes in yields. First, to calculate the estimated change in price, take the expected changes in yields at different maturities and calculate the expected price change utilizing KRD from Table 2. This is highlighted in the yellow box under year 2014. Using the current yield as a proxy for the coupon income, add the expected price change from the first step to get an estimated return for the year. For 2014, the sample portfolio used to make Table 2 had a yield of 2.95% and lost 2.67% due to rising interest rates. Its expected return for the year is 28 basis points.

One important point about Table 2 is that returns are much higher in the later years. Taking into account compounding and investment periods, the return over ten years is very close to the starting yield of 2.98%. Again, this shows the relationship of current yields to expected long term returns.

As of December 31, 2013 the Barclays Capital U.S. Universal MBS had an effective maturity of 7.44 years and a yield of 2.70%. As shown above, investors can reasonably expect a 2.70% annualized compounded return if a portfolio that mirrors the benchmark is held for 7.44 years.

Fixed Income Returns—Reasonable Assumptions

As with any investment, past returns do not predict the future. Though with fixed income, fairly reasonable assumptions of what returns will be in the long term can be made, since investors know yields today and control the length of the investment period. With ten-year yields near 3%, investors can expect fixed income returns over the next ten years to be near 3%. That may not be as attractive as the 8.4% average return of the Barclays Aggregate Bond Index since its inception, but it is still a positive return and bonds provide diversity in well-balanced portfolios. The key risk for fixed income investors is the volatility of returns that comes from unexpected events that are not currently reflected in the markets. Current economic expectations are reflected in the forward rate curve, but an unexpected event such as a bank failure or a geo-political event can cause these expectations to change. This could cause yields to move up or down faster than expected and significantly impact fixed income returns in the short term.

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