Here, we revisit the question of how U.S. taxable bonds may fare in the face of rising interest rates.

In last week’s Market View, we looked at the performance of the municipal bond market during periods of U.S. Federal Reserve (Fed) rate hikes. We showed that not all Fed-tightening cycles are the same. During certain periods when the Fed had raised rates in a slow and gradual manner, through a well-communicated strategy, long-term rates remained relatively stable, and long-term bonds performed well.

As a bond investor, it often is more important to consider moves in longer-term rates rather than changes in the overnight rates directly controlled by the Fed, namely the fed funds rate. So, when investors ask about the impact of higher rates, our first response is often: Which rates are you talking about—fed funds, U.S. Treasury yields, or some other category?

Credit-sensitive and equity-related segments of the bond market have historically have generated positive returns during periods of rising Treasury yields.

In addition, history has shown that there can be a wide range of returns by U.S. fixed-income asset class, depending on the market environment. So, an equally important question surfaces: Which types of bonds do you own? This week, we will review the performance of various bond sectors during period of rising long-term rates, as measured by the (representative) 10-year U.S. Treasury note yield.

The financial media often have characterized the past three decades as a “30-year bull market for bonds.” But as illustrated in Chart 1, which tracks the movement of the yield on the 10-year Treasury note, this bull market has not moved in a straight line. While it generally has been an environment of declining interest rates, there have been eight separate periods when the 10-year Treasury yield has jumped by more than 100 basis points (bps) over a short period, most recently in the second half of 2016.

Chart 1. U.S. Treasuries Have Posted Negative Returns When Yields Rose More Than 100 Basis Points
Return on 10-year U.S. Treasury securities during eight periods of greater than 100 basis-point increase in the 10-year U.S. Treasury yield, March 31, 1993–March 31, 2017
Which Bonds Do You Own?
Table 1 summarizes the returns of various asset classes during these eight periods of rising Treasury yields. Each of these periods led to negative returns for the 10-year Treasury note, as higher yields translated to lower prices, with an average loss of 7.3% during these eight periods.

Table 1. Historically, Lower-Duration, Credit-Sensitive Bonds Have Performed Well in Periods of Rising Long-Term U.S. Treasury Yields
*Index returns during periods of increases greater than 100 basis points in the 10-year U.S. Treasury yield (month-end returns)*
However, different asset classes had very different experiences in these episodes: long-duration government-related securities suffered the most, while lower-duration and more credit-sensitive bonds historically performed well. The Bloomberg Barclays U.S. Aggregate Bond Index, which now has an effective duration of 6.0 years and is largely comprised of U.S. Treasuries and government-related securities, generated losses in seven of these eight periods.

Moving down to lower-duration and lower-rated credit, you will see positive returns in short-term corporate bonds, high-yield corporate bonds, and floating-rate bank loans in all eight periods. Looking at equity-related securities, stocks were positive in every period, while convertible bonds were positive in all periods but one.

Why Has Credit Done Well When Rates Rise?

Higher Treasury rates often coincide with an improving economy, which may lead to a rise in corporate earnings, better credit fundamentals, and increasing investor appetite to take on risk, resulting in declining credit spreads. That spread compression can help offset the move higher in Treasury rates. Then if we look at specific asset classes, we find:

- **Short-term corporate bonds**—Low duration leads to limited price movements in the face of rising rates. Additional yield spread over government-related securities provides higher income, while potential spread tightening can partially offset higher Treasury rates.

- **High-yield corporate bonds**—Although high-yield bonds may have an intermediate stated duration, they historically have had negative correlation with U.S. Treasury bonds. The effect of rising Treasury yields has often been offset by spread compression and high coupon...

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<th>Period</th>
<th>10-Year U.S. Treasury</th>
<th>Bloomberg Barclays Aggregate</th>
<th>Short-Term Corporates</th>
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Source: Morningstar.

1Citigroup 10-Year Treasury Bond Index. 2Bloomberg Barclays U.S. Aggregate Bond Index. 3BofA Merrill Lynch U.S. Corporate BBB-Rated 1-3 Year Index. 4BofA Merrill Lynch High Yield Master II Constrained Index. 5Credit Suisse Leveraged Loan Index. 6Bloomberg Barclays U.S. Floating Rate Note Index. 7BofA Merrill Lynch U.S. Convertible Index. 8S&P 500® Index.

Past performance is no guarantee of future results. Performance during other time periods may have been different or negative.
income, leading to positive returns in periods of rising rates.

- **Floating-rate loans**—Loans also benefit from an improvement in corporate credit associated with a strengthening economy. Since loans have coupons that adjust with short-term rates, typically every 90 days, they can benefit from a rise in the benchmark LIBOR (the London interbank offered rate, which typically moves in line with the fed funds rate). In addition, since loans do not have the duration exposure of typical fixed-rate bonds, prices are not affected by moves in long-term rates.

**What Does Duration Tell Us?**
When considering the interest-rate exposure of a fixed-income portfolio, many investors look at the portfolio’s effective duration. As an example, following the simple math used to illustrate the concept, a portfolio with an effective duration of 5.0 years is expected to decline by approximately 5% for a 100 basis-point move in rates. However, there are a few points to keep in mind:

- A “100 basis-point move in rates” refers to a move in the *yield to maturity* on that bond or portfolio, not the overnight fed funds rate.

- The decline of “approximately 5%” is the expected *price decline*, assuming that the 100 basis-point move in rates occurs immediately, and does not consider any income earned over time.

- *Duration* is a mathematical calculation based on the timing of cash flows on a bond. It does not, however, account for the negative correlation between rate moves and spread moves illustrated above. In other words, this calculation does not adjust for the different behavior of a U.S. Treasury bond and a high-yield corporate bond that each may have a 5.0-year effective duration.

Duration alone does not give a good indication of interest rate sensitivity.

So, rather than simply focusing on the stated duration of a portfolio, it may be better to examine the interest-rate sensitivity of the portfolio. The data in Table 1 provide evidence that effective duration alone does not give a good indication of true interest-rate sensitivity of credit-related bond sectors, and so is a poor indicator of how such bonds may perform during rising rate periods.

Another way to view these relationships is through correlation data. Chart 2 shows that ‘BBB’ rated corporate bonds and high-yield corporate bonds, both with intermediate effective durations, historically have had low or negative correlation with U.S. Treasuries.

**Chart 2. Which Bond Categories Have the Lowest Correlation with U.S. Treasuries?**
*Correlation with Bloomberg Barclays U.S. Government Bond Index, trailing 10 years as of March 30, 2017*
Summing Up

If history is any guide, investors who are expecting a rising-rate environment may want to favor lower-duration assets. But an investor may be better served by digging a little deeper—gaining a greater understanding of the true interest-rate sensitivity of his or her portfolio, which cannot be measured by duration alone.

This *Market View* may contain assumptions that are “forward-looking statements,” which are based on certain assumptions of future events. Actual events are difficult to predict and may differ from those assumed. There can be no assurance that forward-looking statements will materialize or that actual returns or results will not be materially different from those described here.

**A Note about Risk:** The value of investments in fixed-income securities will change as interest rates fluctuate and in response to market movements. Generally, when interest rates rise, the prices of debt securities fall, and when interest rates fall, prices generally rise. Bonds may also be subject to other types of risk, such as call, credit, liquidity, interest-rate, and general market risks. High-yield securities, sometimes called junk bonds, carry increased risks of price volatility, illiquidity, and the possibility of default in the timely payment of interest and principal. Moreover, the specific collateral used to secure a loan may decline in value or become illiquid, which would adversely affect the loan’s value. Longer-term debt securities are usually more sensitive to interest-rate changes; the longer the maturity of a security, the greater the effect a change in interest rates is likely to have on its price. Lower-rated bonds may be subject to greater risk than higher-rated bonds. No investing strategy can overcome all market volatility or guarantee future results. Statements concerning financial market trends are based on current market conditions, which will fluctuate.

**Treasuries** are debt securities issued by the U.S. government and secured by its full faith and credit. Income from Treasury
securities is exempt from state and local taxes. Although U.S. government securities are guaranteed as to payments of interest and principal, their market prices are not guaranteed and will fluctuate in response to market movements.

A **basis point** is one one-hundredth of a percentage point.

**Duration** is the change in the value of a fixed-income security that will result from a 1% change in market interest rates. Generally, the larger a portfolio’s duration, the greater the interest-rate risk or reward for underlying bond prices.

**A bond yield** is the amount of return an investor will realize on a bond. Though several types of bond yields can be calculated, nominal yield is the most common. This is calculated by dividing the amount of interest paid by the face value.

In the United States, **federal funds** (often referred to as fed funds) are overnight borrowings between banks and other entities to maintain their bank reserves at the U.S. Federal Reserve. Banks keep reserves at Federal Reserve Banks to meet their reserve requirements and to clear financial transactions.

The **London interbank offered rate** (LIBOR) is an interest rate at which banks can borrow funds, in marketable size, from other banks in the London interbank market. The LIBOR is fixed on a daily basis by the British Bankers’ Association. The LIBOR is derived from a filtered average of the world’s most creditworthy banks’ interbank deposit rates for larger loans with maturities between overnight and one full year.

**TIPS** (Treasury inflation-protected securities) are U.S. Treasury securities indexed to inflation in order to protect investors from the negative effects of inflation. The principal of a TIP is adjusted according to the CPI-U. With a rise in the index, or inflation, the principal increases. With a fall in the index, or deflation, the principal decreases. Though the rate is fixed and paid semi-annually, interest payments vary because the rate is applied to the adjusted principal. Specifically, the amount of each interest payment is determined by multiplying the adjusted principal by one-half the interest rate. Upon maturity, TIPS pay the original or adjusted principal amount, whichever is greater. Because TIPS are adjusted for inflation, a change in real interest rates (but not nominal interest rates) will affect the value of TIPS. When real interest rates rise, the value of TIPS will decline, and when real interest rates fall, the value of TIPS will rise.

The **Bloomberg Barclays Corporates Baa Index** is the Baa component of the Bloomberg Barclays U.S. Corporate Investment Grade Index. The index includes publicly issued U.S. corporate and specified foreign debentures and secured notes that meet the specified maturity, liquidity, and quality requirements. To qualify, bonds must be SEC-registered.

The **Bloomberg Barclays U.S. Aggregate Bond Index** represents securities that are SEC-registered, taxable, and dollar denominated. The Index covers the U.S. investment-grade fixed-rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities. Total return comprises price appreciation/depreciation and income as a percentage of the original investment.

The **Bloomberg Barclays U.S. Corporate High Yield Bond Index** is a market value-weighted index which covers the U.S. noninvestment grade fixed-rate debt market. The index is composed of U.S. dollar-denominated corporate debt in Industrial, Utility, and Finance sectors with a minimum $150 million par amount outstanding and a maturity greater than 1 year. The index includes reinvestment of income.

The **Bloomberg Barclays U.S. Floating Rate Note Index** is designed to measure the performance of U.S. dollar-denominated, investment grade floating rate notes.

The **Bloomberg Barclays U.S. Government Bond Index** is a market value-weighted index composed of all publicly issued, nonconvertible, domestic debt of the U.S. government or any agency thereof, quasi-federal corporations, or corporate debt guaranteed by the U.S. government. Flower bonds and pass-through issues are excluded. Total return consists of price appreciation/depreciation plus income as a percentage of the original investment. Indexes are rebalanced monthly by market capitalization.
The Bloomberg Barclays U.S. TIPS Index is an unmanaged index comprised of U.S. Treasury Inflation Protected Securities with at least $1 billion in outstanding face value.

The BofA Merrill Lynch U.S. High Yield Master II Constrained Index tracks the performance of US dollar denominated below investment grade corporate debt publicly issued in the US domestic market. Qualifying securities must have a below investment grade rating (based on an average of Moody’s, S&P and Fitch), at least 18 months to final maturity at the time of issuance, at least one year remaining term to final maturity as of the rebalancing date, a fixed coupon schedule and a minimum amount outstanding of $100 million.

The BofA Merrill Lynch U.S. Corporate BBB-Rated 1-3 Year Index is an unmanaged index comprised of U.S. dollar denominated investment grade corporate debt securities publicly issued in the U.S. domestic market with between one and three year remaining to final maturity.

The BofA Merrill Lynch U.S. Convertible Index tracks the performance of publicly issued U.S. dollar-denominated convertible securities of U.S. companies. Qualifying securities must have at least $50 million face amount outstanding and at least one month remaining to the final conversion date.

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The Citigroup 10 Year Treasury Bond Index is a broad measure of the performance of the medium-term U.S. Treasury securities.

The Credit Suisse Leveraged Loan Index is designed to mirror the investable universe of the U.S. dollar-denominated leveraged loan market.

The S&P 500® Index is widely regarded as the standard for measuring large cap U.S. stock market performance and includes a representative sample of leading companies in leading industries.

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