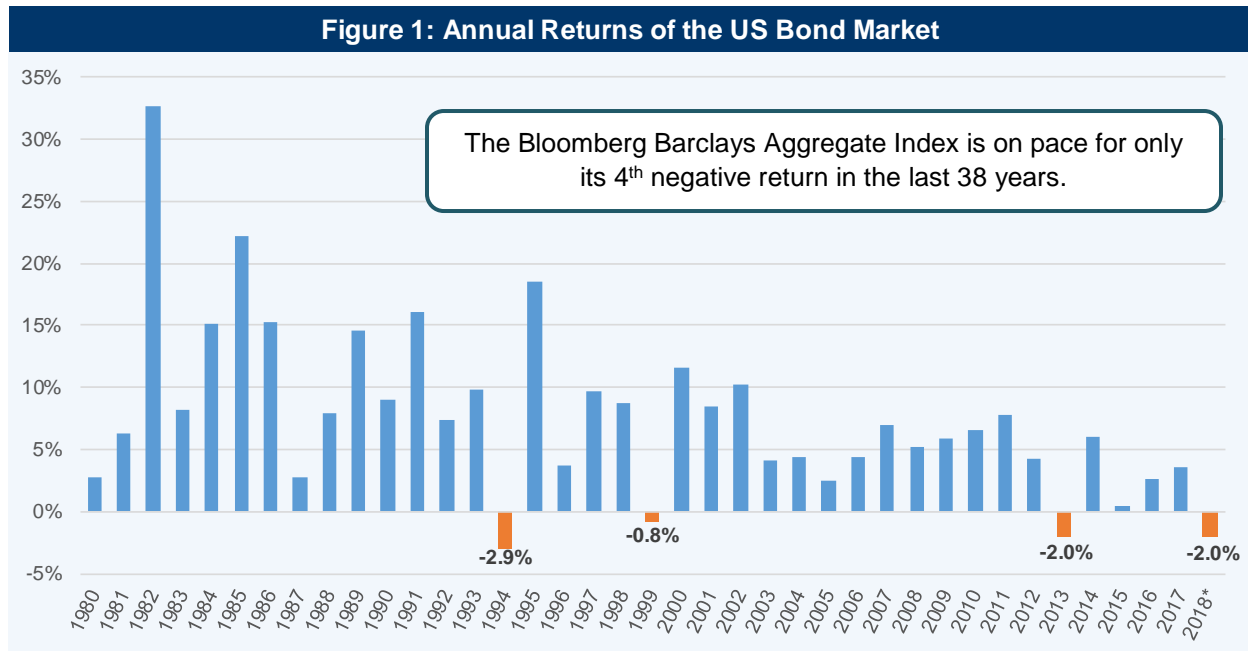


June 2018

## Life in the Slow Lane

### Evaluating the Fixed Income Portion of Your Portfolio

After a relatively smooth ride up in 2017, volatility has returned to the equity markets in 2018. Trade tensions, higher interest rates, and retributive political rhetoric have all taken their turn rattling the markets over the past few months. Despite strong underlying economic fundamentals and record corporate profits, stocks have struggled to gain traction in 2018 and the market volatility index (CBOE VIX) has risen over 45.0% since the start of the year. In a period of such discord, an investor would expect to find solace in the fixed income portion of their portfolio. It is at uncertain times like these when lower volatility investments, such as bonds, tend to shine. However, this has not been the case in 2018, as the US bond market is on pace for one of its worst years in over two decades.



Fiscal stimulus in the form of tax cuts, a more aggressive Federal Reserve Chairman, and improving economic growth have all put upward pressure on interest rates in 2018. Bond prices, which move inversely to interest rates, have declined since the start of the year with the Bloomberg Barclays Aggregate Bond Index, -2.0% YTD. If the index finishes the year negative, it will be only the fourth year since 1980 that it has failed to post a positive annual return. While a 2.0% decline pales in comparison to the 37.5% decline the S&P 500 experienced in 2008, the worst year for stocks in decades, it is nonetheless disheartening for investors to see the “safe” portion of their portfolios decline in value.

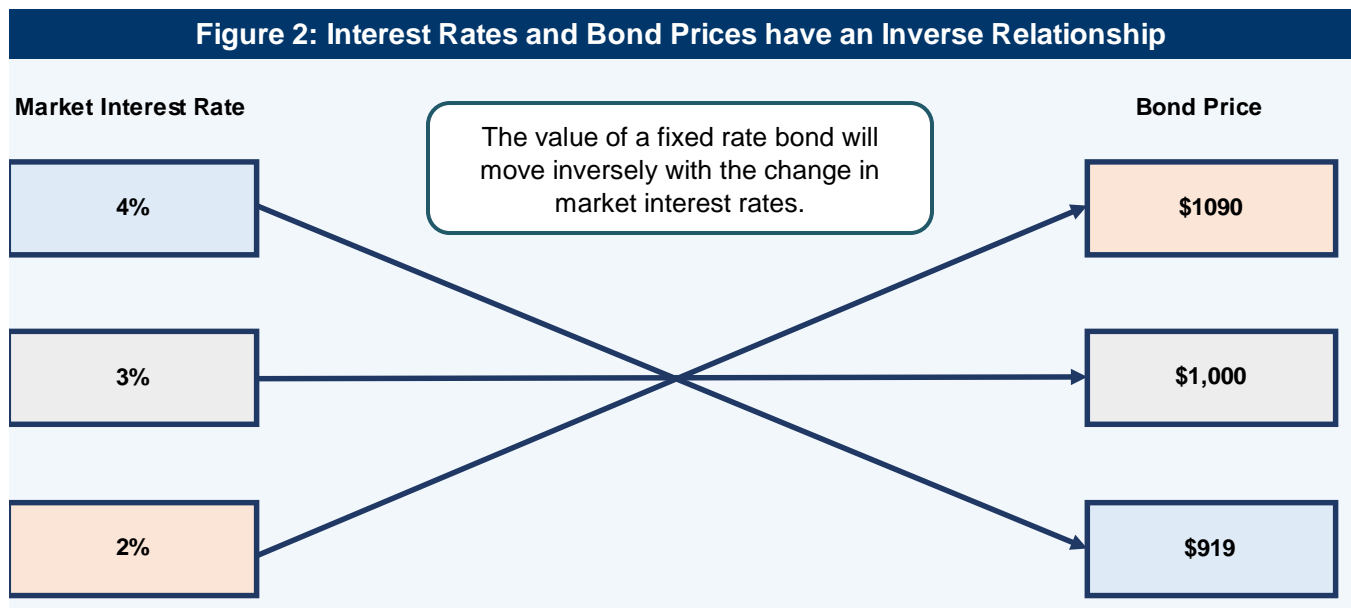
Rising interest rates have been the main culprit of poor fixed income returns over the last few months, but interest rates are just one of many factors that an investor needs to consider when positioning their fixed income portfolio. While market pundits and most news outlets tend to focus their attention on the more “exciting” equity markets, a portfolio’s fixed income positioning has an equally important role in most diversified portfolios. Just as with stocks, knowing when to be a buyer and when to be a seller of different types of bonds is crucial to improving the return of a fixed income portfolio. Maintaining an active strategy that takes into account credit spreads, fluctuations in currency levels, and the shape of the yield curve can be instrumental in adding value to the return of a portfolio.

### Components of Fixed Income Returns:

Just as not all stocks have the same expected return, bonds also have varying risk/return profiles. Investors have to be compensated for the additional risk they take and therefore bonds with higher perceived risk will have a higher expected return, in the form of a higher yield. When evaluating bonds, there are four main components of risk – interest rate, credit, currency, and liquidity. Different types of bonds will have varying degrees of sensitivity to each of these components. For example, a high yield bond will be more sensitive to changes in the credit cycle while an emerging market bond will be more sensitive to currency fluctuations. Understanding each risk factor and how they affect underlying bond prices is key for investors looking to mitigate certain types of risk in their portfolio.

**1. Interest Rate Risk** – The primary driver of fixed income returns is the inverse relationship between interest rates and bond prices. When you purchase a bond, you are essentially lending money to the issuer who will pay you interest on the loan until maturity at which point the issuer will repay the principal. The rate of interest is determined by the bond's coupon rate, which is typically fixed. As market interest rates change during the course of a bond's lifetime, the bond's coupon rate will become more or less attractive depending on which way interest rates move.

Suppose that you purchase a \$1,000 bond at par from company XYZ that has a fixed annual coupon rate of 3.0% and a 10-year maturity. Every year, company XYZ will pay you \$30 in interest and then at the end of ten years, they will repay the \$1,000 principal. If market interest rates do not change over the course of the year, your investment will still be worth \$1,000 and you will have collected \$30 in interest (3.0% annual return). However, interest rates are constantly moving, so this scenario is unlikely. Now let's consider your investment if interest rates rise by 1.0%. If XYZ were to issue a new \$1,000 bond, they would have to pay a coupon of 4.0% (\$40 of annual interest) to reflect the higher market rates. If you try to sell your 3.0% coupon bond in the marketplace, investors will not be willing to pay \$1,000 for your bond, if they can buy a similar \$1,000 bond with a 4.0% coupon. The price of your 3.0% bond will then decline to a point where investors are indifferent between the return streams of the 3.0% bond and the 4.0% bond. In this case, the price of the \$1,000 original investment will now be worth approximately \$919.

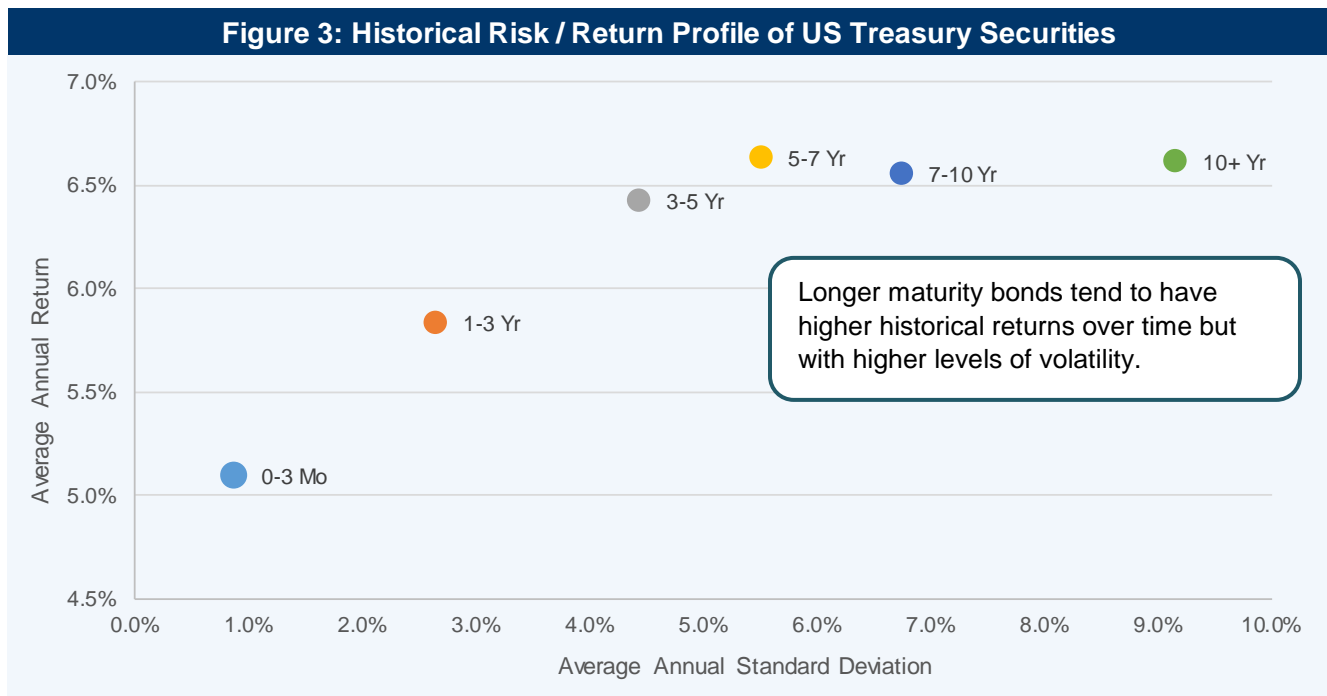


The reverse is true if interest rates decline. The 3.0% coupon payment will be more attractive if market interest rates are at 2.0%. Now your bond will be worth more than new bonds that pay only 2.0% (\$20 annual interest). In this instance, your bond will now be worth approximately \$1,090.

Not all bonds have the same sensitivity to interest rate fluctuations. There are many factors that determine a bond's correlation to interest rates, including its coupon rate, time to maturity, and embedded options. A bond's effective duration is a measurement that tries to encapsulate all of these components into one number. A bond's effective duration is the approximate percentage change in price for a 100 basis point change in interest rates. For example, a bond with a duration of 5, will decrease in value by about 5.0% if interest rates move up 1.0%.

Bonds with longer durations are more sensitive to interest rate risk. Investors are compensated for taking this extra risk, with a higher expected return. The chart below shows the historical risk/return trade-off of US treasury securities with varying maturities. The longer maturity issues have higher durations, and over time tend to have higher returns than their shorter maturity counterparts. However, the higher return is accompanied with greater levels of volatility.

**Figure 3: Historical Risk / Return Profile of US Treasury Securities**



A forward-looking investor can adjust their portfolio's duration based on interest rate expectations. If interest rates are expected to rise, an investor will want to own shorter duration bonds, which will decline less in price than longer duration bonds will if rates do rise. On the other hand, if interest rates are expected to decline, an investor will want to extend the duration of their portfolio to capture greater price appreciation.

**2. Credit Risk** – The second risk factor that fixed income investors must be compensated for is the risk that the bond issuer fails to make the required payments. When a company issues debt, it is making a contractual promise to repay the loan along with a stated amount of interest. If the company's financial health deteriorates to the point where it can no longer repay its loans or files for bankruptcy, the price of its bonds will significantly decline.

Now, not all bond issuers have the same credit risk. US government bonds, for example, are considered free of “credit risk” because the US government has never defaulted on its debt. Not all government bonds are risk free though. Argentina has famously defaulted on its debt multiple times, which is one reason that investors require a higher interest rate on Argentinian bonds compared to US treasuries.

To help investors discern who is a credible borrower and who is not, credit rating agencies, such as Moody’s, were created. These independent agencies assign credit ratings to companies based on their financial stability. Companies pay close attention to their ratings because a credit downgrade can increase the cost of borrowing. Investors need to be compensated for lending to a company that has a higher rate of default so therefore the yield on a poorly rated company will be higher than the yield of a financially sound company. Bond ratings vary by agency but anything rated higher than Baa3 by Moody’s or BBB- by Standard & Poor’s is considered investment grade, while any rating lower is considered high yield.

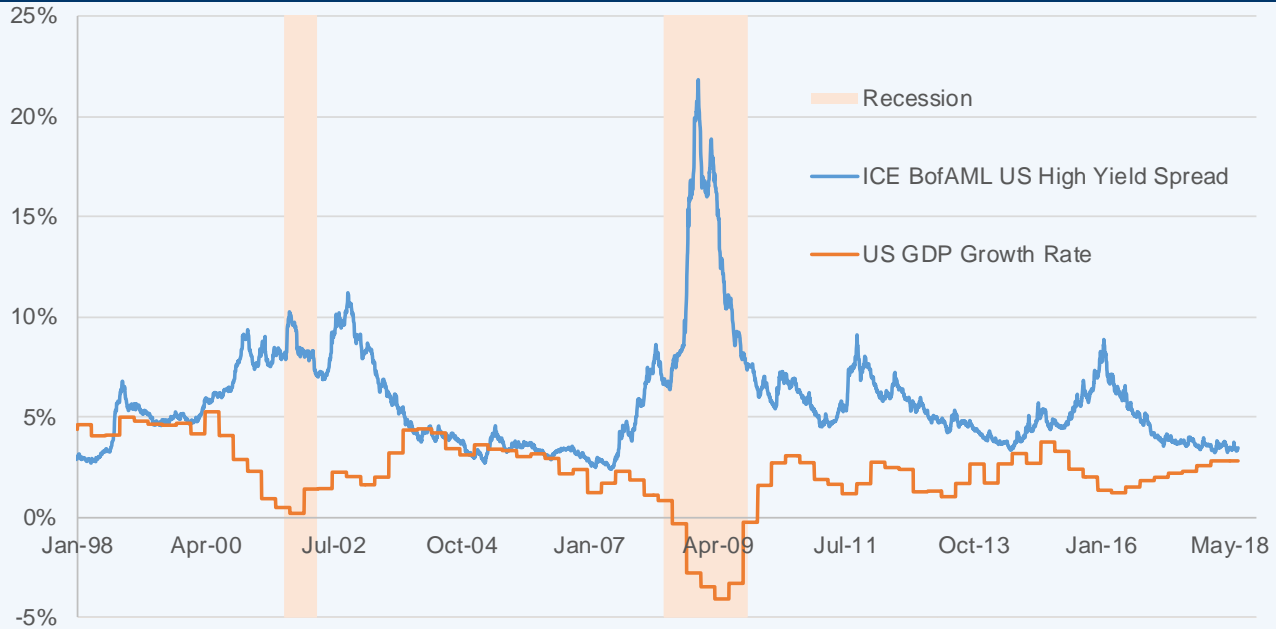
**Figure 4: Historical Default Rates**

Bond Rating	Cumulative Default Rates		
	One Year	Five Year	Ten Year
Aaa	0.00%	0.11%	0.50%
Aa	0.02%	0.23%	0.54%
A	0.05%	0.72%	2.05%
Baa	0.18%	1.93%	4.85%
Ba	1.17%	10.40%	19.96%
B	4.55%	25.90%	44.38%
Caa-C	17.72%	52.29%	71.38%
Investment Grade	0.08%	0.97%	2.50%
High Yield	4.53%	21.36%	34.01%

As you can see from the table above, lower credit quality bonds have significantly higher rates of default than high credit quality bonds. An investor who is investing in a Caa-C bond must be compensated with a much higher yield if they are going to accept a 17.0% one-year default rate.

The difference between the yield on a risky bond and the yield of a risk-free bond (US treasury) is called a credit spread. Historically, credit spreads are closely correlated with an economy’s business cycle. When an economy is booming and future growth is expected to be positive, credit spreads will narrow (i.e. the risk premium for bonds will decline). In times of economic distress, however, credit spreads will widen because there is a higher probability that debt-laden issuers will default (i.e. risk premium for bonds will increase).

**Figure 5: High Yield Spreads Correlated with State of Economy**



As you can see from the graph above, the spread between US high yield debt and US treasuries is inversely correlated with US GDP growth. During recessionary periods, such as 2008, the credit spread widens (i.e. high yield bonds become cheaper) while in times of strong economic growth such as January 2016 to March 2018, credit spreads narrow (i.e. high yield bonds become more expensive).

An investor ideally wants to buy high yield debt at the bottom of a recession (when spreads are wide) and then sell at the end of an economic boom (when spreads are narrow). The timing of this is more difficult in practice than in theory. Buying junk bonds in March 2009 when it seemed the world was falling apart may not have seemed like a reasonable proposition in the moment, but it turned out to be a very profitable trade for those willing to take the risk.

**3. Currency Risk** – An important component of risk for fixed income investors looking outside the US is currency rate fluctuations. Currency exchange rates can have a significant impact for unhedged investments denominated in foreign currencies. To illustrate this, let's consider a US investor who has \$10,000 to invest and decides to buy a German bond yielding 5%. When he purchases the German bond, he has to exchange his US dollars for euros. At the end of the year, the bond will mature and he will then have to exchange his euros back to US dollars. The exchange rate at the beginning and the end of his investment will have a significant impact on the return he earns on the bond.

**Figure 6: Impact of Currency Movements on Fixed Income Returns**

Scenario 1: US Dollar Appreciates

<u>Beginning Value</u>			<u>Annual Return</u>				<u>Ending Value</u>		
USD Value	USD/EUR Rate	EUR Value	Yield on German Bond	Interest on Bond	End EUR Value	EUR Return	USD/EUR Rate	USD Value	USD Return
\$10,000	1.17 / 1.00	€ 8,547	5%	€ 427	€ 8,974	5%	1.00 / 1.00	\$8,974	-10%

Scenario 2: US Dollar Depreciates

<u>Beginning Value</u>			<u>Annual Return</u>				<u>Ending Value</u>		
USD Value	USD/EUR Rate	EUR Value	Yield on German Bond	Interest on Bond	End EUR Value	EUR Return	USD/EUR Rate	USD Value	USD Return
\$10,000	1.17 / 1.00	€ 8,547	5%	€ 427	€ 8,974	5%	1.34 / 1.00	\$12,026	20%

In Scenario 1, the beginning exchange rate is 1.17 USD per 1.00 EUR. This means that his initial \$10,000 investment is worth €8,547. During the year, the investor collects his 5.0% interest and the return of his principal. However, by the end of the year, the US dollar has appreciated versus the euro. This means that he will be able to buy less US dollars with his euro proceeds. In fact, he will be able to buy only \$8,974, which means that even though he earned a 5% return on the bond, he lost -10.0% on his net investment.

In Scenario 2, the beginning exchange rate is also 1.17 USD per 1.00 EUR. During the year, the investor collects the same 5.0% interest, but this time the US dollar depreciates versus the euro. This means that his euros will be able to purchase more US dollars than at the beginning of the year. In fact, his total return will be quadruple the return he earned on the bond. Even though the investor earned 5.0% on the bond in both scenarios, his net return was significantly different depending on the exchange rate of the dollar versus the euro.

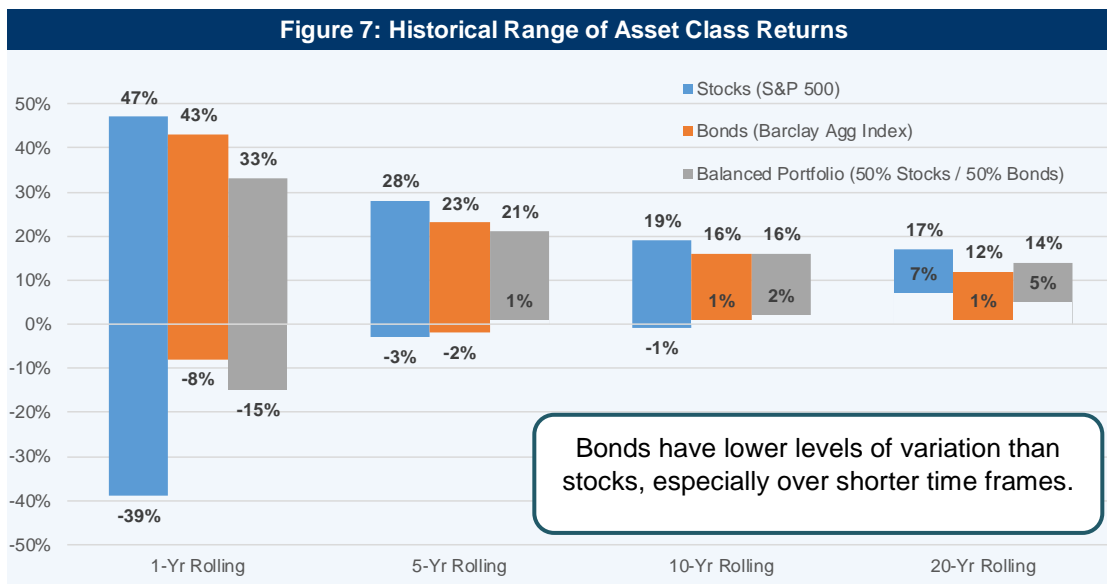
A US investor buying bonds in foreign denominated currencies should always take into account what the expectations are for exchange rates over the course of the investment. If the US dollar depreciates, the investment can become even more profitable, but an appreciating US dollar can greatly reduce the net return of the investment.

**4. Liquidity Risk:** A final risk component that affects bond prices is liquidity. Compared to most equity markets, there is less liquidity in fixed income markets. Due to the fact that bonds trade less frequently and in lower quantities than stocks, liquidity is an additional risk factor that fixed income investors must consider. During periods of economic instability or credit concerns, bid-ask spreads for bonds can significantly widen. An investor holding both the stock and bond of a distressed company will usually find it much easier to exit the equity position than the fixed income position.

Over the past decade, the bond market has become much more efficient with the advances of technology. This has improved liquidity and narrowed fixed income spreads, especially for retail investors. However, an investor should still consider the liquidity of a bond before purchasing, especially if they will want to exit the investment in times of turmoil. One solution is to invest in fixed income ETFs or mutual funds. These investment vehicles own hundreds of underlying bonds and trade every day on exchanges. Instead of having to sell multiple individual bonds when liquidating a portfolio, an investor can instead get similar exposure through a fund and have the ability to exit their position through a single trade with lower levels of liquidity risk.

## All Risk and No Return? The Importance of Maintaining Fixed Income Exposure in a Rising Rate Environment

The risks outlined above are not meant to persuade investors to shun bonds. Instead, they should be used as a basic guideline to the mechanics that affect fixed income prices. For most diversified investors, bonds play a crucial role in smoothing the return stream of their portfolio. Over time, stocks and bonds tend to have a negative correlation. This relationship can significantly reduce the volatility of a portfolio. The graphic below illustrates how a balanced portfolio (50% stocks and 50% bonds) has much lower levels of return variability, especially over short periods of time. Since 1950, every rolling 5-year period of a portfolio invested in 50% stocks and 50% bonds has generated a positive return between 1% and 21%. The same cannot be said for an all-stock or all-bond portfolio. Each of these portfolios experienced a negative 5-year rolling return during the back-tested time period.



While maintaining an allocation to fixed income is instrumental to reducing the level of risk in a portfolio, adjusting the fixed income exposure in response to changing market conditions can add long-term value. Take for example, the current market environment where rising rates have hampered bond prices. In anticipation of rising interest rates, we selected ETFs that hold bonds of shorter duration than the market, which has dampened the interest rate sensitivity and added value to portfolios versus the benchmark. However, when rates spiked in January, we began extending the duration of the portfolio, selling shorter duration municipal bonds in favor of the longer duration equivalents, to buy bonds at discounted prices that now had higher yields thanks to the rising interest rates. This move simultaneously took advantage of oversold conditions while also raising the expected income stream of the portfolio. The portfolio has benefited as interest rates have since moved back lower.

Another instrument we have used to combat the negative effects of rising interest rates on the portfolio has been to maintain exposure to fixed-to-floating rate preferred securities. Unlike traditional bonds, which pay a fixed coupon, fixed-to-floating rate securities re-adjust their coupon based on market interest rates. This mechanism reduces their price sensitivity to rising interest rates. Finding the more flexible way to own preferred stocks has generated substantial alpha over the past few years, outperforming bonds by several percentage points over the past few years though still in-line with the bond market in a tough tape this year.

These are just a few examples of how using an active asset allocation strategy in the fixed income portion of your portfolio can add just as much value as the equity portion even if seems that prices don't move as much. Anticipating that financial conditions will continue to tighten in the coming years, evaluating the risks of your fixed income portfolio is as important now as ever.

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Figure 1: Annual Returns of the US Bond Market: Shows the annual total return of the Bloomberg Barclays Aggregate Index from 1980 to 2018. Negative returns are highlighted in orange while positive returns are highlighted in blue. \*2018 through 6/22/18. Source – Ycharts.com

Figure 2: Interest Rates and Bond Prices have an Inverse Relationship: Shows the value of a 10 year straight bond with a 3% coupon if the market interest rate is 2%, 3%, or 4%. Assumes the bond makes an annual payment at the end of the year.

Figure 3: Historical Risk/Return Profile of US Treasury Securities: Shows the historical risk return of US treasury bonds with different maturities since 1960. Source – Bank of America Merrill Lynch, CFA Institute

Figure 4: Historical Default Rates: Shows the one year, five year, and ten year cumulative default rates of US companies from 1950 to 2015. Source – CFA Institute

Figure 5: High Yield Spread: High Yield Spreads Correlated with the State of the Economy: Shows the ICE BofAML High Yield Option Adjusted Spread in blue and the US GDP annualized growth rate per quarter in the orange line from Jan 1 1998 to May 31 2018. Recessions are highlighted in orange. Source - FRED

Figure 6: Impact of Currency Movements on Fixed Income Returns: Shows the affect of dollar appreciation and depreciation versus the euro on the return of a German bond with a 5% coupon for a US investor. Assumes that the bond is purchased and sold at par and that there are no transaction costs.

Figure 7: Historical Range of Asset Classes: Shows the range of returns for stocks (S&P 500), bonds (Barclay Agg) and a 50/50 portfolio from 1950 to 2015. Source – JPMorgan