

# Bond Investing in a Volatile World: How to Manage All Fixed Income Risks with Quality, Nimbleness, and Active Management

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## The Basics of Bond Investing

Investors who own debt instruments, known as bonds, have provided a loan to the issuer and have secured the right to periodic interest payments and principal repayment at maturity. When it comes to fixed income strategy, most investors are familiar with the most straightforward approach: buying bonds and holding them until maturity. Referred to as “passive management,” the investor’s return is approximately the average yield of the bonds that make up the portfolio.

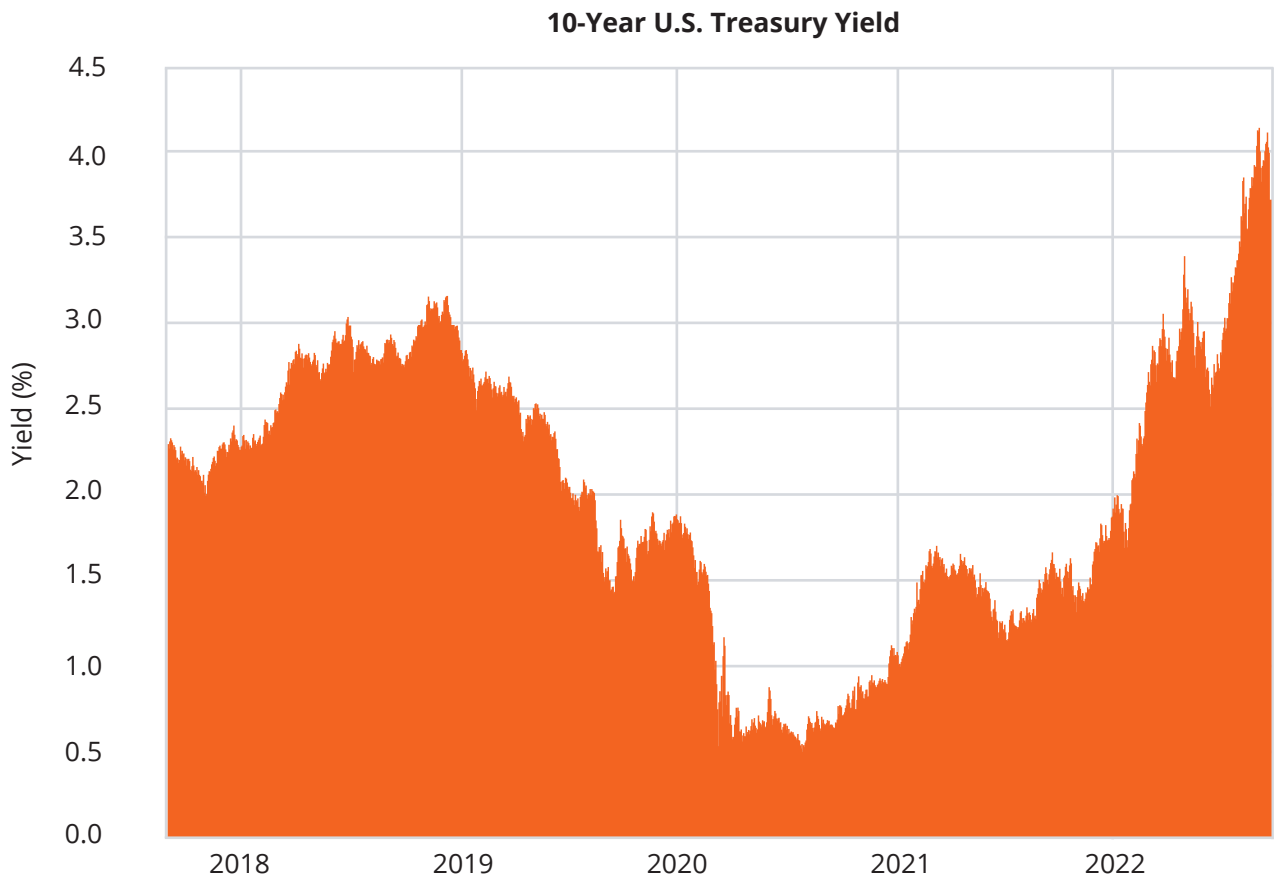
While a bond’s interest payment and principal generally remain constant, the market value of a bond will fluctuate based on market dynamics. As interest rates rise, the future value of a bond’s interest payments will be worth less. This discrepancy is reflected in the bond’s price. Conversely, as interest rates fall, a bond’s price will increase.

This white paper will focus on “active management,” which sets out to manage the different characteristics of fixed income securities, taking advantage of rising and falling interest rate environments as well as the change in yield differential of corporate and other bond types over U.S. Treasuries, known as “spread.” Spread is measured in basis points, where 100 basis points (bps) amounts to a 1% higher yield for securities of the same maturity date. This and other definitions are further defined at the end of this paper.



In a vacuum, the simplest of fixed income investments isn't such a hard concept to grasp. You buy a bond, collect the interest, and get your money back at maturity. What income-seeking investors may not realize is that at any given time, there are a multitude of risks working against each other to wreak havoc on a portfolio, fluctuating the value of your investment and the income generated from it. Instead of taking on these risks blindly, an active and nimble manager can be prescriptive in how they attack risk, moving with precision to position a portfolio at the command of extensive analysis.

Entering 2022, investors could buy a 10-year Treasury at 1.5%, corporate bond spreads over Treasuries were below 100 basis points, and inflationary pressures caused by pandemic-induced supply chain issues were expected to reside. As the first quarter of the year progressed, however, inflation did not reside, new risks emerged from all corners of the world, and volatility returned in dramatic fashion to both equity and bond markets.



The Federal Reserve (the Fed), needing to step in to fight off this rampant inflation, found itself without the precise tools required to make an impact in the areas in which inflation was taking hold. Instead, by raising interest rates, it sought to slow the overall economy in an attempt to bring inflation down.

In this backdrop of rising rates and elevated risks, fixed income investors of all types experienced some degree of price movement within their portfolio. Investors that had thrown money at high-yielding bonds of lower quality or longer maturities suddenly found themselves down 15%, 20%, or more. The importance of risk awareness became painfully clear.

In this paper, we discuss the importance of managing all risks in fixed income and why it matters to be active, nimble, and up in quality.

### Understanding Fixed Income Correlations in an Asset Allocation

One of the fundamental attributes of fixed income we're taught in Investing 101 is that it provides diversification from equities and other types of investments. When equities go down, fixed income counteracts – or at least should maintain stability for a portfolio. For the greater part of the past four decades, this has held mostly true. The slow and steady interest rate decline from the 1980s on, while frustrating from an income-generation perspective, had given bonds an added boost in price movement.

Then came 2022. With the emergence of economic (inflation, supply chain, Fed), geopolitical (Russia/Ukraine), and market (liquidity, interest rates) risks, volatility hit both the stock and bond markets, sending corporate spreads over treasuries sharply higher and portfolio values plummeting. If your portfolio was holding up-in-quality corporates, you likely fared better than lower-investment grade or high yield. Astute investment scholars will note that this behavior from lower-quality corporate bonds is not uncommon. In fact, the correlation between corporate bonds and equities tends to be greater the lower in credit quality you go. So, as investors were reaching for yield in the low-yield era of months (and years) past, the diversification factor became noticeably absent in portfolios in 2022.

#### Historical Averages – Correlations vs. S&P 500 Index

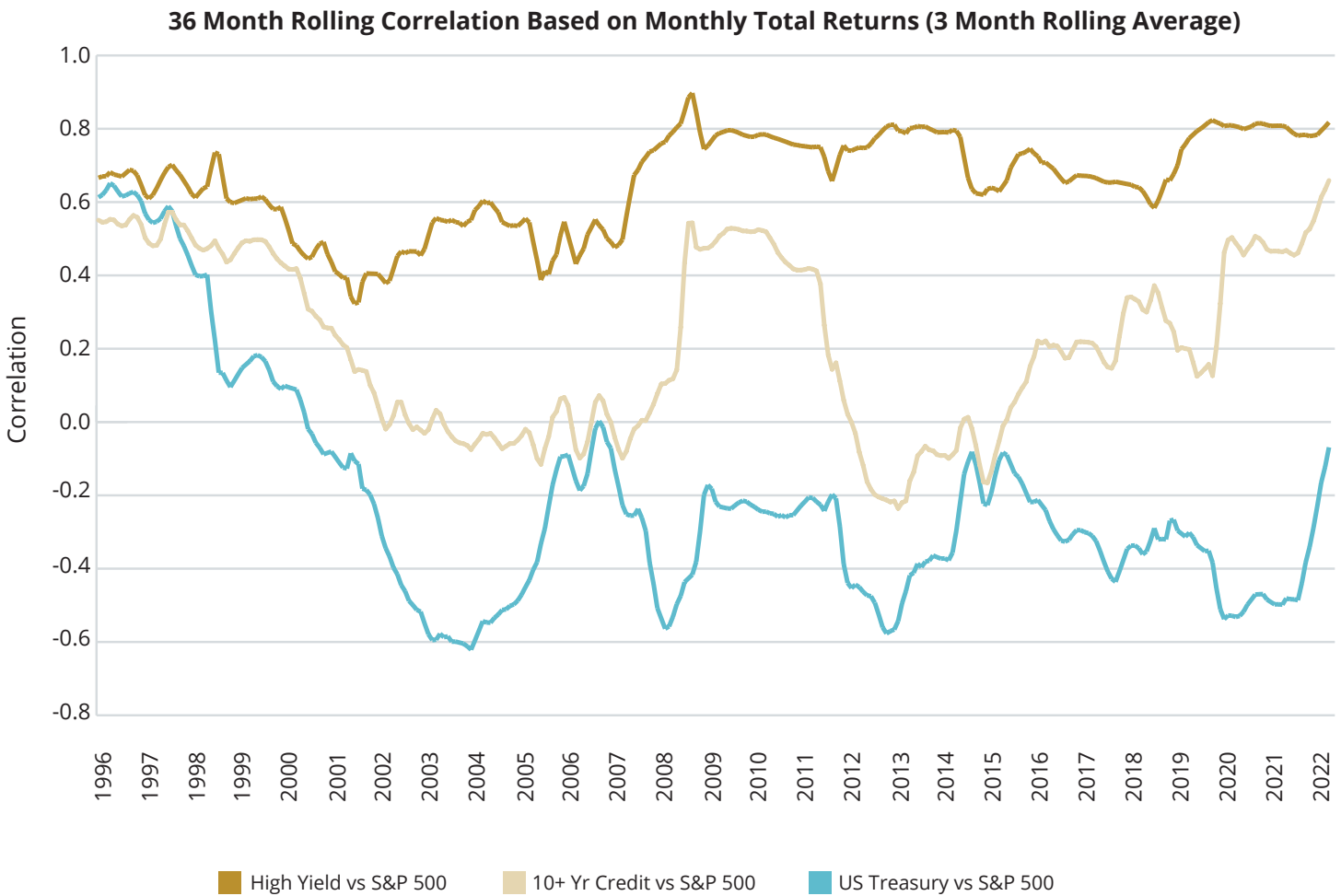
	5 Year	10 Year	15 Year
US Treasury	-0.10	-0.13	-0.24
A and above (Investment Grade)	0.50	0.39	0.39
BBB and above (All Investment Grade)	0.57	0.48	0.46
10+ Year BBB and above (All investment Grade)	0.57	0.45	0.39
BB and below (High Yield)	0.81	0.77	0.75

As of 9/22/2022

Correlations against the S&P 500® using the following indexes: ICE BofA 1-10 Year US Treasury Index, ICE BofA 1-10 Year AAA-A US Corporate Index, ICE BofA 1-10 Year US Corporate Index, ICE BofA 10+ Year US Corporate Index, and ICE BofA US High Yield Index.



To illustrate the credit quality effect on correlation, we plotted the rolling average correlation to equity market performance (S&P 500 Index). As expected, when you need fixed income to act as a buffer to equity declines, lower-quality bonds tend to look like equities, and disappoint.



An active manager continually monitors the quality breakdown in a portfolio and the market, and based on extensive analysis, has a good idea of when the amount of compensation is adequate for a given level of risk.

As many investors in lower-quality, long-term bonds can attest, while the reward of higher yields is alluring, the pain of widening spreads, amplified by lower quality, can be debilitating. Low-quality credit tends to act like equities when markets are volatile.



Compounding the issue is the exposure to added interest rate risk. Using duration to measure interest rate sensitivity, many of the lower-quality long bonds had duration in the range of 15-18 years, meaning that for a 1% move higher in interest rates, the bonds would be worth 15-18% less.

Consider a “diversified” portfolio with exposure to both technology stocks and long-term bonds. Tech experienced significant growth between 2010 and 2021, but is highly sensitive to interest rates due to the long-term, speculative nature of their equity valuation multiples. As interest rates moved higher in early 2022, your technology stocks were likely down about 20%, if not more, and the long-term bonds you had invested in for their higher yields fell in value by a comparable amount.

### Actively Managing Interest Rate Risk

Using duration to manage interest rate exposure often allows for the taking of gains in falling rate environments and the preservation of principal in rising rate environments. During periods of rising rates, active management can also minimize the opportunity cost of locking into lower rates for extended periods.

Duration is defined as a measure of interest rate sensitivity. For example, a portfolio with a duration of 3 years would be expected to rise 3% if interest rates were to fall 1%. It is measured in years because it can also be used to measure the time it takes to recover one’s original investment taking all cash flows into account.

### Using Breakeven Analysis to Measure Downside Risk

One of the ways an investor can assess the potential downside risk of a fixed income investment or portfolio is to calculate its breakeven yield change. Put simply, the breakeven yield change is the magnitude (in basis points) of a rise in interest rates, whether from spreads or Treasuries, to drop the price of your investment so much that it offsets all of the income you would have earned in the portfolio over the following year. The higher the breakeven value, the greater the downside protection. Breakeven scenario analysis will also reveal how much protection you could have buying bonds today versus waiting. If an investor thinks they may lose money by investing today, they will be able to plan for different scenarios with hard numbers.

“ During periods of rising rates, active management can minimize the opportunity cost of locking into lower rates for extended periods. ”



The 2yr UST currently yields 4.33%. To achieve a 0% return at the end of 1-year, the yield on a 1yr UST needs to be roughly 9.14%, or 481 basis points higher.

B R E A K E V E N

481 bps

### 2yr UST

**Current yield:** 4.33%

**Breakeven:** 9.14% (481 bps higher)

It would take significantly more upward yield movement for the 2yr Treasury to achieve a breakeven return after one year, giving it greater interest rate protection.

The 10yr UST currently yields 3.81%. To achieve a 0% return at the end of 1-year, the yield on a 9yr UST needs to be roughly 4.34%, or 53 basis points higher.

53 bps

B R E A K E V E N

### 10yr UST

**Current yield:** 3.81%

**Breakeven:** 4.34% (53 bps higher)

It would only take a small jump in Treasury yields for the 10yr Treasury to achieve a 0% return.

Data as of November 10, 2022

An active investment manager will likely have a view on where interest rates and spreads are headed. For Madison, when we are thinking about positioning portfolios and executing trades, looking at breakeven values is another risk metric we use to offer downside protection.

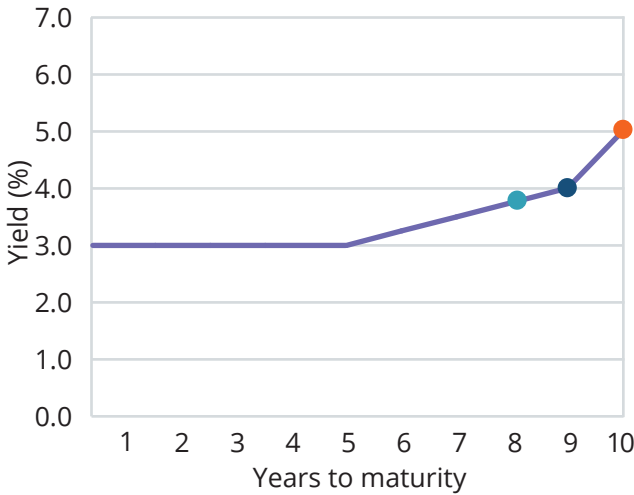
## Optimizing Maturities on the Yield Curve

An underappreciated, yet very important lever that fixed income portfolio managers use to generate performance is roll-down returns. The yield curve is positively sloped much of the time, meaning that shorter-term maturity bonds yield less than longer-term maturity bonds. This provides an opportunity for investors to earn higher yields by purchasing slightly longer maturities. If an investor buys a bond with a longer maturity, at a higher yield, and holds the security for a period of time, the bond's market value becomes greater over time because of the inverse relationship between yield and price. For example, if a 10-year bond yields 5% and the 9-year bond – because the yield curve is positively sloped – yields 4%, the total return after one year, assuming the 9-year bond still yields 4%, is over 12%. The price of the bond goes up 7% given its new valuation at a lower interest rate, plus the investor gets the 5% in interest income. An active portfolio manager will decide whether to hold the bond to maturity, locking in the 5% annual yield, or sell the bond to realize the 7% gain in market value and reinvest into a security with a better risk-return profile.

Conversely, if the yield curve is inverted and the 9-year bond yields 6%, the total return after one year is -2% due to “rolling up” an inverted sloped yield curve. Certain ETF or passive fixed income strategies cannot take advantage of strongly positively sloped curves nor underweight very inverted curves. Active management provides the manager the tools to maximize total return with this underappreciated lever.



**Positive**

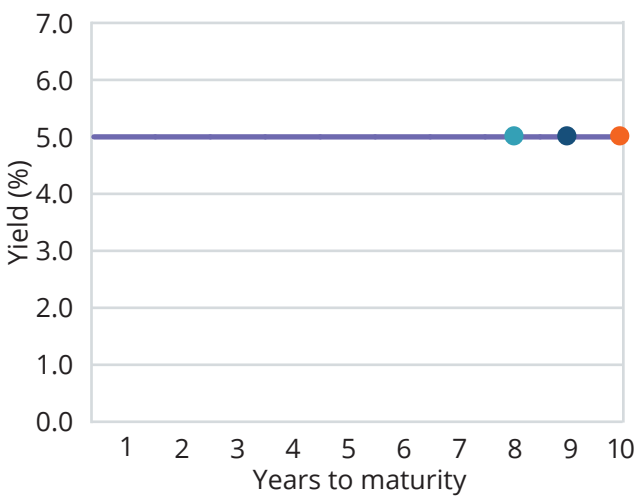


If the yield curve remains sloped positively, you will earn the coupon each year plus the natural price appreciation of the bond's value when the market interest rate falls.

An active manager may decide to buy or sell a bond to realize these price gains or reposition a portfolio's risk profile.

<p>● 10yr bond purchased</p> <p>Interest payment: 5%</p> <p>Value: \$100</p>	<p>● After one year</p> <p>Interest payment: 5%</p> <p>Value: \$107.44</p> <p>Year 1 Total Return: 12.4%</p>	<p>● After two years</p> <p>Interest payment: 5%</p> <p>Value: \$108.50</p> <p>Year 2 Total Return: 5.7%</p>
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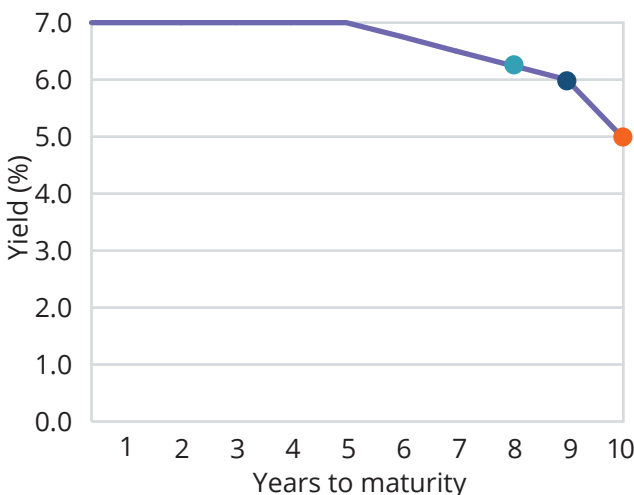
**Flat**



If the yield curve remains flat, you will earn the same coupon payment each year and the price of your bond will not change. An active manager may decide to buy or sell a bond depending on their view of future rate moves.

<p>● 10yr bond purchased</p> <p>Interest payment: 5%</p> <p>Value: \$100</p>	<p>● After one year</p> <p>Interest payment: 5%</p> <p>Value: \$100</p> <p>Year 1 Total Return: 5.0%</p>	<p>● After two years</p> <p>Interest payment: 5%</p> <p>Value: \$100</p> <p>Year 2 Total Return: 5.0%</p>
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**Inverted**



In the case of an inverted curve, a bond's value will decrease from year to year, which could lead to a negative return.

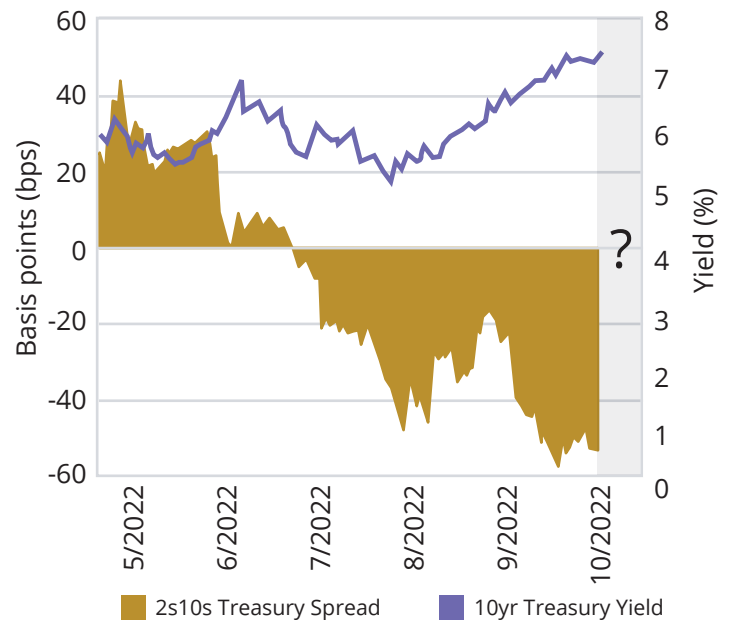
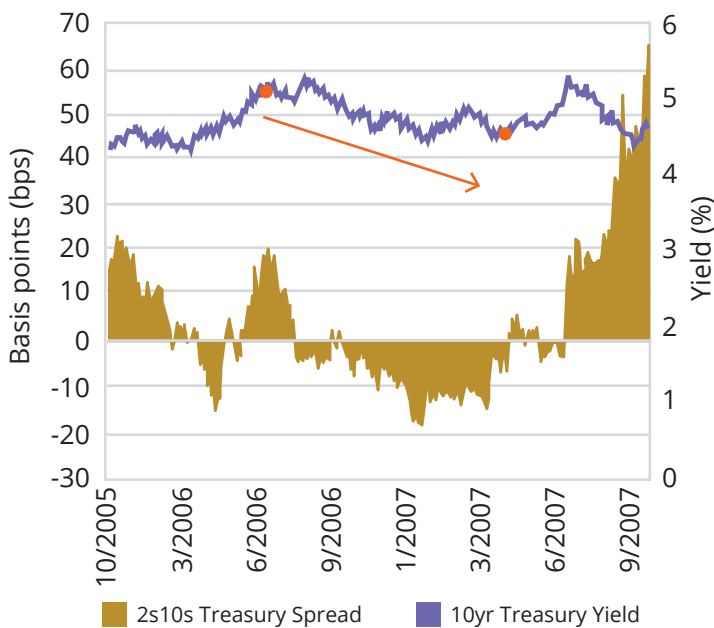
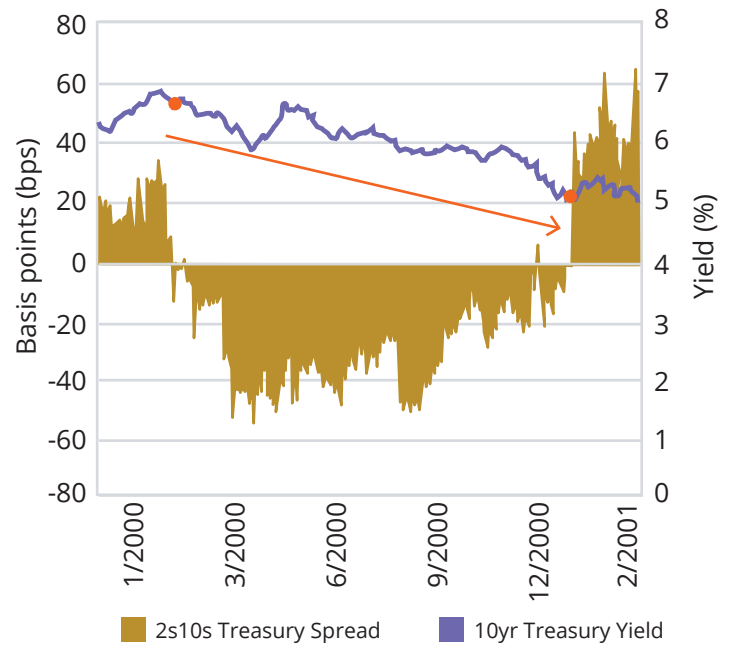
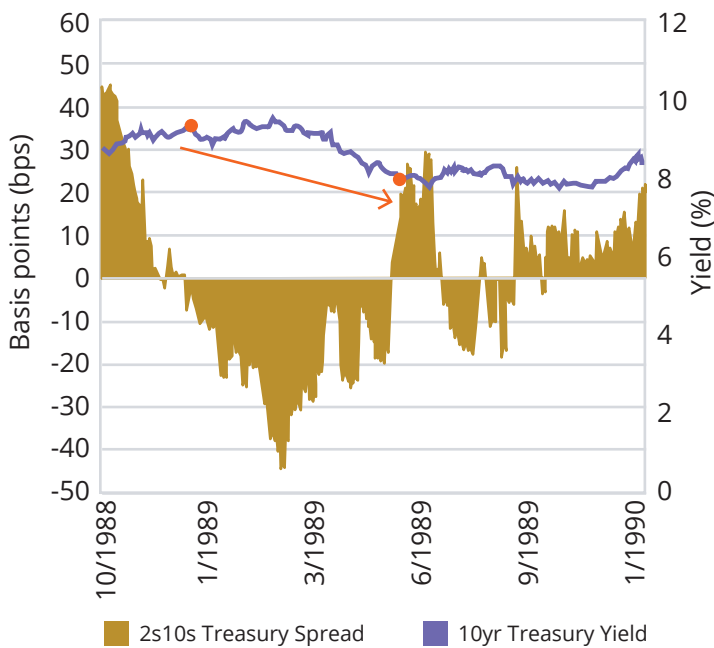
An active manager may buy or sell bonds at what they believe to be advantageous parts of the yield curve to minimize loss or rebalance risk.

<p>● 10yr bond purchased</p> <p>Interest payment: 5%</p> <p>Value: \$100</p>	<p>● After one year</p> <p>Interest payment: 5%</p> <p>Value: \$93.20</p> <p>Year 1 Total Return: -1.8%</p>	<p>● After two years</p> <p>Interest payment: 5%</p> <p>Value: \$92.31</p> <p>Year 2 Total Return: 4.4%</p>
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## Managing Through an Inverted Yield Curve

At times, often preceding a recession, the yield curve inverts. This means, shorter-term bonds offer a higher yield than longer-term bonds. Because of this expected slower or negative growth, the market is expecting the Fed will have to cut interest rates down the road. On the surface, an investor may think higher yield for less risk is a good thing. History shows, however, that as the Fed cuts interest rates, the next move for the entire curve is down. So, while locking in a particular rate on a longer-term bond and forgoing yield in the short run may not seem like a wise move as the curve is inverted, it may be in the investor's best interest to do so. An active manager can make that relative value decision based on their view of Fed policy, the evolution of interest rates and economic cycles, and how that translates to corporate bond spreads. Let's explore previous inverted curve periods:





## Paying Attention to Your Liquidity Risk

Credit quality, interest rate sensitivity, and yield curve positioning are some of the decisions an active manager can make in positioning a portfolio to optimize the risk, return, and income for an investor. When it comes to implementing a manager's views in a portfolio, another risk must be considered: liquidity. Liquidity risk is an often-overlooked aspect of fixed income investing that many investors do not experience the same way they may for stocks. Liquidity risk factors appear at both the individual security and portfolio levels – and the dynamics will differ based on the type and size of a portfolio.

## Understanding the Mechanics of Bond Trading

Unlike equities, which trade on centralized public exchanges, bonds trade in an over-the-counter market mostly inaccessible to the general public. Buyers and sellers of bonds get together in these markets to set the price of a given issue and the aggregate of all these deals makes up the spread over a given time period. These complex mechanics are important for the market, but make bonds a less liquid asset class than equities.

The emergence of low-cost exchange-traded funds (ETFs) over the years has added to the complexity of the bond market. With ETFs, you have a product designed for its liquidity, trading over an exchange, but used to access a relatively less liquid asset in bonds. This mismatch puts investors at risk during times of volatility, when the liquidity transmission mechanism becomes bogged down due to heightened uncertainty. Investors might achieve the liquidity they desire through an ETF at the expense of getting full value for the investment.

## Nimbleness Matters During Times of Volatility

Liquidity risk also plays an important role depending on a portfolio's size. While giant portfolios and passive ETFs can present a lower management fee for the investor, other risks must be considered as typically, risk is magnified as a portfolio becomes larger. Imagine a corporate bond portfolio with \$50 billion in assets. To express a view on a particular credit or sector, the manager will likely have to buy bonds across the curve and across a capital structure, even for a position size of less than 1%. The impact of this positioning may also be diminished based on volume

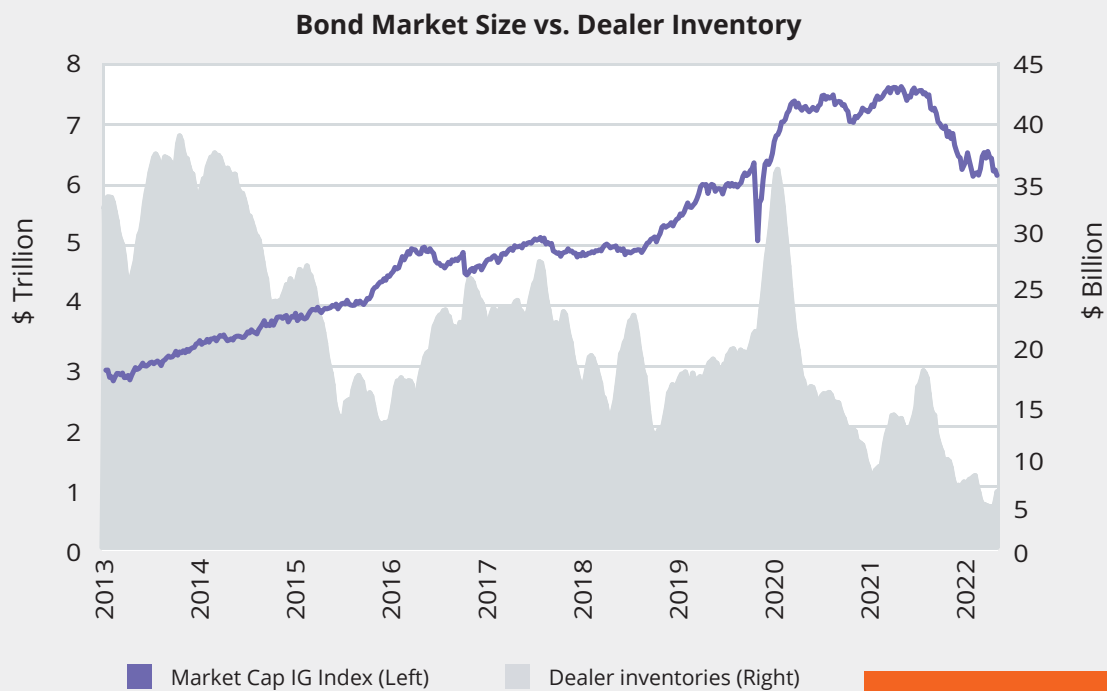
“ Credit quality, interest rate sensitivity, and yield curve positioning are some of the decisions an active manager can make in positioning a portfolio to optimize the risk, return, and income for an investor. ”



alone. There may not be enough inventory available to make the position size relevant, and the portfolio may have to own more of the lesser-desirable bonds in the market – looking more like the index the larger the fund becomes.

Where liquidity risk can really hurt a giant manager is in times of volatility, when the manager wants to exit a position but there may not be a market for such a large volume of bonds. For what may seem like a minor shift in the giant portfolio's risk budget, because of their massive scale, the actions can move the markets and cause significant volatility.

Following the 2008-2009 financial crisis, increased regulation reduced Wall Street's influence over certain areas of the bond market, and large banks and broker/dealers no longer held vast inventories of corporate debt, leaving the mega fund managers and ETFs without a large-scale trading partner to buy or sell securities.



**Since 2013:**  
**Overall bond market size:**  
grew 59%  
**Dealer inventories:**  
shrank 60%



Sector	Interest Rate	Credit
<b>Giant managers</b>		
To express a sector view, must buy bonds of many issuers and maturities along with lower quality.	Because of their size, may take oversized risks due to lack of alternatives.	Must own lower-quality bonds to generate return or illiquid bonds for increased yield.
<b>Passive ETFs</b>		
Own bonds of all sectors.	Do not actively buy or sell securities.	Own bonds of all credit ratings within a given index.
<b>Nimble managers</b>		
Can express a sector view by buying just one or a few credits.	Can quickly move out of a credit or maturity range when the manager believes a rate move will negatively impact price.	Can invest in credits the manager believes may be incorrectly rated or at a certain point on the yield curve in which the compensation for a given level of risk is attractive.

<p><b>It's All Relative with Mortgage-Backed Securities</b></p> <p>Early in 2022, the Federal Reserve indicated a desire to normalize monetary policy by raising interest rates in conjunction with a reduction in the amount of bond purchases (quantitative easing), especially mortgage-backed securities. It was likely that the economic-sensitive buyers would demand higher yields to purchase mortgage-backed securities versus what non-economic buyers would demand (Fed). As the year progressed, the market began to realize that, indeed, higher spreads and yields would be needed before buyers would step in. An active manager that understands the dynamics at play in the mortgage-backed security market can put their views to work in a portfolio as the market evolves.</p>	<p><b>Moving on a Mis-Priced Treasury Market</b></p> <p>As 2022 began, market expectations shifted regarding the longevity of inflation the economy was experiencing. Historically, the interest rate increases by the Fed to reduce inflation would end with the Federal Funds rate exceeding the level of inflation, thus creating a positive real Federal Funds rate at the end of the cycle. As 2022 began, the market was still pricing in a Federal Funds rate of only 1.75 to 2.00% by the end of 2022, well below the inflation levels at that time. An active manager that recognized this underpricing may have placed an underweight on the 7-10 year part of the yield curve in anticipation of more attractive interest rates as the market repriced down the road.</p>	<p><b>Rich Credit Valuations in 2019</b></p> <p>With spreads tightening in late 2019, investors were not being adequately rewarded for the risk they were taking, by historical standards. The rich valuations, paired with rising uncertainty in late 2019, suggested a significant repricing was imminent. An active manager that had an underweight in corporate bonds in 2019 could be afforded the flexibility to move on the repricing in the bond market in early 2020 by buying corporates at higher yields. By the end of March 2020, corporate bonds, especially high-quality bonds, had returned to historically-normal spread levels.</p>
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As we progress in this very mature stage of the credit cycle, investors can expect volatility to remain elevated. We believe an active approach in this environment will best serve those investors that want to manage all fixed income risks – specifically, by choosing a manager that conducts their own credit research to find mispricings in the market, focuses on quality bonds over the pursuit of higher returns, and has the nimbleness to express their views in a portfolio.



### Disclosures

"Madison" and/or "Madison Investments" is the unifying tradename of Madison Investment Holdings, Inc., Madison Asset Management, LLC ("MAM"), and Madison Investment Advisors, LLC ("MIA"), which also includes the Madison Scottsdale office. MAM and MIA are registered as investment advisers with the U.S. Securities and Exchange Commission. Madison Funds are distributed by MFD Distributor, LLC. MFD Distributor, LLC is registered with the U.S. Securities and Exchange Commission as a broker-dealer, and is a member firm of the Financial Industry Regulatory Authority. The home office for each firm listed above is 550 Science Drive, Madison, WI 53711. Madison's toll-free number is 800-767-0300.

Any performance data shown represents past performance. Past performance is no guarantee of future results.

Non-deposit investment products are not federally insured, involve investment risk, may lose value and are not obligations of, or guaranteed by, any financial institution. Investment returns and principal value will fluctuate.

This report is for informational purposes only and is not intended as an offer or solicitation with respect to the purchase or sale of any security.

In addition to the ongoing market risk applicable to portfolio securities, bonds are subject to interest rate risk. When interest rates rise, bond prices fall; generally, the longer a bond's maturity, the more sensitive it is to this risk. Bonds may also be subject to call risk, which allows the issuer to retain the right to redeem the debt, fully or partially, before the scheduled maturity date. Proceeds from sales prior to maturity may be more or less than originally invested due to changes in market conditions or changes in the credit quality of the issuer. Unlike individual bond positions, managed bond strategies have ongoing fees and expenses.

**ICE BofA 1-10 Year AAA-A US Corporate Index** tracks the performance of U.S. dollar-denominated investment-grade corporate debt publicly issued in the U.S. domestic market. Qualifying securities must have a rating between A and AAA (based on an average of Moody's, S&P and Fitch), a fixed coupon, and between one and ten years remaining term to final maturity.

**ICE BofA 1-10 Year US Corporate Index** tracks the performance of U.S. dollar-denominated investment-grade corporate debt publicly issued in the U.S. domestic market. Qualifying securities must have an investment-grade rating (based on an average of Moody's, S&P and Fitch), a fixed coupon, and between one and ten years remaining term to final maturity.

**ICE BofA 10+ Year US Corporate Index** tracks the performance of U.S. dollar-denominated investment-grade corporate debt publicly issued in the U.S. domestic market. Qualifying securities must have an investment-grade rating (based on an average of Moody's, S&P and Fitch), a fixed coupon, and at least ten years remaining term to final maturity.

**ICE BofA US High Yield Index** tracks the performance of U.S. dollar-denominated below investment-grade corporate debt publicly issued in the U.S. domestic market. Qualifying securities must have a rating below BBB (based on an average of Moody's, S&P and Fitch), a fixed coupon, and between one and ten years remaining term to final maturity.

**ICE BofA 1-10 Year US Treasury Index** tracks the total return performance of U.S. Treasury bonds with an outstanding par that is greater than or equal to \$25 million. The maturity range of these securities is between one and ten years.

**The S&P 500®** is an unmanaged index of large companies and is widely regarded as a standard for measuring large-cap and mid-cap U.S. stock-market performance. Results assume the reinvestment of all capital gain and dividend distributions. An investment cannot be made directly into an index.

Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only, and do not represent the performance of any specific investment. Index returns do not include any expenses, fees or sales charges, which would lower performance.

The examples provided in this material are mathematical illustrations only and do not represent any Madison strategy or investment.

Diversification does not assure a profit or protect against loss in a declining market.

### Definitions

#### Coupon Rate

The annual interest paid on a bond, based on a percentage of its par or face value.

#### Duration

A measure of interest rate sensitivity. For example, a portfolio with a duration of three years would be expected to rise 3% if interest rates were to fall 1%. It is measured in years because it can also be used to measure the time it takes to recover one's original investment taking all cash flows into account.

#### High-Yield Bonds

Also known as junk bonds, high-yield bonds are bonds issued by companies that are considered to be at a greater risk of failing to make interest and principal payments on schedule.

#### Spread

The yield difference between a Treasury bond and a bond of the same duration that has additional risks, such as a corporate bond.

#### Total Return

The actual rate of return realized over some evaluation period. Considers all sources of return: coupon interest, interest on coupon interest, and any capital gain/loss.

#### Volatility

The degree of variation of returns for a given security or market index.

#### Yield Curve

A graph showing the various yields of similar types of securities that vary in their maturity dates. A flat yield curve is one in which short-term bonds have yields similar to longer bonds.

#### Yield to Maturity

The rate of return on a bond calculated on the basis of purchase price, redemption price, the total interest payments, and the number of months or years until maturity. The yield to maturity is greater than the current yield when the bond is selling at a discount, and less when the bond is at premium.

