ProShares

TAKE ACTION WHEN RATES RISE

A Playbook for Rising Rates

Executive Summary

After more than a decade of historically low or falling interest rates, today's market environment, in which interest rates are rising, may be unfamiliar to many investors. Indeed, many of the fixed income and equity investment strategies that worked so well during a sustained bull market may not be as effective. That's why we believe investors need a new playbook to help them identify solutions as interest rates begin to climb. In this rising rate playbook, we will provide fresh insight and strategies to help you:

- **Go on defense against rising rates in your fixed income portfolio:** Traditional bond strategies for rising rate environments – short duration, floating rates, bank loans and Treasury Inflation-Protected Securities, known as TIPS – may not be the most effective choices, while investment tools, such as interest rate-hedged bond strategies, may represent an attractive alternative.
- **Go on offense with rising rates in your equity portfolio:** While equities in general tend to fare better than bonds when interest rates rise, there is also room to tailor an equity strategy for a rising rate environment. We will discuss how an equity strategy that selects sectors and stocks most correlated to rising interest rates may provide enhanced performance when interest rates are rising.

Of course, there is no single strategy that is right for every investor; the best approach is to analyze a broad spectrum of ideas and choose the right ones, or right combination, that best suit your needs. However, given ProShares' large lineup of rising rate solutions, this playbook provides an easy, simple and convenient place to start.

Strategies for Rising Rate Environments

FIXED INCOME	Pros	Cons
Interest rate hedged strategies	Virtually eliminates interest rate risk; preserves credit risk	Likely underperforms if interest rates fall
Short duration bonds	Reduces interest rate risk	Some interest rate risk remains, lower yields, reduces credit exposure
Floating rate bonds	Virtually eliminates most interest rate risk	Lower yields, reduces credit exposure
Bank loans	Virtually eliminates interest rate risk; preserves credit risk	Potential liquidity and structural challenges, likely underperforms if interest rates fall
EQUITIES		
Equities for rising rates	Specifically designed and targeted for a rising rate environment	May underperform if interest rates do not rise

Go on Defense: Fixed Income Strategies

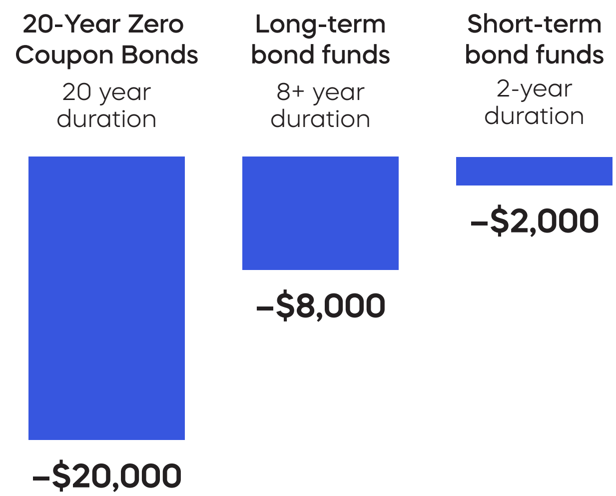
Bond Basics

When interest rates rise, bonds lose market value. Most bonds pay fixed coupons. If interest rates rise, the only way that a fixed coupon can equate to a higher interest rate is if the buyer pays less for the bond. How much less? A bond's duration is the measure of its price sensitivity to interest rate changes.

Simply multiply a change in interest rates by a bond's duration and you have a solid estimate of its change in price. Interest rates go up 50bps. A bond with a duration of 10 will lose approximately 5% of its value. Duration is a function of maturity. The longer the maturity of a bond, the longer its duration. The price of a longer-maturity bond is more sensitive to a change in interest rates than that of a shorter maturity bond (all else being equal).

When Interest Rates Rise, Bond Portfolios Decline

Approximate decline in value for a $100,000 bond portfolio if U.S. interest rates rise 1%.



Credit Risk Versus Interest Rate Risk

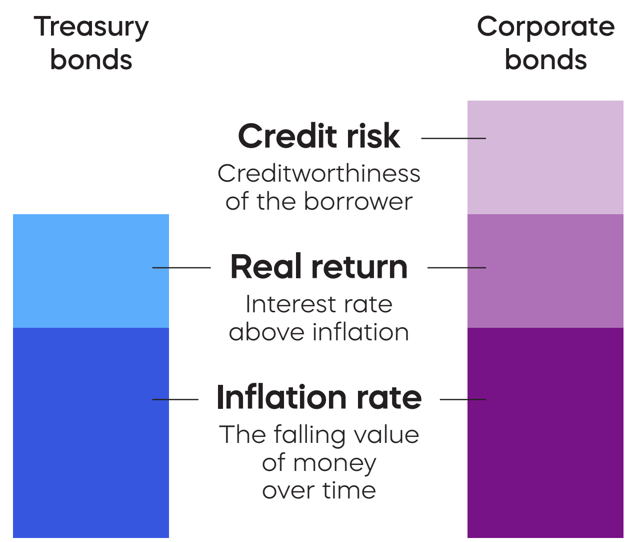
Some consider a U.S. Treasury bond to have virtually no default risk. Its interest rate – known as a "risk-free rate" – is solely a compensation for giving up money for a period of time. Even without default risk, investors demand a return for lending their money. That return is composed of an inflation component and a "real return" typically over and above inflation. A 10-Year U.S. Treasury bond yielding 3% when inflation is 2% has a 1% "real return."

While a U.S. Treasury bond has virtually no default risk, it is far from riskless. Higher inflation could push yields higher and prices lower. Lower inflation could push yields lower and prices higher. And real returns can shift as well – interest rates can rise without additional inflation. For example, quantitative easing can force real returns lower, and quantitative tightening can force real yields higher.

Corporate bonds have default risk. Companies can go bankrupt. Investors demand an interest rate

Bonds' Sources of Return and Risk

Investors demand a return for lending their money. That return is made up of several risk-based components.



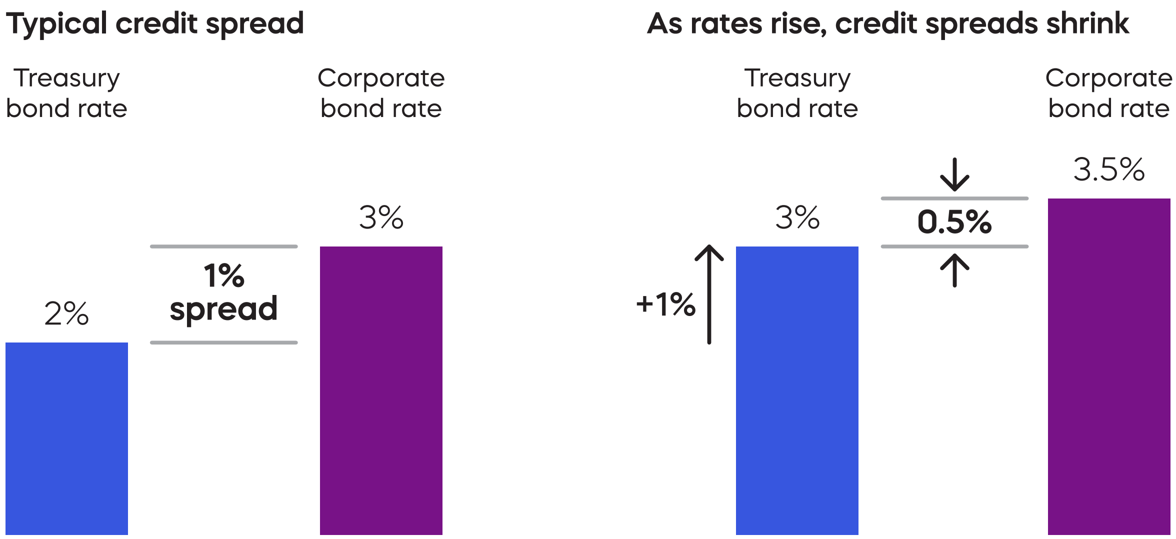
that's higher than that on a Treasury bond. That "extra" yield is called a credit spread and is a function of the creditworthiness of the borrower: wider spreads for companies with a greater risk of default and narrower spreads for companies with a lower risk of default. A corporate bond, therefore, has an additional source of risk (and return). The Treasury rate component can go up or down, but spreads can widen or narrow based on either changes in a company's creditworthiness or the market's pricing of risk.

The Relationship Between Treasury Rates and Credit Spreads

Inflation typically rises when the economy improves. Therefore, when the economy improves, U.S. Treasury rates often rise, and prices fall. But an improving economy can have two contradictory effects on corporate bond returns. Rising Treasury rates reduce bond prices. But there's another, positive effect. Because companies often thrive in a booming economy, investors don't demand as much of a premium for investing in corporate bonds when growth accelerates. Credit spreads – that is, the difference in the interest rates between corporate bonds and Treasurys – can shrink. In fact, credit spreads for both investment-grade and high-yield bonds have been negatively correlated with interest rates.

Rising Rates Can Have Contradictory Effects on Corporate Bond Returns

Corporate bonds have often outperformed Treasury bonds in rising rate periods because the tightening of credit spreads offsets some of the rise in Treasury rates.



Historically, that's meant that corporate bonds – investment grade and high yield – have outperformed Treasury bonds in rising rate periods because the tightening of credit spreads can offset some of the rise in Treasury rates.

Fixed Income Strategies for Your Portfolio

Basic bond math is at the core of most bond strategies for rising rates. Shortening duration limits the potential damage if rates rise. A bond with a duration of five has roughly half the exposure to rising rates as a bond with a duration of 10. This is a straightforward approach for U.S. Treasurys. And for the very low-risk portion of an investment portfolio where low yields and returns are par for the course – think cash or near cash – short-duration treasurys may be a prudent choice. There's more to the story for corporate bonds.

Fixed Income Strategies for Rising Rate Environments

	Pros	Cons
Interest rate hedged strategies	Virtually eliminates interest rate risk; preserves credit risk	Likely underperforms if interest rates fall
Short duration bonds	Reduces interest rate risk	Some interest rate risk remains, lower yields, reduces credit exposure
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Interest Rate Hedged Bonds: Virtually Eliminates Interest Rate Risk, While Preserving Credit Risk

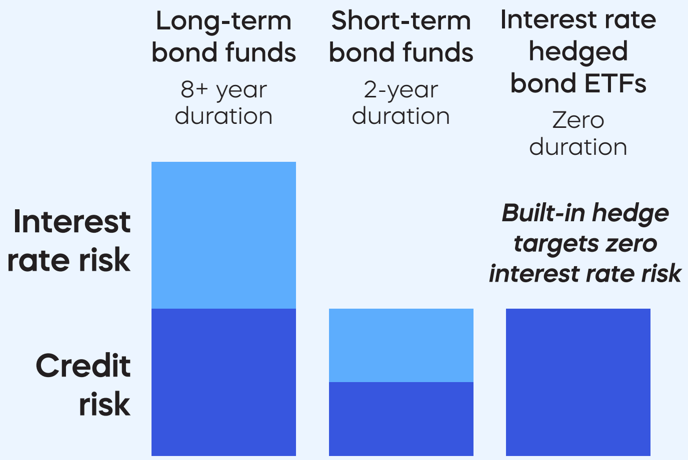
As we mentioned above, credit spreads often compress or tighten in a rising rate environment. Back to simple bond math: Tightening credit spreads push corporate bond prices up. As a result, investors concerned about rising interest rates might consider a strategy that seeks to eliminate interest rate risk during rising rates while still potentially benefiting from improving credit spreads. That runs counter to the common assumption that short-duration or floating-rate strategies provide the best protection in a rising rate environment. These strategies do reduce interest rate risk, but they also limit credit exposure. They may help dampen the negative effects of rising rates but at the cost of limiting the opportunity to profit from credit spreads. Interest rate hedged bond strategies are structured to virtually eliminate interest rate risk while retaining full exposure to credit risk. It's a combination that may be well-suited to a rising interest rate environment.

How Interest Rate Hedged Bond Strategies Work

Interest rate hedged bond strategies typically invest in portfolios of investment-grade or high-yield bonds and include built-in hedges to alleviate the impact of rising Treasury rates. Since the hedges are specifically targeted at rising Treasury rates, the strategies retain the full exposure to credit risk as a primary source of return.

The Fixed Income You Want Without the Interest Rate Risk

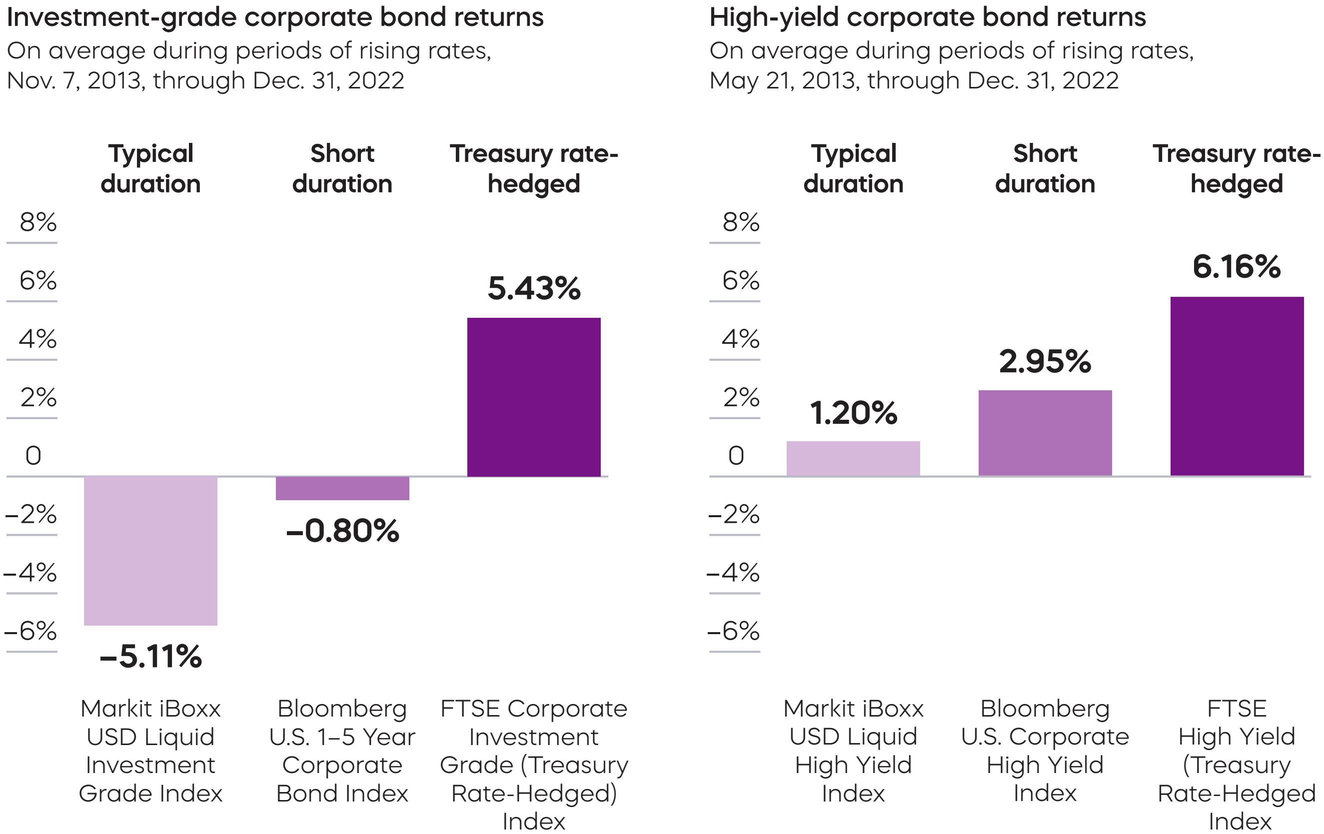
Short duration bond strategies reduce interest rate risk – but do not eliminate it. Interest rate hedged bond ETFs can virtually eliminate interest rate risk.



Short Duration Bonds:
Some Interest Rate Exposure, Limited Credit Exposure

Short-duration bond strategies reduce interest rate risk but do not eliminate it. And they limit exposure to credit risk. By virtually eliminating interest rate risk and preserving credit risk, interest rate hedged bond strategies – both investment grade and high yield – have outperformed in rising rate environments.

Interest Rate Hedging versus Short Duration Bond Strategies



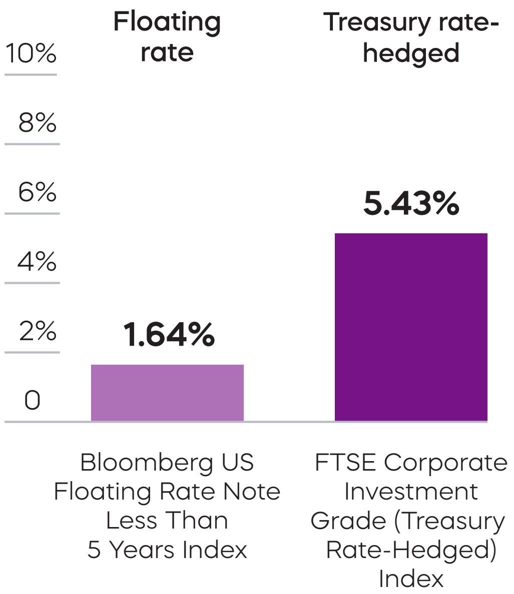
Source: Bloomberg. Starting dates reflect available data since ProShares launched ETFs tracking the respective interest rate hedged indexes. IGHG for the FTSE Corporate Investment Grade (Treasury Rate-Hedged) Index and HYHG for the FTSE High Yield (Treasury Rate-Hedged) Index.

Floating Rate Investment Grade Bonds: Less Interest Rate Exposure, Little Credit Exposure

Floating rate investment grade corporate bonds have interest payments that increase when Treasury rates rise. As a result, investors in these securities have minimal exposure to changes in Treasury rates. In addition, because floating-rate securities generally have short maturities, changes in credit spreads have limited (but not zero) impact on their value. Just like short-duration corporate bonds, these securities reduce exposure to interest rates and credit spreads simultaneously. The combination of minimal interest rate exposure and reduced credit exposure can limit an investor's potential returns from floating-rate bonds.

Interest Rate Hedging versus Floating Rate

Returns, on average during periods of rising rates, Nov. 7, 2013, through Dec. 31, 2022



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Bank Loans: Reduced Interest Rate Risk, Liquidity and Other Challenges

Bank loans are high yield offerings with floating coupon payments tied to short-term interest rates. Because they often have longer maturities (and lower credit quality) than floating-rate securities, they are exposed to significantly more risk from changing credit spreads than floating-rate investments. Bank loans do offer some opportunity to reduce interest rate exposure while maintaining credit risk exposure. However, there are several important considerations investors should keep in mind when evaluating bank loans and bank loan strategies.

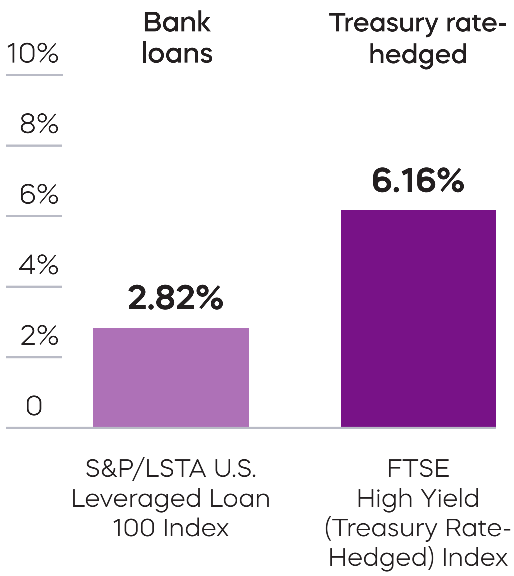
The first is liquidity. Bank loans can't be bought and sold as quickly as high-yield bonds. Most bond trades settle within two days, while settlement for bank loans can take up to 20 days. This can affect liquidity and depress yields in bank loan funds.

Call provisions are another issue. Bank loans can be "called at par," which means the issuer may be able to pay back the loan at face value. That limits the potential for price appreciation for investors. Any time a loan trades above par, it is likely to be called, leaving investors with cash to reinvest. Some high-yield bond funds exclude callable bonds for this reason.

And finally, the bank loan coupon payments don't always "float," or rise with rates as expected. For instance, if a loan has a floor, which puts a limit on how low a coupon payment can go, rates may need to rise substantially before investors benefit from coupon increases. In addition, issuers can change reference rates, or the benchmark rates. For example, an issuer may change the benchmark rate from the three-month reference rate to the one-month reference rate. In this situation, bank loan coupons may not float as expected if the three-month reference rate rises faster than the one-month rate.

Interest Rate Hedging versus Bank Loans

Returns, on average during periods of rising rates, May 23, 2013, through Dec. 31, 2022



Source: Bloomberg. Starting dates reflect available data since ProShares launched ETFs tracking the respective interest rate hedged indexes. IGHG for the FTSE Corporate Investment Grade (Treasury Rate-Hedged) Index and HYHG for the FTSE High Yield (Treasury Rate-Hedged) Index.

TIPS: Protection Against Rising Inflation Expectations, Not Rising Rates

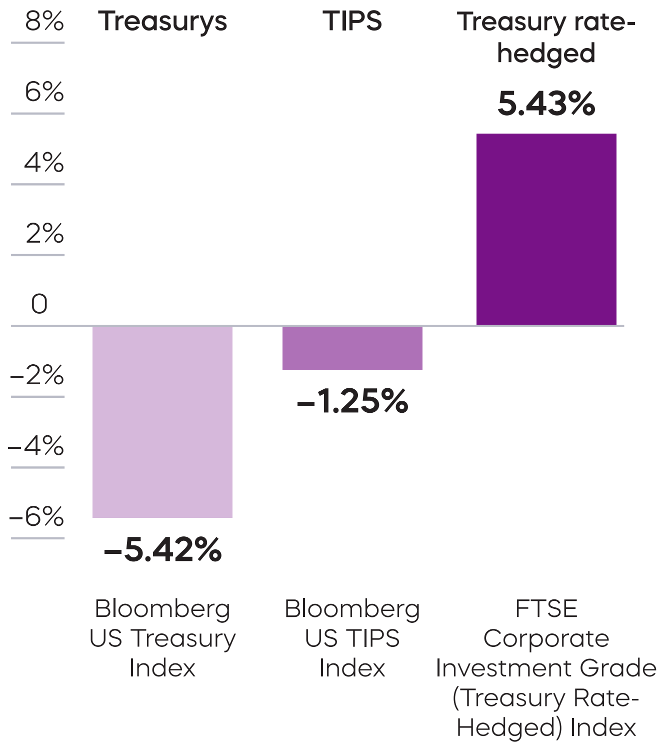
As of December 31, 2022, Treasury Inflation Protected Securities (known as TIPS) have a duration of 6.7 years. That means if U.S. Treasury rates rise 1%, the price of TIPS could fall 6.7%. You may be thinking to yourself, "Wait. I thought TIPS protected investors from rising interest rates. Don't they?" The short answer is "Not quite."

TIPS can help protect investors from rising inflation expectations, not inflation itself, and not specifically from rising interest rates. Inflation expectations can certainly rise when interest rates rise, and that's why, as the adjacent chart shows, TIPS have historically outperformed regular Treasuries when rates have risen. However, the Treasury Rate-Hedged Index (based on the FTSE Corporate Investment Grade Index) has performed even better, because interest rates can rise even if inflation expectations don't.

In fact, that's what the Fed's tapering program combined with likely increases in the Fed Funds rate is intended to achieve. The goal is to create a rise in interest rates that comes with a *decrease* in inflation expectations. And that is a recipe for disappointing TIPS performance.

Interest Rate Hedging versus TIPS

Returns, on average during periods of rising rates, Nov. 7, 2013, through Dec. 31, 2022



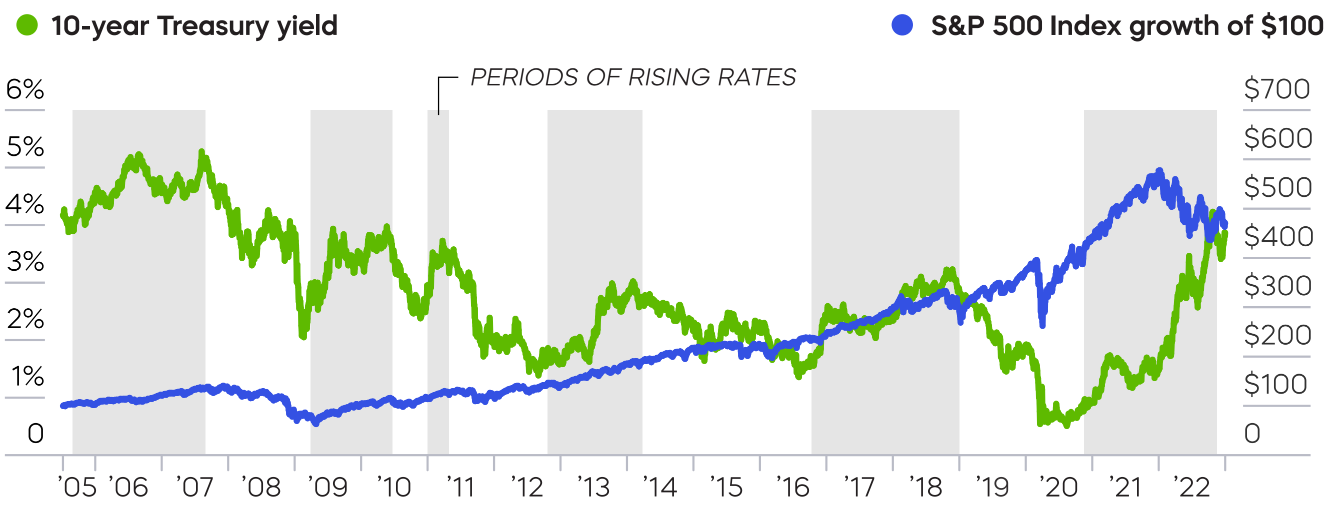
Source: Bloomberg. Starting dates reflect available data since ProShares launched ETFs tracking the respective interest rate hedged indexes. IGHG for the FTSE Corporate Investment Grade (Treasury Rate-Hedged) Index and HYHG for the FTSE High Yield (Treasury Rate-Hedged) Index.

Go on Offense: Equity Strategies for Rising Rates

Bonds with fixed coupons are defenseless when interest rates rise. Stocks are not defenseless. Earnings, dividends and cash flow can all grow. And aligned with the historical tightening of credit spreads in a rising rate environment, economic growth and robust corporate performance have driven solid performance from stocks in rising rate environments.

Stock Market Performance During Rising Rate Periods

Economic growth and robust corporate performance have driven solid performance from stocks in rising rate environments.



Source: Bloomberg, data from 5/2/05-12/31/22. Periods of rising rates indicated by shaded bars.

Not all stocks react in the same way in a rising rate environment. Sectors matter. Financials have been a historical winner, as rising rates typically mean a steeper yield curve and fatter net interest margins. Energy and Materials have done well, enjoying the rising prices that often accompany rising rates.

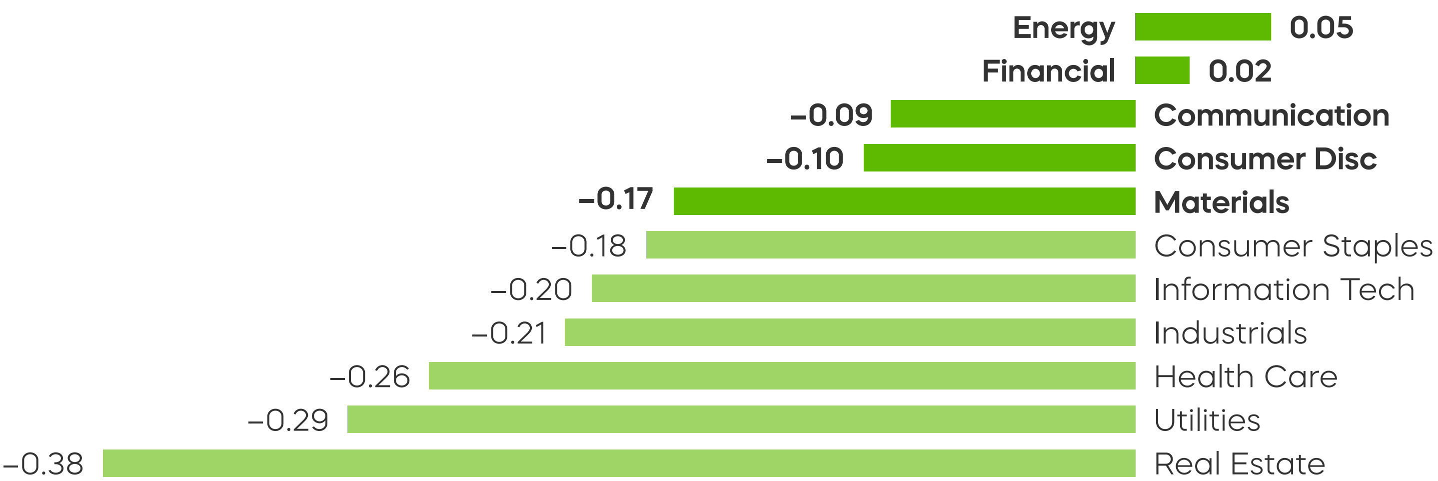
A Focused Equity Strategy for Rising Rates

The robust relationship between sector performance and rising interest rates lends itself quite well to a "rules-based" strategy. The Nasdaq Equities for Rising Rates Index targets sectors that have had the highest correlation to 10-Year U.S. Treasury yields, and within those sectors targets the stocks that have had a tendency to outperform as rates rise. The strategy is laser-focused on rising rate environments. It selects the five sectors that have demonstrated the highest correlation, and tilts substantially towards them. It is likely to outperform when interest rates rise, but may underperform when interest rates fall. The index has a total allocation of 80% to the financials, energy and materials sectors, compared to 20% for the S&P 500.

The index goes a step beyond just reallocating among sectors. It also targets stocks within those sectors that have had the tendency to outperform as rates have risen. The combination has been powerful – delivering double the return of the S&P 500 since the 10-Year Treasury's lowest historical closing level in the summer of 2020.

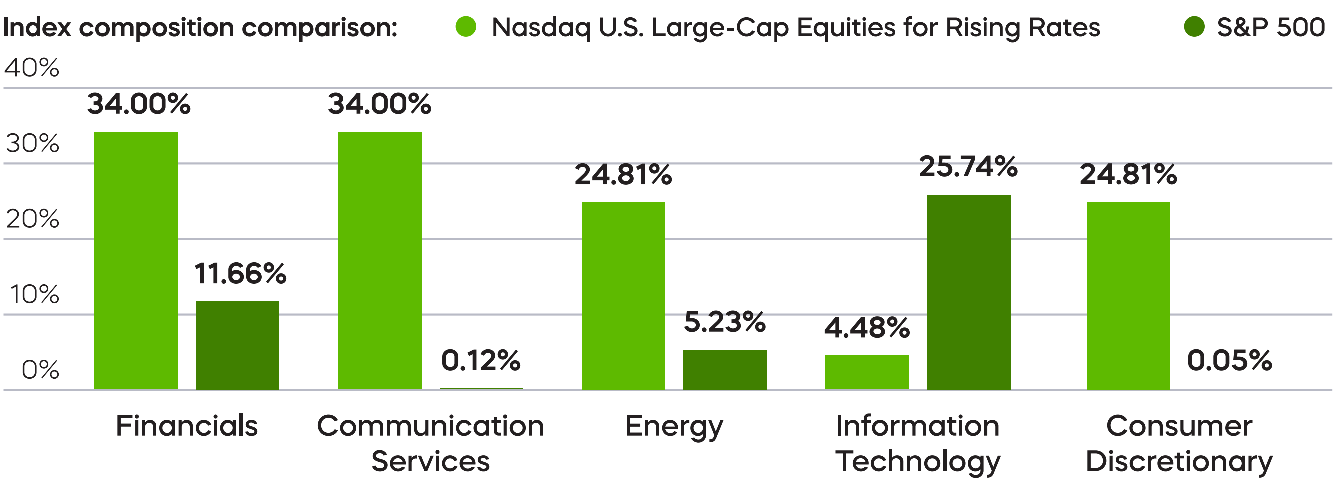
Some Stock Sectors Perform Better When Interest Rates Rise ...

Three-year average correlation of S&P 500 sectors to rising 10-year Treasury rates



Source: Bloomberg, as of 12/31/22. Sectors based on GICS classification.

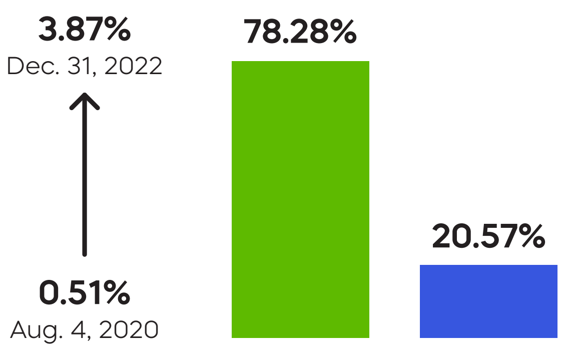
. . . And the Nasdaq Equities for Rising Rates Index Tilts Substantially Toward These Sectors



Source: Bloomberg, as of 12/31/22. Sectors based on ICB classification.

The Nasdaq Equities for Rising Rates Index Has Outperformed the S&P 500 …

Performance during period of rising 10-year Treasury rates, Aug. 4, 2020, through Dec. 31, 2022

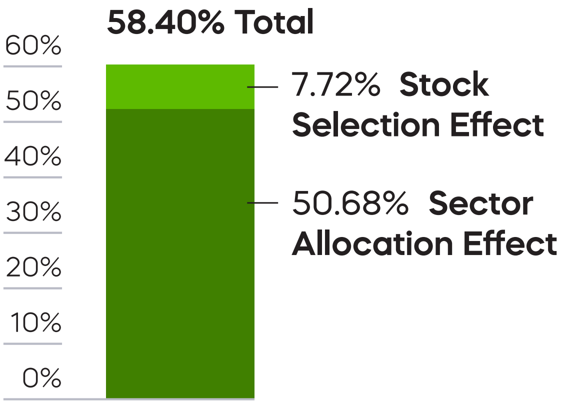


Source: Bloomberg.

… By Focusing On the Right Sectors — and the Right Stocks — for a Rising Rate Environment

Sector allocation and stock selection components were both key contributors to the index's performance vs. the S&P 500

Contribution to relative performance of the Nasdaq U.S. Large-Cap Equities for Rising Rates Index vs S&P 500



Source: FactSet.

Get the Convenience of ETFs

Bond and stock strategies specifically designed for rising interest rate environments can be important solutions for investors looking to prepare their portfolio – or even profit – in this environment. It's a challenge orchestrate these opportunities on their own. However, an ETF provides a convenient solution. Indeed, ProShares offers a large lineup of investment tools for the rising rate environment, including:

- **Interest rate hedged bond ETFs**, which have historically outperformed traditional bond strategies such as short duration, floating rate, bank loans and TIPS when interest rates have risen.
- **An Equities for Rising Rates ETF** focused on sectors and stocks most correlated with rising rates that has delivered nearly double the return of the S&P 500 since interest rates bottomed in the summer of 2020.

Interested in learning more?

Financial professionals can contact ProShares at **866-776-5125** or email **info@proshares.com** for additional information about ProShares' investment products.

Important information

Holdings are subject to change.

This is not intended to be investment advice. Indexes are unmanaged, and one cannot invest directly in an index. Past performance does not guarantee future results.

Any forward-looking statements herein are based on expectations of ProShare Advisors LLC at this time. Whether or not actual results and developments will conform to ProShare Advisors LLC's expectations and predictions, however, is subject to a number of risks and uncertainties, including general economic, market and business conditions; changes in laws or regulations or other actions made by governmental authorities or regulatory bodies; and other world economic and political developments. ProShare Advisors LLC undertakes no duty to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Investing is currently subject to additional risks and uncertainties related to COVID-19, including general economic, market and business conditions; changes in laws or regulations or other actions made by governmental authorities or regulatory bodies; and world economic and political developments.

Investing involves risk, including the possible loss of principal. This information is not meant to be investment advice.

These ProShares ETFs entail certain risks, including risks associated with the use of derivatives (swap agreements, futures contracts and similar instruments), imperfect benchmark correlation, leverage and market price variance, all of which can increase volatility and decrease performance. Please see their summary and full prospectuses for a more complete description of risks. **There is no guarantee any ProShares ETF will achieve its investment objective.**

HYHG and IGHG do not attempt to mitigate factors other than rising Treasury interest rates that impact the price and yield of corporate bonds, such as changes to the market's perceived underlying credit risk of the corporate entity. HYHG and IGHG seek to hedge high yield bonds and investment grade bonds, respectively, against the negative impact of rising rates by taking short positions in Treasury futures. These positions lose value as Treasury prices increase. Investors may be better off in a long-only high yield or investment grade investment than investing in HYHG and IGHG when interest rates remain unchanged or fall, as hedging may limit potential gains or increase losses. No hedge is perfect. Because the duration hedge is reset on a monthly basis, interest rate risk can develop intra-month, and there is no guarantee the short positions will completely eliminate interest rate risk. Furthermore, while HYHG and IGHG seek to achieve an effective duration of zero, the hedges cannot fully account for changes in the shape of the Treasury interest rate (yield) curve. HYHG and IGHG may be more volatile than a longonly investment in high yield or investment grade bonds. Performance of HYHG and IGHG could be particularly poor if high yield or investment grade credit deteriorates at the same time that Treasury interest rates fall. There is no guarantee the fund will have positive returns.

Bonds will decrease in value as interest rates rise.

High yield bonds may involve greater levels of credit, liquidity and valuation risk than higher-rated instruments. High yield bonds are more volatile than investment grade securities, and they involve a greater risk of loss (including loss of principal) from missed payments, defaults or downgrades because of their speculative nature.

Short positions in a security lose value as that security's price increases.

Important information

EQRR is designed to provide relative outperformance, as compared to traditional U.S. large-cap indexes, such as the S&P 500, during periods of rising U.S. Treasury interest rates. As a result, the fund may be more susceptible to underperformance in a falling rate environment. There can be no guarantee that the fund will provide positive returns or outperform other indexes.

EQRR concentrates its investments in certain sectors. Narrowly focused investments typically exhibit higher volatility.

Carefully consider the investment objectives, risks, charges and expenses of ProShares before investing. This and other information can be found in their summary and full prospectuses. Obtain them from your financial professional or visit ProShares.com. Read them carefully before investing.

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