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Long-term treasuries in diversified portfolios

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Investors have long been aware of the advantages of holding fixed income securities. High quality bonds, in particular, have historically been used as "anchors to windward" in conjunction with other assets. While the total return from most bonds is typically lower than that from equity-type assets,[1] the opportunity cost incurred by holding bonds can often be offset by a number of potential benefits. These advantages are pronounced for bonds issued by the US Treasury, and long-term Treasuries have heightened impact due to their longer duration. In this paper we will describe the primary benefits that Treasuries, as a special type of high quality fixed income, can contribute at the total portfolio level.

Key takeaways

- Long-term US Treasuries have historically served as a dependable hedge during equity market drawdowns, generally preserving or increasing value during periods of market stress.
- Their long duration amplifies sensitivity to falling interest rates, making long-term Treasuries particularly effective during recessionary periods or monetary easing cycles.
- With minimal credit risk, high liquidity, and low correlation to equities, long-term Treasuries act as both a volatility dampener and a spendable hedge in diversified portfolios.
- Although vulnerable to inflation and rising interest rates, long-term Treasuries can still provide meaningful insurance protection within a portfolio.
- Given their efficiency and limited active management potential, long-term Treasuries can be effectively accessed through low-cost passive strategies and paired with complementary diversifiers.

[1] This is expected from capital markets theory. Since equities are subordinate to bonds in firms' capital structure, they present higher risk to investors and must compensate them with higher returns.

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Definitions and characteristics

Treasury bonds are fixed-rate debt securities issued by the US government. They are generally considered low-risk investments because they are backed by the full faith and credit of the US Treasury. Because Treasury bonds are perceived as a low-risk asset, the interest rate (i.e., yield) they offer often serves as a floor for yields on other bonds. "Long-term Treasuries" refers to Treasury bonds with maturities greater than 10 years and up to 30 years.

In this primer, we use the Bloomberg US Long Treasury Index as a proxy for the asset class. The average maturity for the benchmark is about 22 years, and the average duration is 14.7 years.[2] Because of the long duration, the prices of long Treasuries are more sensitive to changes in interest rates than are most other bonds. Long Treasuries also exhibit positive convexity. This means they offer greater price appreciation during declining interest rates than the corresponding price decline when rates rise by the same amount.

[2] Source: Bloomberg US Treasury: Long Index, as of June 30, 2025.

Performance

While long-term Treasuries can offer various portfolio benefits, their standalone performance can vary across different market environments, particularly due to their heightened sensitivity to changes in interest rates. Figure 1 highlights the average annualized returns of long-term Treasuries compared to global equities and investment grade bonds over trailing 5-, 10-, 20-, and 30-year periods. Over the past five years, long-term Treasuries significantly underperformed both global equities and investment grade bonds, mostly as a result of the rising interest rate environment from early 2022 to late 2023. However, over very long horizons (i.e., 20+ years), their performance has been more competitive, matching or even exceeding returns of investment grade bonds, though consistently trailing equities' performance. As a lower risk asset, long-term Treasuries should be expected to offer lower returns compared to higher-risk assets such as equities, and this has typically proved to be the case.

Trailing Period	Global Equities	Investment Grade Bonds	Long-Term Treasuries
5 Years	13.7%	-0.7%	-8.2%
10 Years	10.0%	1.8%	0.1%
20 Years	8.2%	3.1%	3.1%
30 Years	7.8%	4.3%	4.9%

FIGURE 1
Average Annualized Returns of Equities, Bonds, and Long-Term Treasuries

Source: Data from Bloomberg for the MSCI ACWI, Bloomberg US Aggregate, Bloomberg US Treasury: Long, as of June 30, 2025.

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Long-term performance for high quality bonds, including Treasuries, is largely driven by the yield available at the start of the period. This is particularly true for long-duration assets like long-term Treasuries, where greater sensitivity to interest rate changes amplifies the impact of starting yield levels. Historically, the starting yield therefore has served as a strong indicator of the returns investors can expect over the following ten years (see Figure 2). This relationship is intuitive: for high-quality fixed income securities like Treasuries, the returns are largely derived from the predictable income stream of coupon payments, making the entry yield a primary indicator for expected performance.

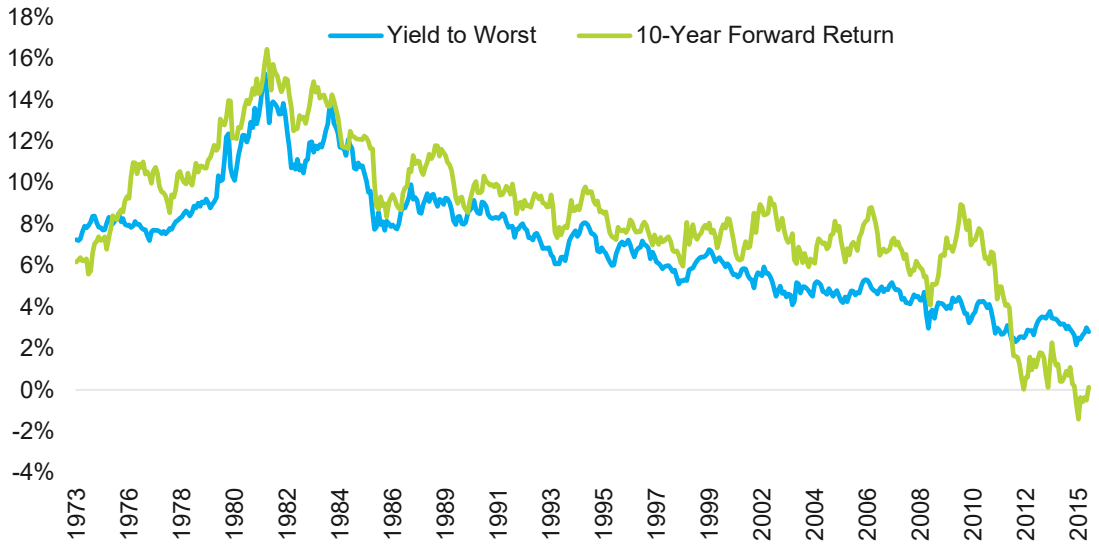

FIGURE 2
Relationship Between Starting Yield and Returns for Long-term Treasuries

Source: Data from Bloomberg for the Bloomberg US Treasury: Long, as of June 30, 2025.

Because of their higher sensitivity to interest rates, long-term Treasuries have exhibited far more volatility across the market cycle than the broad investment grade bond market (see Figure 3). On a standalone risk-return basis, this makes them appear to be less attractive than core bonds.

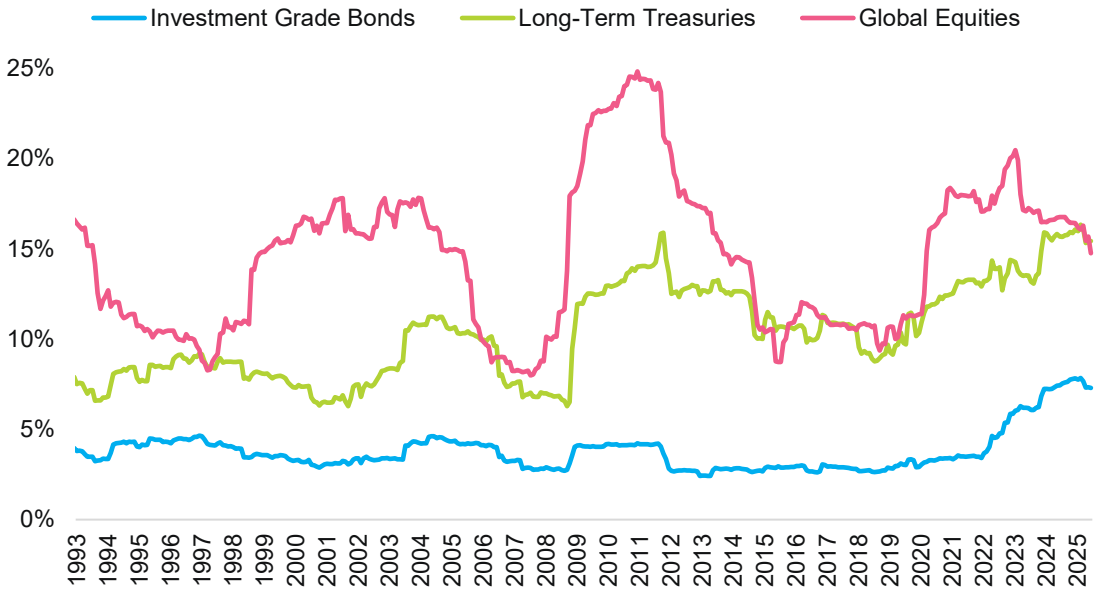

FIGURE 3
Rolling 3-Year Annualized Volatility

Source: Data from Bloomberg for the MSCI ACWI, Bloomberg US Aggregate, Bloomberg Long US Treasury indices, as of June 30, 2025.

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However, long-term Treasuries have historically exhibited negative correlations with equity markets, on average, and lower correlations than core bonds (see Figure 4). This makes them potentially beneficial in a broader portfolio, a point to which we return later in this paper.

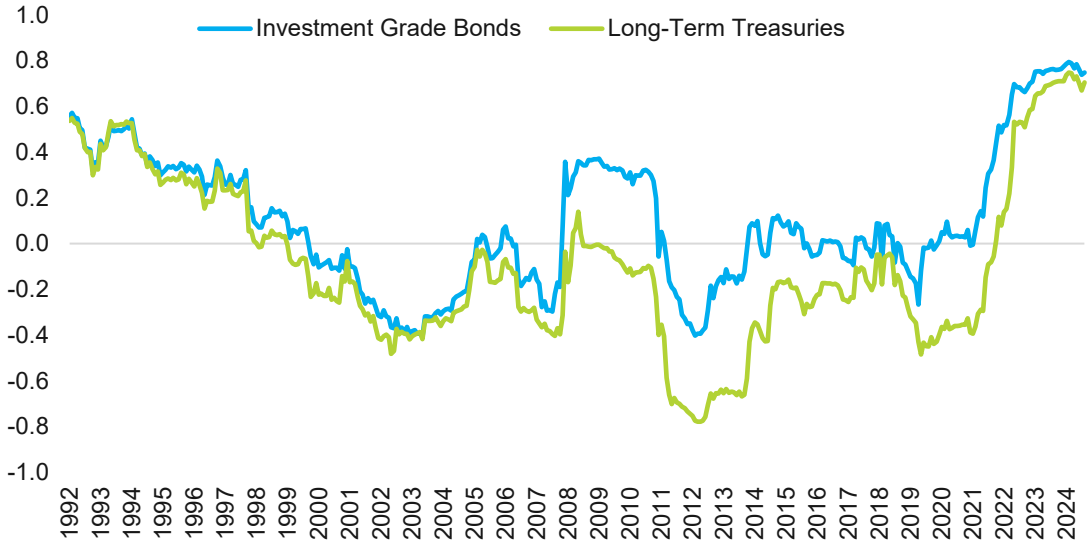

FIGURE 4
Rolling 3-Year Correlation to Global Equities

Source: Data from Bloomberg for the MSCI ACWI, Bloomberg US Aggregate, Bloomberg US Treasury: Long, as of June 30, 2025.

Value retention during equity declines

Many institutional portfolios are dominated by equities (and equity-like assets) because both theory and history have shown that a high exposure to equity markets delivers, over the long term, returns that meet the objectives of those institutions. On the downside, high returns from equities are often accompanied by high volatility, so equity-dominated portfolios can suffer severe declines during periodic, short-term crises. If such crises occur, tapping distressed-priced equities as a source for spending[3] would force paper losses to be realized, which substantially erodes the value of the portfolio and impairs its ability to rebound. To mitigate this risk, a well-constructed portfolio can partly allocate to assets that have minimal equity beta and, thus, retain value, or even appreciate, during those equity downturns; these assets could then fund outflows for some period, potentially providing equities the time to recover.[4]

Many portfolio hedges require a tradeoff between greater portfolio resiliency during crises and the opportunity cost of lower long-term returns for the hedging assets.[5] Hedging assets like these are uncommon – a characteristic of such equity crises is that "systemic risks" are heightened, in which many assets begin to move together. It is often said that correlations among them "go to 1" because many investors are seeking to sell their risk assets in a flight to safety, and the selling pressure further drives down prices. It is, therefore, desirable to identify which asset classes' return streams remain mostly independent of the group tendency and can serve as safer havens.

[3] Such as for an endowment, or for a cash-flow-negative pension.

[4] See Appendix B for detail.

[5] See our separate paper "The Art of Patient Investing," (July 2024) for further information regarding the benefits of a diversified portfolio in improving risk-return tradeoffs and smoothing out market fluctuations.

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Scenario	Cash	Investment Grade Bonds	Long-Term Treasuries	US Equities
Post-COVID Rate Hikes (Jan 2022-Oct 2023)	5.5%	-15.4%	-38.5%	-11.6%
COVID-19 Market Shock (Feb 2020-Mar 2020)	0.4%	-0.9%	12.7%	-35.0%
Taper Tantrum (May - Aug 2013)	0.0%	-3.7%	-11.6%	3.0%
Global Financial Crisis (Oct 2007 - Mar 2009)	2.6%	8.5%	24.2%	-45.8%
Popping of the TMT Bubble (Apr 2000 - Sep 2002)	9.9%	28.6%	35.5%	-43.8%
LTCM (Jul - Aug 1998)	0.8%	1.8%	4.1%	-15.4%
Asian Financial Crisis (Aug 97 - Jan 98)	2.4%	4.9%	8.6%	3.6%
Rate spike (1994 Calendar Year)	3.9%	-2.9%	-7.6%	1.3%
Early 1990s Recession (Jun - Oct 1990)	3.3%	3.8%	2.4%	-14.7%
Crash of 1987 (Sep - Nov 1987)	1.4%	2.2%	2.6%	-29.5%
Strong dollar (Jan 1981 - Sep 1982)	24.4%	29.9%	28.4%	-2.3%
Volcker Recession (Jan - Mar 1980)	2.9%	-8.7%	-13.6%	-4.1%
Stagflation (Jan 1973 - Sep 1974)	13.5%	7.9%	-1.8%	-42.6%

FIGURE 5
Historical Scenario Analysis

Source: Meketa Capital Market Expectations and Meketa Asset Allocation Tool Historical Stress-Test Scenario Analysis as of June 2025. Underlying data is based on the Bloomberg US Treasury Bill Index, the Bloomberg Aggregate Index, the Bloomberg US Treasury: Long Index, and the Russell 3000 Index. Each percent shows the total cumulative return over the stated time period for each asset class.

Examining the behavior of various asset classes during actual crisis periods provides further evidence of the potential benefits of long-term Treasuries (see Figure 5). In the thirteen historical scenarios examined, long-term Treasuries retained value best (and actually appreciated) in six of the tracked periods and came in a close second in a seventh scenario. For nearly all of these cases, equities suffered declines, many of them quite severe. Neither of the other potential hedges – cash or investment grade bonds – protected nearly as well. On the flip side, however, long-term Treasuries performed the worst in four of the scenarios, which were periods in which interest rates rose markedly.

The major risk for Treasuries is interest rate exposure: as rates increase, the value of a future stream of interest payments declines. The more payments remain in that stream, the more severe will be the impact of a rise in rates – measured by the duration of the bond. Central banks such as the US Federal Reserve have often lowered rates in response to a sharp equity market downturn, intending to stimulate the economy, and in the process, increasing the value of bonds. Long-term US Treasuries are expected to retain value or appreciate in such periods and have done so historically.

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This is because they have little equity beta, de minimis credit exposure, and interest rate exposure that benefits them, augmented by a long duration. Furthermore, investor perception of long-term US Treasuries as a safe haven itself augments their value during crises, as money flows their way during crises and bids up their prices. Treasuries tend to offer better protection than corporate bonds because corporate fixed income issues possess greater exposure to credit risk, which has some relation to equity market risk, while US Treasury issues have little chance of default.[6]

[6] Market environments that put pressure on earnings, which can affect equity values, may also put pressure on firms' ability to service their debt, increasing the chance of default.

Liquidity

Holding a hedge that retains or gains in value during equity declines does an investor little good if the asset is not liquid and available to fund spending, assuming both are needed by the investor. Average daily trade volumes for Treasuries are high, at $1,493 billion (compared with $60.9 billion for all corporate bonds).[7] Although traded over-the-counter (OTC) rather than through an exchange, there are many counterparties available, usually broker-dealers. Owners of Treasuries may expect strong demand at times, especially during equity market downturns when other investors often seek to buy Treasuries as flight-to-safety assets. Furthermore, liquidity is typically enhanced by a robust exchange-traded market in Treasury futures. In summary, long-term US Treasuries provide not only a hedge but what has historically been a source of liquidity for meeting potential cash flow needs in stressed environments.

[7] Source: SIFMA, "Quarterly Report: US Fixed Income, 1Q25," April 2025.

Volatility dampener

Treasuries' tendency to zig when equities zag – that is, to not move in lockstep with equities to a greater extent than most other asset classes – is what makes them a hedging component within a portfolio. Additionally, this lower correlation dampens total portfolio volatility. In terms of risk metrics, this low correlation results in a greater reduction in standard deviation than other fixed income diversifiers, and a greater increase in risk adjusted return as measured by the Sharpe ratio.

More tangibly, the gains in Treasuries can partially offset the losses in equities, with larger gains the longer the Treasuries' duration. This reduces the fluctuations in the portfolio's value over time, which in turn, smooths distributions from the portfolio calculated based upon a spending rule, causing less variable impact upon an operating budget or benefit stream funded by those distributions. The reduced variation to both the asset value and to distributions is likely to have a positive effect on the behavior of portfolio stakeholders. Treasuries should help stakeholders be better able to tolerate the ups and downs, and therefore less prone to take rash action during the down periods – such as de-risking and impairing the portfolio's ability to take part in a rebound.

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	100% Investment Grade Bonds	100% Long Treasuries	70% Equities / 30% Investment Grade Bonds	70% Equities / 25% Investment Grade Bonds / 5% Long Treasuries	70% Equities / 20% Investment Grade Bonds / 10% Long Treasuries	70% Equities / 15% Investment Grade Bonds / 15% Long Treasuries
Expected Return (20 year)	5.3%	5.7%	7.7%	7.8%	7.8%	7.9%
Standard Deviation	4.0%	12.0%	12.2%	12.1%	12.0%	12.0%
Sharpe Ratio	0.55	0.22	0.38	0.39	0.39	0.40

FIGURE 6
Risk-Return Profiles for a Portfolio with Different Bond Mixes

Source: Meketa Asset Allocation Tool, based on Meketa's 2025 capital market assumptions (CMAs). Underlying data based on the Bloomberg Aggregate Index, the Bloomberg US Treasury: Long Index, and the Russell 3000 Index.

This behavior may also be seen in modeled portfolios with increasing amounts of long-term Treasuries. We show a simple 70% equity / 30% bond mix, where the bond component reflects different mixes of investment-grade bonds and long-term Treasuries. In isolation, long-term Treasuries appear unattractive, with a lower Sharpe ratio and higher volatility than that of investment grade bonds. But because of their very low correlation to equities, introducing long Treasuries as part of a diversified blend to an equity-heavy portfolio both increases expected returns and decreases volatility, improving risk-adjusted returns beyond what is achieved with investment grade bonds alone. A similar effect occurs when comparing a blend of equities plus long-term Treasuries to a blend of equities plus cash.

Role in portfolio

An investment should not be considered based solely on its individual risk-return profile, but rather, how it fits within a portfolio. The portfolio on the left below (see Figure 7) is diversified across four major asset classes: stocks, bonds, real estate, and private equity. Now consider the addition of a fifth asset class: long-term Treasuries. When compared to "core" bonds, long-term Treasuries might have a similar expected return, but they have much more interest rate risk and exhibit substantially greater volatility. Thus, on a stand-alone risk-return basis, long-term Treasuries appear to be inferior to core bonds, and replacing some of the core bonds with long-term Treasuries would seemingly increase risk.

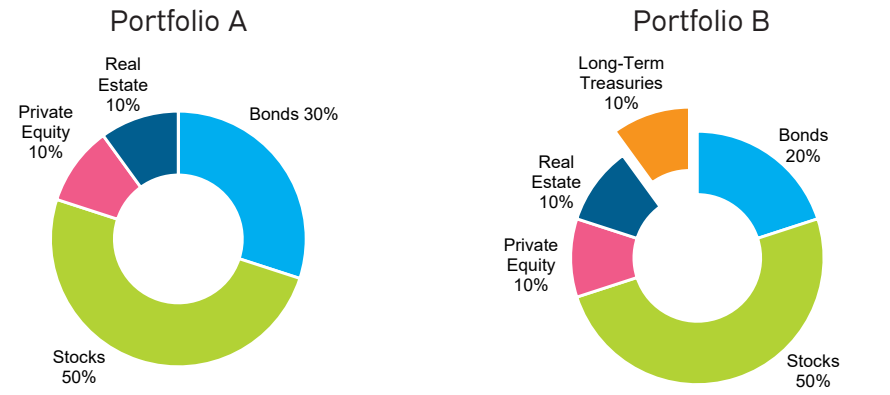

FIGURE 7
Example of the Counter-Intuitive Benefits of Adding a "Riskier" Asset

Source: Based on Meketa's 2024 10-year capital markets assumptions for core bonds, global equities, private equity, real estate, and long-term government bonds.

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Yet, when long-term Treasuries are added to the portfolio, overall expected volatility declines, as illustrated in the portfolio on the right. This is because long-term Treasuries are generally negatively correlated with stocks and other risky assets that dominate the portfolio. Thus, it is the interaction between long-term Treasuries and other assets that enables the construction of a more efficient portfolio.

Role in RMS program

Long-term Treasuries can serve as an effective, low-complexity tool for downside protection and play a key role in many Risk Mitigating Strategies (RMS) frameworks. In a typical RMS framework, long-term Treasuries function as a "first responder" – a category of assets intended to provide initial portfolio protection during sharp equity drawdowns. Long-term Treasuries operate as a correlation hedge, emphasizing their historically negative or low correlation to equities, especially during times of market stress.

Unlike many other hedges, Treasuries offer positive carry, which is to say, they provide yield and have a positive expected return. This makes long-term Treasuries a more cost-efficient hedge compared to other explicit hedging strategies, such as equity options or long-volatility strategies, which often require ongoing premium payments that may reduce returns during stable markets. Treasuries' yield helps offset the opportunity cost of holding defensive assets and contributes to long-term portfolio growth, reinforcing their value in a diversified portfolio. Rather than incurring ongoing costs for downside protection, investors should receive steady income from Treasuries, making it easier to stick with the allocation even when the markets are calm and the protection may seem unnecessary.

Use in hedging long-dated liabilities

Although beyond the scope of this paper, we note that some investors use long-term Treasuries to hedge long duration pension and insurance-like payments, particularly within liability driven investing (LDI) and overlay strategies.[8] Their extended duration and predictable cash flows may make them an effective allocation for investors whose long-term liabilities are highly sensitive to interest rate changes. By aligning the duration of funds' liabilities with that of their assets, investors can help hedge this interest rate risk, as the value of assets and liabilities then tend to move in tandem in rate change environments.

[8] See our separate paper "Liability Driven Investing" (June 2023) and "Viewpoints: Overlay Strategies" (2021) for further information regarding these strategies.

For such investors, since the yield curve is typically upward-sloping, cash may be considered the riskier investment versus a long-dated Treasury (with the same duration as the payment), since shorter-term investments will need to be re-invested and there is the risk that future interest rates will decline. Long-term Treasuries, on the other hand, allow investors to lock in current yields and mitigate reinvestment risk within these portfolios. While long-term Treasuries may have lower expected returns compared to equities, the predictability of income they offer can be more valuable for portfolios with known, long-term cash needs, such as pension plans or insurance-related payouts.

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Considerations of long-term treasuries

All investments come with tradeoffs. Despite the many benefits of holding long-term Treasuries, there are countervailing considerations.

Low Expected Returns

Their relative safety when compared with equities or corporate bonds means that Treasuries have a lower expected return than the riskier assets that dominate many investor's portfolios. For those investors with a higher return target, this limits the allocation to Treasuries because of the opportunity cost.

Inflation Risk

Except for inflation-linked bonds such as Treasury Inflation-Protected Securities (TIPS), fixed income instruments possess inflation risk. This is because the income they deliver is fixed in nominal terms – the coupon is the semiannual interest rate times the principal of the bond and it is paid in current dollars. Inflation reduces the value of current dollars; thus, even if a bond issuer pays all its interest coupons and returns the principal, the presence of inflation causes the bondholder to be worse off because purchasing power was not preserved.

Figure 8 illustrates the sensitivity of various asset classes to inflation scenarios based on historical performance. The long-term Treasuries asset class was the worst-performing asset in three of the eight scenarios, alternating with equities as the lowest-returning asset. Among the assets shown, cash demonstrated the most reliable and consistent performance in inflation-driven market environments.

Scenario	Cash	Investment Grade Bonds	Long-Term Treasuries	US Equities
Inflation slightly higher than expected	0.0%	-0.6%	-1.8%	-0.6%
Inflation meaningfully higher than expected	-0.1%	-3.1%	-7.3%	-9.2%
Low Growth and Low Inflation	0.2%	-2.5%	-2.9%	-9.8%
Low Growth and High Inflation	0.6%	-4.4%	-8.8%	-13.7%
Brief, moderate inflation spike	0.3%	-2.1%	-8.3%	-3.2%
Extended, moderate inflation spike	0.5%	-1.9%	-9.1%	-8.8%
Brief, extreme inflation spike	0.6%	-1.9%	-9.9%	-12.3%
Extended, extreme inflation spike	0.8%	-1.5%	-9.8%	-17.5%

FIGURE 8
Inflation Scenario Analysis

Source: Meketa inflation scenario analysis, based on published CPI, unemployment, and GDP growth data as of January 2025, and historical monthly asset class returns as of December 2024. Underlying data is based on the Bloomberg US Treasury Bill Index, the Bloomberg Aggregate Index, the Bloomberg US Treasury: Long Index, and the Russell 3000 Index. Reflects average annualized returns.

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Line-item volatility

Despite delivering interest income, the total return on Treasuries may be negative if their market value declines sufficiently due to rising interest rates, particularly for long-term Treasuries whose value is more sensitive to rate changes.

From a behavioral standpoint, this can present a challenge if investors forget to look at the full portfolio and instead focus on the negative return from that specific line item, questioning why they hold this declining asset while many others are posting gains. Furthermore, as long-term Treasuries have more exposure to changes in rates, they are more volatile than shorter-term issues, and investors could lament the swings resulting from duration exposure in this position.

Hence, investors may need reminders that long-term Treasuries play a hedging role in the portfolio, that insurance may feel costly when it is not needed (even if it adds value in bad times), and that it is risky to try to market-time the purchase of insurance.

Factors driving interest rates (and returns)

Treasury yields ebb and flow with five intertwined forces: expected inflation, the Fed's policy trajectory, the economy's growth outlook and risk mood, the tug-of-war between Treasury supply and global demand, and the term-premium's response to market volatility, liquidity and other technical currents.

When investors believe future inflation will be higher, they demand a larger nominal return to preserve purchasing power, so yields rise. Conversely, falling inflation expectations—or confidence that the Fed will keep prices in check—lets nominal yields drift lower. Because inflation erodes value over time, this factor carries the most weight on longer-dated Treasuries.

Short-term Treasury yields track the expected path of the federal-funds rate: a credible signal of forthcoming rate hikes pushes the entire front end of the curve up almost immediately. Balance-sheet policy matters too—large-scale asset purchases (e.g., quantitative easing) compress term premiums and pull long yields down, while quantitative tightening has the opposite effect. Markets continually re-price as fresh data shift views about where, and how quickly, the Fed is heading.

Strong economic data, improving corporate profits, or a "risk-on" mood can lure capital into equities and credit, raising the opportunity cost of holding safe Treasuries and nudging yields higher. In contrast, recession worries, geopolitical shocks, or banking-system stress trigger flight-to-quality buying that compresses yields—often most sharply at the long end. Thus the curve steepens in booms and flattens or inverts when investors fear a downturn.

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A widening federal deficit forces the Treasury to issue more debt, increasing supply and putting upward pressure on yields, particularly beyond five years where most financing occurs. Demand swings matter just as much: foreign reserve managers, pension funds meeting liability-matching needs, and banks seeking high-quality collateral can soak up new issuance and temper rate moves. Shifts in the Fed's own holdings—expanding under quantitative easing, shrinking under quantitative tightening—alter this balance further.

Apart from expected short-rate paths, investors require compensation for the risk of holding duration—this is the term premium, and it widens when rate volatility is high or market liquidity is thin. Mortgage-bond hedging flows, regulatory balance-sheet constraints, and futures-market positioning all create technical pushes and pulls that can move long-bond yields even when macro fundamentals are steady. In calm, liquid conditions the premium shrinks, letting yields fall below the average projected short rate; in stressed markets it expands, lifting yields above it.

Rising rates

When interest rates increase, prices for Treasuries fall. In the event that interest rates do rise, it is useful to consider how different asset classes may respond to such shifts. Based on historical data, we stress test various asset classes under hypothetical scenario of interest rates movements. Unsurprisingly, long-term Treasuries delivered the lowest returns across these scenarios, again reflecting their heightened sensitivity to changes in interest rates (see Figure 9).

Negative Scenario	Cash	Investment Grade Bonds	Long-Term Treasuries	US Equities
10-year Treasury Bond rates rise 100 bps	-0.2%	-3.9%	-9.3%	6.8%
10-year Treasury Bond rates rise 200 bps	-0.4%	-7.6%	-16.9%	-1.8%
10-year Treasury Bond rates rise 300 bps	-0.6%	-10.6%	-21.4%	2.8%

FIGURE 9
Interest Rate Scenarios

Source: Meketa stress test analysis based on a weighted average of the annualized return of the asset class when the specific scenario has occurred and relying on historical data on past asset behavior and macroeconomic event, based on Meketa's 2025 Capital Market Assumptions (CMAs). Underlying data is based on the Bloomberg US Treasury Bill Index, the Bloomberg Aggregate Index, the Bloomberg US Treasury: Long Index, and the Russell 3000 Index.

However, much depends on the way rates rise. History confirms that more muted losses happen when rates rise gradually, as shown by the performance of long-term Treasuries during the second half of the twentieth century, when rates followed an upward trajectory through the early 1980s, before starting their secular declining trend. During timeframes when yields increased by at least a full percentage point, the more gradual the increase, the less impact there was on total return. The only exceptions were during the 1980s when the initial yield was high enough to partly offset the losses from sharply rising rates.

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Implementation

In theory, active management may generate alpha, potentially justifying additional costs. However, research regarding the issuer of Treasuries (i.e., the US government) is not likely to provide the same level of informational advantage as it might for stocks or corporate bonds. There is not the same level of default risk given the little unpriced risk to their highly certain cash flows. The relatively limited number of actively-managed strategies in the US government bond space provides evidence that the investment management community may have little conviction in their ability to sustainably add value in this asset space (although some may be achievable on the margins). A review of the fund universe over the past decade reveals an average of just seven actively managed long-term government bond funds, in sharp contrast to the 196 investment grade bond funds.[9]

[9] Source: eVestment Alliance, as of December 2024.

Investors seeking to hold long-term Treasury exposures may do so passively, via a low-cost index fund. Many of these can be had for expense ratios of 10 basis points or less from leading providers of such vehicles. Alternatively, very large investors with experienced, in-house investment staff and infrastructure might be able to run a long Treasury portfolio internally.

Conclusion

Many institutional portfolios require long-term returns that can only be delivered by portfolios dominated by equities, but equities are volatile. During crises when equity prices fall to distressed levels, if required distributions are funded by selling equities, the ability of portfolios to recover could be permanently impaired. This problem could be exacerbated by behavior in such financial disasters, when investors/decision-makers may be tempted to de risk their portfolios. Holding diversifying hedges that retain value or appreciate during equity crises, and that may be spent in lieu of equities to fund distributions, may offer a solution to this challenge, albeit with opportunity cost and other concerns that must be addressed.

Fixed income has long been utilized for this diversifying role. Meketa Investment Group believes that long-term US Treasury bonds offer distinct characteristics that can be beneficial in certain market environments. Historically, these securities have exhibited low correlation with equities, and in periods of market stress, they have demonstrated performance that often differs from equity markets. They are among the most liquid assets and typically considered safe from credit risk; their longer duration can heighten the diversification impact for a given allocation size. Hence long-term Treasuries are a good option as a protective asset.

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Investors must also remain aware that yields from long-term Treasuries are on the low end for fixed income assets, and that inflation would be damaging to their real value. Additionally, investors must acknowledge that in a rising rate environment, even though the rest of the portfolio might be doing well, long-term Treasuries would likely struggle, creating behavioral pressures around whether to continue to hold this line item as insurance. Finally, in a low-rate environment, investors may question whether it is the right time to hold such an asset, but we believe that these assets could still offer meaningful protection in a downturn.

As long-term Treasuries are highly liquid and offer little informational advantage to investors, we consider them to be efficient, which means that gaining exposure via passive and low-cost vehicles will be suitable for many investors.

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Appendix A: stress-testing a cash-flow negative portfolio

We stress-test portfolios by subjecting them to the returns experienced during the Global Financial Crisis (GFC), but without the strong rebound that followed. Portfolios are subjected to the same crisis-period returns, followed by projected returns in Years 4-10 based on Meketa's capital market assumptions for each asset class. Figure 10 illustrates the performance of a 100% equity portfolio compared to a portfolio with 30% of assets allocated to long-term Treasuries. A 100% equity portfolio would retain only 54% of its initial value after three years, whereas one allocating 30% of assets to long-term Treasuries would retain 73%. Additionally, the potential rebound for a 100% equity portfolio is substantially slower than that of a portfolio with assets allocated to long-term Treasuries, failing to reach a full rebound by the end of the 10 years.[10] The equity portfolio suffers from this impairment because so much of the annual return must be earmarked to cover outflows, providing little to support growth of the corpus during the recovery.

[10] If equities return 15% compounded over the subsequent 15 years, the all-equity portfolio can cover spending and recover its initial value. If long-term Treasuries return 0% over the same period, the 70/30 portfolio will return 10.5% compounded over 15 years, and the portfolio can cover spending and recover its initial value. While this spread level has occurred historically – the 15-year periods comprising 1942–1956, 1944–1958, and 1947–1961 – it is rare.

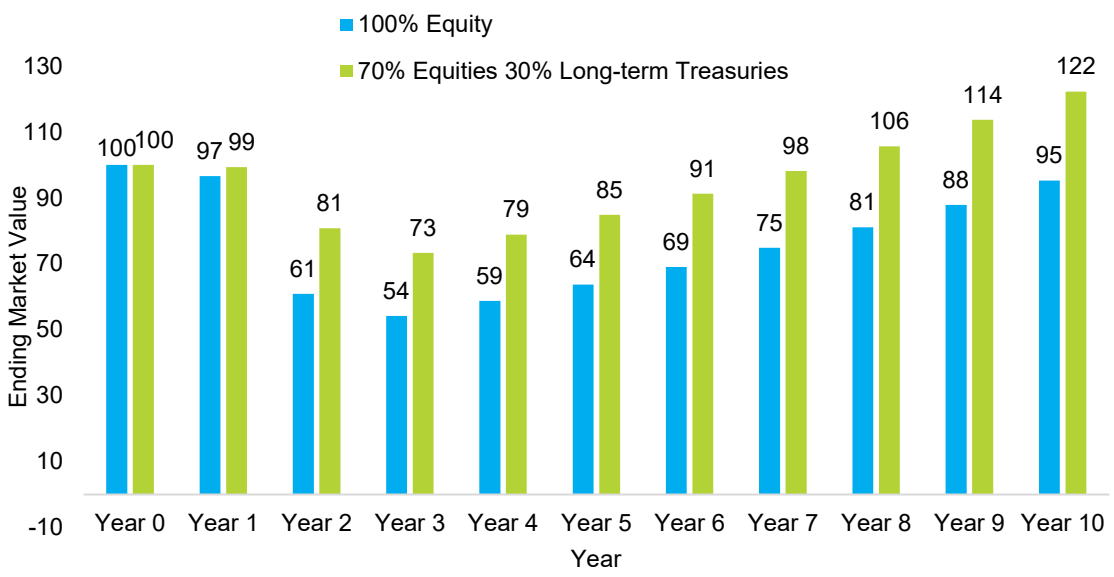

FIGURE 10
Liquidity Analysis Stress Test

Meketa liquidity analysis estimate of a portfolio's liquidity and net flows over the next 10 years using its cash flows, private market contributions, private market distributions, and each asset class's liquidity type under a stressed scenario, which uses the first three years of returns an asset class experienced during the GFC: Q4 2007, 2008, and Q1 2009. Years 4-10 then estimate the portfolio expected return based on Meketa's 2025 Capital Market Assumptions.

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Appendix B: using duration to amplify impact without leverage

Duration measures the average timing of remaining cash flows – interest payments and principal – from a bond. The longer the duration, the further in the future that cash flows will be received, on average. Mathematically, duration is also (approximately) the percentage change in the value of a fixed income security that accompanies a one percentage-point change in interest rates. Thus, longer-duration Treasuries are expected to appreciate more when rates fall, as policymakers combat equity market downturns (although certainly when rates are near historic lows there is less room for them to fall). This effect could be achieved with a larger exposure to shorter-duration bonds, but the opportunity cost of that large an allocation may be prohibitive. Alternatively, a like-sized position in shorter-duration bonds could be levered to create a similar response to changes in rates, but many institutional investors' policies prevent utilizing leverage in this way. At one extreme, the ability to invest in Treasury STRIPS – bonds that do not pay interest but only promise the repayment of principal at maturity – enables leverage-averse investors to maximize the duration effect of holding long term Treasuries.

Appendix C: the level of interest rates

From roughly 1980 through the end of the GFC, long-term Treasuries produced very strong returns. This is because one of the drivers of those returns was the tailwind of falling rates. In the early 1980s, long-term Treasuries were yielding over 14%, a level that declined in fits and starts, but ultimately reached an all-time low in the summer of 2020.

Since 2020, rates have rebounded, with Treasury yields reaching levels last seen twenty years ago. The question for many investors is whether this represents "the new normal," or if rates might return to the lows of the 2010s that were driven by central bank intervention.

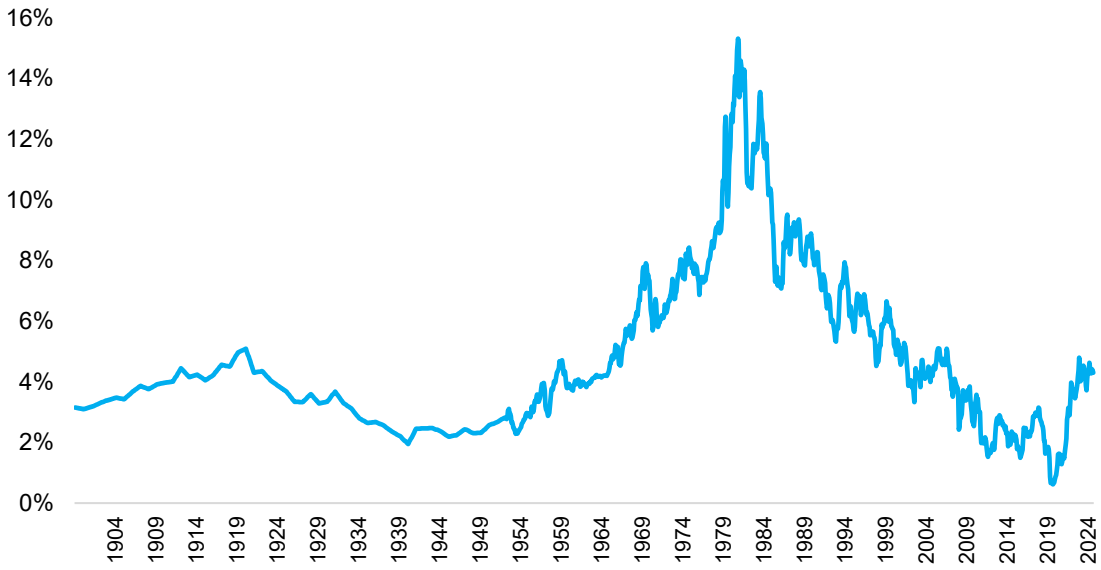

FIGURE 11
US 10-Year Treasury Yield

Source: Multpl.com, "10 Year Treasury Rate," As of July 1, 2025.

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Alternatively, rates could rise even further, a prospect that might give pause to investors considering long-term Treasuries. Still, as with any investment, prices change when expectations change. To the extent that a gradual rise in rates is already expected, current prices would reflect that, and investors should theoretically only see losses if the rate rises surprise with their suddenness or magnitude.

Appendix D: inflation scenario analysis methodology description

- Meketa's Inflation Scenario Analysis is for the period February 1973-December 2024.
- The Scenario Analysis is based on a generalized linear regression (GLS) model that estimates the effects of realized and surprise inflation on monthly asset returns, controlling for the economic environment. The GLS model assumes a residuals autocorrelation of 1. Quadratic independent variables are added to the regression model to account for potential non-linearity between an asset class and inflation. Estimated scenario returns at the asset class level are then calculated as the expected value of asset class returns, conditional on the inflation scenario.
- Inflation is the monthly change in CPI from the 3-month rolling average CPI, surprise inflation is the difference between this month and last month's inflation rate, and GDP Growth is the percent change in GDP from the previous quarter. Inflation and GDP data are taken from the St. Louis Federal Reserve Bank's FRED database. Meketa backdated all asset class returns whose inceptions were after February 1973 with the closest available proxies.
- Inflation slightly higher than expected is when inflation is in the 25th percentile of positive, historical surprise inflation.
- Inflation meaningfully higher than expected is when inflation is in the 75th percentile of positive, historical surprise inflation.
- Low Growth and Low Inflation is when real GDP Growth is the 25th percentile of historical GDP growth and inflation is in the 25th percentile of historical inflation.
- Low Growth and High Inflation is when real GDP growth is the 25th percentile of historical GDP growth and inflation is in the 75th percentile of historical inflation.
- Brief, moderate inflation spike is when inflation is in the 75th percentile of historical inflation and lasts for 4-8 months.
- Extended, moderate inflation spike is when inflation is in the 75th percentile of historical inflation and lasts for 12+ months.
- Brief, extreme inflation spike is when inflation is in the 95th percentile of historical inflation, and lasts for 4-8 months.
- Extended, extreme inflation spike is when inflation is in the 95th percentile of historical inflation and lasts for 12+ months.
- Indices Used: the Bloomberg US Treasury Bill Index, the Bloomberg Aggregate Index, the Bloomberg US Treasury: Long Index, and the Russell 3000 Index.

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Appendix E: interest rate scenarios methodology description

- Interest Rate Scenarios are calculated using Meketa's Stress Test, which shows how a portfolio may perform based on defined market fluctuations (positive or negative). Each percent value in the table shows the return based on various scenarios.
- Stress Test scenarios are defined as a weighted average of the annualized return of the asset class when the specific scenario has occurred and a conditional beta of the scenario, as defined as:

$$Conditional\ Beta = \rho_{asset,scenario} * \frac{\sigma_{asset}}{\sigma_{scenario}}$$

where:
ρ = correlation
σ = standard deviation

- The stress test scenarios rely on calculations using historical data. In creating estimates with historical data, Meketa assumes that future asset behavior is similar to past asset behavior, and future macroeconomic events are similar to past macroeconomic events. This modeling assumption may over or underrepresent the actual future scenario performance.

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