

Build low-cost core fixed income exposure

Vanguard Treasury ETFs

Discover the benefits of Treasuries exposure

Understanding U.S. Treasuries

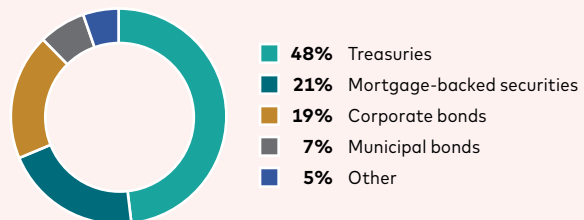
The U.S. Treasury debt market is the deepest and most liquid sovereign bond market in the world, offering investors easy access to bonds free of credit risk.¹ This brochure explores why Treasuries often act as an anchor to bond portfolios and describes how low-cost Vanguard Treasury ETFs can provide investors easier access to Treasuries than is possible from individual bonds. It also explores how Treasury ETFs can be used to optimize exposure across the yield curve and even hedge against inflationary pressures.

U.S. Treasuries debt amounts to more than \$28 trillion in outstanding marketable bond securities and makes up more than 50% of the U.S. fixed income universe.² Treasuries play a key role in the economy, helping the U.S. government finance expenditures.

Backed by the full faith and credit of the U.S. government, Treasuries are deemed to be virtually credit-risk-free.³ They also have a very robust secondary market; close to \$900 billion in Treasuries change hands every day.⁴

Given this status, Treasury bills (i.e., Treasuries with a year or less to maturity) serve as a baseline expectation for the risk and returns of other financial assets. Investors build on this rate to evaluate other asset classes in terms of duration, credit, or liquidity risk.

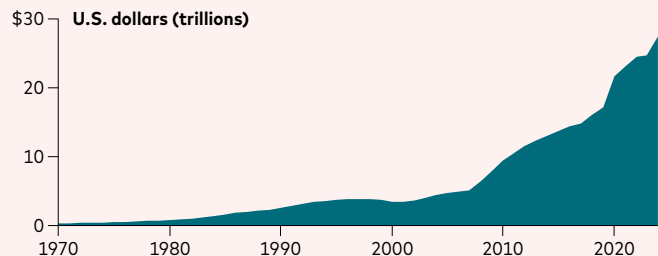
U.S. fixed income outstanding



Notes: "Other" includes asset-backed securities, money market instruments, and agency debt. Numbers may not add to 100 because of rounding. Data are as of September 30, 2024.

Source: SIFMA (Securities Industry and Financial Markets Association).

Federal debt held by public, 1970–2024



Source: Federal Reserve Bank of St. Louis, as of December 31, 2024.

- ¹ Source: SIFMA (Securities Industry and Financial Markets Association), as of December 13, 2024.
- ² The \$28 trillion represented here includes only marketable securities held by the public; it excludes around \$7 trillion in non-marketable debt and intergovernmental holdings. Total U.S. federal debt outstanding is roughly \$35 trillion. Source: Department of the Treasury, as of September 30, 2024.
- ³ All investing is subject to risk, including possible loss of principal. U.S. government backing of Treasury or agency securities applies only to the underlying securities and does not prevent share-price fluctuations. Unlike stocks and bonds, U.S. Treasury bills are guaranteed as to the timely payment of principal and interest.
- ⁴ Source: SIFMA, as of December 31, 2024.

Outlook and case for U.S. Treasuries

Treasury yields—especially on the shorter end of the yield curve—are heavily dependent on interest rate policy set by the Federal Reserve.

The Fed sets the federal funds rate, which is the rate of interest that banks pay one another for overnight loans. Although controlling this rate is just one of many policy tools the Fed can use to maintain price stability and achieve maximum employment, it's possibly the most discussed and influential.

Changes made to the federal funds rate ripple across the yield curve—though they mostly affect the yields of shorter-dated bills and notes. The fed funds rate also affects a range of other fixed income markets where it is used as a baseline for corporate debt, asset-backed securities, floating-rate notes, and other sovereign debt as examples. Even so, longer-term inflation and growth expectations have a larger impact on longer-term rates than the federal funds rate does.

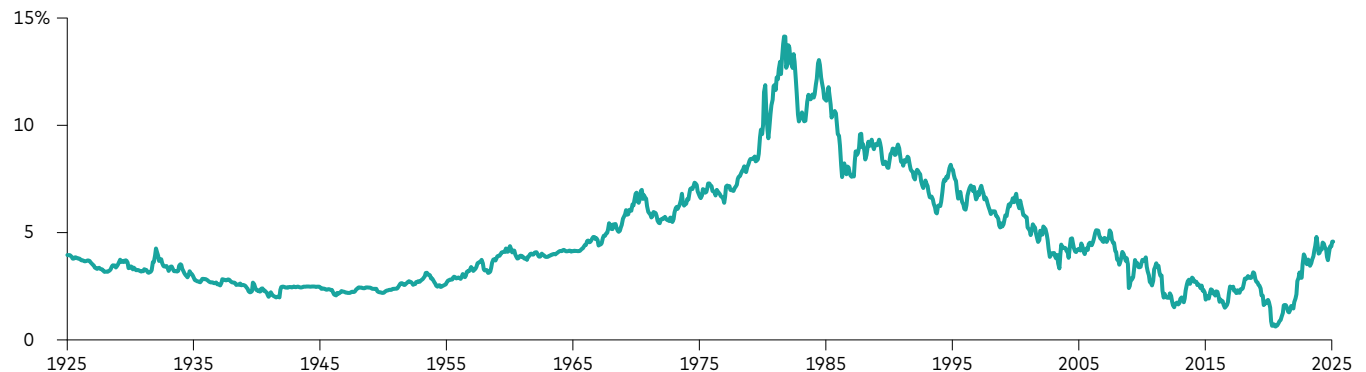
Although the Fed sets short-term rates, longer-term inflation and growth expectations help dictate the rates on longer-term notes and bonds issued by the U.S. Treasury. The 10-Year Treasury note is often used as a bellwether for investor confidence, with higher yields reflecting a higher level of confidence in future U.S. growth.

As the chart below of historical long-term (i.e., 10 years and longer) Treasury bond yields shows, after their lows in the Great Depression, these yields climbed for decades as inflationary pressures grew, peaking in the early 1980s. Then, rates began a steady decline for about the next 40 years, culminating with a sharp COVID-19-related collapse in 2020.

That decades-long decline reached a trough in 2021, however, and yields shot up in 2022 as the Fed raised short-term rates sharply to tame a pandemic-related surge of inflationary pressure.

Yields of long-term Treasuries

January 1925–February 2025



Notes: Data from January 1925 through June 2000 are from the U.S. Federal Reserve and are for the category "Long-Term U.S. Government Securities." Data from July 2000 through February 2025 are also from the U.S. Federal Reserve and are for "Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Quoted on an Investment Basis."

Past performance is not a guarantee of future returns.

Sources: Vanguard calculations, based on data from the U.S. Federal Reserve.

Although the aggressive interest rate tightening from 2022 through mid-2023 led to steeply negative returns, it also created opportunities to generate meaningful yield for the first time in a decade.

That's noteworthy, especially because since the 2008 global financial crisis, the Fed had kept short-term borrowing rates pinned down near zero, helping to limit yield increases across the yield curve.

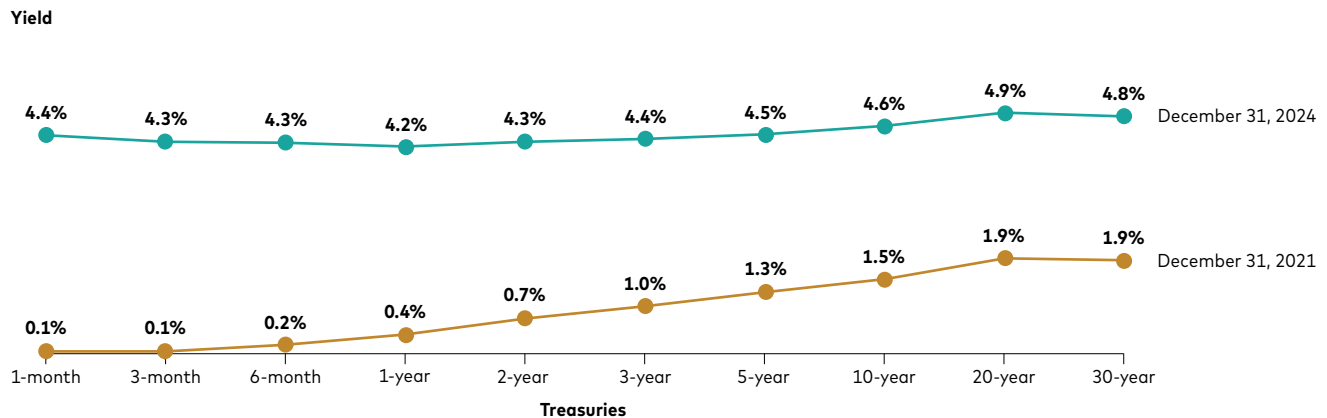
This led investors to seek creative ways, many of which added unexpected risks, just to add income and yield back to their portfolios. But now, with higher rates, Treasuries have reprised their role as "ballast" in portfolios, providing both stability in the form of returns that have low correlations with equities as well as a baseline for yield expectations. With these yield levels, investors can benefit from rising bond prices if rates decline, earn yield if they remain steady, and even buffer losses if rates rise even more.

The before-and-after glimpse of the Treasury yield curve below shows just how much has changed for investors since the Fed began raising the fed funds rate from near zero in early 2022, to where it stood at the end of 2024 between 4.25% and 4.50%.

While yields are attractive in ways they haven't been for the better part of a generation, matching duration exposure with investment horizon remains a reasonable starting point for most investors. Indeed, with the outlook on rates not clear, having that kind of strategic objective becomes more important.

While yields are attractive in ways they haven't been in more than a generation, matching duration exposure with investment horizon remains a reasonable starting point for most investors.

The Treasury yield curve, before rates started going up, and at year-end 2024



Sources: Vanguard calculations, based on data from the U.S. Department of the Treasury (daily Treasury par yield curve rates), accessed January 1, 2025.



Why use ETFs to invest in Treasuries?

Successfully integrating Treasuries into diversified bond portfolios can be relatively easy compared to integrating other types of bonds into broader portfolios. That's because of the relative liquidity of the Treasuries market compared to other bond markets.

But Treasury ETFs can potentially make it even easier for investors to gain access to the asset class. Moreover, many Treasury ETFs are available at relatively low cost—a critical benefit for long-term investors.

Liquidity

The underlying market is extremely liquid, which makes creating Treasury ETF shares relatively easy. More relevant to end investors, buying and selling ETFs in the secondary market can be done with dependably tight trading spreads.

Liquidity may also be easier to find in the ETF universe than via trades on individual Treasuries on the secondary market, especially for larger trades.

Treasuries' higher liquidity, paired with the diversity inherent in ETFs, can also make it easier to transact. If the volume in the ETF's secondary market does not cover all the shares being traded, the high liquidity of Treasuries makes it possible to create or redeem additional shares in the primary market without causing large market impacts.

Conversely, in moments of heightened volatility when the underlying market for Treasuries starts to lose liquidity, the secondary market of ETFs can breathe new life into Treasuries, making it possible to reallocate, execute tactical trades, or buy in/cash out as desired. That's an advantage of ETFs that maps over to other bonds such as emerging markets, corporate debt, or mortgage bonds.

Looked at another way, by owning Treasuries via ETFs, investors may be getting the best of both worlds: a deep underlying market with abundant liquidity, complemented by a resilient secondary ETF market that enables relatively smooth trade execution even in roiled markets.

While laddering individual bonds has its merits, the explicit costs associated with reinvestment of individual bond proceeds into purchasing new bonds can be prohibitively expensive.

Ease of use

Compared with building and managing a bond ladder of Treasuries, owning a low-cost, tight-spread Treasury ETF makes managing duration risk a much more efficient process. Individual, short-, medium-, or long-term Treasury ETFs keep their exposures tightly targeted—a quality that could potentially help make controlling duration at the portfolio level just a click away.

Bond ETFs have proved worthy of investors' consideration over the last two decades. In large part, this is because investors can use them to gain and maintain exposure across the bond market in a relatively low-cost and efficient manner. Treasury ETFs are especially notable in this regard.

Most Treasury ETFs pay monthly distributions, rather than the twice-yearly coupons typically paid by individual bonds. This schedule benefits both investors needing immediate income and investors whose portfolios are in an accumulation phase: The former have a steady stream of income if they want it, while the latter have a convenient way to reinvest their proceeds.

A viable option to laddering

While laddering individual bonds has its merits, the explicit costs associated with reinvestment of individual bond proceeds into purchasing new bonds can be prohibitively expensive. If a Treasury bond matures and needs to be rolled into other Treasuries, the associated reinvestment risk could be higher than for reinvesting proceeds using Treasury ETFs. Reinvestment risk occurs when you have to reinvest a maturing bond and current yields are lower than the maturing bond. The diversification inherent in ETFs lowers that risk, since assets are spread across the maturity spectrum.

All of this makes Treasury ETFs excellent candidates for efficiently scaling an advisor's operations. Instead of needing to manage multiple bonds in multiple client accounts and navigate large differences in yields upon reinvestment, advisors can use these ETFs for targeted exposure, freeing themselves to focus on other value-add activities.

Moreover, for some client portfolios, investing in multiple individual bonds may not be a viable option, thanks to minimum purchase amounts or other expenses. Purchasing individual ETF shares that represent ownership in many bonds can provide a good workaround in such cases—especially when platforms allow for fractional-shares trading.



Understanding Treasury ETF liquidity

About 84% of all ETF trades take place in the secondary market, meaning that in most cases individual bonds don't need to exchange hands: They remain in the ETF's pool of assets while the ETF trades among investors.⁵

The other 16% of trades occurs in the primary market, where ETF shares are created when demand swells beyond what's available in the secondary market. Shares are also redeemed in the primary market when demand for them declines enough to alter the equilibrium of supply and demand in the secondary market.

A clear benefit of Treasury ETFs is that they have turned the historical problems associated with the illiquidity of individual bonds on their head. That's because the liquidity of a bond ETF in the secondary market is often plentiful enough to offset the lack of liquidity that can sometimes characterize different parts of the bond market.

In other words, a portfolio of bonds in an ETF wrapper can trade much more smoothly than can the individual underlying bonds in a given portfolio. This holds true even in the Treasuries market.

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⁵ Source: Investment Company Institute, *2024 Investment Company Fact Book*.



Vanguard Treasury ETFs

Vanguard Treasury ETFs are built to provide pure Treasury exposure at a low cost and with ample liquidity. A total of five maturity-bucketed ETFs can help fine-tune portfolio duration and yield curve positioning with current income backed by the full faith and credit of the U.S. government.

Additionally, Vanguard Extended-Duration ETF makes use of STRIPS (Separate Trading of Registered Interest and Principal of Securities) and can give advisors an option for clients looking to extend duration. Investors can also use STRIPS for liability management. As components of Treasuries, STRIPS are of the highest credit quality and are also backed by the full faith and credit of the U.S. government.



Vanguard Short-Term Treasury ETF

Bloomberg U.S. Treasury 1–3 Year Index

A vehicle for short-term savings goals and controlling volatility

VGSH offers targeted, diversified exposure to short-term Treasuries with 1 to 3 years to maturity. VGSH's 0.05% 1-year total cost of ownership enables investors to keep more of their returns, particularly in a low-yield environment.⁶

VGSH can provide ballast to equity exposure with low to negatively correlated return profiles over the long term.

It can also potentially provide a yield premium to money markets and short-term savings vehicles, and it can represent an opportunity to shorten duration and limit overall portfolio volatility.



Vanguard Long-Term Treasury ETF

Bloomberg U.S. Long Treasury Index

A tool for extending duration on Treasuries with 10 years or more to maturity

VGLT provides liquid exposure to Treasury bonds with 10 or more years to maturity at the lowest total cost of ownership in its peer group.⁷

VGLT can provide ballast to equity exposure with low to negatively correlated return profiles over the long term. The ETF represents an opportunity to enhance yield for investors willing to take on more duration risk. Longer-term bonds provide the added benefit of locking in yields for longer, thus minimizing reinvestment risk.



Vanguard Intermediate-Term Treasury ETF

Bloomberg U.S. Treasury 3–10 Year Index

U.S. Treasuries exposure with intermediate duration

VGIT provides low-cost and pure exposure to Treasury notes with 3 to 10 years to maturity.

VGIT can provide ballast to equity exposure with low to negatively correlated return profiles over the long term. The ETF represents an opportunity to enhance yield for investors willing to take on more duration risk than they would with short-term Treasuries.

VGIT's liquidity, along with the depth of the Treasury bond market, means it can absorb significant rebalances and individual trades with ease, even in the most volatile markets.



Extended Duration Treasury ETF

Bloomberg U.S. Treasury STRIPS 20–30 Year Equal Par Bond Index

Exposure to STRIPS with 20 to 30 years to maturity

EDV provides exposure to stripped coupon and principal payments (STRIPS) with 20 to 30 years to maturity at the lowest total cost of ownership in its peer group.⁸

STRIPS act as zero-coupon bonds that allow for more targeted and longer duration exposure.

For investors who may be interested in adding more duration or managing liabilities, a nominal allocation to EDV can go a long way to extending the overall duration of a fixed income portfolio.

⁶ Total cost of ownership represents ongoing expenses (expense ratio) as well as trading costs (bid-ask spread). For the 20-day period ended December 31, 2024, VGSH traded at a bid-ask spread of 0.02%. VGSH had an expense ratio of 0.03% as of the most recent prospectus dated December 20, 2024. Sources: Vanguard calculations, using Bloomberg data, as of December 31, 2024.

⁷ Total cost of ownership represents ongoing expenses (expense ratio) as well as trading costs (bid-ask spread). For the 20 trading days ended December 31, 2024, VGLT traded at a median bid-ask spread of 0.02%, which is lower than any other ETF in the long government bond peer group per Bloomberg data as of December 31, 2024. VGLT had an expense ratio of 0.03% as of the most recent prospectus dated December 20, 2024. Source: Vanguard calculations, using Bloomberg data, as of December 31, 2024.

⁸ Total cost of ownership represents ongoing expenses (expense ratio) as well as trading costs (bid-ask spread). For the 20 trading days ended December 31, 2024, EDV traded at a median bid-ask spread of 0.06%, which is lower than any other ETF in the extended duration government bond peer group per Bloomberg data as of May 31, 2023. EDV had an expense ratio of 0.05% as of its most recent prospectus dated December 31, 2024. Sources: Vanguard calculations, using Bloomberg data, as of December 31, 2024.



Treasury ETFs in your portfolio

It's worth unpacking how significant the changes in yield since the end of 2021 are. As of this writing, in February 2025, the yield on a 2-year Treasury note stands at about 4.25%. In 2021, the Bloomberg High-Yield Corporate Index had an average yield of 2.2% and an average duration of 7 years.⁹ Put another way, investors can now earn risk-free yield that's almost twice the yield provided by some of the riskiest bonds available three years ago. Given that our research indicates that many investors may be underallocated to Treasuries, these are crucial considerations.¹⁰

Long- and short-term applications

For more long-term, strategic allocations, Treasury ETFs can help keep tracking error in check, manage portfolios more efficiently, minimize premiums and discounts, and generate excess return through a long-term focus.

Investors with more short-term, tactical or active bets could also benefit from using Treasury ETFs. An active secondary market makes it easier to quickly alter a portfolio's credit and rate exposure, while Treasury ETFs' traditionally tight bid-ask spreads can keep transaction costs low.

⁹ Source: Bloomberg, as of December 31, 2022.

¹⁰ Vanguard research, from Vanguard Portfolio Analytics and Consulting group for the one-year period ended June 30, 2024. Source: Vanguard, 2024. Advisor Portfolio Construction Trends and Insights: 2024 Midyear Update. Available at: <https://advisors.vanguard.com/content/dam/fas/pdfs/PID3001012.pdf>.

Convenient, controlled maturity buckets allow for multiple applications

Treasuries are often the backbone of diversified fixed income allocations.

Our quartet of maturity-bucketed Treasury ETFs —VGSH, VGIT, and VGLT—are ready-made solutions for building a broad fixed income portfolio from the ground up. And for investors who may be looking to extend duration or manage liabilities, EDV is available.

These core Treasury ETFs can be combined with varying weights to reach many desired duration targets for an investor’s fixed income portfolio, as the accompanying table begins to show.

Starting with a Treasuries core, investors can build out their fixed income portfolios to include other available bond exposures, including corporate credits, emerging markets debt, mortgage-backed bonds, or Treasury inflation-protected securities (TIPS).

Fine-tuning portfolio duration with Vanguard Treasury ETFs

ETF	Maturity range	Average duration
VGSH (Vanguard Short-Term Treasury ETF)	1–3 years	1.9
VGIT (Vanguard Intermediate-Term Treasury ETF)	3–10 years	5.2
VGLT (Vanguard Long-Term Treasury ETF)	10+ years	16.0

Target duration	VGSH	VGIT	VGLT
0.5	0%	0%	0%
1.0	34%	0%	0%
1.9	100%	0%	0%
2.0	97%	3%	0%
3.0	66%	34%	0%
4.0	35%	65%	0%
5.0	5%	95%	0%
5.2	0%	100%	0%
6.0	0%	92%	8%
7.0	0%	83%	17%
8.0	0%	74%	26%
9.0	0%	65%	35%
10.0	0%	55%	45%
15.0	0%	9%	91%
16.0	0%	0%	100%

Source: Vanguard, as of January 31, 2025.

By owning Treasuries via ETFs, investors may be getting the best of both worlds: a deep underlying market with abundant liquidity, complemented by a resilient secondary ETF market that enables relatively smooth trade execution even in roiled markets.

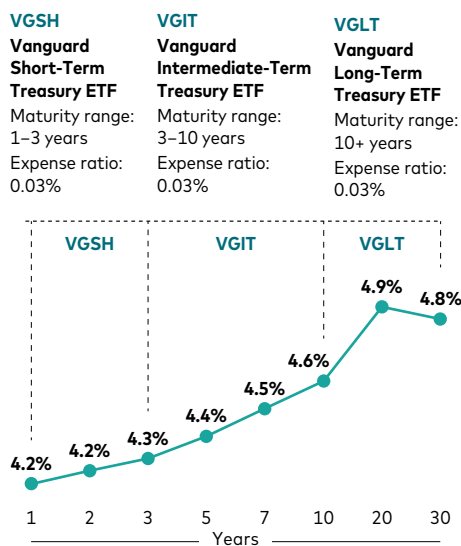
Expressing yield curve views

Financial professionals may hold views on the direction and shape of the yield curve and of credit spreads, and they may act on those views when positioning client portfolios.

For example, an advisor could tactically position the whole portfolio to be either longer or shorter duration based on their client's goals and the anticipated economic environment. While this tactic may add or remove interest rate risk to a portfolio more broadly, it cannot remove interest rate risk at specific intervals—key rate duration—along the yield curve.

To do that, an advisor could use Vanguard Treasury ETFs to efficiently express views on the future direction of each segment of the yield curve. For example, if an advisor believes that long-term rates/yields will fall, but short-term rates/yields will rise, they could overweight long-term Treasuries with VGLT and underweight short-term Treasuries with VGSH.

Vanguard building blocks for yield-curve exposure

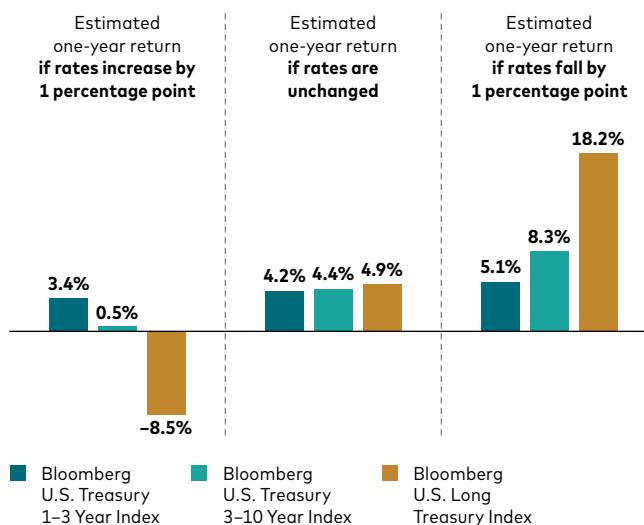


Sources: Vanguard calculations, based on Vanguard data (ETF expense ratios and maturity ranges) and U.S. Treasury Department data (yields), as of January 31, 2025.

In general, investors should keep two rules of thumb in mind when using these ETFs to express yield curve views:

- Underweight the segment(s) of the curve where they believe yields/rates will rise, and overweight the segment(s) of the curve where you believe yields/rates will fall.
- Given the higher volatility of long-term rates, views on their direction could impact portfolio returns more than short-term rates. As the visual below shows, a 1-percentage-point change in either direction for long-term rates has a larger impact on portfolio returns than short-term rates. A little bit can go a long way. While this volatility could turn some clients away, longer-term bonds also provide a larger diversification against equity risk for the portfolio overall than shorter-term bonds do.

Yields add to upside and help cushion downside



Notes: This illustration is hypothetical and does not represent the return on any particular investment; the rates shown are not guaranteed. As of January 31, 2025, the Bloomberg U.S. Treasury 1–3 Year Index had a duration of 1.86 years and a yield to maturity of 4.22%. The Bloomberg U.S. Treasury 3–10 Year Index had a duration of 4.90 years and a yield to maturity of 4.37%. The Bloomberg U.S. Long Treasury Index had a duration of 14.67 years and a yield to maturity of 4.86%. The scenario assumes that any interest rate changes occur at the beginning of the period and before any reinvestment of dividends; it does not take convexity into account.

Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Sources: Vanguard calculations, using Bloomberg data as of January 31, 2025.

Evaluating the risk of being underallocated to Treasuries

Vanguard research suggests that many investors are underallocated to Treasuries—especially those investors who take a more active role in their fixed income allocations. (See figure below.) This tendency toward underallocation is the result of a decade-plus of low inflation and historically low rates on Treasuries.

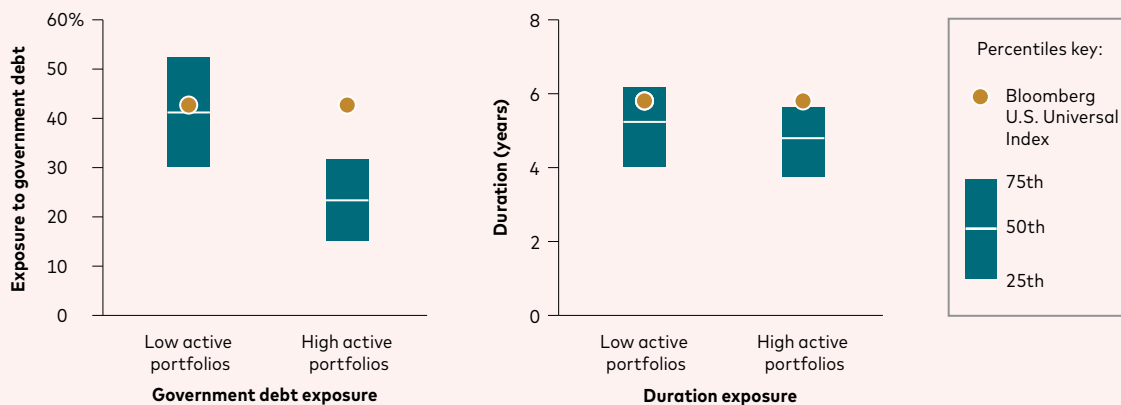
Seeking extra yield, some investors invested in debt instruments with higher yields than those of comparable Treasuries with similar maturities. However, such instruments also carried increased credit risk.

The significance of deviating from benchmark exposures at a time when yields have risen sharply is that any macroeconomic shock can hurt the returns of these portfolios.

The ease of using Treasury ETFs also underscores the importance of having a sufficient allocation to credit-risk-free Treasuries. Investors can use these ETFs to target duration risk with a high degree of precision—again, an especially important consideration at a time when rates have moved considerably higher compared with even a year ago.

So while it may be tempting to think that a high allocation to Treasuries would detract from the alpha an advisor can deliver, using Treasuries to tailor portfolio duration and credit exposure can be an effective way for advisors to add value.

Advisors continue to underweight government debt and duration



Sources: Vanguard calculations, using data from Morningstar, Inc., as of December 31, 2024. A total of 1,768 portfolios were analyzed, for the period between January 1, 2024–December 31, 2024. Fixed income charts include all observed portfolios for the period.

Partner with a leader in fixed income indexing

Experienced and specialized investment professionals

With more than \$1.9 trillion in assets under management and nearly 60 employees across the globe focused on fixed income indexing, Vanguard Fixed Income Group aims to replicate a benchmark's performance to the highest degree possible with a focus on reducing cost and tracking error.¹¹ Portfolio managers and traders work directly with internal risk management and credit research teams to evaluate issuers and individual bonds and optimize exposures relative to the benchmark. This process, which is exceedingly important in the vast universe of bond issuance, focuses on key benchmark characteristics, such as:

- Duration by maturity bucket and curve position.
- Sector and subsector weights.
- Credit quality.
- Issuer exposure (weightings in multiple offerings from a single issuer).

Vanguard's size and scale provide a number of benefits to investors, including:

- Consistently low expense ratios and, on a relative basis, a larger number of bonds in portfolios, allowing for greater coverage across the bond market.
- Favorable new-deal allocations and best execution from bond dealers.
- Participation in primary issuances, allowing for a cost-effective way to obtain bonds that can be expensive to acquire in the secondary market.

Vanguard Treasury ETFs can provide investors easier access to Treasuries than is possible from individual bonds. Vanguard also has consistently low expense ratios and, on a relative basis, a larger number of bonds in portfolios, allowing for greater coverage across the bond market.

¹¹ Source for assets under management and fixed income indexing employee count: Vanguard, as of December 31, 2024.

ETF facts

	Benchmark	Expense ratio	ETF/fund assets	Number of bonds	Average duration
<u>VGSH</u> Vanguard Short-Term Treasury ETF	Bloomberg U.S. Treasury 1-3 Year Index	0.03%	\$21.1 billion/ \$25.7 billion	97	1.9 years
<u>VGIT</u> Vanguard Intermediate-Term Treasury ETF	Bloomberg U.S. Treasury 3-10 Year Index	0.03%	\$30.8 billion/ \$38.4 billion	106	4.9 years
<u>VGLT</u> Vanguard Long-Term Treasury ETF	Bloomberg U.S. Long Treasury Index	0.03%	\$9.7 billion/ \$14.0 billion	88	14.35 years
<u>EDV</u> Vanguard Extended Duration Treasury ETF	Bloomberg U.S. Treasury STRIPS 20-30 Year Equal Par Bond Index	0.05%	\$3.7 billion/ \$4.4 billion	80	24.0 years

Source: Vanguard, as of January 31, 2025. Expense ratios as of February 1, 2025.

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All investing is subject to risk, including the possible loss of the money you invest. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income.

Diversification does not ensure a profit or protect against a loss.

Bond funds are subject to interest rate risk, which is the chance bond prices overall will decline because of rising interest rates, and credit risk, which is the chance a bond issuer will fail to pay interest and principal in a timely manner or that negative perceptions of the issuer's ability to make such payments will cause the price of that bond to decline.

Stocks of companies based in emerging markets are subject to national and regional political and economic risks and to the risk of currency fluctuations. These risks are especially high in emerging markets.

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