Vanguard

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Active Fixed Income Perspectives Q2 2024: Data dependent

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Key takeaways

Performance

Stronger economic data during the first quarter reduced 2024 rate-cut expectations. Rates moved higher across the curve and credit spreads tightened further. Lower-credit-quality and shorter-term bonds performed best. The Bloomberg U.S. Aggregate Index ended the period with a return of –0.78%, while the Bloomberg Municipal Bond Index returned –0.39%.

Looking ahead

The Federal Reserve aims to ease policy, but sticky inflation poses a noticeable risk to those expectations. Rate cuts may come later than the market expects, giving investors an extended window to lock in attractive yields for the long term. Credit sectors easily absorbed a record amount of issuance in the first quarter, an optimistic sign for the rest of the year. Carry and credit selection will be key in municipals.

Approach

We think current yields are fairly priced. In credit, valuations are justifiably rich given sound fundamentals and strong demand. In higher-rated municipal bonds, the long end of the curve offers the best value. Opportunities in lower-quality municipals are best at the short end.

Contents

Trying to find a landing

Since the Fed paused its interest-rate-hiking cycle in July of last year, the focus of the asset management and economic forecasting complex has been on when and by how much the Fed will cut rates once it starts to do so.

Financial markets had good reason to follow the soft-landing path into 2024. Inflation rates were falling and economic growth, driven by robust labor supply and rising productivity, was strong in the face of restrictive monetary policy.

However, recent economic releases in the United States have shifted the narrative from a gradually cooling economy to one that appears more robust. Inflation appears to be stuck above target levels, raising doubts about the Fed's ability to achieve its 2% goal with growth and labor markets this strong.

Our base-case scenario remains that the Fed has concluded its hiking cycle and is likely to continue holding until later in the year. Policy, and investors, will be data dependent. If above-trend growth and persistent inflation continue, the Fed could have limited room to cut rates and may need to remain on hold until the end of the year.

What could go wrong: Achieving a true soft landing is challenging, as cutting rates too late can push the economy into a recession but cutting too soon can reignite inflationary pressures.

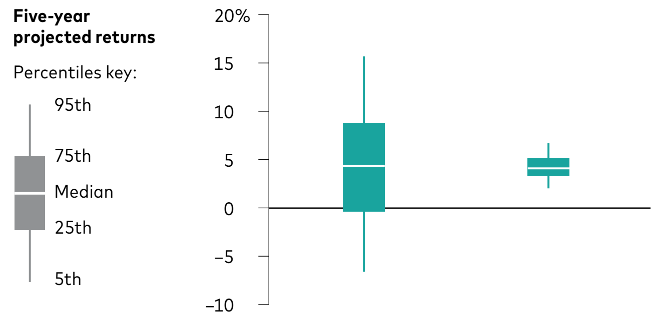
- With restrictive monetary policy, there is an above-average risk of an economic slowdown, particularly if the tailwinds that have supported growth begin to fade.
- If the potential for another rate hike rises, it could cause turmoil in both the stock and bond markets.

The big picture: All eyes are searching for signs of a more definitive inflation trend. Higher market volatility should provide more opportunities for our portfolios.

However, we think investors should also take a longer-term perspective and act on the opening to right-size their portfolio allocation to bonds and lock in attractive yields for longer.

Why it matters: We see the potential for better risk-adjusted returns for bonds than stocks. Vanguard's forecasts show there's a 50% chance that U.S. aggregate bonds will return about as much over the next five years as U.S. equities—4.3% for bonds versus 4.5% for stocks—with one-third of the median volatility.

Bonds could return as much as stocks, with far less volatility



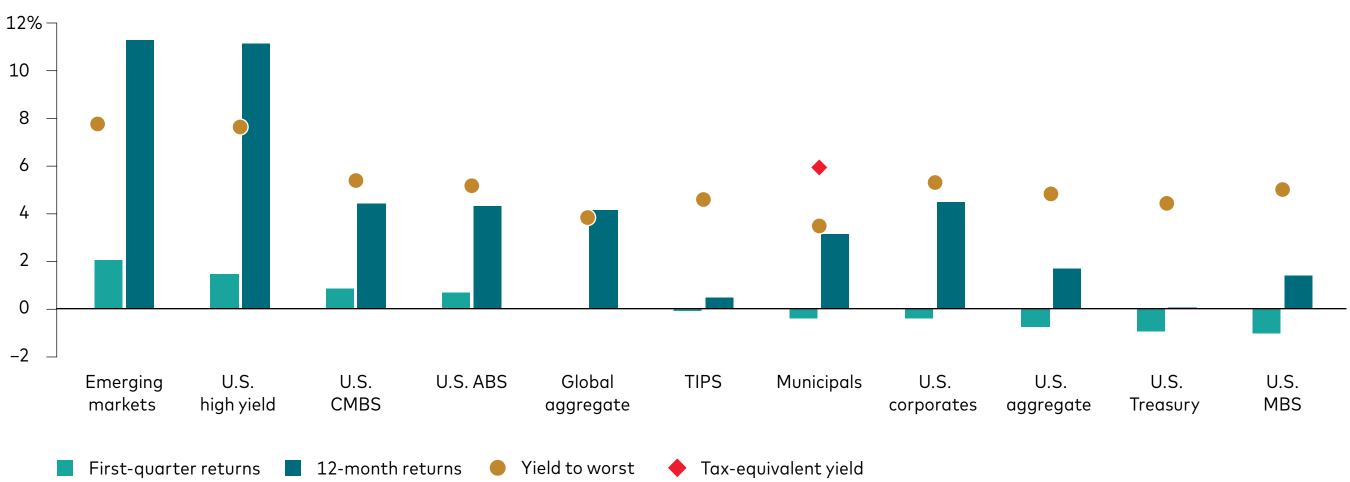
	U.S. equities	U.S. aggregate bonds
95th percentile	15.7%	6.7%
75th percentile	9.0%	5.2%
Median	4.5%	4.3%
25th percentile	–0.1%	3.4%
5th percentile	–6.5%	2.1%
Median volatility	**15.8%**	**5.2%**

Note: The projections use the MSCI U.S. Broad Market Index as a proxy for stocks and the Bloomberg U.S. Aggregate Index as a proxy for bonds.

Source: Vanguard Capital Markets Model projections, as of December 31, 2023.

IMPORTANT: The projections or other information generated by the VCMM regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from the VCMM are derived from 10,000 simulations for each modeled asset class. Simulations as of December 31, 2023. Results from the model may vary with each use and over time. For more information, please see the last page.

Fixed income sector returns and yields



Note: The municipal tax-equivalent yield is calculated using a 40.8% tax bracket, which includes a 37.0% top federal marginal income tax rate and the 3.8% Net Investment Income Tax to fund Medicare.

Sources: Bloomberg indexes and J.P. Morgan, as of March 31, 2024.

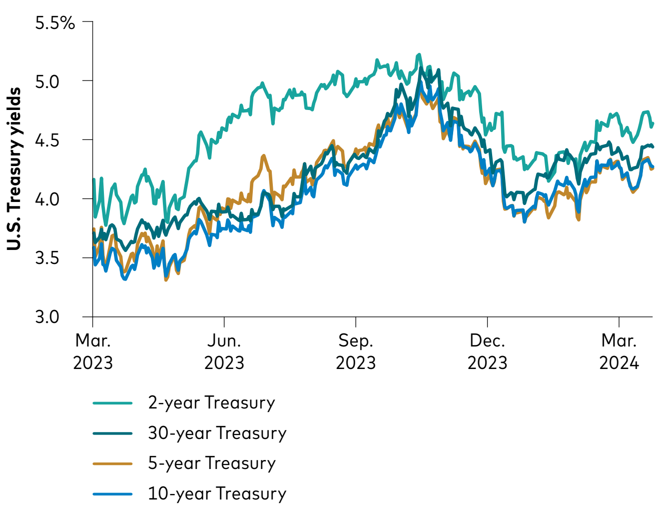
Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Rates and inflation

What happened: Treasury yields backed up more than 30 basis points (bps) across the curve and another 40 bps through mid-April. The yield on the 10-year U.S. Treasury note has held above 4% since February and recently moved into a higher range above 4.5%.

Recent inflation readings have accelerated compared with the pace of disinflation observed at the end of last year. The downward trend that markets and the Fed were celebrating is no longer apparent, and core inflation measures have been moving in the wrong direction over the past few months.

U.S. Treasury yields have climbed on stronger data but not to cycle peaks



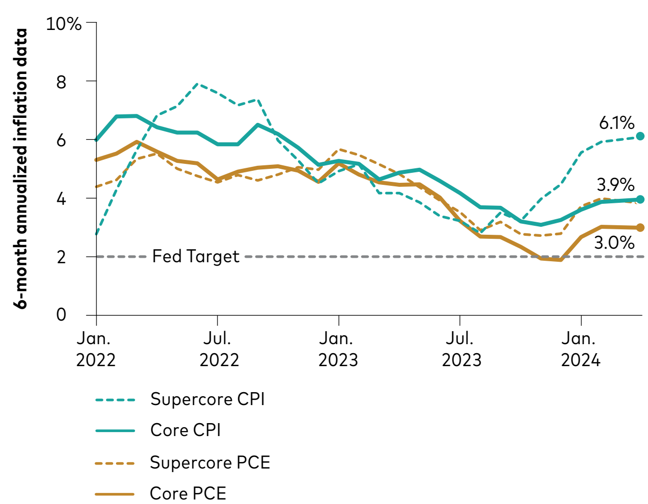
Source: Bloomberg, as of March 31, 2024.

What's next: After a burst of productivity and employment growth last year, we expect to see the economy settle down in the latter half of 2024. Similarly, we expect inflation to move lower, but the path back to target will be a long one. In our view, the core Personal Consumption Expenditures (PCE) reading may not fall back to 2% until 2025.

If economic conditions hold, rates are likely to stay rangebound. Bumpy inflation should keep the Fed cautious over the near term. When rate cuts do appear imminent, the curve should steepen with short-term rates falling.

We think that the bar is high for any additional rate hikes, but a sustained pattern of inflation above 3% and growth above 2% would spark that debate. In such a scenario, markets would see further upward pressure on rates and greater volatility. The Fed delivering fewer cuts than forecasted this year is a higher probability in our view.

Recent data suggest inflation's path to 2% will be bumpy



Source: Bloomberg, as of April 26, 2024.

Our approach: After taking profits on our long-duration positions earlier this year, we see the upside and downside risks for rates as balanced over the near term and do not have a strong bias toward U.S. duration and curve positioning. Front-end U.S. Treasury Inflation-Protected Securities breakeven exposure offers attractive carry with potential upside if inflation continues to surprise higher.

Global rates opportunities

The inflation outlook is more benign in the euro area. Inflation is tracking below 2%, and growth remains slow amid still-restrictive monetary and fiscal policy and the lingering effects of the energy crisis.

The European Central Bank has indicated that it will be ready to cut rates in June and the Bank of England acknowledged that cuts are on the horizon. We remain overweight to Spain and Greece sovereigns. We also believe that Japan Government Bond 10-year yields will be rising toward 1%.

Why interest rates will remain higher

Vanguard research[1] from last year argues that r-star—the real (inflation-adjusted) central bank interest rate that would neither stimulate nor restrict the economy—is higher than what the Fed believes it to be. R-star is a crucial determinant of monetary policy.

The research projects that the r-star has risen by 100 bps since the 2008-09 global financial crisis to 1.5% today, driven primarily by demographics, long-term productivity growth, and higher structural fiscal deficits.

The investment implications of a higher r-star are significant. Our analysis reveals that the rise of r-star reflects secular changes that are unlikely to quickly reverse. This strongly suggests that the era of secularly low rates is over.

Mortgage-backed securities

What happened: Agency mortgage-backed securities (MBS) modestly underperformed similar-duration Treasuries over the first quarter. Spreads held steady and traded within a tight range, but higher rates held back returns.

What's next: A delayed Fed easing cycle represents a modest headwind for MBS. Demand from large buyers, like commercial banks, is not expected to pick up meaningfully until rate volatility subsides and the path toward lower rates and steeper yield curves is more certain.

Our approach: MBS spreads remain in the middle of our fair-value range. We are overweight to segments of the sector that offer a more stable carry and duration profile. We see better opportunities in agency collateralized mortgage obligations, select specified pools, and agency commercial mortgage-backed securities (CMBS).

1 Davis, Joseph H. and Zalla, Ryan and Rocha, Joana and Hirt, Josh, "R-Star is Higher. Here's Why" (June 14, 2023). Available at SSRN: https://ssrn.com/abstract=4478413.

Credit

With the Fed on hold and growth still above trend, the backdrop for fixed income credit sectors continues to be supportive. Fundamentals remain mostly stable, and strong demand from all-in yield buyers helped credit spreads narrow in the first quarter even amid record levels of new bond issuance.

Good news

We expect these tailwinds to continue into the second quarter. We're past the largest wave of issuance for the year, which will limit supply as demand should remain constant or increase.

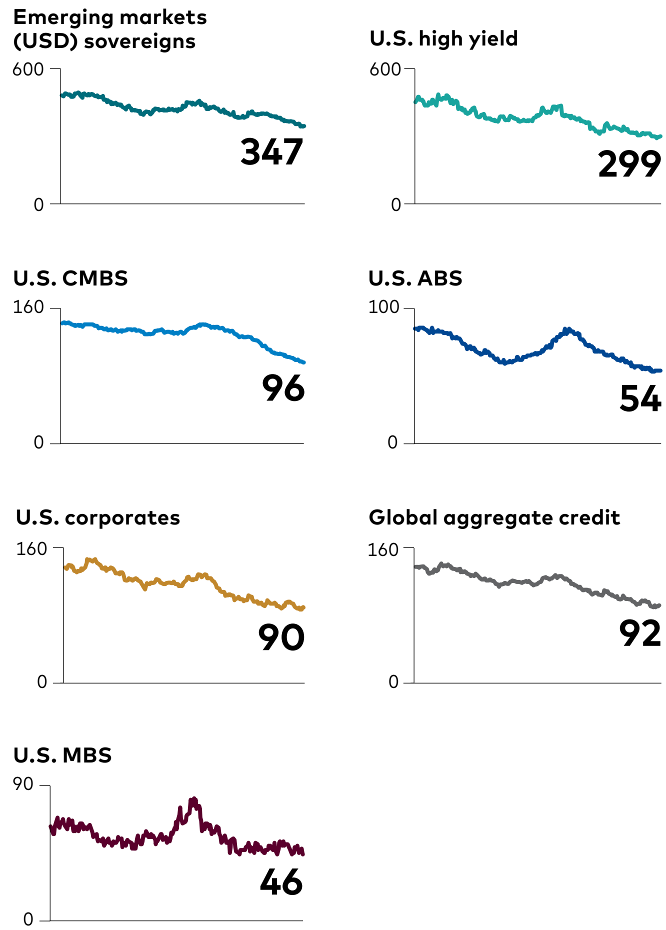
- We continue to have a positive outlook on credit but recognize that the window of opportunity for potential outperformance is getting smaller.
- We don't think small deviations from our base-case view would be overly detrimental to credit performance, particularly in higher-quality segments.
- We still see value in sectors in which spreads have lagged and have room to tighten further, including shorter-maturity investment-grade corporates, emerging markets (EM), and segments of structured products.

Key risks

An extended higher-for-longer rate environment offers more opportunity for risks to emerge. If economic conditions worsen—either because of higher inflation or slower growth—spreads have room to widen from expensive levels.

Credit spreads

(in bps, from March 31, 2023, through March 31, 2024)



Sources: Bloomberg indexes and J.P. Morgan EMBI Global Diversified Index, as of March 31, 2024.

Investment-grade corporates

What happened: So far this year, high-grade corporate spreads have drifted tighter. The greatest performance obstacle over the first quarter was the expected surge in new-issue bond supply.

Year to date, the high-grade primary market has seen a record level of activity, with over $500 billion of new issuance. Strong demand from a wide range of investors more than offset that headwind, and spreads have managed to stay pinned under 1% since early January.

All-in yields, however, have held above 5%, which has historically been an attractive entry point for institutional yield-focused buyers. With the Fed inclined to cut rates at some point, investors have flocked to lock in attractive longer-term yields. Investment-grade credit funds have experienced more than 20 consecutive weeks of positive cash flows, taking in more than $80 billion in the first quarter.

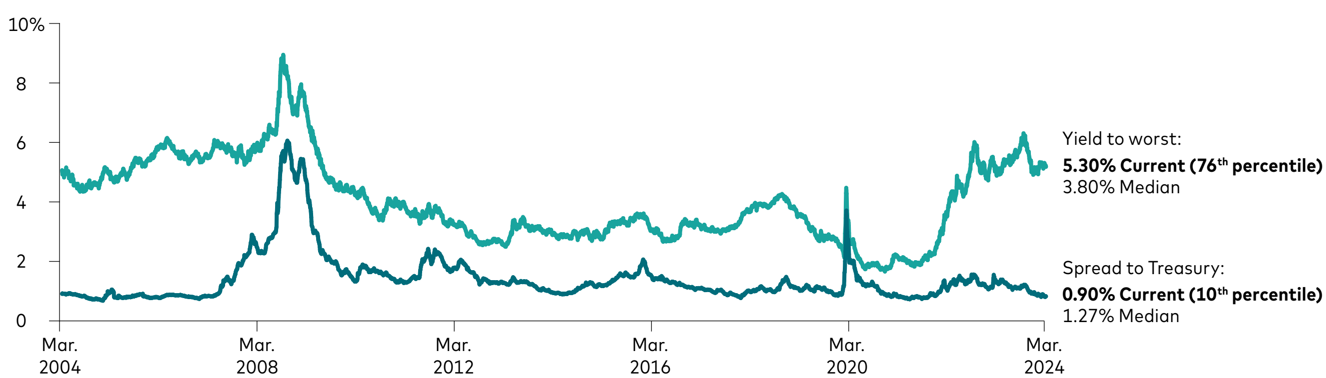
What's next: Absent a reacceleration of inflation or broader indications of an impending recession, credit spreads should trade in a narrow range, with buyers stepping in when rates back up.

Corporate credit fundamentals remain stable. Profit margins are near record highs, and lower-rated credits have been actively shedding leverage even as the cost of servicing outstanding debt has increased with higher rates. Conservative balance sheet management has kept corporate cash balances high, which could pose a risk to fundamentals if companies were to increase their merger-and-acquisition activity from low levels today.

Our approach: Modestly slower growth or, conversely, a further reduction in 2024 Fed rate-cut expectations should pose limited risk to higher-quality credit.

Yield buyers seeking longer duration have flattened credit curves over recent quarters. We like the relative value of shorter-maturity bonds, where spread levels look cheap. We also like opportunities in European credit. Valuations are more compelling versus those in the U.S., and we don't think our forecast of a soft and gradual economic recovery for the euro zone should have a negative impact on strong credit fundamentals.

Corporate bond yields and spreads since 2004



Source: Bloomberg Corporate Bond Index, as of March 31, 2024.

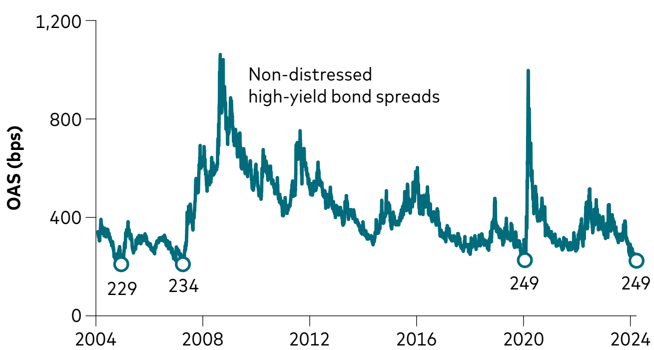
Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

High-yield corporates

What happened: Higher yields, a supportive growth environment, and lower sensitivity to interest rates have enabled high-yield bond returns to stay positive so far this year following a double-digit return in 2023.

Index-level spreads touched below 300 bps for the first time since January 2022, but the market is very bifurcated beneath the surface. Performing bonds are trading at extremely expensive levels, while the percentage of distressed securities (those with option-adjusted spreads above 1,000 bps) has grown. If the distressed part of the market is removed, high-yield spreads are only 249 bps—representing the 2nd percentile over the last 20 years.

Non-distressed high-yield bond spreads are near 20-year lows



Sources: Bloomberg and ICE BofA US Non-Distressed High Yield Index, as of March 31, 2024.

What's next: The high-yield market has benefited from two years of ratings upgrades and muted rates of new issuance, but we expect a more balanced mix of supply and demand going forward.

Ratings upgrades from high yield to investment grade should slow, and we expect a higher pace of new issuance for standard refinancing needs and from the eventual pickup in debt-funded leveraged buyout and merger-and-acquisition activity.

Fundamentals remain stable. Similar to the investment-grade market, strong profits have helped offset higher interest costs. Default rates will rise but not to high levels unless there is a deep or prolonged recession.

Our approach: We remain cautious on high yield due to tight valuations. BB and B rated bonds offer attractive yield, but upside from additional spread tightening is limited. We see upside opportunities in the lower-quality and stressed parts of the market and find high-quality bank loans attractive.

Emerging markets

What happened: A record front loading of 2024 issuance from investment-grade EM countries widened spreads over the quarter and provided an opportunity to add high-quality bonds at attractive valuations.

Below-investment-grade-rated EM bonds have significantly outperformed so far this year because of a supportive global appetite for risk and meaningful improvement in the country fundamentals of higher-risk issuers like Ecuador, Egypt, and Argentina. Local currency bonds underperformed USD-denominated segments, as the dollar strengthened against most EM currencies.

What's next: With nearly half of expected 2024 issuance already complete, the supply-and-demand mix for the sector looks favorable over the remainder of the year. A pickup in demand would allow EM to outperform.

The EM sector's attractive yields and longer duration profile make it uniquely poised to benefit from a rally in rates as central banks cut, potentially attracting additional investor interest. Country fundamentals remain supportive, and EM inflation rates continue to edge down toward target levels. We do not see any notable countries on the edge of default.

Our approach: Although spreads have narrowed to less-compelling levels in recent weeks, all-in yields of around 8% remain attractive. We are avoiding the most expensive segments of the sector, specifically higher-rated bonds in Asia and parts of the Middle East. EM high yield offers better valuations but requires a more selective approach.

EM local rates are vulnerable to a U.S. real rate sell-off. We've pared back our local market positions ahead of the recent backup, but we are maintaining positions in select markets where local fundamentals continue to justify a deep policy rate-cutting cycle or where sensitivity to U.S. rate moves is lower.

Structured products

What happened: A narrowing of spreads drove positive performance for both asset-backed securities (ABS) and CMBS over the first quarter. ABS valuations today are fair for 1-5-year investment-grade corporates. While longer-term CMBS have approached fair value relative to 5-10-year corporates after a period of strong performance, 1-5-year CMBS still appear cheap relative to shorter-maturity corporates because of concerns about loan extension and office concentration.

What's next: We expect commercial property sellers to accept the reality of lower property valuations. For lenders, greater clarity on valuations should provide more confidence in real estate appraisals and increase their willingness to originate commercial real estate (CRE) loans.

- In the office sector, resolution and workout will be a multiyear process. Our outlook is more constructive for other commercial property sectors, including retail, which is starting to normalize after several years of underperformance.

How we see it: Delinquency rates for the office sector have risen twice as fast as the broader CRE market, with the potential for further increases in the coming months. However, risks remain manageable and, absent a severe recession, we remain comfortable adding high-quality CMBS across our portfolios.

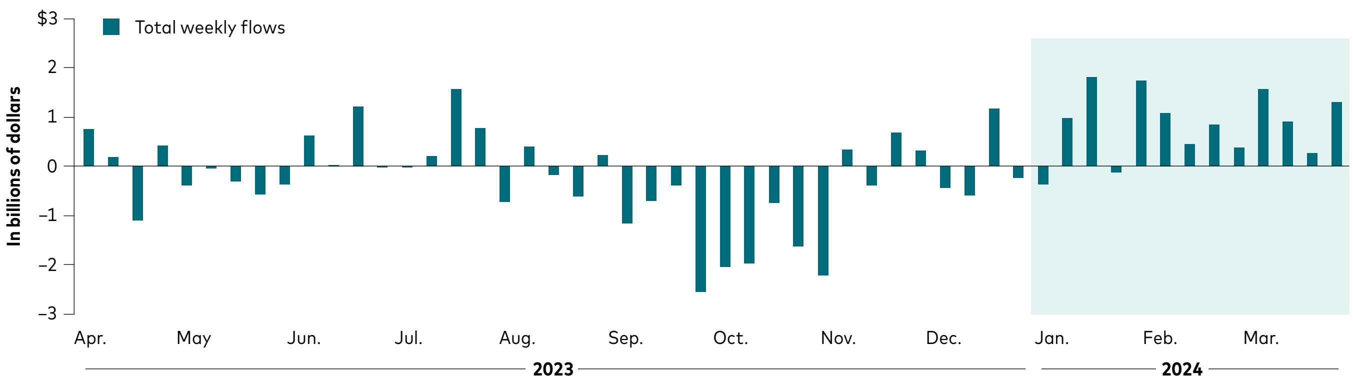
We continue to keep a close eye on the health of the U.S. consumer and any impacts on the ABS sector. A sustained strong labor market, reasonable credit usage, and favorable wealth effects provide the backdrop for continued consumer health. Deterioration to date has been isolated to lower-quality borrowers and is rising from a very low base.

Municipal bonds

What happened: Following Fed Chair Jerome Powell's dovish tone in December, there was ample momentum to believe rate cuts may begin by mid-2024. Municipal fund flows, while not on the heavier side, turned positive, with the expectation that the ensuing yield rally would, in turn, drive meaningful positive returns.

However, the higher-than-expected mid-January Consumer Price Index report fractured confidence in this belief. Investors wondered: Does this change the playbook for an asset allocation strategy? Investors appear to be in two camps. The first is being comfortable in cash, waiting to move out in duration until the next phase has clearly begun. The second is already moving, as evidenced by positive overall flows and longer-duration products receiving the most interest year to date.

Municipal fund flows turn positive in 2024



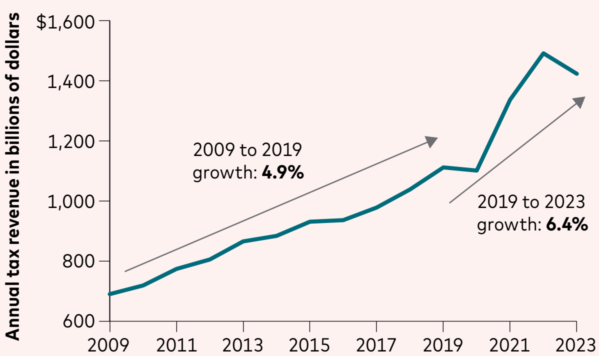
Source: Investment Company Institute, as of March 27, 2024.

A return to normalcy for state tax revenue

State tax revenue declines have made headlines. U.S. Census data show that totals for state taxes fell 4.5% overall in 2023, and 32 states posted declines individually.

Consider, however, the extraordinary tax revenue growth in 2021 and 2022 fueled by pandemic-era federal stimulus. Despite declines in 2020 and 2023, the overall growth trend from the end of 2019 to 2023 was 6.4%, relative to the prior 10-year average of 4.9% and the 25-year average of 4.4%. The revenue heights of 2021-2022 were unsustainable, so a post-stimulus decline is a reasonable expectation and not cause for broad credit concerns.

State tax totals showed a return to normalcy in 2023



Source: U.S. Census Bureau, as of December 31, 2023.

What's next: We believe there is a possibility the Fed does not cut for the entirety of 2024. While consensus pricing indicates the next step is down, the timing and magnitude of the next rate move remain unclear. Nevertheless, that pricing has investors' attention: Our traders report that new deals have been heavily oversubscribed despite the fastest pace of tax-exempt issuance in the first quarter since 2015. While fund demand is difficult to forecast, it appears primed to remain strong in the near term.

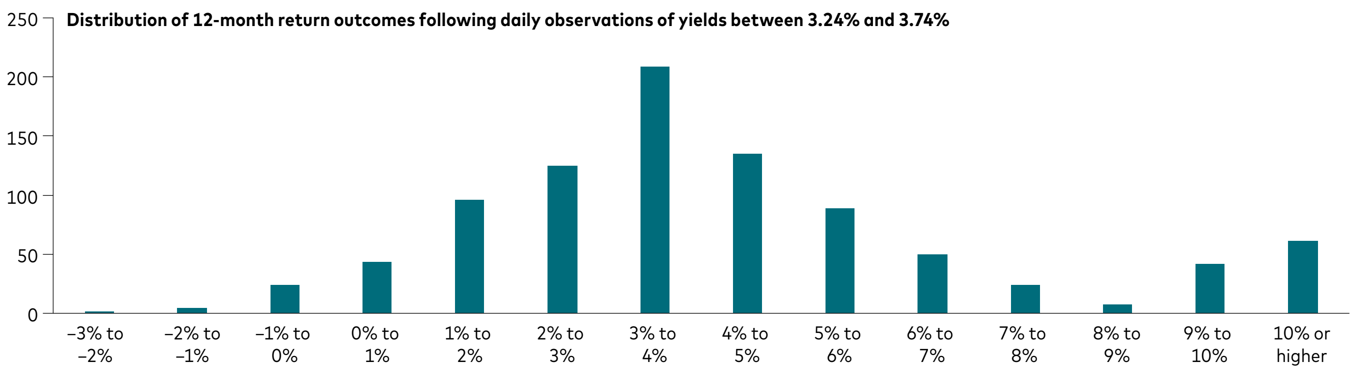
- Credit and carry will be the primary strategies going forward. Over the next 12 months, it is likely that municipal bonds will deliver positive returns. At an index yield of 3.49% and a duration of 6.07 years, yields would need to rise 58 bps to generate a negative return in the Bloomberg Municipal Bond Index.
- Even if the first rate cut isn't imminent, investors are being "paid to wait" at these yield levels.

In the interim, demand for tax-exempt paper may continue to mute volatility in municipal bond returns going forward. As Treasuries oscillate between soft- and deferred-landing scenarios with every new data print, holders of municipal bonds will likely wait for more sustained trends—higher or lower—before making price adjustments.

Our approach: Our team has been allocating municipal portfolios to take advantage of the trends that should materialize next. With the expectation of Fed cuts, falling yields (but not to pandemic lows), and fund inflows, we expect that credit and carry will be successful strategies.

- AAA bonds are an overcrowded trade, driven by investors' demand for individual bonds and separately managed accounts. With this cohort of municipal buyers primarily focused on shorter maturities, the long end remains considerably more attractive.
- We're finding many credit opportunities in the short end. Value there lies in the middle rungs of credit (As, BBBs, and BBs), and our credit analysts continue to seek out both value and strong underlying fundamentals. Their expertise provides us with confidence in sectors such as hospitals, higher education, land deals, and retirement communities.
- These are all issuer-by-issuer decisions. Higher education is a particularly interesting story of a sector experiencing demographic and other challenges, with pockets of strength to choose from if you know where to look.
- Call-and-coupon structure will still serve an important role. After exiting many of our 4% coupon holdings at large gains from the end of last year, we will again look to take advantage of a potential backup in rates to reestablish positions in discount securities.

Municipal bonds are likely to deliver positive returns over the next 12 months



Notes: The chart shows the distribution of returns from December 29, 2000, to March 31, 2024, based on daily observations of yields in a 50-bps range around 3.49% (the March 31, 2024, yield-to-worst). For every daily occurrence of yields within that range, the ensuing 12-month total return was calculated and counted as a single observation. Only 3% of 910 observations exhibited negative returns over the following 12 months.

Source: Bloomberg indexes, as of March 31, 2024.

Vanguard active bond funds and ETFs

Vanguard active bond funds and ETFs		Admiral™ Shares or ETF ticker symbol	Expense ratio*
Treasury/ Agency	GNMA†	VFIJX	0.11%
	Inflation-Protected Securities	VAIPX	0.10
	Intermediate-Term Treasury	VFIUX	0.10
	Long-Term Treasury	VUSUX	0.10
	Short-Term Federal	VSGDX	0.10
	Short-Term Treasury	VFIRX	0.10
Investment-grade corporate	Core Bond	VCOBX	0.10%
	Core Bond ETF	VCRB	0.10
	Core-Plus Bond	VCPAX	0.20
	Core-Plus Bond ETF	VPLS	0.20
	Intermediate-Term Investment-Grade	VFIDX	0.10
	Long-Term Investment-Grade†	VWETX	0.12
	Multi-Sector Income Bond	VMSAX	0.30
	Short-Term Investment-Grade	VFSUX	0.10
	Ultra-Short-Term Bond	VUSFX	0.10
	Ultra-Short Bond ETF	VUSB	0.10
Below-investment-grade	High-Yield Corporate†	VWEAX	0.13%
Global/ international	Emerging Markets Bond	VEGBX	0.40%
	Global Credit Bond	VGCAX	0.25

Vanguard active municipal bond funds			
National municipal	Ultra-Short-Term Tax-Exempt	VWSUX	0.09%
	Limited-Term Tax-Exempt	VMLUX	0.09
	Intermediate-Term Tax-Exempt	VWIUX	0.09
	Long-Term Tax-Exempt	VWLUX	0.09
	High-Yield Tax-Exempt	VWALX	0.09
State municipal	California Intermediate-Term Tax-Exempt	VCADX	0.09%
	California Long-Term Tax-Exempt	VCLAX	0.09
	Massachusetts Tax-Exempt‡	VMATX	0.13
	New Jersey Long-Term Tax-Exempt	VNJUX	0.09
	New York Long-Term Tax-Exempt	VNYUX	0.09
	Ohio Long-Term Tax-Exempt‡	VOHIX	0.13
	Pennsylvania Long-Term Tax-Exempt	VPALX	0.09

Active fixed income leadership team

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In industry since 2005

Active fixed income at Vanguard

$217B
Taxable bond AUM
19 funds/ETFs**

$185B
Municipal bond AUM
5 national funds/
7 state-specific funds

25+
Portfolio managers

35+
Traders

60+
Credit research analysts

130+
Dedicated team members

* As reported in each fund's prospectus. A fund's current expense ratio may be higher or lower than the figure shown.
† Investment advisor: Wellington Management Company LLP.
‡ Investor Shares available only. There is no minimum investment required for advised clients.
** Includes funds advised by Wellington Management Company LLP.
Note: Data as of March 31, 2024.

For more information about active fixed income, speak with your financial advisor.

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For more information about Vanguard funds or Vanguard ETFs, visit advisors.vanguard.com or call 800-997-2798 to obtain a prospectus or, if available, a summary prospectus. Investment objectives, risks, charges, expenses, and other important information are contained in the prospectus; read and consider it carefully before investing.

Vanguard ETF Shares are not redeemable with the issuing Fund other than in very large aggregations worth millions of dollars. Instead, investors must buy and sell Vanguard ETF Shares in the secondary market and hold those shares in a brokerage account. In doing so, the investor may incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.

Past performance is no guarantee of future results. All investing is subject to risk, including possible loss of principal. Diversification does not ensure a profit or protect against a loss.

Bonds 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.

High-yield bonds generally have medium- and lower-range credit-quality ratings and are therefore subject to a higher level of credit risk than bonds with higher credit-quality ratings.

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.

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.

Investments in bonds issued by non-U.S. companies are subject to risks including country/regional risk and currency risk.

Although the income from a municipal bond fund is exempt from federal tax, you may owe taxes on any capital gains realized through the fund's trading or through your own redemption of shares. For some investors, a portion of the fund's income may be subject to state and local taxes, as well as to the federal Alternative Minimum Tax.

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.

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model (VCMM) regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM results will vary with each use and over time.

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The Vanguard Capital Markets Model® is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the Vanguard Capital Markets Model is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

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