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Active Fixed Income Perspectives Q1 2023: From pain to gain

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Key takeaways

Performance

Tighter credit spreads and higher coupon payments helped generate positive returns in the fourth quarter amid a historically bad year for bonds.

Looking ahead

For 2023, we see a transition from pain to gain. While we still see a bumpy road ahead, investors can lock in yields that haven't been this high in years. More stability in interest rates and clarity on monetary policy should bring flows back into fixed income.

Approach

Credit spreads have room to widen, but higher yields will provide more cushion. Valuations warrant a more defensive position focused on higher-quality securities. We believe 2023 will offer the opportune time to add risk.

The backside of the storm

The upper-right quadrant of a hurricane is called the "dirty side" by meteorologists because it is the most dangerous. It can bring high winds, storm surges, and spin-off tornadoes that cause massive destruction as a hurricane makes landfall.

Similarly, last year's fixed income market was hit by the brunt of a storm. Low initial rates, surprisingly high inflation, and a rate-hike campaign by the Federal Reserve led to historic bond market losses.

In early 2023, we ascertain that we are in the figurative backside of the storm. Rates may not go much higher, but a recession looms, credit spreads remain uncomfortably narrow, inflation is still high, and several important countries face fiscal challenges.

We still believe that volatility will remain high for the foreseeable future, but with increased yields, investors can not only survive the storm but, to borrow a phrase, build back better.

Opportunity ahead

Even as we admired Argentina's World Cup victory in December, the counterattack of France resonated with us. In fixed income investing, it

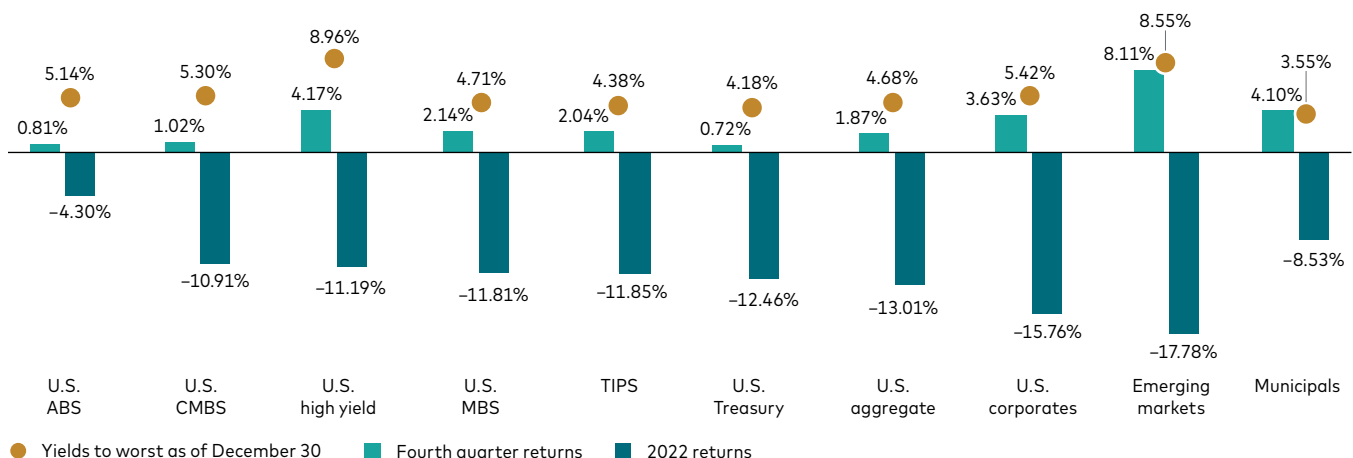
doesn't necessarily pay to keep pressing by adding risk. Sometimes it's best to wait and, like *Les Bleus*, strike when the break is available.

While we expect more volatility this year, we see greater opportunity ahead for active management to shine. Active sector and security selection decisions should carry more weight in a market not overwhelmed by macroeconomic forces or dominated by central banks like in the wake of the 2008 global financial crisis (GFC). Bond investors will be paid to bear risks.

Attractive yields can be found across most segments, with some of the best value in higher-quality bonds, which should hold up well even if economic conditions weaken. For high-income taxable investors, we are expecting a municipal bond renaissance.

This is also a good inflection point to pause and take a longer view. Vanguard's 10-year annualized return expectations for fixed income have doubled from a year ago. We expect the Bloomberg U.S. Aggregate Bond Index to return an average of 4.1% to 5.1% per year and for currency-hedged international bonds to perform substantially the same.

Fixed income sector returns and yields



Sources: Bloomberg indexes and J.P. Morgan EMBI Global Diversified Index, as of December 31, 2022.

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.

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. Distribution of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations as of September 30, 2022. Results from the model may vary with each use and over time. For more information, please see page 10.

Rates and inflation

Market pricing for interest rates has moved closer to the Fed's forecasted terminal rate of 5.1%, but the market continues to anticipate a pivot to rate cuts in the third quarter of this year. For now, market participants either expect a faster deceleration in inflation than the Fed does, or they question policymakers' resolve to hold rates in restrictive territory for long.

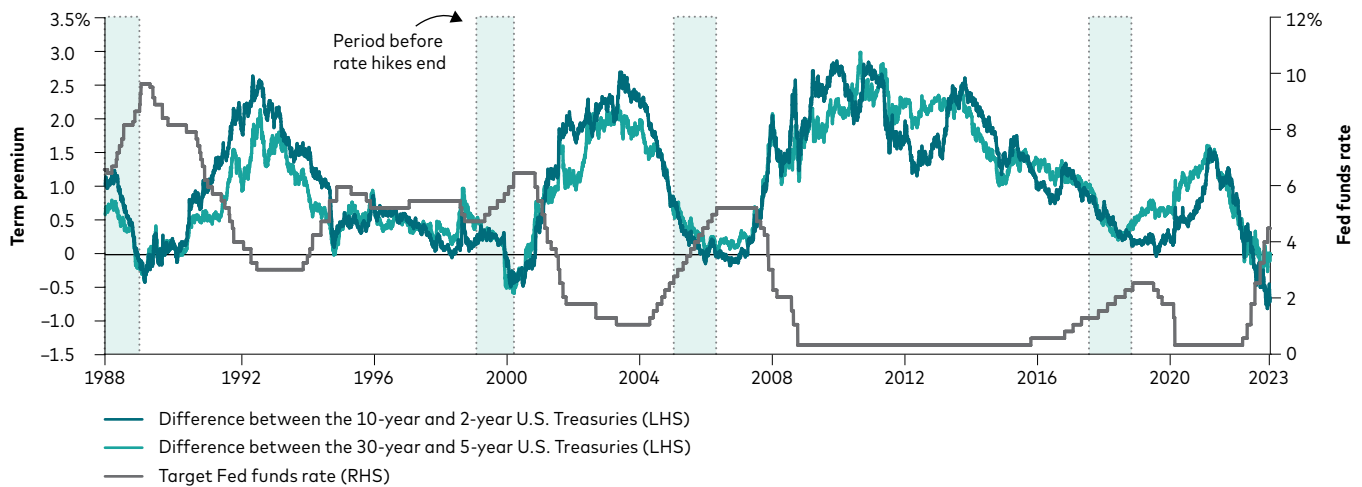
With policy already restrictive, we project the Fed will further step down the pace of hikes to 25 basis points (bps) in February and deliver another 25 bps hike in March, with further moves dependent on how the data evolves. That would push the terminal rate to at least 5%. After a period on hold, with a recession our base case in 2023, we no longer rule out Fed cuts towards the end of the

year if unemployment is rising toward 5%, as we predict, and inflation has declined toward 2%, as markets discount.

The outlook for the Treasury market is much brighter now. Higher yields provide a stronger starting point, although there could be upward pressure on yields if the Fed does follow through on its "higher for longer" message.

Historically, we note that the yield curve starts to steepen several months before the last Fed rate hike of the cycle, which we believe will be in the first half of the year. The outcome is likely a steeper Treasury curve offering more term premium. As we approach the end of the hiking cycle, we are positioned to benefit from the changing shape.

The yield curve tends to start steepening as rate hikes end



Source: Bloomberg data as of January 6, 2023.

International rates

The European Central Bank (ECB) is widely expected to hike rates a full percentage point and begin a quantitative-tightening program in March—dramatic changes for what had been a famously dovish institution.

The significant increase of government bond supply in the euro zone and U.K. will dramatically change the supply/demand dynamics in those markets. We believe this will place upward pressure on European yields and, as a knock-on effect, Treasury yields.

More significant is the potential for a pivot by the Bank of Japan (BOJ). Governor Haruhiko Kuroda surprised markets in December by increasing the cap on the 10-year Japanese government bond (JGB) to 0.50%. Overnight, the 10-year JGB yield surged more than it had in almost two decades, approaching the top of the new policy band, while the yen rose more than 4% against the U.S. dollar.

We believe, as the market does, the BOJ is likely to abandon its yield-curve control policy at some point, which will have implications throughout the fixed income world.

Japanese savers stay close to home

Japan's interest rate decisions are important because the Land of the Rising Sun remains the largest holder of U.S. Treasuries. But because the cost of currency hedging had become prohibitive to Japanese investors, Japan began reducing its Treasury holdings after July.

Higher JGB yields and a stable (and potentially stronger) yen make JGBs even more attractive to domestic Japanese investors, likely further reducing Japanese demand for foreign fixed income, including Treasuries. Japanese households—who have long sent their savings overseas in search of yield—may finally be able to park their money at a local bank.

Risks to the outlook

There are risks to any rates outlook. The path of U.S. inflation remains unknown, and there is a substantial chance that wages will remain high as employers seek to retain valued workers.

While this is not our base case, we could see a Fed, faced with continued wage inflation, forced to raise the federal funds rate closer to 6%. While higher bond yields would help temper investors' pain, the market has not yet begun to price such a possibility.

Government rates: Change in fourth-quarter yield curves



Source: Bloomberg, as of December 31, 2022.

Mortgage-backed securities

Agency mortgage-backed securities (MBS) continue to look attractive. From a valuation perspective, we see the sector as cheap on a relative basis. MBS spread levels rank in the 75th percentile post-GFC and the 60th percentile when comparing to the pre-GFC era.

Technicals in the sector are mixed. We expect MBS net issuance to trend lower as housing activity slows due to high mortgage rates and home prices. Offsetting that, the Fed balance sheet runoff is expected to keep private market supply elevated in 2023—that is, other market participants will need to absorb an additional \$20 billion per month to make up for what the Fed is no longer purchasing.

We expect interest rate volatility to trend lower as the pace of Fed rate hikes slows, which will be a tailwind to the MBS sector broadly.

Implications for Vanguard funds

- We expect interest rate volatility to trend lower as the Fed slows and eventually stops raising rates.
- Valuations look cheap in MBS and should benefit from further stability in rates.
- We anticipate the yield curve to flatten and then steepen throughout the year, and we will continue to position accordingly.

Credit markets

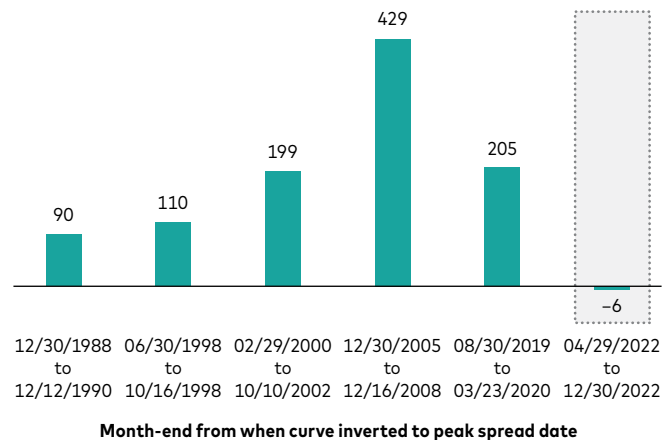
Credit markets enjoyed an end-of-year boost from a slowdown in the Fed's pace of rate hikes. Scant new issuance, more attractive yields, and a return of investor flows also contributed to the rally.

However, we expect the market to shift its attention away from rates and inflation concerns in the first half of this year and toward the effects of a global recession on credit fundamentals and performance.

Credit sector spreads do not yet reflect the late-cycle conditions we see. We've steadily upgraded the credit-quality mix across our portfolios and added liquidity to combat what we expect will be a challenging environment for risk assets. The range of possible outcomes is wide, but 2023 should offer significant opportunities for sector and security selection.

Credit spreads have remained steady

Peak spreads after curve inversion compared with current market (bps over Treasuries)



Notes: Moody's seasoned Baa corporate bond yield relative to the yield on 10-year Treasury constant maturity, percent, daily, not seasonally adjusted.

Source: Federal Reserve data as of December 31, 2022.

Investment-grade corporates

Yields on high-grade corporate bonds appear compelling. However, from a credit-spread perspective, we see too little compensation above risk-free Treasuries given the late-cycle risks in the market.

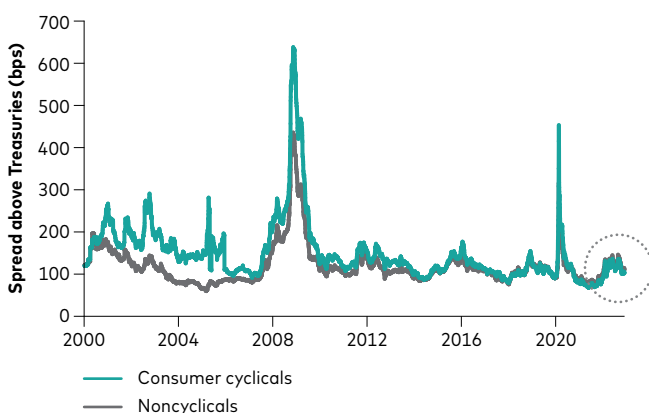
Spreads do have room to widen, but a renewed investor appetite for higher-quality bonds may put a ceiling on how wide spreads could drift.

More downgrades

We expect tighter financial conditions to crimp corporate finances broadly. Rising stars (company upgrades from high yield to investment grade) outpaced fallen angels (downgrades from investment grade) by a wide margin over the past two years. Still, we expect more downgrades in 2023, especially in lower-quality cyclical segments. The depth and duration of any market downturn would determine the impact, but we see that most companies are prepared for a normal recession.

Within a more modest allocation to investment grade, we see value in higher-quality issues within financials, utilities, and noncyclical industries. We prefer noncyclical companies because they tend to retain earnings resilience during economic downturns. Though bonds of cyclical companies can have higher spreads at challenging times, they currently trade in line with noncyclicals, another reason we see noncyclicals as the better bet.

Cyclical and noncyclical spreads remain close with potential recession looming



Source: Bloomberg, as of December 31, 2022.

High-yield corporates

High-yield credit spreads, constrained by a lack of new supply, have held within a range that we consider fair to expensive. Higher borrowing costs and elevated market volatility kept many issuers away last year, which dropped issuance to its lowest level since 2008.

Meanwhile, flows turned positive late in the year as the index-level yield approached 10%, helping push spreads even tighter. In our view, the full scope of the economic slowdown is not currently reflected in prices.

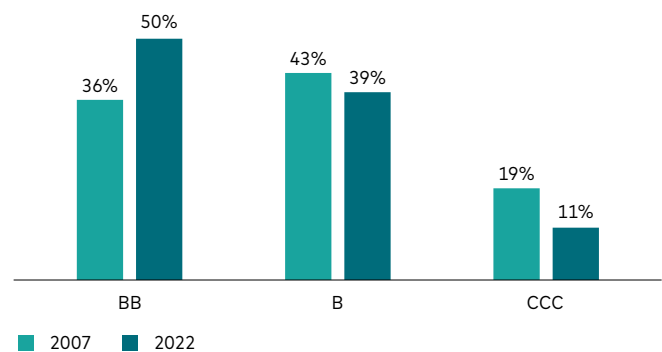
Better quality

Overall credit quality in high yield is much higher than in years past. Half of all bonds below investment grade are rated BB, and only 11% are rated CCC.

Corporate fundamentals are weakening, but they started from a strong base. Many issuers took advantage of the low-yield environment of the last few years to shore up funding needs, leaving little need for market access this year.

High-yield credit quality has improved since the global financial crisis

Credit quality breakdown of high-yield market (% market value)



Source: Bloomberg, as of December 31, 2022. Numbers may not add up to 100 due to rounding.

Default rates to stay low

We expect default rates to continue trending higher, but we do not see a strong case for rates to substantially exceed their historical average of 3%. One area of concern we'll continue to watch is the lower-quality segment of the bank loan market, where "loan-only" issuers are showing signs of stress.

While we remain cautious, we see plenty of potential for risk-taking ahead. Performance dispersion has increased as investors become focused on differentiating across industries and issuers. More than 60% of the high-yield index trades at a price below \$90, which provides a good entry point and cushion against further price declines.

European credit

European investment-grade credit underperformed U.S. corporates in 2022 because of the war in Ukraine and the resulting energy crisis, as well as the end of corporate bond buying by the ECB. Now we see opportunities driven by bottom-up security selection.

In banking, elevated issuance will continue, which could represent an opportunity as the sector is supported by higher interest rates. We also see attractive prices in names with lower cyclicality and strong capital levels. European utilities offer high spread levels.

We also expect higher rates will persuade European insurance companies, which own \$1.9 trillion of corporate bonds—more than half of which is in the euro zone and the U.K.—to tilt their portfolios more toward higher quality and more liquid, investment-grade corporates as a recession develops.

Emerging markets

Some stabilization in U.S. Treasury rates could be a catalyst for emerging markets (EM) inflows. We saw that occur over the last few months of 2022 during a period of light EM bond issuance, and historical data suggest an improving trend. That should bolster the supply/demand picture for EM, as we see another year of net negative supply.

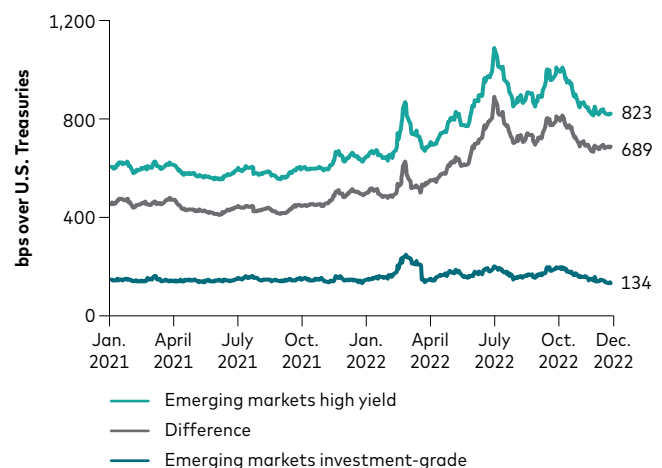
Our more favorable view on the sector late last year benefited from the 125 bps rally in spreads, but it leaves us less constructive today with valuations no longer cheap.

Country fundamentals are broadly stable, but we anticipate significant credit differentiation as the global economy slows down in 2023. This will create opportunities for relative value and active management.

Our preference for higher-quality bonds is balanced by the fact that spreads in investment-grade EM are very tight and additional borrowing is likely. The high-yield segment of EM offers much more compelling valuations but is also the most vulnerable to further economic disruption.

We see 2023 as a market where the best strategy is to be defensive but agile, with enough liquidity to act on new opportunities that arise.

Emerging markets high-yield spreads remain wide



Note: Emerging markets bonds represented by JP Morgan Emerging Market Bond Index Global.

Source: Bloomberg, as of December 31, 2022.

Structured products

Relative to other high-quality segments of fixed income credit, asset-backed securities (ABS) and commercial mortgage-backed securities (CMBS) looked attractive in the fourth quarter. The largest headwind in 2022 was the steady pressure of short-duration bond fund outflows. If those flows reverse this year, spreads could be carried lower.

We expect ABS and CMBS to perform well this year, led by the higher-quality and higher-liquidity portions of the asset class, where we have been increasing positions.

U.S. consumers remain resilient. Low credit card charge-off rates and auto-related delinquencies are in line with what we observed during the pre-COVID era. In CMBS, we're focused on the refinancing risks of a higher borrowing cost environment, particularly with the lingering impacts of COVID.

The idiosyncratic nature of the sector requires a firm understanding of the underlying collateral and deal structures. We see that focus on bottom-up research as an important source of value in the coming quarters.

Implications for Vanguard funds

- Higher-quality bonds are best positioned for a challenging 2023, with opportunities to add risk expected as the year progresses.
- Investment-grade corporates broadly remain expensive. We prefer financials, utilities, and noncyclical industries.
- Emerging markets should be bolstered by stabilized rates, inflows, and reduced supply.

Municipal bonds

A new year should bring a turning tide

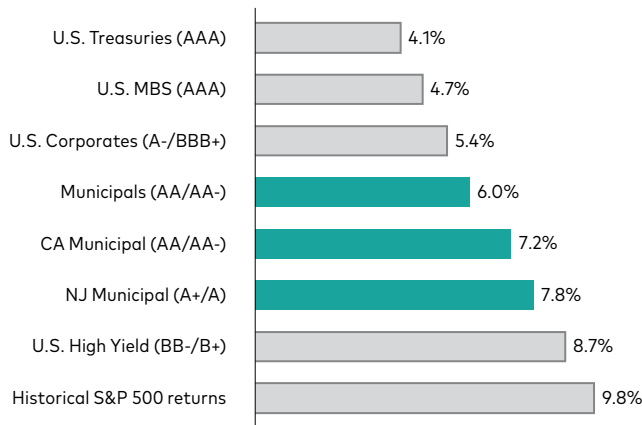
With the Fed making significant progress in hiking interest rates, headwinds should moderate in 2023. Following a year with \$119 billion of outflows from municipal funds and ETFs, we expect the tide to turn.

After all, if individual investors and advisors had allocations to municipals with yields barely over 1% at the beginning of 2022, then they should now salivate at the prospect of yields exceeding 3% (before adjusting for tax benefits). With tax-loss harvesting opportunities ending, we expect that high-earning investors will be motivated to increase their tax-exempt holdings over time. Higher yields not only mean greater income but also greater portfolio stability if a deeper recession transpires.

The tax-exempt primary bond market was busy at the start of 2022, but higher rates stunted the pace of issuance later on, consistent with our forecast. The supply picture going forward is uncertain, as usual, yet future issuance will likely remain subdued as the cost of borrowing is higher and municipal balance sheets are still flush with cash from pandemic-era stimulus.

Both inflows and lower supply should support municipal valuations in 2023. The quick 4.1% rally in the fourth quarter indicated that these effects are underway. The rebound may lure more investors back with attractive yields and reduce the possibility of negative returns this year. With tax-equivalent yields of 6.0% (or meaningfully higher for residents in high-tax states who invest in corresponding state funds), municipals offer great value compared with other fixed income sectors and potentially even equities—especially with the odds of a recession increasing.

Tax-equivalent municipal yields continue to reign



Notes: Tax-equivalent yield is calculated using a 40.8% tax bracket, which includes a 37.0% top federal marginal tax rate and a 3.8% net investment income tax to fund Medicare. The California and New Jersey tax-equivalent yield calculations include the highest state income tax bracket in those states. Historical S&P 500 returns are that index's annualized 20-year return as of December 31, 2022.

Sources: Bloomberg indexes, using yield-to-worst data as of December 31, 2022.

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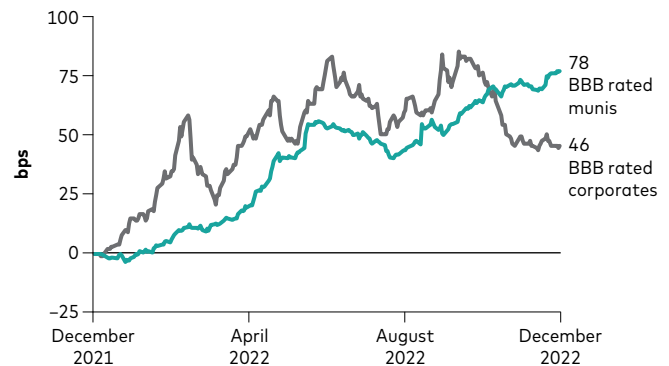
Alpha prospects shift from rates to credit selection

While 2022 price movement was almost entirely driven by rates and technicals, fundamentals and credit selection will come to the fore in 2023. Investors who might be wary of a broader municipal credit sell-off in recessionary conditions should know that last year's outflow cycle already drove spreads wider.

For instance, BBB municipal spreads more than doubled in 2022, from 61 bps to 139 bps. Compare this with BBB corporates, where spreads only rose from 121 bps to 159 bps even with a much more substantial default history.

This movement in tax-exempt credit spreads was more technically driven, as it occurred with municipal balance sheets stronger than they've been in two decades and rainy day funds at all-time highs, leaving states well prepared to weather an economic slowdown or contraction.

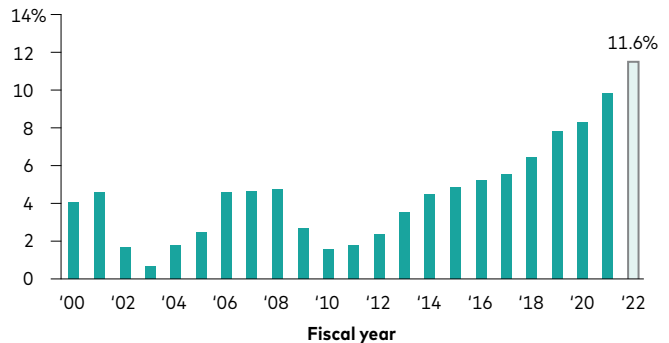
Change in spreads in 2022



Note: Chart represents change in yields above U.S. Treasuries of similar duration for U.S. corporate bonds, and the difference in yields between AAA and BBB rated segments of the municipal market.

Source: Bloomberg data as of December 31, 2022.

States' rainy day funds



Notes: State fiscal years typically run from July 1 to June 30. Rainy day funds are shown as a percentage of general fund expenditures. The percentage for FY 2022 is estimated as of October 18, 2022.

Source: Pew Charitable Trusts.

Thus, we believe the municipal bond market has already *broadly* priced in a recession. Unlike prior economic contractions, this time it will be downgrade activity that *catches up* to current spread pricing—not the other way around.

As always, there will inevitably be winners and losers. But an environment like this this is where 1) diversification should preserve value and 2) expert credit selection can find opportunities to outperform the market.

Implications for Vanguard funds

- Expect a more positive return environment for municipals in 2023 and beyond.
- Intermediate- and long-term municipal bonds should provide both higher levels of tax-exempt income and the diversification potential that investors traditionally covet in their fixed income allocations.
- Municipal credit remains strong, and spreads are attractive compared with corporates.

Vanguard Capital Markets Model®

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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.

Active fixed income at Vanguard

		Admiral™ Shares or ETF ticker symbol	Expense ratio*
Vanguard active bond funds or ETFs	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-Plus Bond	VCPAX	0.20
	Intermediate-Term Investment-Grade	VFIDX	0.10
	Long-Term Investment-Grade†	VWETX	0.12
	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		
	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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32 years' experience



Roger Hallam, CFA
Global Head of Rates
22 years' experience



Paul Malloy, CFA
Head of U.S.
Municipals
17 years' experience

Taxable bond \$234B AUM <small>16 FUNDS/ETF**</small>	Municipal bond \$203B AUM <small>5 NATIONAL FUNDS / 7 STATE-SPECIFIC FUNDS</small>
---	--

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 December 31, 2022.

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

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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. 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.

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.

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.

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