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Municipal market update

31 October 2022

2022 municipal market themes

Economic environment	
Inflation	Inflation remains hard to predict and has likely peaked, but may still be above the Fed's target.
	Further uncertainty has been posed by geopolitical events.
Policy	Fed funds rate has risen by 375 bps in 2022, with more rate hikes expected.
	Fed's policy shift is fully discounted by markets.
Economic growth	U.S. growth is softening due to higher interest rates and fiscal tightening.
Interest rates	Rates remain volatile, and the path of rates depends on inflation.

Municipal market environment	
Valuations	Long-term municipal valuations are attractive compared to similar U.S. Treasuries.
Credit fundamentals	Credit remains strong, with historic levels of revenue collections and rainy day funds.
	Attractive spreads plus sound credit conditions offer an appealing entry point for high yield municipals.
	Defaults remain rare and idiosyncratic.
Supply & demand	Supply is lower than last year due to less taxable municipal issuance from refunding.
	Fund outflows continue to pressure municipal performance.

Fed is reducing monetary policy accommodation

Fed policy has been operating on two axes:

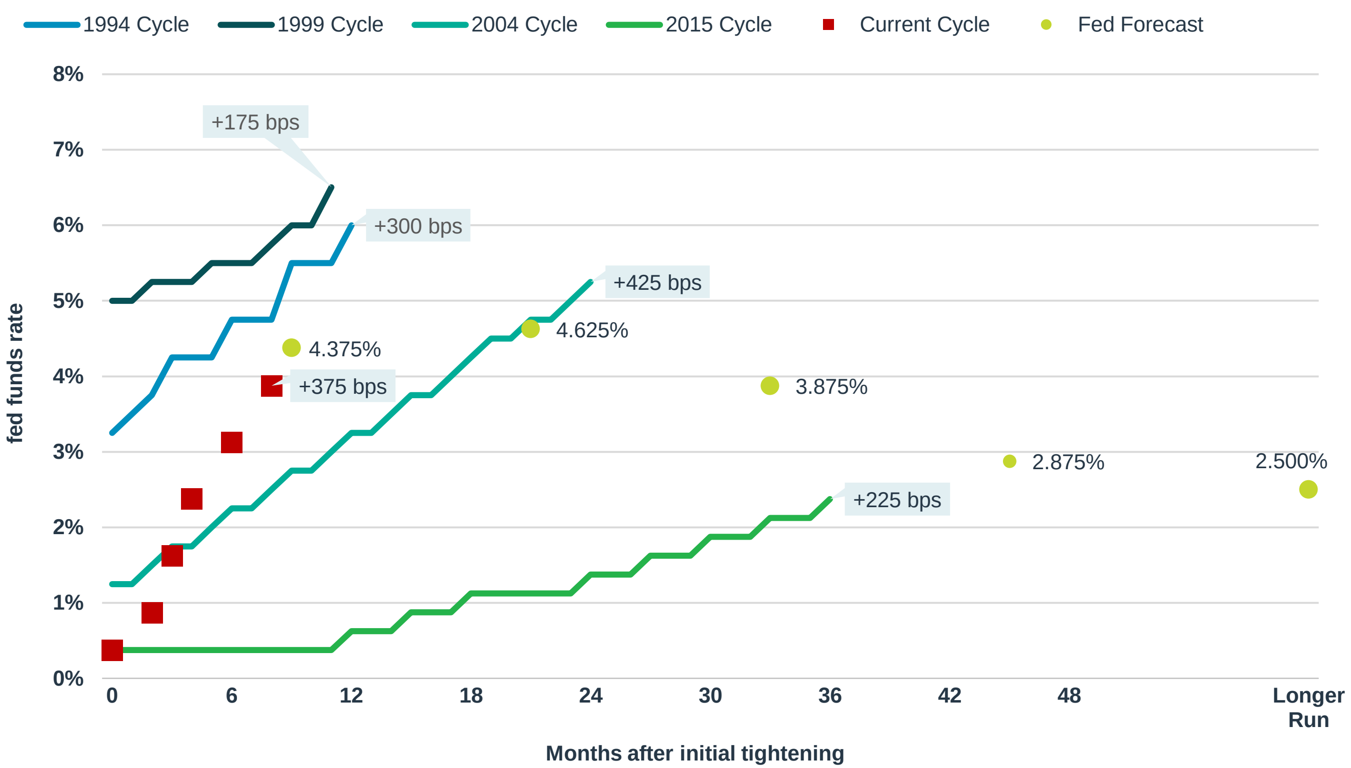
Rate hikes:

- The Fed hiked rates by 75 bps at the November FOMC meeting
- We expect a 50 bps hike in December, followed by 25 bps hikes in first quarter of 2023
- Beyond that, the market is pricing loosening of policy, and possible rate cuts

Balance sheet reduction:

- Reached maximum monthly rate in September, with caps of $60 billion in Treasuries and $35 billion in MBS

Path of fed funds target rate compared to past cycles



Data sources: Bloomberg; Federal Reserve Projection Materials. Fed funds rate and Fed forecasts as of 02 Nov 2022. Fed forecast represents the median forecast of each Federal Open Market Committee participant for the midpoint of the fed funds rate at year ends 2022, 2023, 2024 and longer run. Month 0 shows first rate increase. A basis point is a common unit of measure for interest rates and other percentages in finance. One basis point is equal to 1/100th of 1%, or 0.01% (0.0001).

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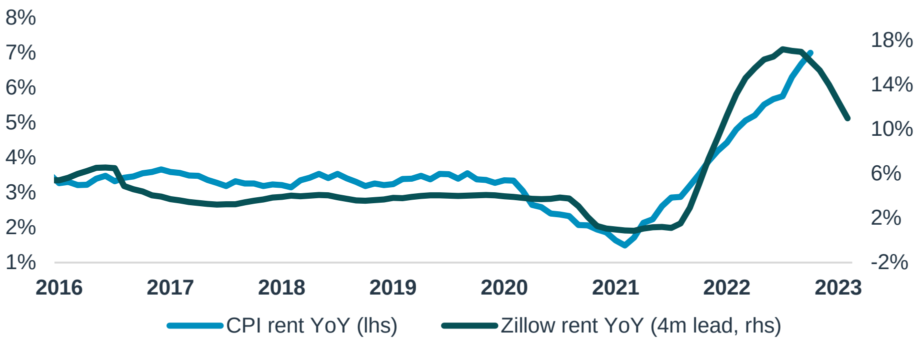
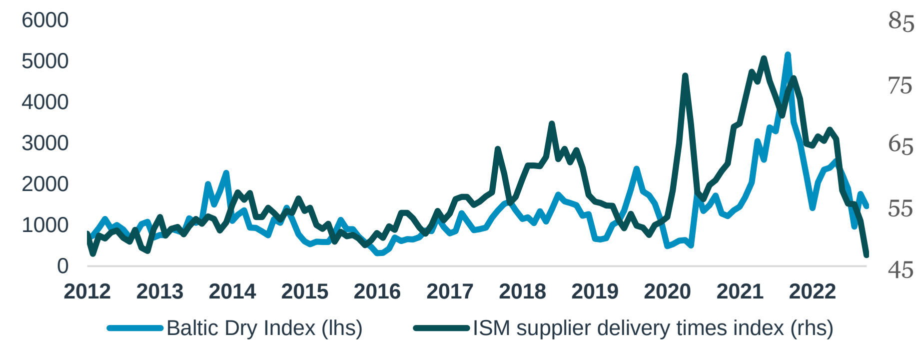
Inflationary pressures are easing, supporting the case for lower yields in 2023

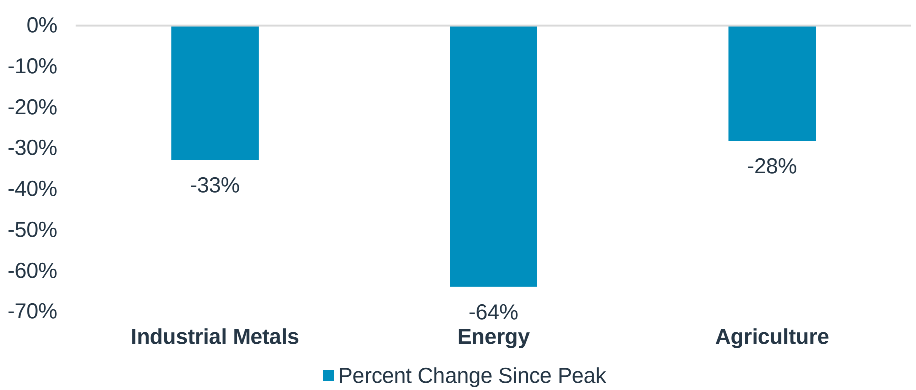
High-frequency indicators point to slower rental inflation ahead



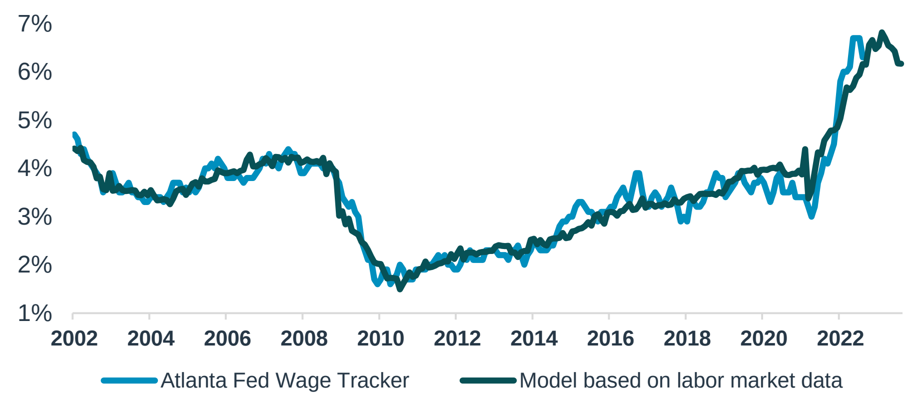
Supply chains (shipping costs, times) are back to pre-covid levels



Commodity prices have broadly fallen since peaking earlier this year



Wage growth is high, but leading indicators point to moderation ahead



Data sources: Bloomberg, BLS, Zillow, ISM, Federal Reserve Bank of Atlanta, as of 31 Oct 2022.

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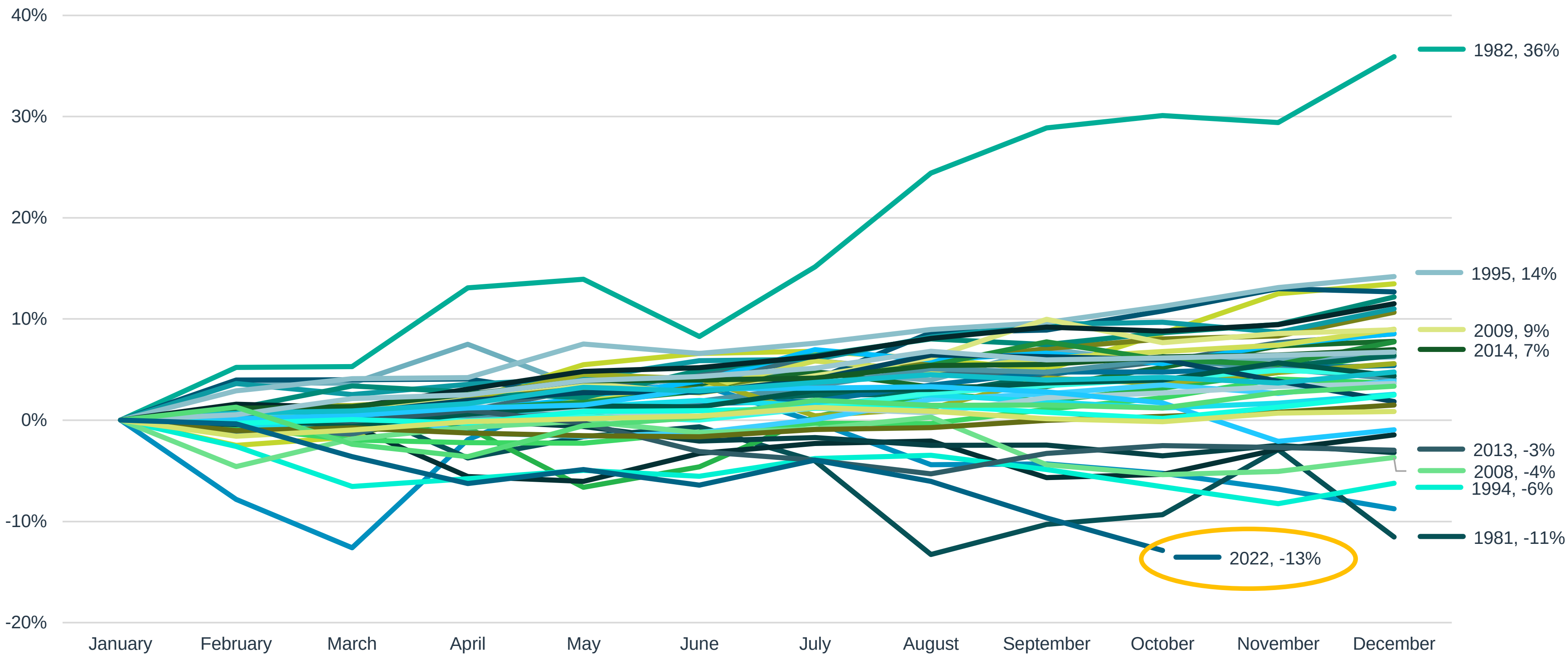
2022 is one for the history books

Municipal markets have experienced the worst year since 1981.

Bloomberg Municipal Bond Index performance, calendar year path



Data source: Bloomberg, L.P., 01 Jan 1980 – 31 Oct 2022; cumulative returns for each calendar year, shown monthly. **Past performance does not predict or guarantee future results.**

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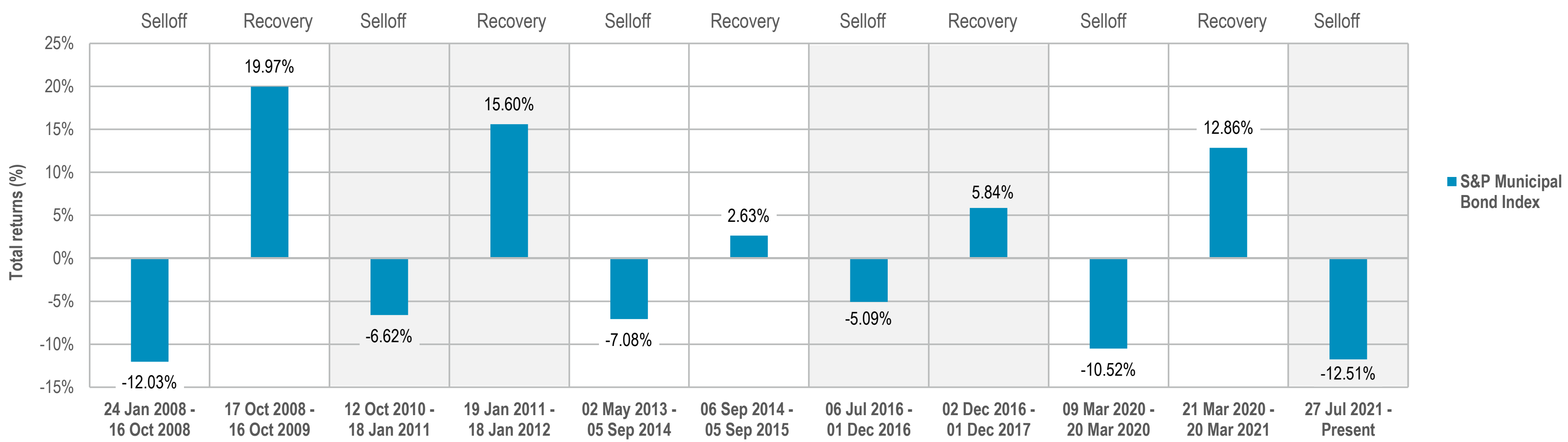
Municipal market has generally bounced back within one year after major downturns

Municipal performance during selloffs and subsequent 1-year recoveries

S&P Municipal Bond Index total returns



Data source: Morningstar Direct. Data shown applies to the actual time periods noted in the table. **Performance data shown represents past performance and does not predict or guarantee future results.** The drawdown time periods are based on periods where the S&P Municipal Bond Index declined 5% or more. The recovery periods are the 1-year period from the trough. Data shown is based on the most recent data provided to Morningstar by asset managers, which may be modified based on Morningstar's methodology and is subject to change.

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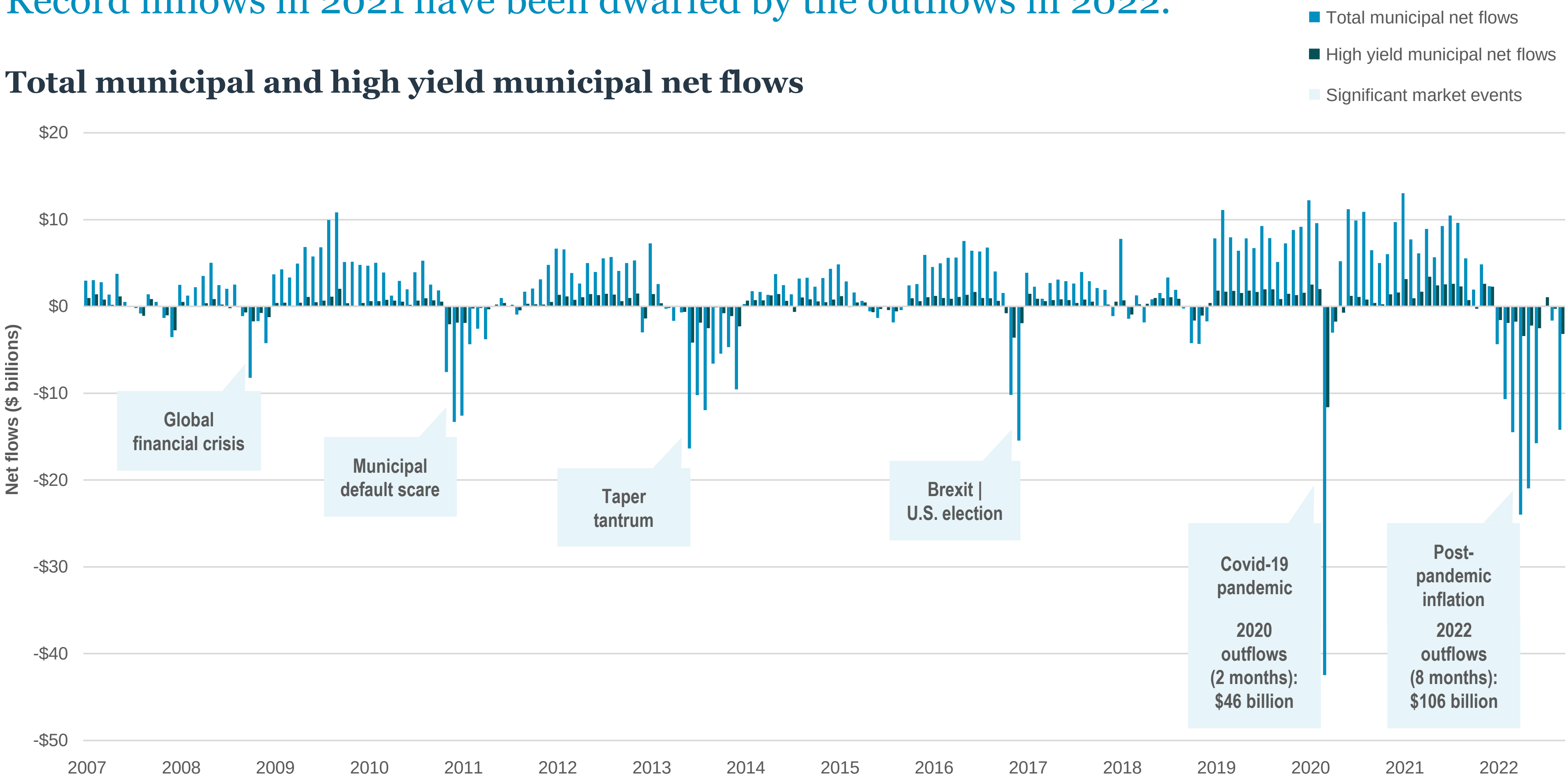
Municipal fund flows have historically returned after market dislocations

Record inflows in 2021 have been dwarfed by the outflows in 2022.

Total municipal and high yield municipal net flows



Data source: Morningstar Direct, 01 Jan 2007 – 30 Sept 2022, shown monthly. Industry categories: **Municipals** represent the total of all all municipal bond open-end funds, including high yield**; High yield municipals** represent all high yield municipal bond open-end funds. Shading represents significant market events.

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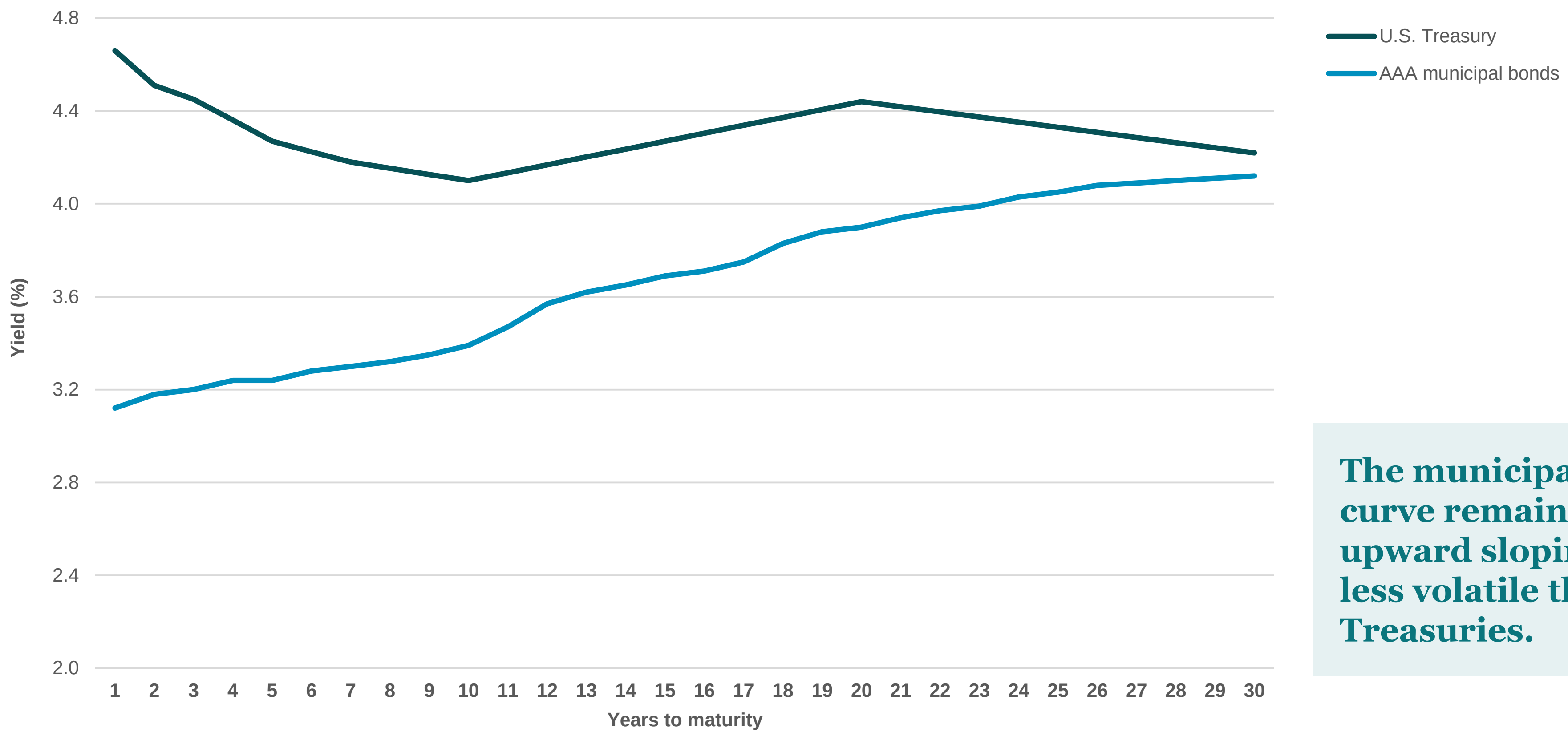
Markets are concerned about inflation and a more aggressive Fed rate increase cycle

U.S. Treasuries vs. AAA-rated G.O. municipal yield curve



The municipal yield curve remains upward sloping and less volatile than Treasuries.

Data sources: U.S. Department of the Treasury; Refinitiv MMD, 31 Oct 2022. **Past performance does not predict or guarantee future results.** AAA municipals represented by Municipal Market Data (MMD) scale**.**

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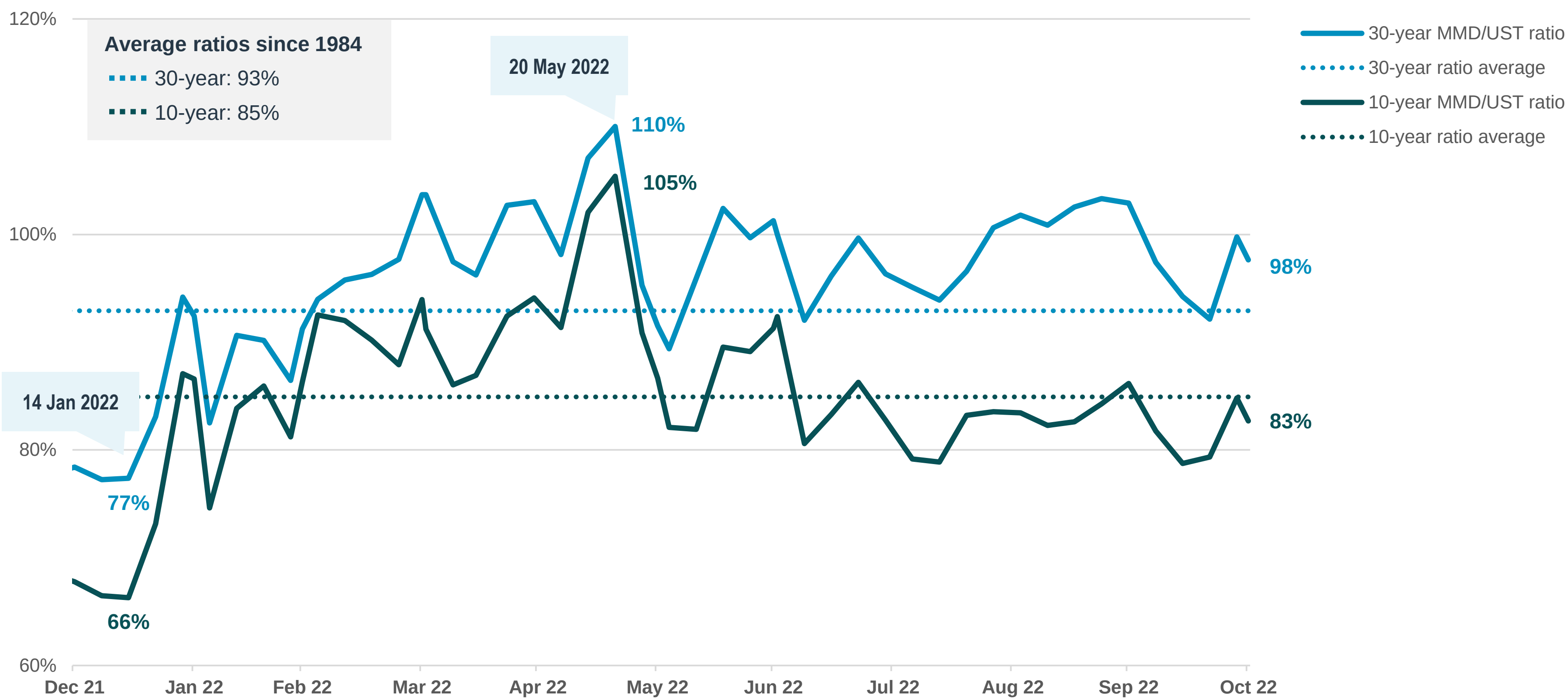
Municipal-to-Treasury ratios have moderated, but the long end of the curve remains attractive

AAA municipal's value relative to Treasuries



Data source: Refinitiv MMD for fair value Municipal 10- and 30-Year Index AAA General Obligation bonds; Bloomberg for 10- and 30-year U.S. Treasury yields, shown weekly, 31 Dec 2021 – 31 Oct 2022, averages shown from 01 Jan 1984 – 31 Oct 2022. **Past performance does not predict or guarantee future results.** Municipal-to-Treasury ratio represents the value of AAA municipal yields relative to U.S. Treasury yields.

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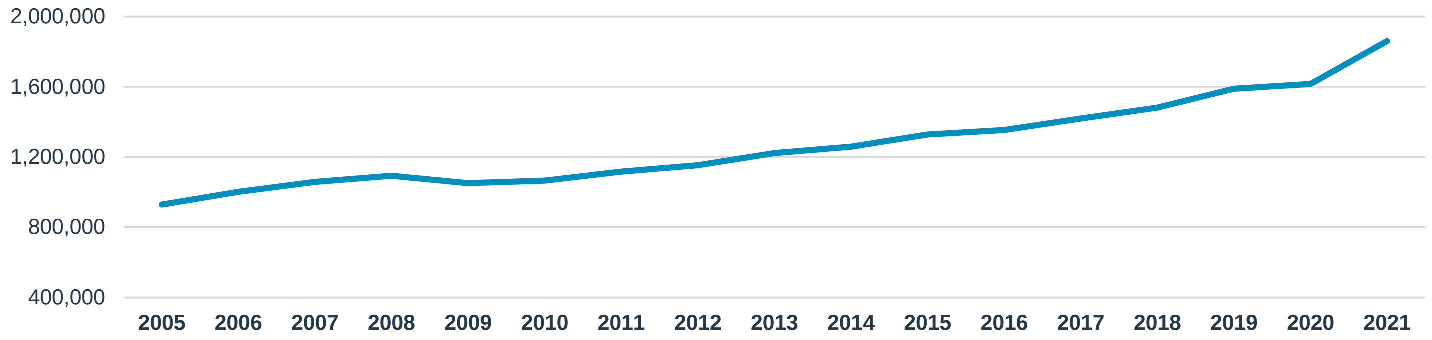
Municipalities are in a strong financial position

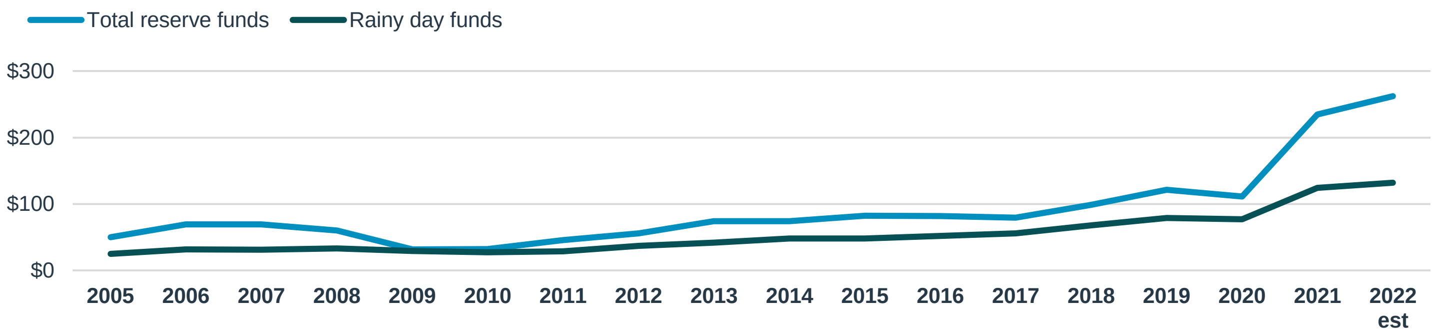
Revenue collections and reserve levels are the highest in more than 40 years.

State & local government tax revenue collections ($)[1]



2021 state revenues rose by 17%, the highest increase dating back to 1979.[1]

State government funds ($ billions)[2]



Total reserve funds in 2022 are $262 billion vs. $11 billion in 1979.[2]

1 Data source: census.gov, 31 Dec 2021.

2 Data source: National Association of State Budget Officers (NASBO), *The Fiscal Survey of States*, Spring 2022.

Municipal bond sectors are resilient in times of uncertainty

Municipal bonds fund essential services such as roads/highways, education, water & sewer, and electric, and many projects are backed by stable revenue sources.

How a potential economic downturn may affect municipal sectors

Low impact	Medium impact	Mixed impact	High impact
• State and local governments • Toll roads • Ports • Airports • Airlines • Charter schools • Public power	• Higher education • Health care • Land secured	• Industrial development revenue/ Pollution control revenue (IDR/PCR)	• Long-term care

Less impact ← → *More impact*

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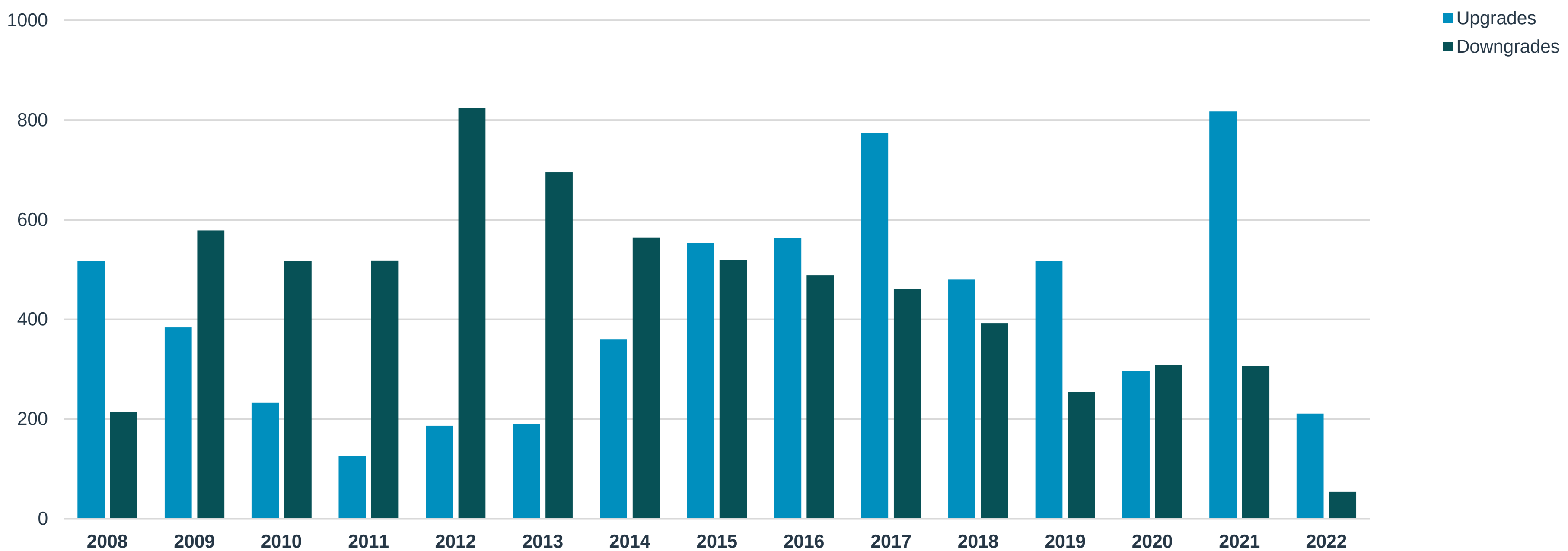
Ratings upgrades have continued to exceed downgrades in recent history

In 2022, credit rating upgrades are exceeding downgrades by approximately 4 to 1.

Number of rating changes for public finance



Data sources: Moody's Investors Service, *Quarterly and Annual Municipal Rating Revisions*, 12 August 2022, data as of 30 Jun 2022; *U.S. Rating Revisions*, 12 August 2022.

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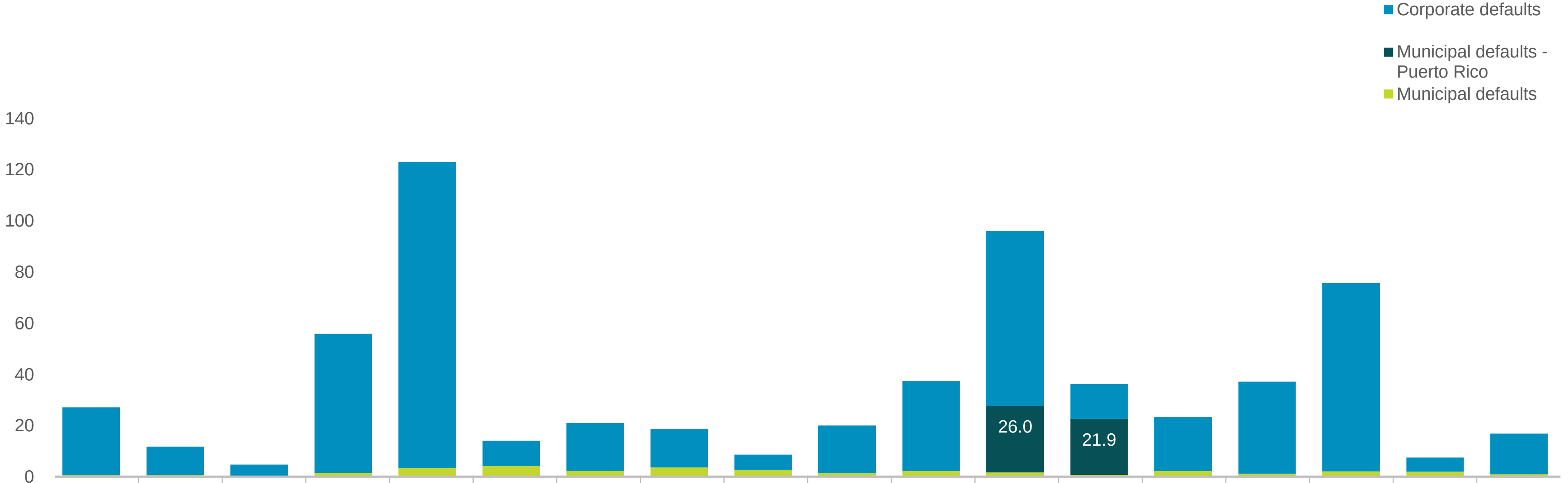
Defaults remain in line with historical trends

Municipal payment defaults ($ billions)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 YTD
Municipal defaults	0.9	0.9	0.2	1.6	3.4	4.3	2.4	3.8	2.8	1.5	2.3	27.8*	22.7*	2.3	1.3	2.2	2.1	1.1
Corporate defaults	26.3	11.0	4.7	54.4	119.8	9.9	18.7	15.0	6.0	18.7	35.3	68.3	13.7	21.2	36.0	73.6	5.6	15.9

Municipal defaults are rare and idiosyncratic. Nursing homes and industrial development bonds have accounted for 54% of municipal defaults in 2022.

Data sources: Bank of America/Merrill Lynch Research, 04 Nov 2022, municipal default data as of 31 Oct 2022. Bank of America/Merrill Lynch Research HY Credit Chart book, corporate default data as of 31 Oct 2022. Data represents defaults on the entire universe of bonds, both rated and unrated, and includes Puerto Rico defaults. * For 2016 and 2017, the figures shown for municipal defaults were primarily from Puerto Rico defaults, which were $26.0B (2016) and $21.9B (2017).

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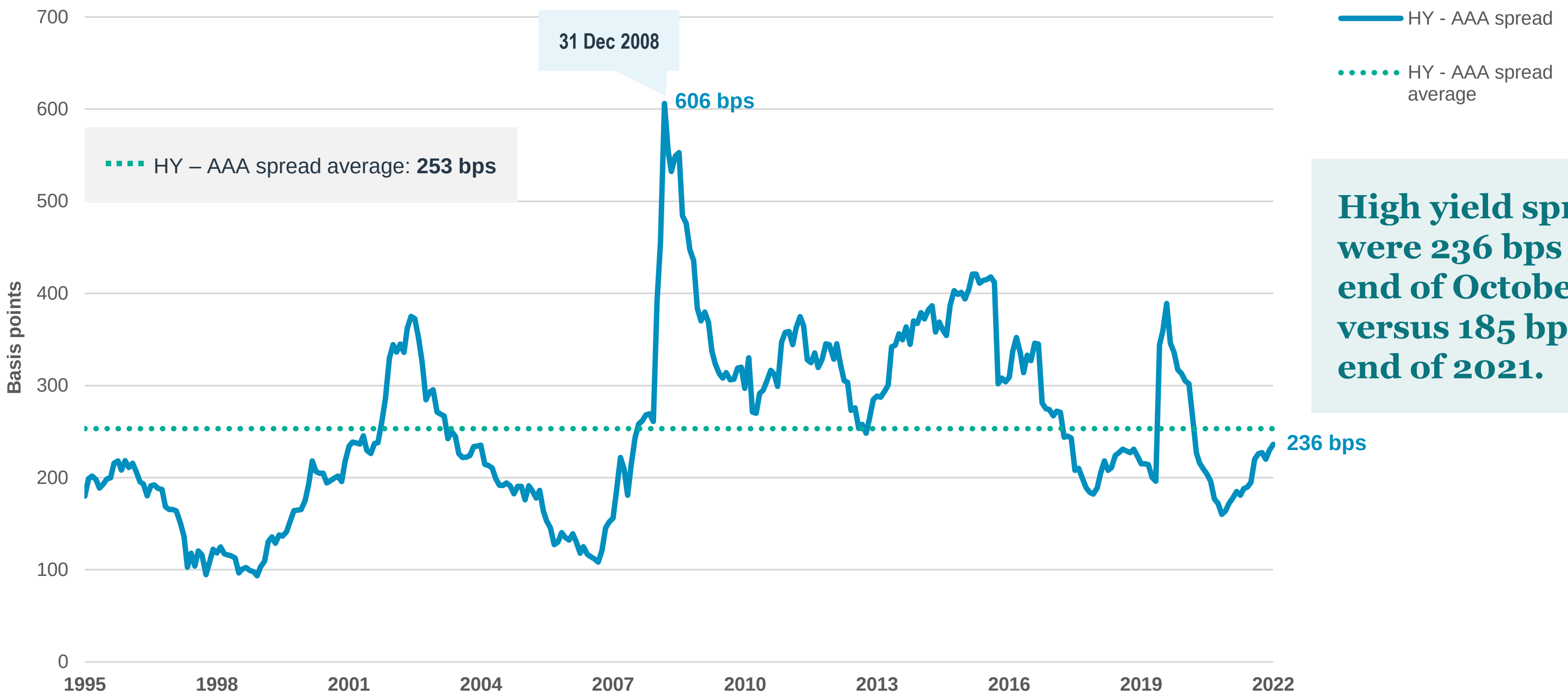
High yield credit spreads have widened slightly since the beginning of the year

Bloomberg High Yield Municipal Index versus AAA yields



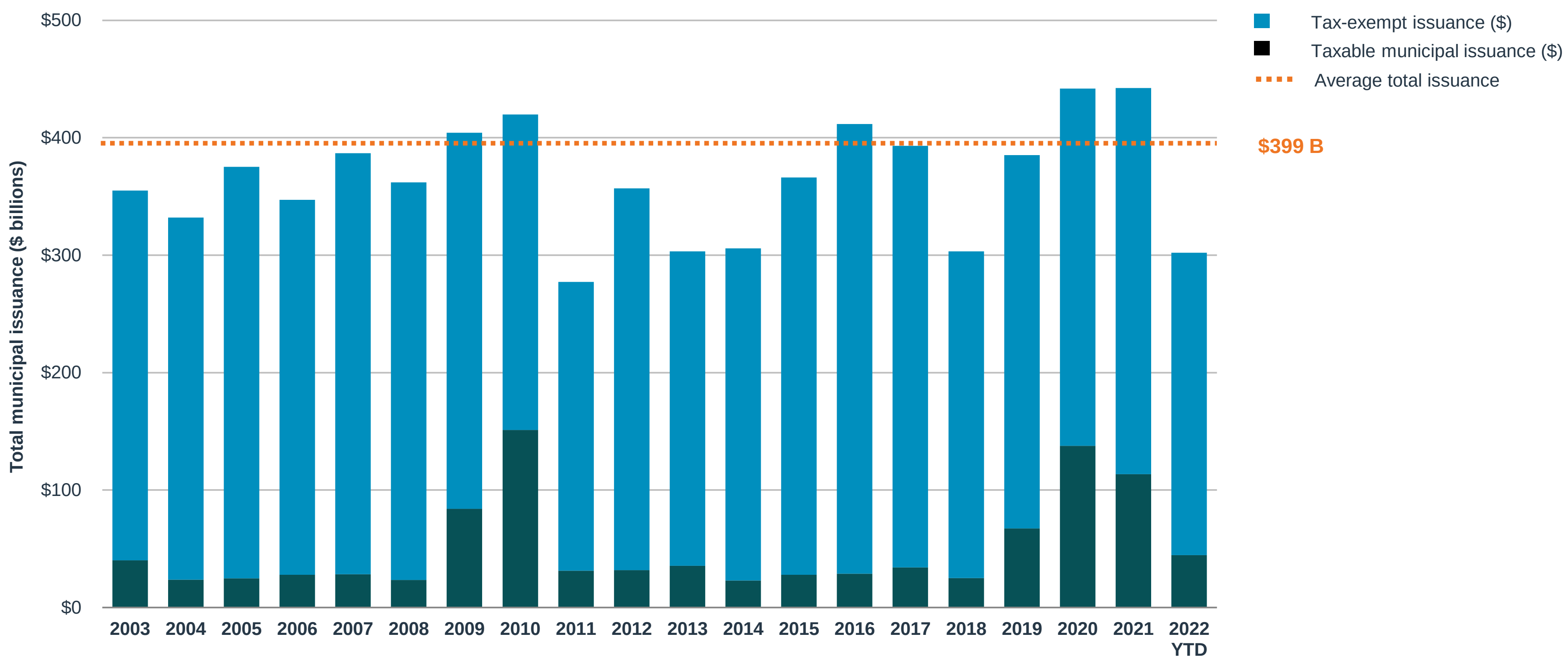
High yield spreads were 236 bps at the end of October versus 185 bps at the end of 2021.

Data source: Bloomberg, Refinitiv MMD, 31 Oct 1995 – 31 Oct 2022, shown monthly. Chart shows data to the earliest period available. **Past performance does not predict or guarantee future results.** High yield municipal yields represented by the Bloomberg High Yield Municipal Index; AAA municipal yields represented by Municipal Market Data (MMD) yields for AAA rated 20-year bonds. High yield or lower-rated bonds and municipal bonds carry greater credit risk, and are subject to greater price volatility. Ratings shown are from S&P and are subject to change. AAA,AA,A, and BBB are investment grade ratings; BB,B, CCC/CC/C and D are below-investment grade ratings. Different benchmarks, economic periods, methodologies and market conditions will produce different results.

Municipal supply is lower than last year; rising rates have dampened refundings

Lower refunding activity has led to less taxable issuance this year.

Municipal issuance



Data source: Securities Industry and Financial Markets Association (SIFMA.org), *U.S. Bond Market Issuance and Outstanding,* 02 Nov 2022 for period ending 31 Oct 2022.
The average total issuance shown is for the period 01 Jan 2003 – 31 Dec 2021.

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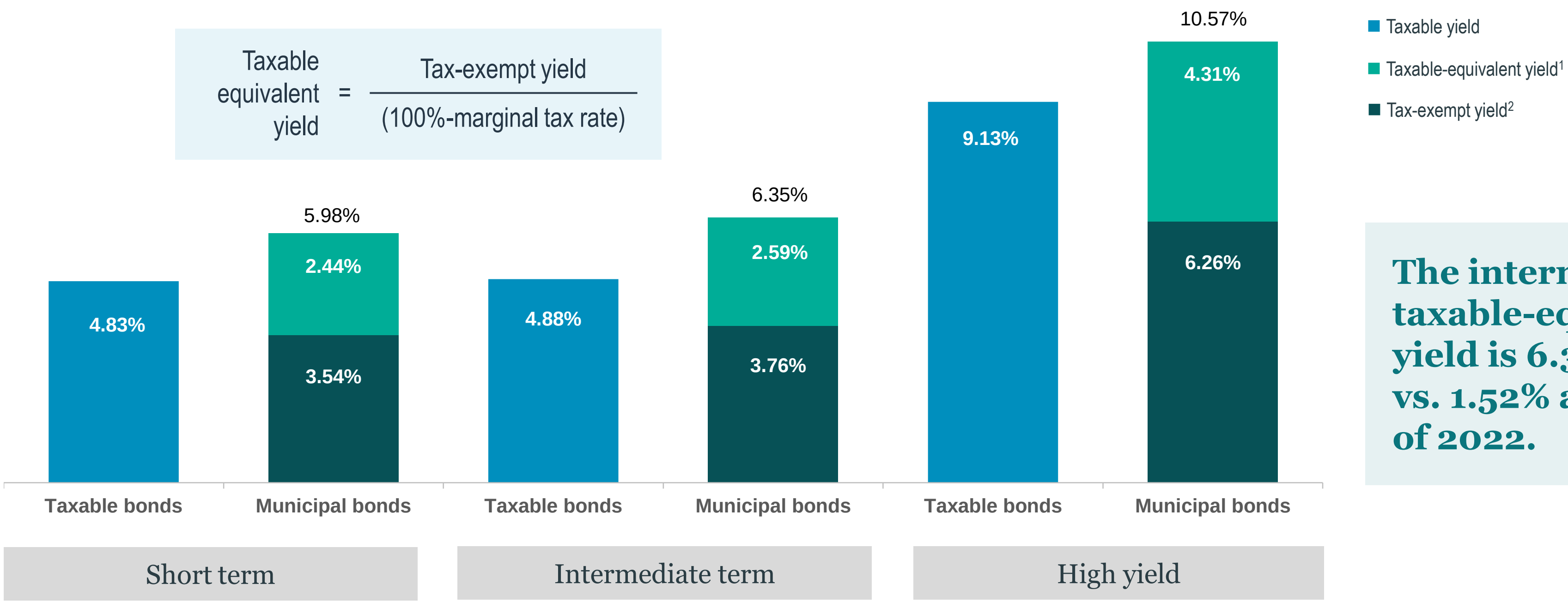
Municipals are attractive on an after-tax basis

Yield comparison

$$\text{Taxable equivalent yield} = \frac{\text{Tax-exempt yield}}{(100\%\text{-marginal tax rate})}$$



The intermediate taxable-equivalent yield is 6.35% today vs. 1.52% at the start of 2022.

1 The taxable-equivalent yield is based on the highest individual marginal federal tax rate of 37%, plus the 3.8% Medicare tax on investment income (the Net Investment Income Tax). Individual tax rates may vary.

2 Some income may be subject to state and local taxes and the federal alternative minimum tax.

Data source: Bloomberg L.P., 31 Oct 2022. **Past performance does not predict or guarantee future results.** Yields are yield to worst. **Yield to worst** is the lowest potential yield that can be received on a bond without the issuer defaulting. **Taxable-equivalent yield** is the yield a taxable investment needs to possess (before taxes) for its yield to be equal to that of a tax-free municipal investment. The yields shown are based on the highest individual marginal federal tax rate of 37%, plus the 3.8% Medicare tax on investment income. Individual tax rates may vary. They do not take into account the effects of the federal alternative minimum tax (AMT) or capital gains taxes. **Representative indexes: Short term taxable bonds:** Bloomberg U.S. Government/Credit 1-5 Year Index; **Short term municipal bonds:** Bloomberg Municipal Short Index; **Intermediate term taxable bonds:** Bloomberg U.S. Government/Credit 5-10 Year Index; **Intermediate term municipal bonds:** Bloomberg Municipal Intermediate Index; **High yield taxable bonds:** Bloomberg Corporate High Yield 2% Issuer Capped Index; **High yield municipal bonds:** Bloomberg High Yield Municipal Bond Index. Different benchmarks, economic periods, methodologies and market conditions will produce different results.

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Which environment seems most likely?

	Rising inflation	Moderating to falling inflation	Recessionary environment
What would the Fed do?	Steeper fed funds rate increases	Shallow fed funds rate increases until Fed determines inflation is under control	Pause in fed funds rate activity and market begins to discount rate cuts
What could happen?	Rising rates Could trigger a recession over a protracted period	Rising but relatively stable rates May lead to an economic slowdown	Stable or falling interest rates May lead to rate decreases if conditions persist
What should fixed income investors consider?	Diversify with shorter duration, risk-off strategies: **Tax-exempt income** • Short/limited term municipals **Taxable income** • Short-term corporates • TIPS • Senior loans	Diversify with credit-based, risk-on strategies: **Tax-exempt income** • High yield municipals **Taxable income** • High yield corporates • Multisector bond • Preferred securities	Diversify with high-quality, risk-off and longer duration strategies: **Tax-exempt income** • Investment grade municipals **Taxable income** • Core • Core plus • Core with ESG/Impact

Source: Nuveen as of 31 Oct 2022. Certain statements may be deemed forward-looking statements. Please note that any such statements are not guarantees or intended to constitute a prediction of any future performance; actual results or developments may differ materially from those projected.

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