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Think You Have Enough Munis . . . Think Again

- All eyes on November
- 84% munis, 16% stocks are optimal allocations
- States, not locals feel shutdown heat, but its ok

Relative Performance

October closed with a standout performance, delivering a three-decade high monthly return of 1.24% for the Bloomberg Municipal Aggregate Index. Attention now shifts to November, a month that historically provides stronger technical support and adds further tailwinds as we head toward year-end. Consider this: the index was down 35 bps through the first half of the year yet now sits up 3.92% year-to-date. This remarkable turnaround in an asset class that checks many investor boxes is a story that continues to resonate, we explain below.

We still do note some weakness on the front end of the tax-exempt AAA curve, with rates in the 3 year portion of the curve rising by 15bps through October, compared to the 15bps decline seen in the long end. We see this as somewhat short lived, since the see-saw effect of portions of the curve creeping ever cheaper inevitably will be met with fund flows looking for any incremental increase in relative value.

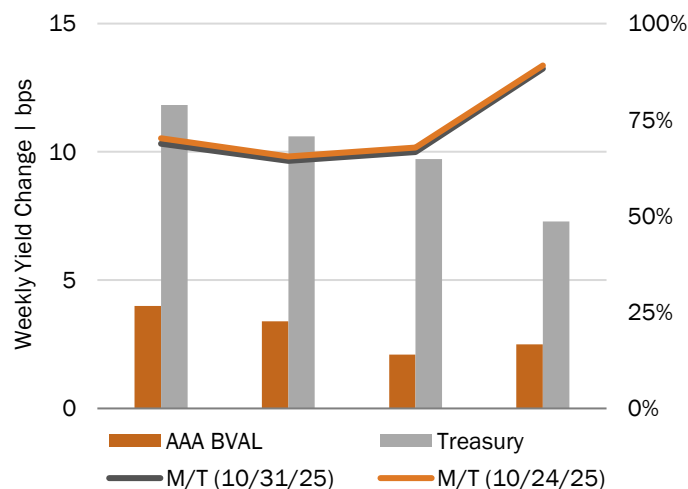
On a weekly performance look, municipals soundly outperformed US Treasuries with notable deltas in yield increases between the two basis curves in every tenor of the yield curve. As such, muni to US Treasury ratios did richen slightly, with the 2-year tenor at 68% appearing cheaper than the 5 year portion of the curve, at 64%.

Technicals

The World Needs More Fixed Income—And We Saw It Coming

At the start of the year, our investment team highlighted a critical imbalance: investors are underexposed to municipals.

FIGURE 1: MUNIS OUTPERFORMED TREASURIES ACROSS THE CURVE



Data as of October 31, 2025. Spot Muni, Spot AA rates
Source: Bloomberg

Household muni holdings are down 2% versus five years ago, while Treasuries and equities have surged 75% and 87%, respectively.¹ We believe reallocation into municipals is overdue—especially with historically high tax-exempt yields.

Now, others are echoing the same theme, with one market participant declaring on Bloomberg TV that “The planet is under allocated to fixed income.”² We wholeheartedly agree!

That last point should frame every client conversation through year-end. With equity valuations stretched tighter than my middle-aged hamstrings, we believe each new high in equities

1. [MacKay Municipal Managers Insights](#), Bloomberg

2. [Bloomberg Surveillance](#), October 29, 2025, 11:08 AM PDT.

only sets the stage for a bigger correction. It is our view that diversification isn't optional—it's essential. Municipals should play a critical role in that effort, let us explain in three different ways.

CORRELATION

If a client is going to be motivated to diversify their portfolio, the case for diversification and risk mitigation should start with correlation. Enter, municipals which have shown to have one of the lower correlation with equities over the past 10 years. (See Figure 2)

NETTING OUT THE NOISE, SHOWS MUNIS SHINE

On a tax-adjusted (using 40.8% federal tax rate, including 3.8% net investment income tax) and risk adjusted basis (Annual return/Volatility) Munis have outperformed S&P in 6 of the last 11 years. In statistical and baseball terms, we call that batting average a success. Risk adjusted returns aside, what is also worth noting is the asymmetry in lower average loss (-0.87%) vs gains (1.25%), when you compare both municipals and stocks. More plainly speaking, Losses tend to be smaller than gains. On average, when things go down, it's about -0.87%, but when they go up, it's around +1.25%. So the upside is bigger than the downside. (See Figure 3 on next page)

MUNIS: THE EFFICIENT FRONTIER

When it comes to optimal portfolio construction, let's go to the tale of the tape for that answer.

Over the 2015–2025 period, municipal bonds (using the ICE Broad Municipal index “MUNI”) delivered an average annual return of about 5.28% with relatively low volatility³ (4.15%), while U.S. equities (SPX) returned roughly 13.6% but with much higher volatility (13.9%), making stocks about 3.4 times more volatile than munis. The assumed correlation between the two asset classes is 0.4 (see CORRELATION above), meaning they don't move in lockstep—providing diversification benefits when combined.

Blending MUNI (stable, tax-efficient) with SPX (higher-return, higher-risk) improves portfolio efficiency. Thanks to imperfect

FIGURE 2: MUNI TO STOCKS—LOW CORRELATION
OCTOBER 1, 2015-SEPTEMBER 30, 2025

	S&P 500
MUNICIPAL BOND	0.4
TAXABLE MUNI INDEX	0.3
HIGH YIELD MUNICIPAL	0.5
U.S. TREASURY	0.1
U.S. AGGREGATE	0.4
U.S. CORPORATE INVESTMENT GRADE	0.6
U.S. CORPORATE HIGH YIELD	0.8
U.S. MORTGAGE BACKED SECURITIES	0.4
PAN-EUROPEAN AGGREGATE	0.5
ASIAN PACIFIC AGGREGATE	0.2
GLOBAL TREASURY EX-U.S.	0.4
JPM GBI (WORLD) USD	0.3
CS LEVERAGED BANK LOAN	0.6
JPM EMBI+	0.6

See index definitions in the disclosures

Source: Bloomberg

correlation, adding a small equity allocation boosts expected returns without a proportionate increase in risk.

Optimization tests⁴ show the best risk-adjusted outcome occurs at 84% MUNI and 16% SPX, yielding:

AVERAGE RETURN	VOLATILITY	RISK-ADJUSTED RETURN
6.72%	4.31%	2.21

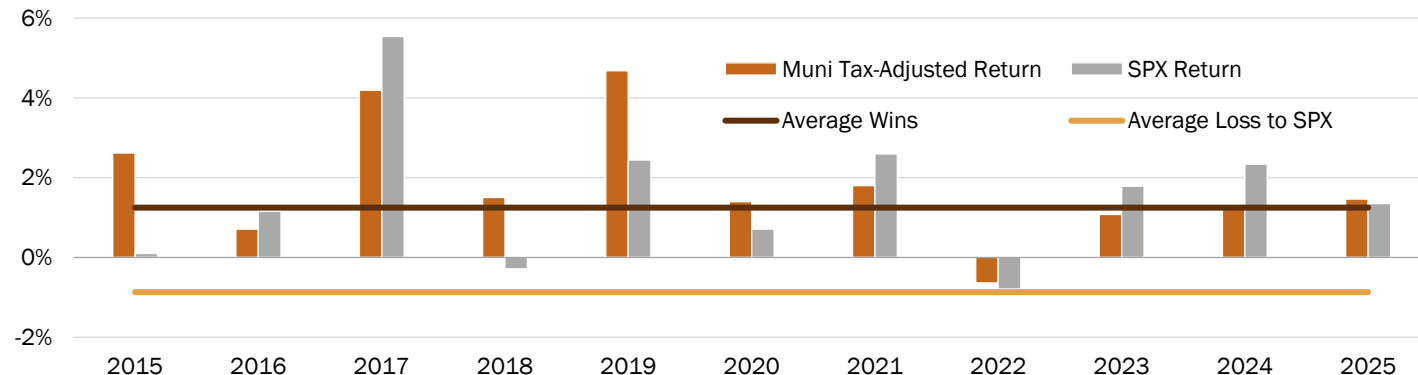
BETTER THAN BOTH ALL-MUNI
AND ALL-SPX PORTFOLIOS

In essence, if you had invested roughly 84% in municipal bonds and 16% in U.S. stocks starting in 2015, your portfolio could have grown steadily and outperformed both an all-bond and all-stock portfolio on a risk-adjusted basis.

3. Volatility is calculated as annualized standard deviation for monthly returns.

4. Excel linear solver was used to find the allocation for the Municipal Bond Index and the S&P500 index, from 2015-Sep 2025. The portfolio allocation constraint was to find highest risk adjusted return. No short sales were allowed. Risk adjusted return is calculated as annual return divided by annualized standard deviation using monthly returns. For illustrative purposes only. Based on ICE and Bloomberg data and asset allocation percentages determined by MacKay Shields. The returns shown above do not represent the returns of any client portfolio or strategy actually managed by MacKay Shields and should not be construed as such. The returns shown are index-based and mathematically calculated based on the percentages shown; MacKay Shields' portfolios are actively managed and would vary from any applicable or benchmarked index. Therefore, the returns shown are not indicative of investment skill. Actual portfolios would be subject to fees and expenses. No fees or expenses were included in the results above. No representation is made as to the accuracy and completeness of information contained in this presentation that has been obtained from third parties. It is not possible to invest directly in an index. Past performance is not indicative of future results. Please see the disclosures and index descriptions at the end of this presentation.

FIGURE 3: MUNI VS. SPX RISK ADJUSTED RETURN



Data as of September 30, 2025

Muni Tax-Adjusted Return: ICE BofA Broad Muni Index; SPX Return: SPX Index

Source: Bloomberg

Questions from the Field

Q With the continuation of the government shutdown, could this have an adverse impact on local governments if it persists much longer

A Local governments are unlikely to experience meaningful financial stress. Even in Washington, D.C., and surrounding Maryland and Virginia municipalities, historical precedent shows that job losses tied to federal shutdowns have not materially disrupted local economies. Property taxes—the primary revenue source for most local governments—are historically slow to react to short-term economic shocks.

States, not localities, sit closer to the front lines during a federal shutdown. While states administer numerous federally subsidized programs, including some without automatic appropriations, the fiscal risk remains limited. The most notable example is the Supplemental Nutrition Assistance Program (SNAP), which provides roughly \$8 billion in monthly food assistance to 42 million Americans. As of early November, SNAP funding has lapsed. (Source: USDA)

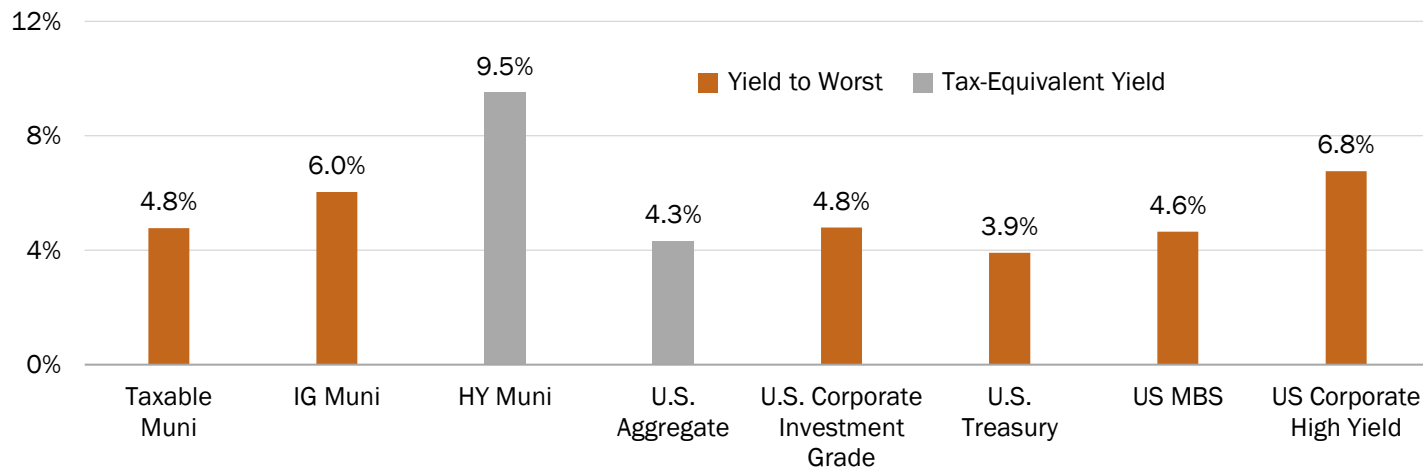
While concerning for beneficiaries, the impact on state finances is muted:

NO STATUTORY OBLIGATION: States are not legally required to provide food security. When federal payments stop, SNAP benefits halt automatically.

VOLUNTARY SUPPORT ONLY: Some states have stepped in, but with caution. Past shutdowns taught them not to expect reimbursement. For instance, New York's largest emergency allocation to date is \$106 million—modest relative to its \$250+ billion FY2024 budget. (Source: New York Governor's Office)

LIQUIDITY OPTIONS: States maintain extensive networks of special funds and restricted accounts, enabling temporary internal borrowing if needed.

INDEX YIELDS

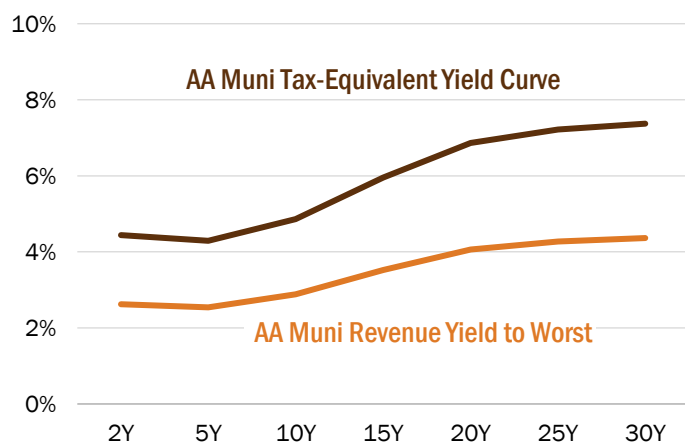


Data as of October 31, 2025.

1. Using 40.8% federal tax rate, including 3.8% Net Investment Income Tax.

Source: Bloomberg

AA MUNI TAX-EQUIVALENT YIELD CURVE

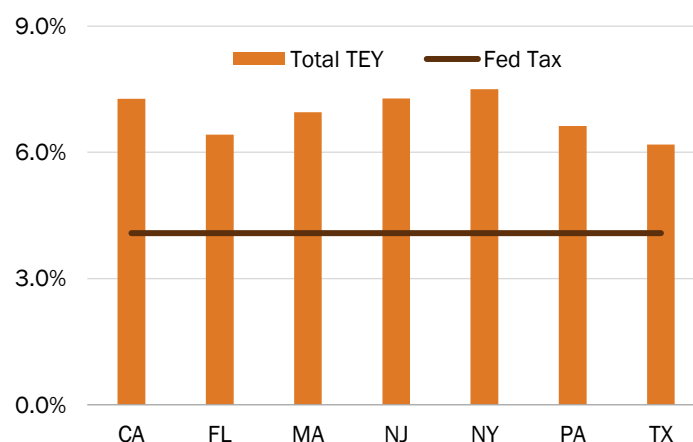


Data as of October 31, 2025.

Using 40.8% federal tax rate, including 3.8% Net Investment Income Tax.

Source: Bloomberg

IN-STATE MUNI TAX-EQUIVALENT YTW

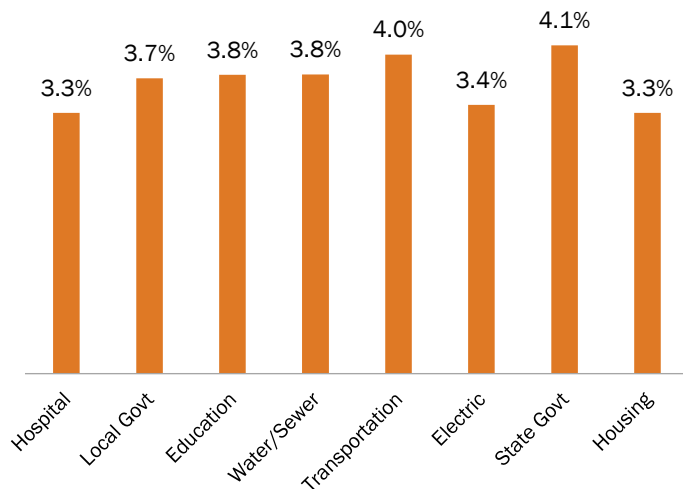


Data as of October 31, 2025.

Using 40.8% federal tax rate, including 3.8% Net Investment Income Tax.

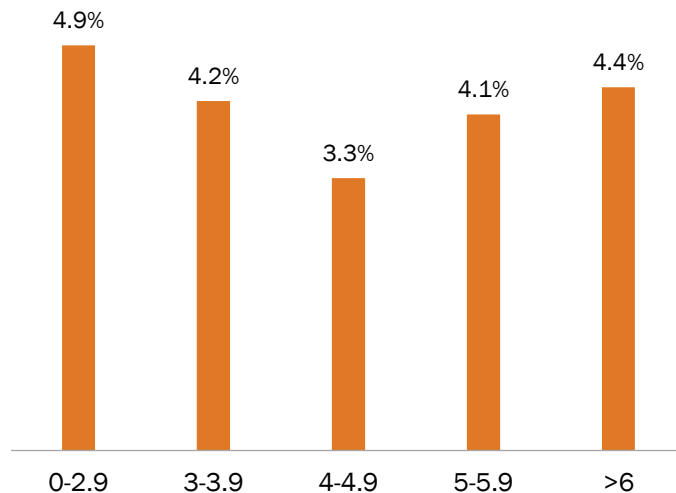
Source: Bloomberg

YTD TOTAL RETURNS BY SECTOR



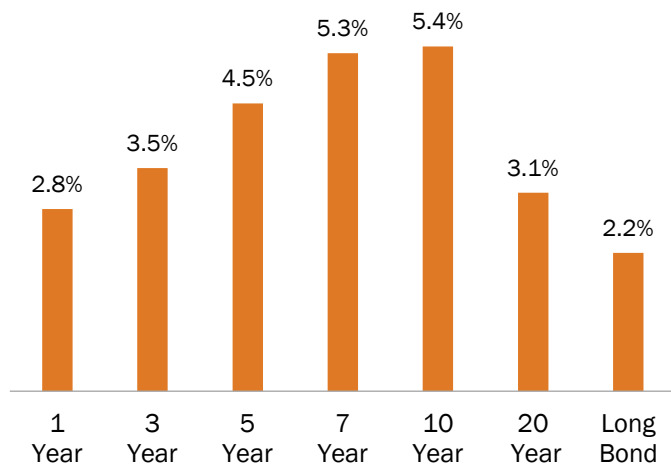
Data as of October 31, 2025.
Source: Bloomberg

YTD TOTAL RETURNS BY COUPON



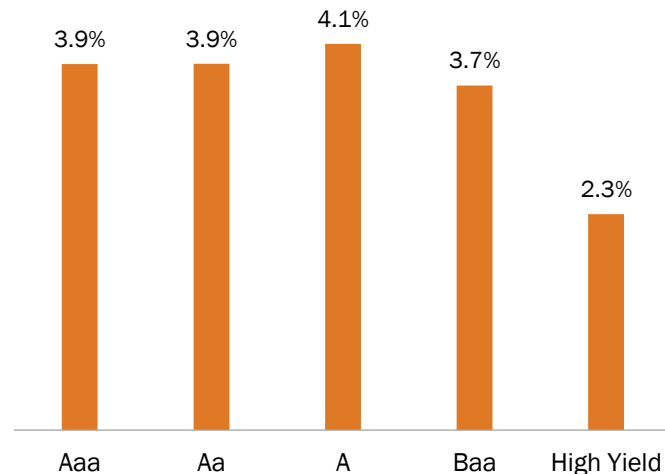
Data as of October 31, 2025.
Source: Bloomberg

YTD TOTAL RETURNS BY MATURITY



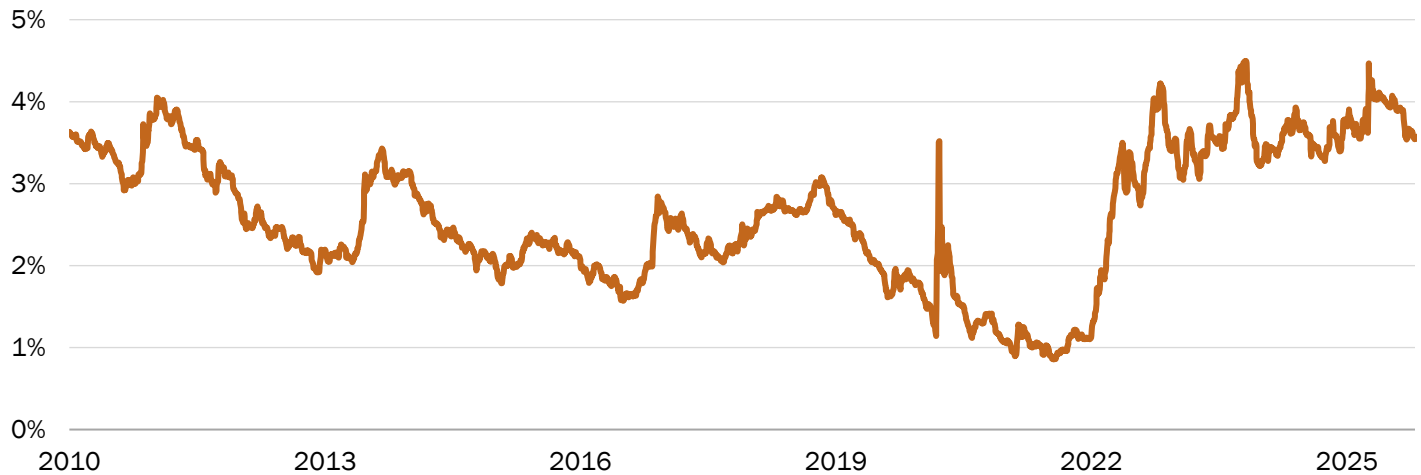
Data as of October 31, 2025.
Source: Bloomberg

YTD TOTAL RETURNS BY RATING CATEGORY



Data as of October 31, 2025.
Source: Bloomberg

BLOOMBERG MUNICIPAL YIELD-TO-WORST



Data as of October 30, 2025.

"Post GFC Average" measures the period from 1/1/2010 – 7/4/2025

Source: Bloomberg

MUNI YIELDS

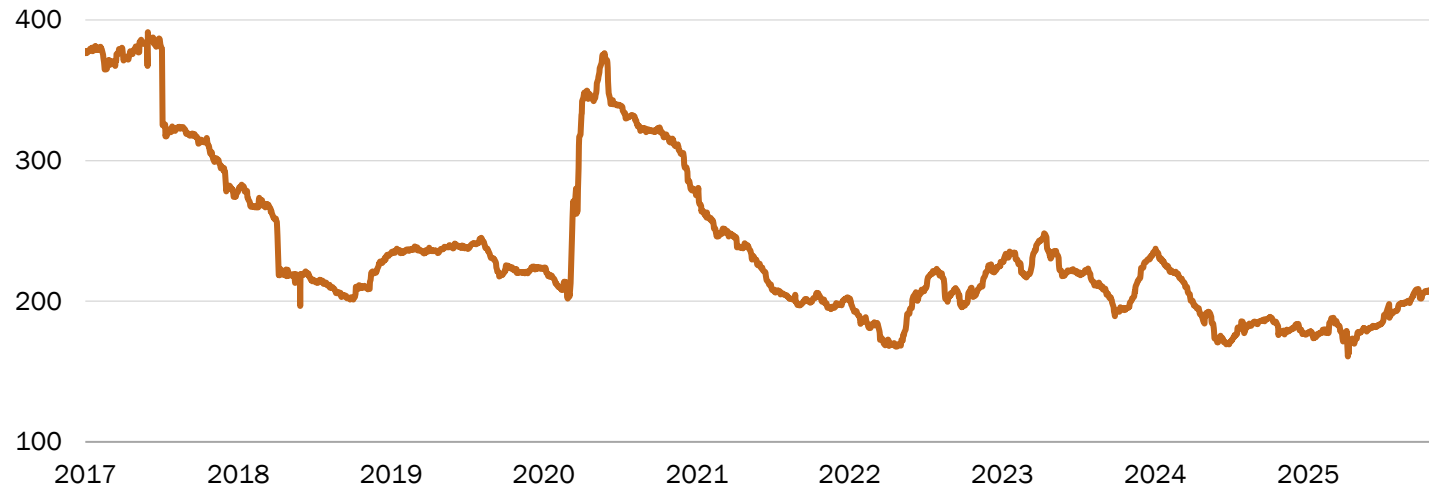
Tenor	10/23/2025	10/30/2025	Change (+/-)
BLOOMBERG AAA MUNI KEY RATE YIELDS			
2 YEAR	2.44%	2.49%	0.04%
5 YEAR	2.36%	2.40%	0.04%
10 YEAR	2.71%	2.73%	0.02%
30 YEAR	4.10%	4.12%	0.02%
US TREASURY RATE YIELDS			
2 YEAR	3.48%	3.61%	0.13%
5 YEAR	3.61%	3.72%	0.11%
10 YEAR	4.01%	4.11%	0.10%
30 YEAR	4.58%	4.65%	0.07%
US TREASURY & AAA MUNI CURVE SLOPES¹			
	2s10s	10s30s	2s30s
US TREASURY CURVE SLOPE	+ 50 bps	+ 54 bps	+ 104 bps
AAA MUNI CURVE SLOPE	+ 25 bps	+ 138 bps	+ 163 bps

Data as of October 30, 2025.

1. 2s10s – is spread between 10yr and 2yr yield; 10s30s – refers to spread between 30yr and 10yr yield; 2s30s – refers to spread between 30yr and 2yr yield

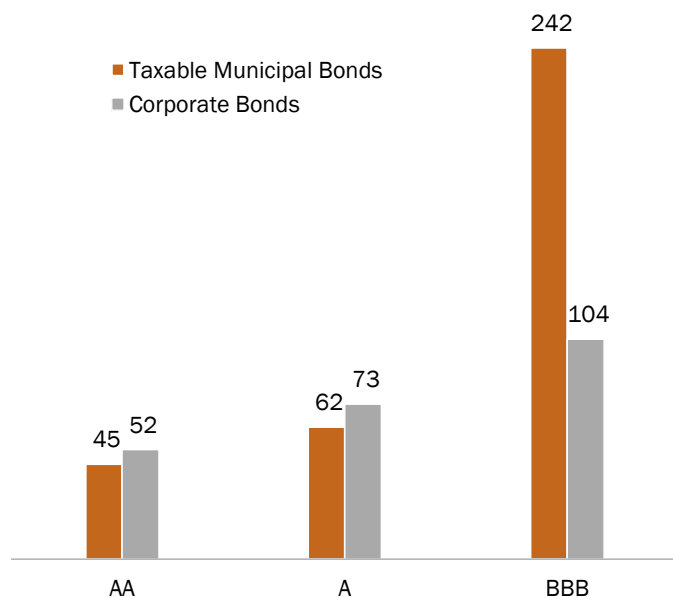
Source: Bloomberg

BLOOMBERG MUNICIPAL HIGH YIELD | AAA YIELD DIFFERENTIAL



Data as of October 30, 2025.
Source: Bloomberg

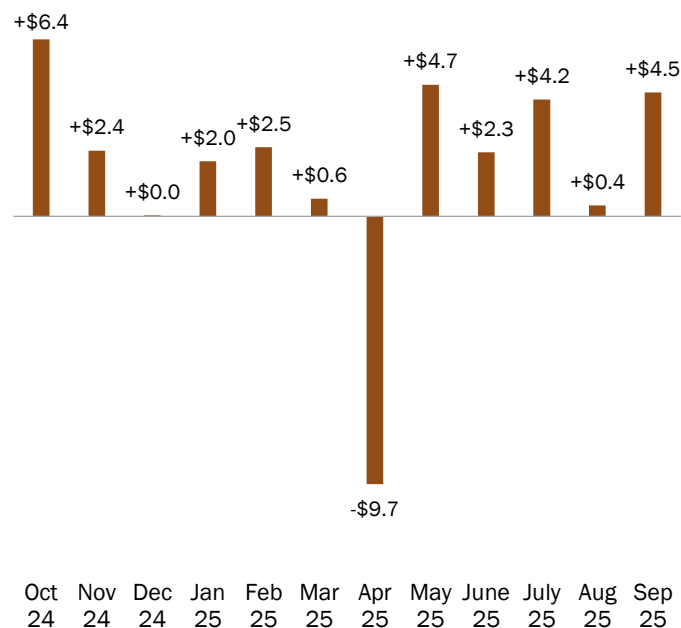
TAXABLE MUNICIPAL AND CORPORATE CREDIT SPREADS



Data as of October 30, 2025.

The spread, better known as the option-adjusted spread (OAS) is the measurement of the yield of a fixed income security over that of a risk-free rate of return, which is adjusted to take into account an embedded option.

LONG TERM FUND FLOWS | USD \$BN



Data as of October 30, 2025.
Source: Bloomberg



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DEFINITION OF TERMS

Option-Adjusted Spread

The option-adjusted spread (OAS) measures the spread between a bond's rate and the risk-free rate, while adjusting for any embedded options like callables or mortgage-backed securities.

Standard Deviation

Standard deviation is a statistical measurement that looks at how far discrete points in a dataset are dispersed from the mean of that set. It is calculated as the square root of the variance.

Tax Equivalent Yield

The tax-equivalent yield is the return a taxable bond needs to equal the yield on a comparable tax-exempt municipal bond. Investors use this calculation to compare the returns between a tax-free investment and a taxable alternative.

Tax Equivalent Yield to Worst

Tax Equivalent YTW is calculated by dividing the tax-exempt yield by one minus the marginal income tax. This is used to compare YTW on a tax-exempt investment to a taxable investment.

Volatility

Volatility is a measurement of how varied the returns of a given security or market index are over time. It is often measured from either the standard deviation or variance between those returns. In most cases, the higher the volatility, the riskier the security.

Yield to Worst

Yield to worst is a measure of the lowest possible yield that can be received on a bond that fully operates within the terms of its contract. It is a type of yield that is referenced when a bond has provisions that would allow the issuer to close it out before it matures. YTW helps investors manage risks and ensure that specific income requirements will still be met even in the worst scenarios.

INDEX DESCRIPTIONS

Bloomberg U.S. Taxable Municipal Bond Index

The Bloomberg U.S. Taxable Municipal Bond Index is a rules-based, market-value-weighted index engineered for the long-term taxable bond market. To be included in the index, bonds must be rated investment-grade (Baa3/BBB- or higher) by at least two of the following ratings agencies if all three rate the bond: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment grade. They must have an outstanding par value of at least \$7 million and be issued as part of a transaction of at least \$75 million. The bonds must be fixed rate and must be at least one year from their maturity date. Remarketed issues (unless converted to fixed rate), bonds with floating rates, and derivatives, are excluded from the benchmark.

Bloomberg Municipal AMT Index

The Bloomberg Municipal AMT index refers to a specific Bloomberg municipal bond index that includes bonds subject to the Alternative Minimum Tax (AMT). Unlike most municipal bond indices, which exclude AMT-subject securities, these indices contain bonds that typically offer higher yields to individuals who are subject to the AMT.

Muni IG AMT ex Territories Index

The Muni IG ex. AMT and ex Territories Index is the Bloomberg Municipal Bond Index excluding AMT and US. Territory exposure.

Bloomberg Municipal Bond Index

A rules-based, market-value-weighted index engineered for the long-term tax-exempt bond market. To be included in the index, bonds must be rated investment-grade (Baa3/BBB- or higher) by at least two of the following agencies: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least \$7 million and be issued as part of a transaction of at least \$75 million. The bonds must be fixed rate, have a date-date after December 31, 1990, and must be at least one year from their maturity date. Remarketed issues, taxable municipal bonds, bonds with floating rates, and derivatives, are excluded from the benchmark. The index has four main sectors: general obligation bonds, revenue bonds, insured bonds (including all insured bonds with a Aaa/AAA rating), and pre-refunded bonds. Most of the index has historical data to January 1980. In addition, sub-indices have been created based on maturity, state, sector, quality, and revenue source, with inception dates later than January 1980.

Bloomberg 5-Year Muni Index

The Bloomberg 5 Year Municipal Bond Index is a capitalization weighted bond index created by Bloomberg intended to be representative of major municipal bonds of all quality ratings with an average maturity of approximately five years.

Bloomberg Municipal 1-10 Year Blend 1-12 Year Index

The Bloomberg Municipal 1-10 Year Blend 1-12 Year Index measures the performance of short and intermediate components of the Municipal Bond Index — an unmanaged, market value-weighted index which covers the U.S. investment grade, tax-exempt bond market.

Bloomberg Municipal Long Bond 22+ Index

The Bloomberg Municipal Long Bond 22+ Index (often referred to as the Bloomberg Long-Term Municipal Bond Index) tracks the performance of long-term, tax-exempt U.S. municipal bonds with maturities of 22 years or longer. This index serves as a benchmark for high-quality municipal debt and covers various sectors, including general obligation, revenue, insured, and pre-refunded bonds.

Bloomberg Municipal Bond High Yield Index

The Bloomberg Municipal Bond: High Yield Index is a flagship measure of the US municipal tax-exempt non-investment grade bond market. Included in the index are securities from all 50 US States and four other qualifying regions (Washington DC, Puerto Rico, Guam, and the Virgin Islands). The index includes state and local general obligation bonds and revenue bonds.

Bloomberg U.S. High Yield Index

Covers the universe of fixed rate, non-investment grade debt. Eurobonds and debt issues from countries designated as emerging markets (sovereign rating of Baa1/BBB+/BBB+ and below using the middle of Moody's, S&P, and Fitch) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included. Original issue zeroes, step-up coupon structures, 144-As and pay-in-kind bonds (PIKs, as of October 1, 2009) are also included.

Bloomberg U.S. Aggregate Bond Index

The Bloomberg U.S. Aggregate Bond Index measures the performance of investment grade, U.S. dollar-denominated, fixed rate taxable bond market, including Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM pass-throughs), ABS, and CMBS. It rolls up into other flagship indices, such as the multi-currency Global Aggregate Index and the U.S. Universal Index, which includes high yield and emerging markets debt.

Bloomberg U.S. Corporate Bond Index

The Bloomberg US Corporate Index measures the investment grade, fixed-rate, taxable corporate bond market. It includes USD-denominated securities publicly issued by US and non-US industrial, utility, and financial issuers. The index is a component of the US Credit and US Aggregate Indices, and provided the necessary inclusion rules are met, US Corporate Index securities also contribute to the multi-currency Global Aggregate Index. The index includes securities with remaining maturity of at least one year.

Bloomberg Pan-European Aggregate Index

Covers eligible investment grade securities from the entire European continent. The primary component is the Bloomberg Euro-Aggregate Index. In addition, the Bloomberg Pan-European Aggregate Index includes eligible securities denominated in British pounds (GBP), Swedish krona (SEK), Danish krone (DKK), Norwegian krone (NOK), Czech koruna (CZK), Hungarian forint (HUF), Polish zloty (PLN), Slovenian Tolar (SIT), Slovakian koruna (SKK), and Swiss franc (CHF). Apart from the currency constraint, the inclusion rules for the Pan-European Index are identical to those of the Bloomberg Euro-Aggregate Index.

Bloomberg Asian Pacific Aggregate Index

The Bloomberg Asian-Pacific Aggregate Index contains fixed-rate, investment-grade securities denominated in Japanese Yen, Australian dollar, Hong Kong dollar, Malaysian ringgit, New Zealand dollar, Singapore dollar, South Korean won and Thai baht.

Bloomberg U.S. Treasury Index

The Bloomberg U.S. Treasury Index measures the performance of public obligations of the U.S. Treasury, including securities that roll up to the U.S. Aggregate, U.S. Universal, and Global Aggregate Indices.

Bloomberg U.S. Mortgage-Backed Security Index

The US MBS Index is formed by grouping the universe of individual TBA-deliverable MBS pools into pool cohorts and then applying the index inclusion rules at the cohort level. Each cohort is a representation of its mapped individual pools and contributes their total amount outstanding to the US MBS Index.

Bloomberg U.S. Corporate High Yield Index

The Bloomberg US Corporate High Yield Bond Index measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch and S&P is Ba1/BB+/BB+ or below.

Bloomberg Global Aggregate Bond Index

The Bloomberg Global Aggregate Index is a flagship measure of global investment grade debt from twenty-seven local currency markets. This multi-currency benchmark includes treasury, government-related, corporate and securitized fixed-rate bonds from both developed and emerging markets issuers.

Bloomberg Global Treasury x US Statistics Index

Unmanaged index composed of those securities included in the Global Aggregate Bond Index that are Treasury securities, with the U.S. excluded.

Bloomberg Securitized Bond Index

The Bloomberg U.S. Securitized: MBS, ABS, and CMBS Index tracks all USD-denominated, investment grade, securitized issues within the "Parent Index". MBS must have a weighted average maturity of at least one year. CMBS and ABS must have a remaining average life of at least one year.

Bloomberg US Municipal Bond Index Total Return Index Value Unhedged

The Bloomberg U.S. Municipal Index covers the USD-denominated long-term tax-exempt bond market. The index has four main sectors: state and local general obligation bonds, revenue bonds, insured bonds and pre-refunded bonds

Bloomberg US Aggregate Total Return Value Unhedged

The Bloomberg US Aggregate Total Return Value Unhedged Index (LBSTRUU:IND) is a benchmark that measures the performance of the U.S. investment-grade, fixed-rate, taxable bond market, excluding any currency hedging. It tracks a broad universe of U.S. dollar-denominated securities, including U.S. Treasuries, government-related debt, corporate bonds, mortgage-backed securities (MBS), and asset-backed securities (ABS).

Bloomberg U.S. Treasury Bond Index

The Bloomberg US Treasury Index is an unmanaged index of prices of US Treasury bonds with maturities of 1 to 30 years. You cannot invest directly in an index.

Bloomberg US Treasury Total Return Unhedged

The Bloomberg US Treasury Index measures US dollar-denominated, fixed-rate, nominal debt issued by the US Treasury.

Credit Suisse Leveraged Loan Index

The Credit Suisse Leveraged Loan Index is a representative index of tradable, senior secured, U.S. dollar-denominated non-investment grade loans.

ICE BofA U.S. 3-Month Treasury Bill Index

Comprised of a single issue purchased at the beginning of the month and held for a full month. At the end of the month that issue is sold and rolled into a newly selected issue. The issue selected at each month-end rebalancing is the outstanding Treasury Bill that matures closest to, but not beyond, three months from the rebalancing date. To qualify for selection, an issue must have settled on or before the month-end rebalancing date. While the index will often hold the Treasury Bill issued at the most recent 3-month auction, it is also possible for a seasoned 6-month Bill to be selected.

JPMorgan Emerging Bond Index +

A liquid U.S. dollar emerging markets debt benchmark and tracks total returns for actively traded external debt instruments in emerging markets. Eligible for inclusion in the EMBI+ are U.S. dollar-denominated Brady bonds, Eurobonds, and traded loans issued by sovereign entities. The EMBI+ country eligibility rules require that a country must be rated Baa1/BBB+ or below by Moody's/S&P rating agencies.

JPM GBI (World) USD

The J.P. Morgan GBI series provides a comprehensive measure of local currency denominated fixed rate government debt consists of five core index products covering developed markets. The broadest series tracks 27 countries.

S&P 500 Index

The S&P 500® is widely regarded as the best single gauge of large-cap U.S. equities and serves as the foundation for a wide range of investment products. The index includes 500 leading companies and captures approximately 80% coverage of available market capitalization