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Domestic Investment Grade Fixed Income Market Summary

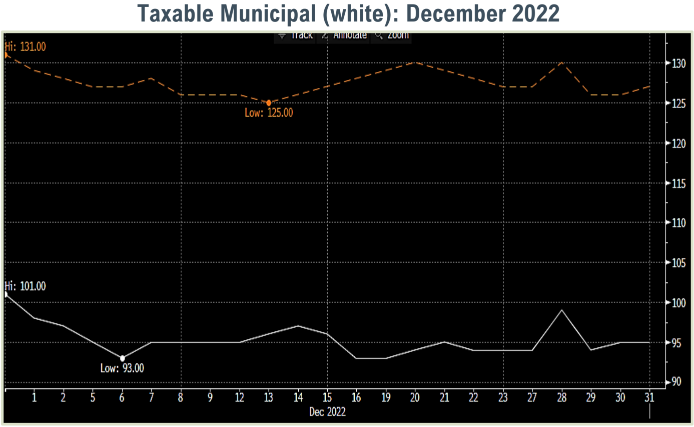
December 2022

Treasury Rates Rose, Ended Difficult Year on Weak Note

- Periods of continued strength from November's rally, influenced by mixed economic data, were offset by weakness during the second half of the month with 5+ year Treasury yields increasing 23-29 basis points (bps) in December.
  - After falling to 3.45% in mid-December, the 10-year Treasury rate rose to 3.88% to end 2022, an increase of 27 bps for the month.
  - The 2-year rate rose 12 bps, reducing the Treasury curve inversion by 15 bps; the 2-10 year Treasury rate spread closed at -55 bps.
- The Fed matched market expectations with a 50 bp increase of the funds rate during the December meeting, but the U.S. central bank's projections for future policy were more hawkish.
  - The median Fed member projection anticipates a 5.125% funds rate at year-end 2023, an increase of 50 bps compared to September projections.
- The Bureau of Labor Statistics reported that total nonfarm payroll employment increased by 263,000 jobs in November, more than the 200,000 expected, while average hourly earnings jumped 0.6% (expected: 0.3%) and the unemployment rate held steady at 3.7%.
- For the second consecutive month, the Consumer Price Index (CPI) increased less than projected, rising 0.1% in November (expected: 0.3%) including a 0.2% increase in the core index (expected: 0.3%), helping pull Treasury rates lower mid-month.
  - Core good prices remained in deflation territory, declining 0.5% in November (used car prices down 2.9%) after falling 0.4% the previous month.
  - Despite continued signs of slowing rental costs, the owners' equivalent rent component of CPI rose 0.7% in November, a slight uptick from October. However, decelerating rental prices are still expected to eventually flow through to the CPI data.

Segment0	December Return	2022 Return
Bloomberg Barclays Intermediate Government Credit Index	-0.18%	-8.23%
ICE BofA 1-10 Year US Treasury Index	-0.21%	-7.60%
ICE BofA 1-10 Year US Inflation-Linked Treasury Index	-0.64%	-7.36%
ICE BofA 1-10 Year Corporate Index	0.09%	-9.63%
ICE BofA 1-10 Year Taxable Municipal Index	0.04%	-9.53%

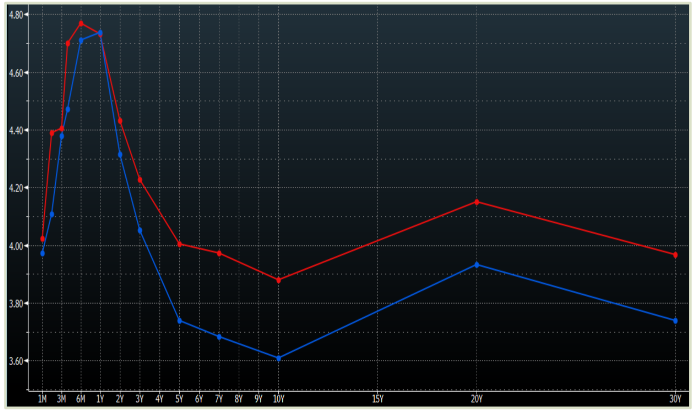
1-10 Year IG Credit Spreads: Corporate (orange) and Taxable Municipal (white): December 2022



Source: Bloomberg; Bureau of Economic Analysis; Federal Reserve; ICE BofA; Veritable, L.P. All numbers are estimates. See Disclosures for index descriptions and additional information.

Maturity	11/30/22 Treasury	12/31/22 Treasury	Change
2-Year	4.31%	4.43%	+0.12%
5-Year	3.74%	4.01%	+0.27%
7-Year	3.68%	3.97%	+0.29%
10-Year	3.61%	3.88%	+0.27%
30-Year	3.74%	3.97%	+0.23%

Treasury Yield Curve: 11/30/22 (blue) vs. 12/31/22 (red)



TIPS Once Again Lagged Nominal Treasuries While Credit Outperformed

- Another cooler than expected CPI print plus more hawkish Fed projections for tightening once again pulled inflation expectations lower, causing Treasury Inflation Protected Securities (TIPS) to underperform.
  - 1-10 year TIPS underperformed nominal Treasuries by -30 bps in December, but the sector outperformed by 79 bps for the full year.
  - The 10-year TIPS break-even inflation rate declined to as low as 2.13% in mid-December, the lowest since February 2021, before rising to 2.30% at year-end, representing a relatively modest 6 bp decline for the month.
  - The 5-year TIPS inflation expectation similarly fell 8 bps in December to 2.35% as market participants continued to project confidence that the Fed will successfully bring down pricing pressures over time.
- The continued trend of slowing inflation and the likelihood that most rate hikes for the current tightening cycle have already occurred remained supportive of credit markets which outperformed government bonds in December.
- Intermediate investment grade corporate bonds outperformed Treasuries for the third consecutive month, providing 38 bps of duration-adjusted excess return in December.
  - For the year, 1-10 year corporate bonds lagged Treasuries by 102 bps, as credit spreads widened roughly 50 bps during the year.
- 1-10 year taxable municipal bonds performed similarly to corporates in December, outpacing Treasuries by 35 bps on a duration-adjusted basis.
  - Despite providing excess return during six of the twelve months of 2022, intermediate taxable municipals underperformed government bonds by 48 bps in 2022, largely driven by spread widening in March through May.

Municipal Performance Mixed But Outperformed Treasuries

- In December, tax-exempt rate moves varied by maturity as short (1-2 year) and long-dated (20+ year) rates rose while intermediate (5-10 year) rates fell.
  - The 1-year municipal yield rose 37 bps due to typical seasonal selling to fund year-end liabilities.
  - Demand in the 5-10 year range was quite robust in December, pulling rates lower by 8-13 bps.
  - Lacking strong retail support given the rate volatility, 20+ year yields rose by 6 bps.
- Municipal debt outperformed its taxable counterparts in maturities of 2+ years as ongoing strong demand from value-hunting institutional buyers encountered a market producing low primary issuance.
- For the month, the 10-year AAA municipal yield declined 8 bps to 2.63%, 78 bps below the October cyclical peak but still 90 bps above the historical average over the past five years.
- The 10-year AAA municipal-to-Treasury yield ratio closed the year at 68%, well below the 5-year historical average of 88%.
- With year-end selling pressure pushing front-end rates higher and healthy demand for intermediate-term maturities, the 2-year and 10-year AAA municipal curve briefly inverted in December (first time since at least 1981) but closed the year in the black at just 3 bps (down 15 bps for the month).

Maturity	11/30/22 Muni	12/31/22 Muni	Change	% of U.S. Govt 12/31/22
2-Year	2.53%	2.60%	0.07%	58.69%
5-Year	2.63%	2.52%	-0.11%	62.84%
7-Year	2.67%	2.54%	-0.13%	63.98%
10-Year	2.71%	2.63%	-0.08%	67.78%
15-Year	3.15%	3.15%	0.00%	80.56%
20-Year	3.31%	3.37%	0.06%	81.20%
30-Year	3.52%	3.58%	0.06%	90.18%

- Treasury market volatility along with tax-loss harvesting prolonged the current municipal bond outflow cycle.
  - According to Refinitiv Lipper, municipal fund outflows totaled $6.2 billion in December, roughly consistent with losses experienced in November.
  - Through December 28th municipal bond funds have shed assets for 46 of the previous 50 weeks.
  - For the full year (period ending December 28), municipal fund outflows totaled a new record of $122 billion, surpassing the previous high of about $73 billion set during the 2013 Taper Tantrum outflow cycle and exceeding 2021's record inflows of around $102 billion.
  - A durable rate rally may pause or even reverse flows with higher nominal yields attracting income-focused investors, but Treasury market volatility coupled with recession fears may limit participation from the herd of retail investors until the Fed signals an end to its current tightening cycle.

10-Year AAA Municipal Yie ld: 2017-2022

- Taxable crossover opportunities remained in front-end maturities, as the 2-year AAA municipal-to-Treasury yield ratio ended the year below 60%.
- A main beneficiary of the front-end rate rise in December was the variable rate demand note (VRDN) sector, as the benchmark floating rate ('SIFMA Municipal Swap Index') climbed to 3.80% on December 21st after starting the month at 1.85% before ending the year at 3.66%.
- Despite expensive relative valuations, attractive nominal rates continued to attract buyers with a general focus on intermediate term (5-10 year) maturities.
- Investors can generate incremental return through callable bonds with less favorable structures like coupons below the standard 5% level, but one should be cautious of offsetting risks like reinvestment, de minimis, and extension.
- A decline in December primary market volume was consistent with the full year trend of lower new issuance due to a combination of factors including a decline in refunding opportunities, rate volatility, and issuers flush with cash with no pressing financing requirements.
- According to JP Morgan, 2022 net supply totaled around -$60 billion with projections of -$47 billion in 2023.
- The "January Effect," wherein strong reinvestment demand from January 1st principal and interest repayments encounters seasonally light new issuance activity, could provide a performance tailwind for municipals, but the market is at risk of an investment 'hangover' thereafter with rich relative valuations, a flat curve, and economic downturn risk.
- Strength in the intermediate range of the curve resulted in the ICE BofA 1-12 Year Municipal Securities Index producing a +0.33% return for December (4Q22 total return: 3.05%), bringing 2022 full-year losses to -4.90%.

Source: Bloomberg; ICE; JP Morgan; MRSB; Refinitiv; SIFMA; Veritable, L.P.
All numbers are estimates. See Disclosures for index descriptions and additional information.

Disclosures

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Index Descriptions *(Investors cannot invest directly in an index)*

Bloomberg Barclays Intermediate Government Credit Index is a total returns index of U.S. dollar denominated U.S. Treasuries, government-related securities, and investment grade U.S. corporate securities that have a remaining maturity of greater than or equal to 1 year and less than 10 years. Securities must have $250 million or more of outstanding face value and must be fixed rate and non-convertible.

Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. The yearly (or monthly) growth rates represent the inflation rate. The CPI is published by the US Bureau of Labor Statistics on a monthly basis.

ICE BofA 1-10 Year US Treasury Index is a subset of ICE BofA Treasury Index including all securities with a remaining term to final maturity greater than or equal to 1 year and less than 10 years.

ICE BofA 1-10 Year US Inflation-Linked Treasury Index is a subset of ICE BofA US Inflation-Linked Treasury Index including all securities with a remaining term to final maturity greater than or equal to 1 year and less than 10 years.

ICE BofA 1-10 Year Corporate Index measures the performance of investment grade corporate bonds of both U.S. and non-U.S. issuers that are U.S. dollar-denominated and publicly issued in the U.S. domestic market with a remaining term to final maturity greater than or equal to 1 year and less than 10 years.

ICE BofA 1-10 Year Taxable Municipal Index is designed to track the performance of U.S. dollar-denominated taxable municipal debt publicly issued by U.S. states and territories, and their political subdivisions, in the U.S. market with a remaining term to final maturity greater than or equal to 1 year and less than 10 years.

ICE BofA 1-12 Year Municipal Securities Ind*ex* is a subset of ICE BofA Municipal Securities Index including all securities with a remaining term to final maturity less than 12 years. The ICE BofA Municipal Securities Index is market capitalization weighted and tracks the performance of U.S. dollar denominated investment grade tax-exempt debt publicly issued by U.S. states and territories, and their political subdivisions, in the U.S. domestic market. Qualifying securities must have at least one-year remaining term to final maturity, at least 18 months to final maturity at the time of issuance, a fixed coupon schedule and an investment grade rating (based on an average of Moody’s, S&P and Fitch).

The Securities Industry and Financial Markets Association (SIFMA) Municipal Swap Index is a 7-day high-grade market index comprised of tax-exempt Variable Rate Demand Notes (VRDNs) with certain characteristics. The Index is calculated and published by Bloomberg. The Index is overseen by SIFMA’s Municipal Swap Index Committee.