Municipals Weekly

Muni rates rally has resumed

Industry Overview

10 March 2023

Municipals
United States

Key takeaways

- Muni rates rally has resumed, in our view. 10-yr AAA should move to 2.00% in 1H and possibly reach 1.65% by 2023 year-end
- 10yr AAA moved 50bp higher in 20 trading days by 2 Mar. That happened 18 other times since '93. Positive returns follow
- POTUS proposed myriad of tax increases in his budget that would boost muni demand. We discount the likelihood of enactment

Heading for 2% and then lower?

We believe the muni rates market rally has resumed. The 10-year AAA rates should move to 2.00% in 1H and possibly reach 1.65% by 2023 year-end.

Rapid rise in yield typically followed by positive returns

From 2 February to 2 March, 10yr AAA rates climbed 50bp. Since 1993, we found 18 other times that happened over as many trading days. While returns over these periods were negative, averaging -3%, returns turned largely positive 3mo, 6mo and 1yr out.

POTUS' tax proposals face a divided Congress

President Biden sent his budget proposal to a divided Congress on Thursday. In it, he proposed raising (a) the top marginal rate to 39.6% from 37% for those earning >$400K, (b) the Medicare surtax to 5% from 3.8%, and (c) the corporate tax rate to 28% from 21%. He also called for a 25% minimum "Billionaire's tax". While the enactment of these provisions would increase demand for tax exempt munis, we discount the likelihood of passing a Republican-controlled House.

Flow of Funds data shows ETFs' holdings grow 20% in 4Q

The muni market stood at $4.01tn as of 4Q22 per Flow of Funds data. While most investor groups' holdings increased q/q, none were as fast as ETFs 19.5% q/q growth.

Key figures: issuance, returns, spreads & fund flows

Supply: MTD issuance through 8 Mar totals $6.4bn, down 37% y/y; YTD issuance of $49.6 is down 27% y/y. YTD issuance is 89% tax-exempt and 8% taxable; 78% is new money and 22% is refundings. **Returns:** For the week ending 8 Mar, the Muni Master index (U0A0) returned 0.18% and the Muni High Yield index (U0HY) returned 0.12%; 1-mo total returns are -1.99% and -2.15%, respectively. By rating, AA's returns for the week are strongest at 0.19%; by sector, Transportation's 0.38% is strongest. Taxables' return for the week is 0.27%. **Spreads:** As of 8 Mar, IG spreads widened 1bp w/w to 31bp while HY spreads narrowed 1bp to 188bp. **Flows:** For the week ending 8 Mar, all municipal bond fund inflows were $0.65bn. IG inflows were $0.76bn, while HY outflows were $0.11bn. Money market fund inflows were $1.93bn for the week.

Table of Contents

Yingchen Li
Municipal Research Strategist
BofAS
yingchen.li@bofa.com

Ian Rogow
Municipal Research Strategist
BofAS
ian.rogow@bofa.com

John Lombardi
Municipal Research Strategist
BofAS
jlombardi3@bofa.com

Sophie Yan
Municipal Research Strategist
BofAS
sophie.yan@bofa.com

John Reilly
Municipal Research Strategist
BofAS
john.reilly2@bofa.com

See Team Page for List of Analysts

Recent Municipals Research

Municipals Weekly: Short end volatility may rise in March/April 03 March 2023

Municipals Weekly: Countertrend selloff near its end 24 February 2023

Monthly Municipal ESG Monitor: January 2023 17 February 2023

See page 22 for abbreviations

 12528450

Timestamp: 10 March 2023 07:30AM EST

Exhibit 1: Strategic and tactical views & key forecasts
Buy long duration high grade bonds, especially 4% coupons

Strategic views
• Overweight: (1) 15-30yr part of the curve, particularly 4% coupon bonds; (2) tech-heavy cities; (3) AMT bonds*
• Neutral: BBBs and high yield
• Underweight: (1) the territories; (2) small private colleges; (3) rural, single-facility hospitals
Tactical views
• TXMB/C0A0 spread to fall to -70bp during tightening cycle
• Position for a muni curve bull flattener and credit spread compression in 1H23
• 4% coupon bracket to benefit more in a rally
• Swap long-end muni taxables for long-end tax-exempts
Key forecasts
• 2023 issuance to total $500bn; $380bn of new money and $120bn of refundings; $400bn tax-exempt, $70bn taxable and $30bn AMT; ESG issuance to total $60bn
• 2023 principal redemptions to total $402bn and coupon payments $161bn. Cumulative fund inflows of $40-$60bn
• 1/30 slope to fall to 65bp, driven by 10/30 AAA flattening, with slope falling to 50bp range
• 10yr AAA rates to reach 2.20% area; 30yr to 2.70%. 10yr muni/Tsy ratio range of 70%-90% and 30yr 85%-100%
• Muni Master index to return 11.5% in 2023; taxable muni index 12.5%

Note: *If the holder is certain they are not subject to the AMT under current tax law.
Source: BofA Global Research

BofA GLOBAL RESEARCH

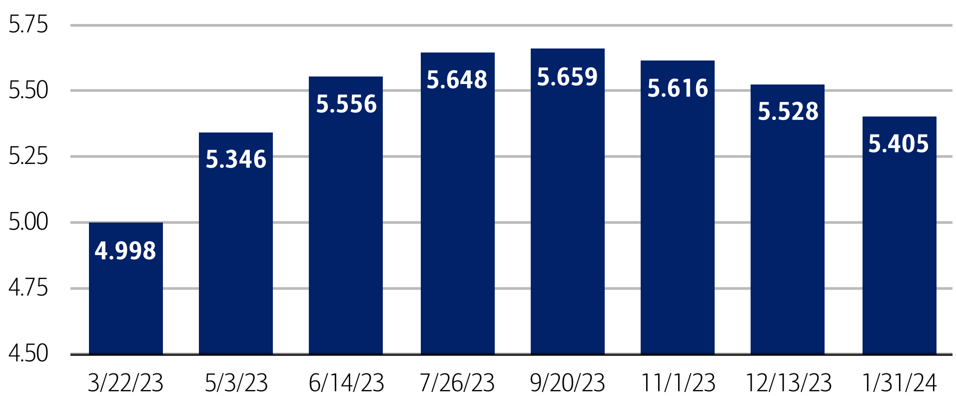
Market views & strategies

Heading to 2% and then lower?

After a quick bear flattening of the muni AAA curve and approximately 50bp selloff in 10+ year munis, we believe the muni market rally has resumed. This outlook is supported by munis' continued supply/demand imbalance and a more hawkish Fed posture.

Fed chair Powell's testimony to Congress shows a more hawkish stance than previously communicated, and is based on the strength of economic and inflation data for the past few weeks. The Fed is prepared to go faster in speed, longer in time and to a higher terminal target rate if inflation remains sticky. As a result, the futures market not only fully priced in four more rate hikes in 2023, it even began to price in a sizeable probability of a 5th hike by July-September this year. See Exhibit 2.

Exhibit 2: Implied Fed Funds rates by the Fed Funds futures market (%) as of 8 March 2023
Market assigns some probability to the 5th hike for the rest of 2023



Source: Bloomberg

BofA GLOBAL RESEARCH

As we emphasized previously, a strong Fed is a friend of long-term bond investors, as the Fed would act rigorously in controlling inflation. The 10-year Treasury yield was kept below 4.00% after a brief break. The 2/10 Treasury curve inverted to -107bp, and the 10/30 Treasury inverted to -10bp. Sub 4.00% Treasury yields at 10- and 30-year would keep muni/Treasury ratios in check and the bond investing sentiment healthy.

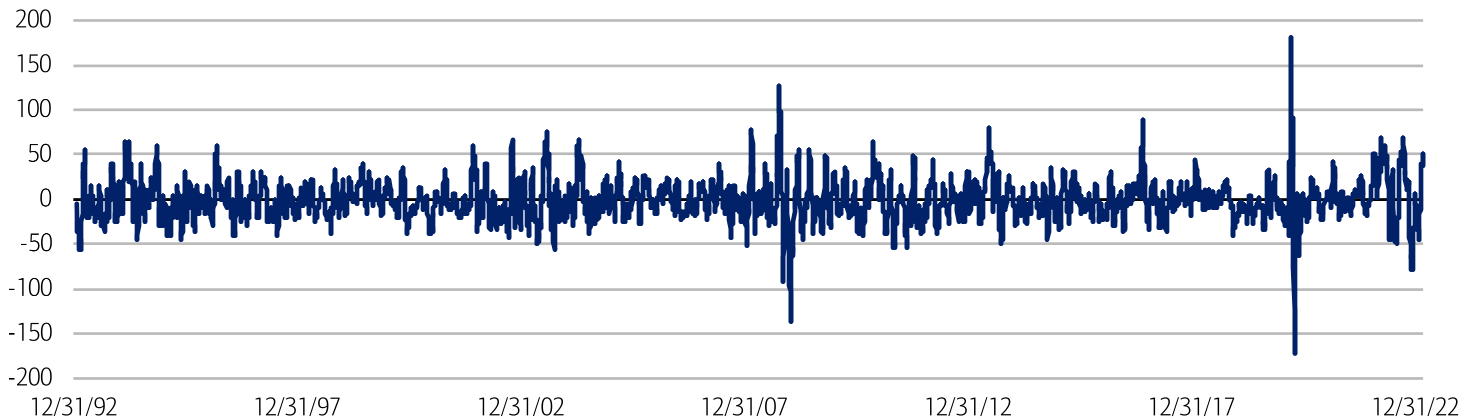
If we are correct in calling the resumption of the muni rally, the market's technicals point to a newer target below 2.20% for the 10-year AAA rates. In our view, a major muni market bullish reversal occurred in early November 2022, and the ensuing rally was strong enough to call it a bull market. In that way, the 50+bp yield back up in February should be viewed as a normal retracement in a bull market. As such, **the resumption of the rally suggests that the 10-year should reach 2.00% in 1H23, and then 1.65% by the 4Q23.** As for the path, we see the 10-year AAA rates declining for the next three months, backing up some in the summer, and then heading lower to the year end.

Factors that will support our targets include improved muni investor sentiment, cash on the sideline, a Treasury market rally, as well as the talk of new taxes in the upcoming budget proposal by President Biden (see section below). This last item, though, has little likelihood of passing, but helps to revive the sentiment on taxes and thus tax-exempt muni investment.

Rapid rises in yield typically followed by positive returns

Between 2 February 2022 and 2 March 2022 (or, 20 trading days), 10 year AAA MMD rates climbed 50bp, reaching 2.63%. Reviewing historical yields since the end of 1992, we identified 18 other periods in which 10 year AAA MMD rates climbed 50bp or more over an equal time span (note, these periods are limited to the first date in which a 50bp or greater rise in yields was reached).

Exhibit 3: 20 trading day change in 10yr AAA MMD yields (bp)
Beyond early 2023, we identified 18 other periods since the end of 1992 in which 10yr AAA MMD yields rose 50bp or more in 20 trading days



Source: BofA Global Research, Refinitiv

BofA GLOBAL RESEARCH

As Exhibit 4 shows, the ICE BofA Muni Master Index (U0A0) total returns during these periods were all negative, and averaged roughly -3%, with the most negative total return occurring between 29 August 2008 and 26 August 2008 at nearly -4%. Fast forwarding over the next 3 months or so, we see returns generally turn positive, though not in all cases, with average returns of 0.8%. Time has historically been the muni investor's ally, though; if we fast forward even further, we see returns grow more positive, with average returns roughly 6 months out of 3.3% and one year out of 6.7%. Please note that we simply assume the index was bought on the first day a 50bp or greater yield rise was achieved, though yields often rose further after the purchase. If one could identify the peak of the yield rise in each period and bought the index there, the returns would clearly be much larger.

Exhibit 4: Muni Master Index total returns during, 3mo, 6mo and one year after 50bp rise period
In 19 periods we identified, U0A0's avg total return during period was -3%, but one year after, almost 7%

From	To	10yr AAA yield rise (bp)	U0A0 total return	Over ensuing 64 trading days (~3mo)	Over ensuing 128 trading days (~6mo)	Over ensuing 255 trading days (~1yr)
3/4/93	3/31/93	55	-1.31%	3.21%	5.96%	1.01%
2/1/94	3/1/94	50	-3.27%	-3.22%	-0.90%	1.89%
10/11/94	11/7/94	50	-2.67%	6.17%	10.06%	16.39%
2/9/96	3/8/96	50	-3.51%	0.88%	2.51%	6.80%
11/8/01	12/7/01	59	-3.61%	1.87%	4.22%	9.66%
9/23/02	10/21/02	58	-3.56%	2.74%	5.21%	7.00%

Exhibit 4: Muni Master Index total returns during, 3mo, 6mo and one year after 50bp rise period

In 19 periods we identified, U0A0's avg total return during period was -3%, but one year after, almost 7%

From	To	10yr AAA yield rise (bp)	U0A0 total return	Over ensuing 64 trading days (~3mo)	Over ensuing 128 trading days (~6mo)	Over ensuing 255 trading days (~1yr)
6/17/03	7/15/03	54	-2.60%	-0.45%	5.21%	3.68%
3/9/04	4/5/04	59	-3.28%	-0.28%	2.85%	5.92%
1/30/08	2/27/08	55	-2.90%	3.19%	3.23%	1.90%
8/29/08	9/26/08	50	-3.97%	-1.56%	3.33%	14.78%
2/18/09	3/17/09	55	-2.25%	3.46%	10.48%	12.92%
5/14/09	6/11/09	56	-1.90%	6.29%	7.52%	10.54%
10/19/10	11/16/10	57	-3.25%	-1.99%	2.68%	7.55%
5/23/13	6/20/13	58	-3.55%	-1.21%	-0.43%	6.10%
10/21/16	11/18/16	54	-2.52%	0.65%	3.10%	4.57%
2/19/20	3/17/20	53	-3.74%	3.65%	5.22%	6.73%
12/31/21	1/28/22	52	-2.62%	-6.52%	-3.97%	-3.82%
2/24/22	3/23/22	52	-2.66%	-4.33%	-6.23%	?
8/10/22	9/7/22	50	-3.30%	1.92%	?	?
2/2/2023	**3/2/2023**	**50**	**-3.06%**	**?**	**?**	**?**

Source: BofA Global Research, ICE Data Indices, LLC, Refinitiv

BofA GLOBAL RESEARCH

2022's return environment, of course, proved more challenging: returns were still negative 64 trading days and 128 trading days following the 20-trading day period ending on 28 January 2022 and 23 March 2022 as rates continued to rise, albeit at a slower pace. That is in contrast to the 3 month, 6 month and 1 year period following the 16 pre-2022 periods we identified above; on average, 10yr AAA rates fell 1.4bp after 3 months, 23.2bp after 6 months and 31.1bp after 1 year.

A quick note on how fast the late-2022/early-2023 rally was

The recent selloff follows what truly was a historically fast rally: the rally from 4 November 2022 until 2 February totaled 123bp, with 10yr AAA MMD reaching a recent low of 2.13%. During that period, U0A0's total return was 8.2%. Reviewing the same data above, we identified only two other periods in which 10yr MMD rallied 100bp or more over a 60 trading day period: (1) 9 October 2008 to 7 January 2009 and (2) 19 March 2020 to 12 June 2020. Both of those periods started around the climax of severe market dislocations and shortly after the 10yr AAA MMMD rose more than 100bp in some nearby 20 trading day span.

POTUS' tax proposals face a divided Congress

On Thursday, President Biden sent his proposed budget to a divided Congress. In it, he called for a myriad of revenue raisers, including a so-called minimum "Billionaires tax" of 25%, raising the top marginal tax rate to 39.6% from 37% for individuals with incomes >$400k, raising the corporate tax rate to 28% from its current 21%, but also raising the Medicare surtax on earned and unearned income above $400K to 5% from 3.8%. Given Republican control of the House, we think both these proposals (and many others contained in his budget) face an uphill battle. Senate Minority Leader McConnell's statements, we think, are telling; he said "The president's budget is replete with what they would do if they could. Thank goodness the House is Republican. Massive tax increases, more spending, all of which, the American people can thank the Republican House for, will not see the light of day."

If the higher 39.6% income tax rate and 5% surtax are enacted, top federal marginal tax rates would increase to 44.6%, and would result in top tax rates of nearly 58% for the highest earners in California and over 59% for top earners in New York City. While, again, we discount the likelihood of these proposals passing, the effect should they pass would be an increase in muni demand, particularly from investors in the highest tax states.

Muni market stands at $4tn as of end of 2022

The Federal Reserve Board released updated flow of funds data for the fourth quarter of 2022 on 9 March. The muni market stood at $4.01tn as of 4Q22, down $23bn q/q. As

Exhibit 5 shows, ETFs' municipal securities holdings grew the most on a q/q basis in 4Q22, increasing by 19.5% to $104bn – the first time ETFs surpassed $100bn in muni holdings. Conversely, Brokers & dealers' muni holdings fell the most q/q in 4Q22, declining by 18.7% to $12.0bn. Versus the fourth quarter of 2017 – the last quarter pre-Tax Cuts and Jobs Act – ETFs' holdings have grown the most while Brokers & dealers' contracted the most; since then, US banks' holdings are up 1.3% to $579.9bn.

Exhibit 5: Change in muni holdings by investor group ($bn)
4Q212s holdings versus 4Q17's (when TCJA enacted), 1Q20 (start of COVID) and on a y/y & q/q basis

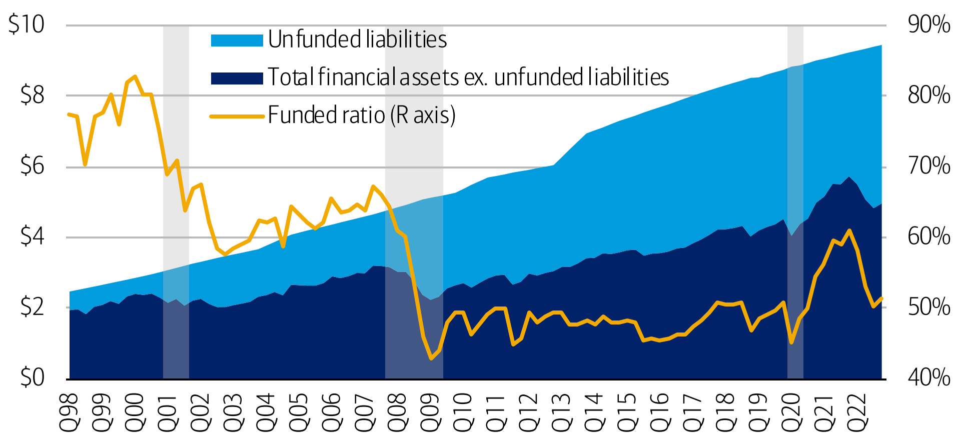
	4Q22 holdings	vs 4Q17	vs 1Q20	vs 4Q21	vs 3Q22
Households & nonprofits	1,595.0	-17.3%	-15.6%	-11.7%	3.7%
US banks	579.9	1.3%	9.0%	-8.1%	0.0%
P&C insurers	256.4	-24.4%	-8.8%	-11.4%	4.1%
Life insurers	212.8	7.6%	-0.9%	-9.4%	5.3%
Money market funds	117.9	-14.7%	-13.0%	6.3%	4.2%
Mutual funds	758.4	10.2%	-3.5%	-23.5%	-2.1%
Closed-end funds	82.4	-8.4%	-7.8%	-16.1%	2.4%
ETFs	104.0	246.0%	115.0%	24.9%	19.5%
Brokers & dealers	12.0	-54.9%	-12.2%	-5.2%	-18.7%
Rest of world	108.6	7.2%	5.5%	-1.6%	-5.4%

Note: TCJA is the Tax Cuts and Jobs Act of 2017
Source: BofA Global Research, Fed Flow of Funds

BofA GLOBAL RESEARCH

Unfunded defined benefit public pension liabilities stood at roughly $4.5tn in 4Q22, which is a $84bn or 1.8% decrease q/q. On a y/y basis, 4Q22's unfunded amounts are $985bn, or 28% larger. Funded ratios increased 1.1ppt q/q but decreased 9.7ppt y/y to 51.3% on a projected benefit obligation (PBO) basis – well off the post-financial crisis highs reached on year ago.

Exhibit 6: State & local govt defined benefit retirement plans financial assets, unfunded liabilities & funded ratio (1Q98–4Q22) ($tn)
Funded ratio based on Fed data climbs to 1.1ppt q/q to 51.3%



Source: BofA Global Research, Fed Flow of Funds

BofA GLOBAL RESEARCH

As a reminder, the Fed revised its reporting to a PBO basis from an accumulated benefit obligation (ABO) basis in 2Q18; a PBO basis represents the actuarial present value of vested and non-vested benefits and includes assumptions on future employee pay increases while an ABO basis does not take into account future salary increases. Note how the funded ratios derived from the Fed's data compare to 4Q22's 72.8% funded ratio of the Milliman Public Pension Funding Index. The difference between the two – Fed figures and Milliman's – likely has to do with the accounting method (Milliman uses a PBO-like method) and discount rates being employed. Nevertheless, we note that the funded ratio derived from Fed data and from Milliman (and Wilshire too) are all directional consistent.

Performance

Muni IG spreads largely stable w/w

Muni IG spreads widened 1bp w/w to 30bp, or to the 68th percentile of their 52-wk range. Muni HY spreads widened 6bp to 189bp and are now sitting 22bp inside of their 52-wk wide. Non-rated spreads widened 2bp and sit at the 41st percentile of their 52-wk range. GO spreads widened 3bp w/w, with AA spreads widening 3bp. Revenue bond spreads widened 1bp w/w overall. Among muni IG revenue bond sectors, Industrial Development Rev widened 8bp w/w, while the Education sector narrowed by 2bp.

Exhibit 7: Muni YTW spread monitor as of 8 March

IG spreads widened 1bp w/w overall while HY spreads narrowed 1bp

	52wk				Current	Change from				Current as %		
	Tights	Wides	T-1wk	T-1d	3/8/23	Tights	Wides	T-1wk	T-1d	of 52wk range	Price	Yield
Investment Grade	**11**	**39**	**30**	**32**	**31**	**20**	**-8**	**1**	**-1**	**71**	**99**	**3.74**
AA	-2	21	10	11	10	12	-11	0	-1	52	101	3.53
A	28	79	66	68	68	40	-11	2	0	78	97	4.11
BBB	53	133	114	117	116	63	-17	2	-1	79	93	4.59
High Yield	**98**	**211**	**189**	**192**	**188**	**90**	**-23**	**-1**	**-4**	**80**	**94**	**5.31**
Non-rated	160	298	217	218	218	58	-80	1	0	42	64	5.61
General Obligation	**-9**	**3**	**-4**	**-4**	**-5**	**4**	**-8**	**-1**	**-1**	**33**	**101**	**3.38**
AA	-15	3	-10	-9	-10	5	-13	0	-1	28	100	3.33
A	-14	12	-9	-8	-10	4	-22	-1	-2	15	102	3.33
BBB	33	122	72	73	69	36	-53	-3	-4	40	102	4.12
State	-28	-5	-21	-20	-22	6	-17	-1	-2	26	105	3.21
Local	1	19	16	16	16	15	-3	0	0	83	96	3.59
Revenue	**16**	**52**	**41**	**43**	**43**	**27**	**-9**	**2**	**0**	**75**	**99**	**3.86**
AA	2	30	19	20	20	18	-10	1	0	64	101	3.63
A	29	83	69	71	71	42	-12	2	0	78	97	4.14
BBB	56	140	126	128	128	72	-12	2	0	86	91	4.71
Airport	49	98	72	76	76	27	-22	4	0	55	102	4.19
Education	6	44	24	26	26	20	-18	2	0	53	102	3.69
Health	44	155	146	150	151	107	-4	5	1	96	91	4.94
Hospital	29	97	77	79	80	51	-17	3	1	75	97	4.23
Industrial Development Rev	42	130	105	108	106	64	-24	1	-2	73	98	4.49
Leases, COPs & Appropriations	-1	23	11	12	11	12	-12	0	-1	50	101	3.54
Miscellaneous	2	16	2	3	2	0	-14	0	-1	0	102	3.45
Multi-family Housing	53	90	84	85	85	32	-5	1	0	86	90	4.28
Pollution Control	-42	58	41	43	43	85	-15	2	0	85	99	3.86
Power	0	34	33	34	32	32	-2	-1	-2	94	101	3.75
Single-family Housing	45	98	76	78	77	32	-21	1	-1	60	94	4.20
Tax Revenue	7	32	12	13	13	6	-19	1	0	24	99	3.56
Tobacco	10	78	21	23	22	12	-56	1	-1	18	100	3.65
Toll & Turnpike	14	50	39	42	42	28	-8	3	0	78	96	3.85
Transportation - other	25	62	50	50	49	24	-13	-1	-1	65	97	3.92
Utilities - other	3	97	75	80	80	77	-17	5	0	82	101	4.23
Water & Sewer	-8	21	16	17	17	25	-4	1	0	86	102	3.60

Note: YTW spread to the ICE BofA AAA US Municipal Securities Index (U0A1).
Source: BofA Global Research, ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Muni IG returns turn positive this week

After four straight weeks of negative returns, muni IG finally turned in a positive week, with nearly 18bp of total returns. That was enough to outperform govies by roughly 4bp, but still not as strong as corporates or taxable munis. Taxable munis not only outperformed tax-exempt munis by 10bp this week, but are outperforming over the last month by about 12bp and 189bp for the YTD. Muni IG again outperformed HY this week, this time by 5bp, and is outperforming for the last month by 16bp. Still, HY is outperforming IG by about 28bp for the YTD. In total, muni IG lost 199bp of returns over the last month, only about 3bp better than govies but 64bp better than corporates.

For the second week in a row, AAs had the strongest week by rating grade, gaining 19bp of returns. In comparison, AAAs had the weakest week, returning 15bp. Note that AAAs' return has been weakest among the rating grades in 11 of the last 17 weeks. Over the last 3 months, AAAs lost 63bp of returns while AAs lost 39bp, and single-A's gained 9bp and BBBs 4 bp.

Exhibit 8: Municipal total returns (%) monitor, as of 8 March 2023
IG munis' return turn positive this week, outperforming govies but underperforming corporates

Index	Ticker	1d	1wk	MTD	1mo	3mo	YTD	1yr
Govt Master	G0A0	-0.032	0.140	-0.382	-2.020	-2.226	-0.264	-10.224
Corporate Master	C0A0	-0.190	0.289	-0.236	-2.630	-1.649	0.625	-8.629
IG munis	**U0A0**	**0.024**	**0.175**	**0.060**	**-1.987**	**-0.269**	**0.628**	**-4.821**
AAA	U0A1	0.005	0.147	0.036	-2.065	-0.633	0.263	-4.476
AA	U0A2	0.023	0.190	0.085	-1.975	-0.391	0.448	-4.485
A	U0A3	0.032	0.159	0.022	-1.917	0.091	0.981	-5.164
BBB	U0A4	0.033	0.171	0.030	-2.192	0.040	1.397	-6.229
1-3yr	U1A0	0.026	0.219	0.226	-0.586	-0.118	0.130	-0.602
3-7yr	U2A0	0.058	0.152	0.111	-1.674	-0.176	0.142	-2.270
7-12yr	U3A0	0.080	0.141	0.053	-1.973	0.206	0.568	-2.509
12-22yr	U4A0	0.024	0.196	0.059	-1.983	-0.145	0.906	-5.285
22+yr	U5A0	-0.037	0.167	-0.064	-2.961	-0.832	0.988	-9.742
HY munis	**U0HY**	**0.043**	**0.123**	**-0.095**	**-2.147**	**-0.085**	**0.906**	**-6.492**
Non-rated	U0NR	0.046	0.245	0.106	-2.527	-0.604	1.503	-6.063
General Obligation	**U0AG**	**0.044**	**0.212**	**0.139**	**-1.882**	**-0.433**	**0.405**	**-3.807**
AAA	UGA1	0.020	0.137	0.013	-2.124	-0.924	-0.066	-4.381
AA	UGA2	0.034	0.217	0.142	-1.877	-0.453	0.366	-3.799
A	UGA3	0.096	0.171	0.115	-1.829	-0.229	0.305	-2.840
BBB	UGA4	0.206	0.457	0.578	-1.111	1.390	2.576	-2.534
State	U0AA	0.062	0.207	0.187	-1.639	-0.145	0.560	-2.655
Local	U0AB	0.022	0.218	0.081	-2.181	-0.787	0.215	-5.267
Revenue	**U0AR**	**0.017**	**0.163**	**0.033**	**-2.023**	**-0.214**	**0.703**	**-5.158**
AAA	URA1	-0.007	0.153	0.052	-2.023	-0.419	0.504	-4.558
AA	URA2	0.019	0.178	0.060	-2.019	-0.363	0.485	-4.802
A	URA3	0.029	0.158	0.018	-1.921	0.105	1.011	-5.282
BBB	URA4	-0.012	0.095	-0.115	-2.482	-0.322	1.080	-6.930
Airport	U0AV	0.023	0.152	0.003	-1.913	0.347	1.324	-4.593
Education	U0AE	-0.014	0.095	-0.021	-2.240	-0.650	0.460	-5.607
Health	U0HL	-0.071	-0.162	-0.448	-3.222	-2.113	-0.906	-9.789
Hospital	U0AH	-0.011	0.092	-0.084	-2.616	-0.710	0.476	-7.425
Industrial Development Rev	U0ID	0.091	0.183	-0.021	-1.789	0.522	1.628	-5.178
Leases, COPs & Appropriations	U0AL	0.040	0.129	0.020	-1.967	-0.420	0.273	-4.472
Miscellaneous	U0AM	0.014	0.218	0.109	-1.929	-0.326	0.422	-4.065
Multi-family Housing	U0AU	-0.010	0.070	-0.065	-2.414	-0.296	0.655	-7.844
Pollution Control	U0AQ	0.022	0.117	-0.008	-1.949	-0.173	0.458	-3.604
Power	U0AP	0.073	0.185	0.089	-1.658	-0.155	0.533	-4.030
Single-family Housing	U0AS	0.012	0.144	0.011	-2.182	-0.676	-0.202	-6.387
Tax Revenue	U0TX	0.026	0.213	0.088	-2.052	-0.258	0.641	-4.742
Tobacco	U0TB	0.092	0.296	0.158	-1.414	0.756	1.837	-3.305
Toll & Turnpike	U0TL	-0.009	0.117	-0.024	-2.037	-0.203	0.698	-5.143
Transportation - other	U0AT	0.067	0.377	0.278	-1.669	0.525	1.383	-4.240
Utilities - other	U0UT	-0.016	0.019	-0.123	-1.579	0.119	0.870	-4.930
Water & Sewer	U0AW	-0.007	0.173	0.068	-1.848	-0.382	0.480	-4.431
Taxable	**TXMB**	**-0.110**	**0.272**	**-0.243**	**-1.872**	**-0.387**	**2.520**	**-11.816**
Build America Bonds	BABS	-0.071	0.316	-0.188	-1.970	-0.626	2.439	-11.558
VRDOs	**VRDO**	**0.006**	**0.044**	**0.051**	**0.244**	**0.490**	**0.270**	**1.239**
Daily reset	VRDD	0.004	0.032	0.038	0.219	0.427	0.204	1.031
Weekly reset	VRDW	0.007	0.050	0.059	0.257	0.523	0.305	1.348

Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

GOs outperformed revenue bonds this week by 5bp, with GOs gaining 21bp of returns vs revenue bonds' 16bp gain. This marks the 4th straight week of GO outperformance. Still, revenues are outperforming GOs for the YTD by 28bp. Among the muni bond sectors, Transportation had the strongest week, with a weekly return of 38bp; over the last month, Tobacco returns are strongest at -141bp. Local GOs, meanwhile, gained 22bp of returns for the week and state GOs 21bp; for the last month, they returned -218bp and -164bp, respectively. As a reminder, in our 3 February Municipals Weekly, we suggested that if our economists' forecasts for a 2H23 recession are correct, and if history repeats itself this cycle, GOs may outperform in the back half of the year as their YTW ratios richen to revenue bonds.

Exhibit 8 also shows that long maturities are outperforming vs short maturities for the YTD. Indeed, we can see that the 22+yr IG index is outperforming the 1-3yr IG index by 86bp for the YTD. All the same, with their longer duration, they underperformed during the selloff that began in early February, and for the last month, long maturities underperformed short maturities by 238bp.

We note that the Mideast region had the strongest week, returning almost 23bp in total returns. Conversely, the Southeast region's returns were weakest, at just 7bp. The Mideast's returns are also strongest for the YTD and over the last 3 months.

Exhibit 9: Regional total returns (%) monitor, as of 8 March 2023

The Mideast region is outperformed for the week, and has the strongest returns YTD and over last 3mo

Region	1d	1wk	MTD	1mo	3mo	YTD	1yr
Far West	0.051	0.197	0.102	-1.901	-0.373	0.463	-4.412
Great Lakes	0.036	0.202	0.102	-1.972	-0.124	0.770	-5.003
Mideast	0.026	0.226	0.113	-1.913	-0.023	0.908	-4.642
New England	0.014	0.144	0.054	-1.938	-0.274	0.460	-4.321
Plains	0.038	0.151	-0.020	-2.226	-0.358	0.485	-5.503
Rocky Mountain	0.050	0.148	0.019	-2.386	-0.484	0.424	-6.091
Southeast	-0.023	0.068	-0.076	-2.064	-0.348	0.597	-5.246
Southwest	-0.001	0.122	-0.021	-2.178	-0.792	0.201	-5.370

Note: Far West includes AK, CA, HI, NV, OR and WA; Great Lakes includes IL, IN, MI, OH and WI; Mideast includes DC, DE, MD, NJ, NY and PA; New England includes CT, MA, ME, NH, RI and VT; Plains includes IA, KS, MN, MO, NE, ND and SD; Rocky Mountains includes CO, ID, MT, UT and WY; Southeast includes AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA and WV; Southwest includes AZ, NM, OK and TX
Source: BofA Global Research, ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Supply & demand

YTD issuance totals $49.6bn, down 27% y/y

MTD issuance as of 8 March 2023 totaled $6.4bn, down 37% y/y against the same period in March 2022. By tax status, 89% of March's issuance is tax-exempt and 2% is taxable. YTD issuance of $49.6bn is down 27% y/y. Thus far, 78% of YTD issuance is new money, while 22% is refundings. New money volumes are down 20% y/y while refunding volumes are down 45%.

Exhibit 10: Issuance summary ($mn)

YTD issuance of $49.6bn is down 27% y/y; new money down 20% y/y and refundings down 45%

	Month-to-date			Year-to-date		
	3/8/2023	3/8/2022	y/y Δ	3/8/2023	3/8/2022	y/y Δ
Total	**6,374.5**	**10,048.7**	**-37%**	**49,558.4**	**67,943.5**	**-27%**
New Money	5,707.7	6,742.3	-15%	38,570.9	47,922.5	-20%
Total Refunding	666.8	3,306.5	-80%	10,987.6	20,021.0	-45%
Advanced refunding	0.0	0.0	-	1,380.9	1,170.3	18%
Unknown refunding	666.8	3,295.1	-80%	8,462.1	18,238.5	-54%
Current & Forward refunding	0.0	11.4	-100%	1,144.6	612.2	87%
Insured	443.5	1,348.0	-67%	4,473.3	6,278.9	-29%
Fixed rate	5,375.7	9,873.0	-46%	42,811.7	64,311.2	-33%
Variable rate long	967.3	27.6	3405%	5,333.3	2,567.6	108%
Variable rate short	28.5	83.0	-66%	1,237.4	487.8	154%
Zero coupon	3.0	0.5	500%	126.1	297.6	-58%
Convertible	-	64.6	-	-	245.3	-
Linked rate	-	-	-	50.0	34.0	47%
Variable rate no put	-	-	-	-	-	-
Tax exempt	5,662.2	7,813.6	-28%	44,085.6	53,805.8	-18%
Taxable	146.2	2,217.4	-93%	4,012.8	10,193.5	-61%
Alternative minimum tax	566.1	17.7	3098%	1,460.1	3,944.2	-63%
Education	1,812.1	3,359.7	-46%	18,806.0	20,182.0	-7%
Transportation	1,467.7	889.4	65%	4,925.7	11,634.9	-58%
General Purpose	1,200.0	1,790.4	-33%	8,696.3	12,685.6	-31%
Housing	992.2	599.8	65%	4,589.5	4,889.4	-6%
Electric Power	675.0	389.4	73%	3,496.4	2,129.0	64%

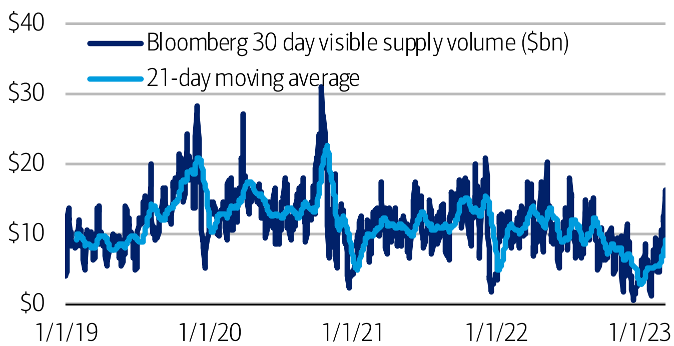
Exhibit 10: Issuance summary ($mn)
YTD issuance of $49.6bn is down 27% y/y; new money down 20% y/y and refundings down 45%

	Month-to-date			Year-to-date		
	3/8/2023	3/8/2022	y/y Δ	3/8/2023	3/8/2022	y/y Δ
Utilities	211.7	2,308.7	-91%	5,618.6	8,995.3	-38%
Development	15.8	268.8	-94%	1,123.8	2,278.5	-51%
Public Facilities	-	239.4	-	447.4	1,438.4	-69%
Healthcare	-	203.2	-	1,704.8	3,706.2	-54%
Environmental Facilities	-	-	-	150.0	4.3	3388%
Muni-backed corporates	0.0	912.0	-100%	88.7	4,697.0	-98%

Note: Long-term bonds only. Reflects any data revisions by Refinitiv or Bloomberg.
Source: BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 11: Bloomberg 30-day visible supply ($bn)
30 day visible supply was $14.4bn as of 9 March 2023 which has bounced back to above $10bn ending a long downward trend since May-22



Note: Data as of 9 March 2023.
Source: Bloomberg

BofA GLOBAL RESEARCH

Exhibit 12: 2023 gross issuance, redemption, forecasts vs actuals ($bn)
Gross issuance forecast of $500bn vs $564bn of prin. & cpn. redemptions

	Issuance		Prin. & cpn redemptions	
Month	Forecast	Actual	Forecast	Actual
January	$26	$23	$42	$39
February	32	19	45	29
March	43	6*	39	
April	38		32	
May	43		45	
June	51		65	
July	40		59	
August	45		62	
September	43		37	
October	53		40	
November	40		41	
December	46		56	-

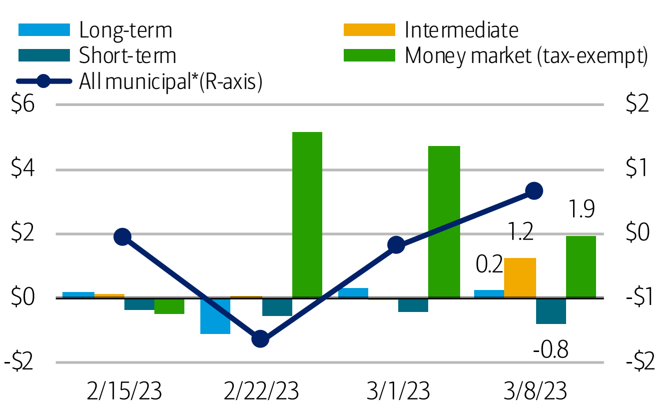
Source: Totals may not add up due to rounding. Data s of 8 March 2023.
Source: BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

Mutual fund inflows total $0.65bn; ETF inflows $0.05bn

Mutual fund flows were positive this week, with inflows totaling $0.65bn, coming mostly from Intermediate funds. There were $0.76bn of inflows to investment grade funds and $0.11bn of outflows from high yield funds. YTD, investment grade outflows total $1.6bn versus $1.0bn of inflows into high yield. ETF fund flows were positive for the week, totaling $0.05bn. Overall, our flow strength indicator measured by the 2-year trailing z-score suggests this week's flow strength was normal.

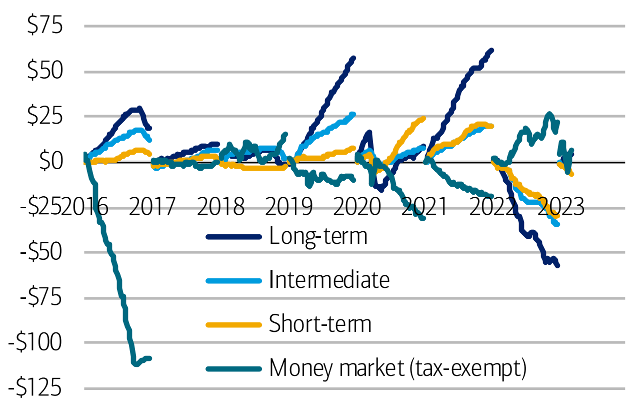
Exhibit 13: Flows by maturity brackets ($bn)
Muni inflows of $0.65bn, money market inflows of $1.93bn



Note: ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 8 March 2023.
Source: Refinitiv Lipper

BofA GLOBAL RESEARCH

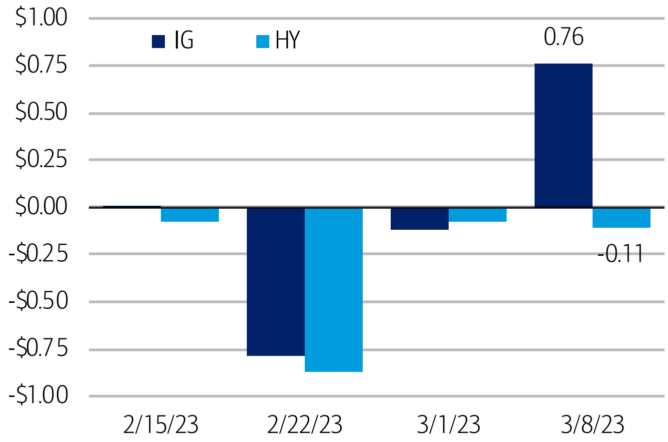
Exhibit 14: YTD cumulative flows ($bn)
2023 flow: LT: $3.9bn, INT: 1.6bn, ST: -$6.1bn, MM: $6.5bn



Note: ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 8 March 2023.
Source: Refinitiv Lipper

BofA GLOBAL RESEARCH

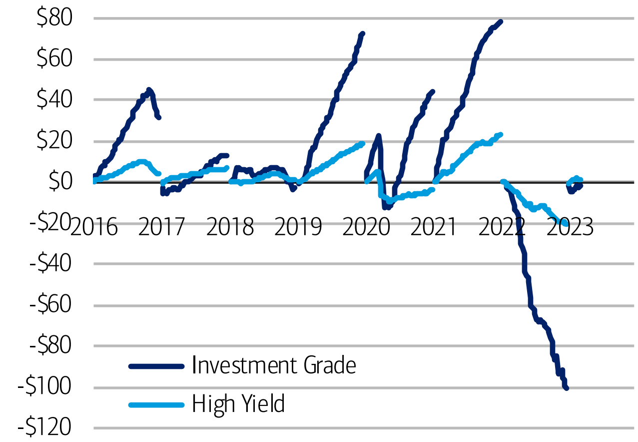
Exhibit 15: IG vs HY muni fund flows ($bn)
IG inflows of $0.76bn vs $0.11bn of HY outflows for the wk of 8 Mar



Note: ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 8 March 2023.
Source: Refinitiv Lipper

BofA GLOBAL RESEARCH

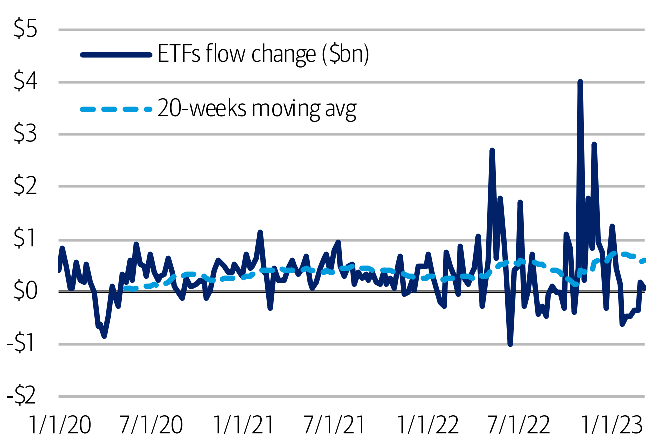
Exhibit 16: Year-to-date cumulative flows ($bn)
2023 flow: IG: -$1.6bn, HY: $1.0bn



Note: ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 8 March 2023.
Source: Refinitiv Lipper

BofA GLOBAL RESEARCH

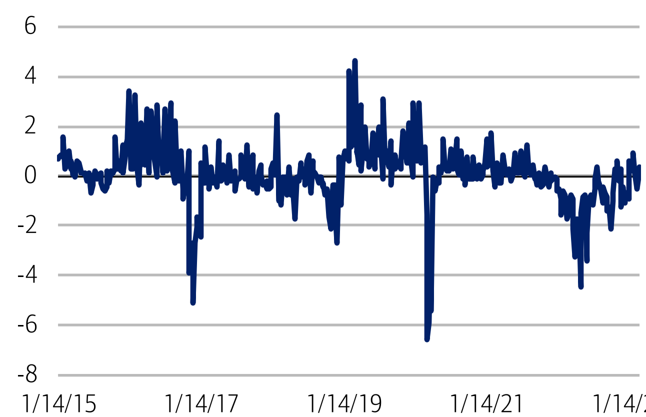
Exhibit 17: Municipal ETF fund flows ($bn)
ETF inflows were $0.05bn for week of 8 Mar 2023



Note: ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 8 March 2023.
Source: Refinitiv Lipper

BofA GLOBAL RESEARCH

Exhibit 18: Flow strength indicator
Flow strength was Normal with 0.39 z-score for the week of 8 Mar



Note: The flow strength indicator is measured by 2-year trailing z-score (A positive or negative number does not necessarily suggest buying or selling). ETFs included. Data includes both weekly and monthly reporting funds as of 8 March 2023.
Source: Refinitiv Lipper

BofA GLOBAL RESEARCH

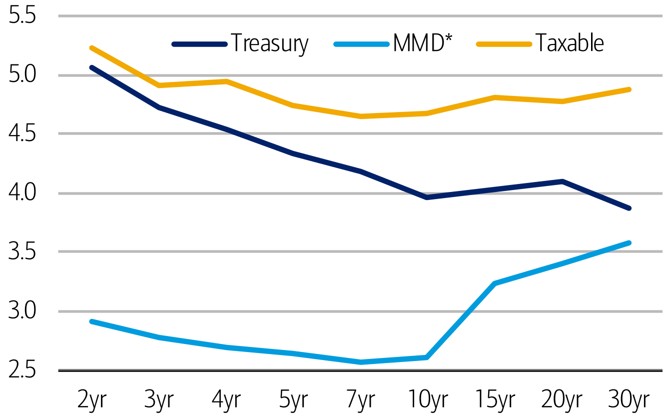
Curve

Curve shifts up 1bp on avg w/w

The AAA MMD curve cheapened w/w by 1bp on average w/w and cheapened by 46bp m/m. For the week, the 1s5s slope continued to undo some of its inversion by a further 10bp to -29bp and is 79bp flatter than it was one year ago; the 5s10s slope steepened 2bp w/w to -3bp and is 34bp flatter than it was one year ago; the 10s20s slope was flat w/w at 79bp and is 51bp steeper than it was one year ago. Meanwhile, the 20s30s slope was also flat w/w at18bp but is still 4bp steeper than it was one year ago. We reiterate our suggestion that investors position for a bull flattener.

Exhibit 22 shows the point on the AAA MMD curve where investors can capture 70%, 80% and 90% of the curve's max yield. Given the 1-12yr curve inversion, investors could capture not only 70%, but 80% of the curve's max yield at the very front end of the curve. To capture 90%, an investor needs to be at the 15yr part of the curve.

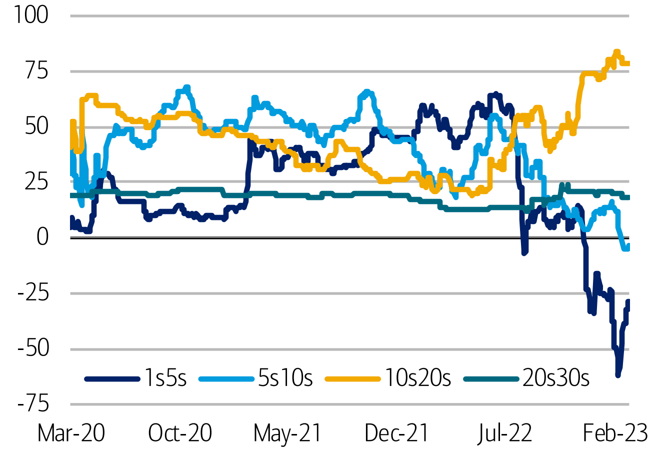
Exhibit 19: AAA GO muni, Treasury and taxable yield curves (%)
On average, Tsy, MMD, Taxable cheapened across the curve w/w



Note: *MMD AAA GO yield curve. As of 8 March 2023.
Source: BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

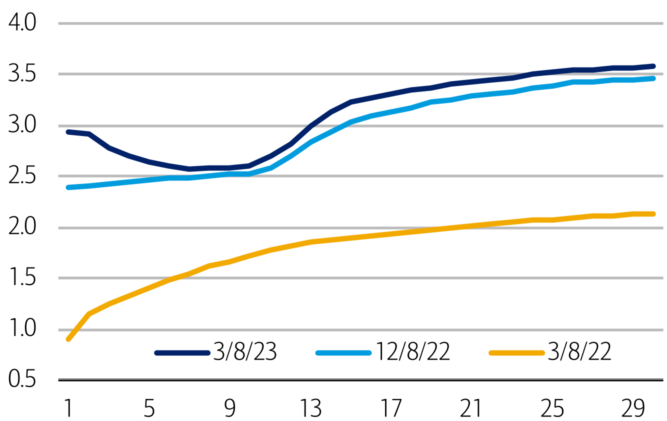
Exhibit 20: Curve slope (bp)
1s5s is less inverted by 10bp to -29bp as 10s20s and 20s30s flat w/w



Source: Refinitiv

BofA GLOBAL RESEARCH

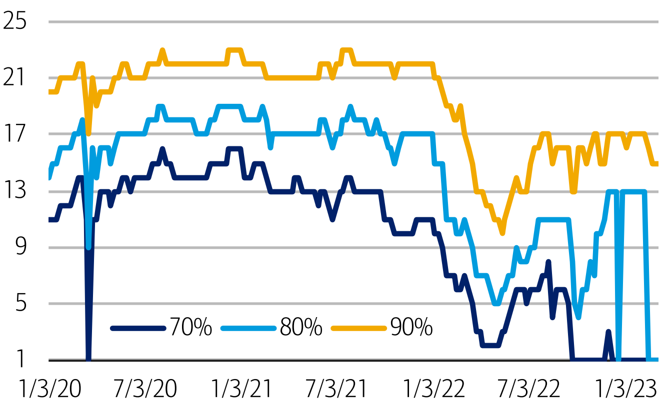
Exhibit 21: AAA GO municipal curve movement (%)
AAA is slightly cheaper across the curve versus 3 months ago



Source: Refinitiv

BofA GLOBAL RESEARCH

Exhibit 22: Point on curve to capture 70%, 80% & 90% of max yield
With curve's inversion, investor can capture 80% of curve's yield at the 1yr



Note: Data as of 8 March 2023
Source: BofA Global Research, Refinitiv

BofA GLOBAL RESEARCH

Relative value

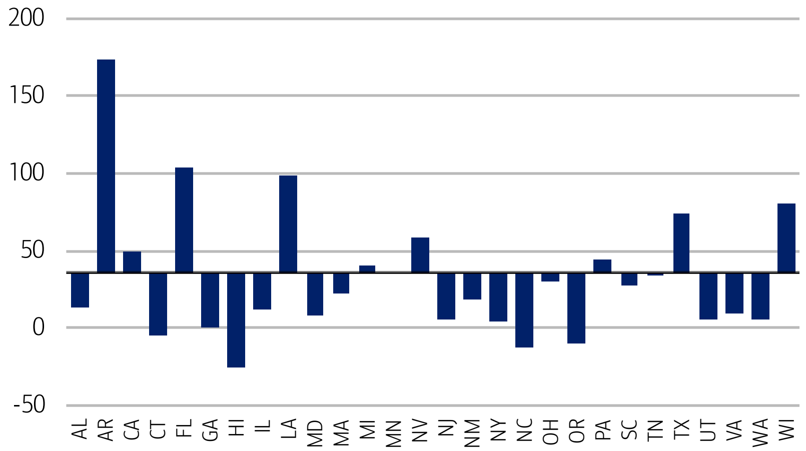
Local GO spreads to state GOs

As of 7 March, the YTW spread from the ICE BofA US Local Municipal Securities (U0AB) index to the ICE BofA US State Municipal Securities (U0AA) index is 36bp. While we consider that neutral on both a short- (3 month) and intermediate-term (1 year) basis using z-scores, we nevertheless consider it cheap on a long-term (3 year) basis.

Looking at this spread by state, Exhibit 23 shows that AR's YTW spread from its local GOs to its state GOs of 174bp offers an additional 138bp versus the market overall. That is likely the result of local GO index constituents' average maturity being 23.5yrs longer than state GO maturities. Note their weighted average ratings of local government debt in AR included in U0AB are equal to the state's debt, but also likely reflects the limited amount of AR state debt in U0AA. Other states with wider spreads than the market's overall include: CA, FL, LA, MI, NV, PA, TX and WI, per ICE data. Note that CA's local GOs' weighted average maturity is about 4yrs longer than the state's; in FL and LA its about 14yrs, in MI its 8yrs, in NV its roughly 11yrs, in PA its about 5yrs, in TX about 10yrs and WI its actually almost 1yr shorter.

Exhibit 24 shows current spreads versus those at the end of 2022. For example, it shows that the spread from local to state GOs narrowed thus far in 2023 in AR, along with CA, HI, LA, MI, MN, NV, NY, OH, OR, SC and TN. That is despite the fact that the overall spread between local and state GOs widened 5bp over the period, per ICE data.

Exhibit 23: Local GO YTW spread to state GO, by state (bp)
9 states' local GOs offer additional spread to the market overall, including CA and FL



Note: Data as of 7 March 2023. Axis set to 36bp, or the YTW spread of U0AB to U0AA.
Source: BofA Global Research, ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Exhibit 24: Local GO YTW spread to state GO, by state (bp), current vs end of 2022
Less than half of the states' Local GO YTW spread to state GOs narrowed since the end of 2022

State	3/7/23	12/30/22	State	3/7/23	12/30/22
AL	13	7	NM	19	17
AR	174	189	NY	4	11
CA	49	53	NC	-13	-16
CT	-5	-8	OH	30	31
FL	104	103	OR	-10	0
GA	1	-2	PA	44	37
HI	-25	-19	SC	28	32
IL	12	-45	TN	35	52
LA	99	112	TX	74	73
MD	8	5	UT	5	0
MA	22	21	VA	10	25
MI	40	55	WA	5	1
MN	36	37	WI	80	79
NV	58	72	**Overall**	**36**	**31**
NJ	6	-24			

Source: BofA Global Research, ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Ratios neutral, curves largely flat

We screen for the muni market for parts of the curve, sectors and ratings that are rich or cheap. Exhibit 25 shows that muni/Treasury ratios are Neutral on both a short- and long-term basis. Exhibit 26 shows that the 10s30s slope is Very Steep while the rest are Very Flat on a long-term basis. Slopes are Neutral on a short-term basis.

Exhibit 25: Rich/cheap analysis of MMD*/Treasury ratios as of 7 March 2023
The muni market is Neutral on both a ST and LT basis

Maturity	Current Treas	Muni/Treas	MMD R/C (short-term)	3 mo. max	3 mo. min	3 mo. avg	MMD R/C (long-term)	3 year max	3 year min	3 year avg
3yr	4.732%	58.7%	Neutral	63.1%	51.7%	58.1%	Neutral	776.8%	26.7%	88.5%
5yr	4.335%	60.9%	Neutral	69.0%	53.5%	61.5%	Neutral	652.7%	39.3%	82.3%
10yr	3.972%	65.7%	Neutral	74.5%	59.9%	66.4%	Neutral	367.4%	54.7%	90.4%
30yr	3.873%	92.4%	Neutral	101.3%	85.8%	91.2%	Neutral	250.7%	63.5%	94.9%

Note: *MMD AAA GO yield curve. R/C = Rich/Cheap Note the benchmark for short-term is the 3-month average and for long-term is the 3-year average. Rich/cheap is based on z-scores: if z-score is >2, then "Very Cheap"; if >1 but <2, then "Cheap"; if between -1 and 1, then "Neutral"; if <-1 but >-2, then "Rich"; if <-2, then "Very Rich".
Source: BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 26: Rich/cheap analysis of MMD* slopes (bp) as of 7 March 2023
The 10s30s curve is Very Steep while the rest are Very Flat on a LT basis

Slope	Current slope	Slope S/F (short-term)	3 mo. max	3 mo. min	3 mo. avg	Slope S/F (long-term)	3 year max	3 year min	3 year avg
1/5s	-29	Neutral	14	-62	-28	Very Flat	65	-62	24
1/10s	-34	Neutral	22	-56	-20	Very Flat	120	-56	64
10/30s	97	Neutral	104	87	96	Very Steep	104	32	63
1/30s	63	Neutral	109	45	76	Very Flat	170	45	128

Note: *MMD AAA GO yield curve. S/F = Steep/Flat Note the benchmark for short-term is the 3-month average and for long-term is the 3-year average. Steep/Flat is based on z-scores: if z-score is >2, then "Very Steeo"; if >1 but <2, then "Steep"; if between -1 and 1, then "Neutral"; if <-1 but >-2, then "Flat"; if <-2, then "Very Flat".
Source: BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

Best spot for credit spread roll is the 7yr on the BAA curve

For tax-exempt munis, the 7yr spot on the BAA curve is the best for credit spread roll at 12bp. For taxable munis, the 7yr is also the best spot but on the A curve where 16bp of credit spread roll can be found.

Exhibit 27: Tax-exempt credit curve spreads to AAA MMD as of 8 March 2023 (bp)

A 12bp pickup can be found at the 7yr on the BAA curve

		1yr	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Spread to MMD AAA	AA	5	6	7	8	10	12	14	16	17	18	20	22	24	27	30	30	30	30	32	34	36	36	36	36	37	37	37	37	37	37
	A	16	20	21	23	24	30	33	34	39	38	43	44	47	49	51	51	51	51	53	55	57	57	57	57	57	57	57	57	57	57
	BAA	49	50	50	54	59	65	77	79	85	90	91	92	93	94	95	95	95	95	97	99	101	101	101	101	101	101	101	101	101	101
Bp pickup along curve	AA	-	1	1	1	2	2	2	2	1	1	2	2	2	3	3	0	0	0	2	2	2	0	0	0	1	0	0	0	0	0
	A	-	4	1	2	1	6	3	1	5	-1	5	1	3	2	2	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0
	BAA	-	1	0	4	5	6	12	2	6	5	1	1	1	1	1	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0

Source: Refinitiv

BofA GLOBAL RESEARCH

Exhibit 28: Taxable credit curve spreads to AAA MMD as 8 March 2023 (bp)

A 16bp pickup can be found at the 7yr on the A curve

		1yr	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Spread to MMD AAA	AA	15	15	17	16	17	20	29	27	25	26	26	28	30	32	31	30	30	30	29	29	28	28	28	28	28	28	28	28	28	28
	A	35	35	37	37	37	42	58	56	58	60	62	63	65	67	66	65	64	64	64	64	63	63	63	63	63	63	63	63	63	63
	BAA	120	120	122	122	122	122	129	130	136	143	149	152	154	156	158	157	156	155	154	154	153	153	153	153	153	153	153	153	153	153
Bp pickup along curve	AA	-	0	2	-1	1	3	9	-2	-2	1	0	2	2	2	-1	-1	0	0	-1	0	-1	0	0	0	0	0	0	0	0	0
	A	-	0	2	0	0	5	16	-2	2	2	2	1	2	2	-1	-1	-1	0	0	0	-1	0	0	0	0	0	0	0	0	0
	BAA	-	0	2	0	0	0	7	1	6	7	6	3	2	2	2	-1	-1	-1	-1	0	-1	0	0	0	0	0	0	0	0	0

Source: Refinitiv

BofA GLOBAL RESEARCH

Screening for cheap OAS

At the 7-12yr part of the curve, we consider AAA Utilities', single-A Health's and BBB Lease COPS & Appropriation's OAS cheap. At the 22+yr part of the curve, we consider AAA Higher Ed, AAA GO Local, single-A & BBB Health and BBB Power sectors' OAS Cheap. Conversely, we consider BBB Utilities' OAS at the 22+yr part of the curve to be Very Rich.

Exhibit 29: OAS, 7-12yr indexes (bp)

Single-A Health at 10bp

Sector	AAA	AA	A	BBB
Airports		50	48	52
Higher Education	-2	8	64	
GO Local	6	17	58	148
GO State	-3	1	49	105
Health		45	96	52
Hospital		27	52	125
IDR		88	56	100
Leases COPS & Appr.		20	48	78
Pollution Control	10		72	
Power	6	7	27	
Tax Revenues	16	16	68	131
Tobacco			93	
Toll & Turnpike		29	36	130
Transportation - Other	8	31	70	103
Utilities - Other	0	10	26	
Water & Sewer	6	8	27	144

Note: Data as of 7 Mar 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Exhibit 30: Rich/cheap OAS, 7-12yr

...is Cheap right now at 7-12yrs...

Sector	AAA	AA	A	BBB
Airports		N	N	N
Higher Education	R	R	N	
GO Local	R	R	N	N
GO State	R	R	N	N
Health		R	C	N
Hospital		R	N	N
IDR		N	R	N
Leases COPS & Appr.		N	N	C
Pollution Control	N		N	
Power	N	R	N	
Tax Revenues	R	R	N	N
Tobacco			N	
Toll & Turnpike		N	N	N
Transportation - Other	N	N	N	N
Utilities - Other	C	N	N	
Water & Sewer	R	R	R	N

Note: Data as of 7 Mar 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Exhibit 31: 3-yr avg OAS, 7-12 year (bp)

...against its 3yr OAS avg of 62bp

Sector	AAA	AA	A	BBB
Airports		40	45	97
Higher Education	-4	5	55	
GO Local	3	16	53	140
GO State	0	5	48	141
Health		34	62	106
Hospital		24	54	107
IDR		50	64	99
Leases COPS & Appr.		17	47	111
Pollution Control	2		84	
Power	6	3	33	
Tax Revenues	14	15	59	140
Tobacco			61	
Toll & Turnpike		27	33	94
Transportation - Other	6	24	82	114
Utilities - Other	-4	5	45	
Water & Sewer	3	0	25	115

Note: Data as of 7 Mar 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Exhibit 32: Current OAS, 22yr+ indexes (bp)
BBB Utilities at 0bp

Sector	AAA	AA	A	BBB
Airports		32	24	1
Higher Education	37	-10	21	102
GO Local	9	6	17	85
GO State	-13	-22		77
Health		-24	68	195
Hospital		19	34	70
IDR			55	93
Leases COPS & Appr.	12	-5	42	39
Pollution Control			31	
Power		-6	19	101
Tax Revenues	10	6	55	112
Tobacco				114
Toll & Turnpike			18	56
Transportation - Other		0	34	55
Utilities - Other		-13	47	0
Water & Sewer	-17	-17	0	

Note: Data as of 7 Mar 2023. Only includes non-prerefunded securities. Benchmark is 3-yr avg.
Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Exhibit 33: Rich/Cheap OAS analysis, 22yr+
...is Very Rich right now at 22+ years

Sector	AAA	AA	A	BBB
Airports		N	N	N
Higher Education	C	N	N	N
GO Local	C	N	N	N
GO State	N	N		N
Health		N	C	C
Hospital		N	N	N
IDR			N	N
Leases COPS & Appr.	N	N	N	N
Pollution Control			N	
Power		N	N	C
Tax Revenues	N	N	N	N
Tobacco				N
Toll & Turnpike			N	N
Transportation - Other		N	N	N
Utilities - Other		N	N	VR
Water & Sewer	N	N	N	

Note: Data as of 7 Mar 2023.. Only includes non-prerefunded securities. Benchmark is 3-yr avg.
Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Exhibit 34: 3-yr avg OAS, 22yr+ (bp)
...against its 3yr OAS avg of 73bp

Sector	AAA	AA	A	BBB
Airports		34	40	49
Higher Education	14	-1	31	87
GO Local	-12	3	33	115
GO State	-25	-15		116
Health		3	35	98
Hospital		8	33	64
IDR			54	80
Leases COPS & Appr.	-7	-1	36	72
Pollution Control			18	
Power		-6	21	53
Tax Revenues	8	10	64	93
Tobacco				86
Toll & Turnpike			20	57
Transportation - Other		17	53	67
Utilities - Other	-11	-8	27	73
Water & Sewer	-17	-9	10	

Note: Data as of 7 Mar 2023. Only includes non-prerefunded securities. Benchmark is 3-yr avg
Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

MWIs retrace during selloff

Our market width indicator, which measures muni sectors' recent market momentum by calculating the percentage of a sectors' CUSIPs whose current yields-to-worst are below their moving 20-week average, shows that all sectors' MWIs retraced back to the neutral/underpriced levels (50%/below 20%). The ETM, Pre-Re, Health and Single Family Housing sector's MWIs are lowest overall. W/w, all the sectors' MWIs decreased, with the Airports, Education, Hospitals, Lease COPs & Appropriations, Multi-Family Housing, Pollution Control, Toll & Turnpike and Utilities sectors seeing the biggest decreases.

Exhibit 35: MWIs – sector momentum (%) as of 8 March 2023
The ETM, Pre-re, Health and Single-Family Housing are lowest overall

Sector	MWI	w/w Δ	Sector	MWI	w/w Δ
U0A0 Index	**29.7%**	**-8.7%**	Miscellaneous	25.7%	-5.8%
ETM	6.6%	-5.7%	Multi-Family Housing	17.7%	-11.0%
GO - Local	20.0%	-9.2%	Pollution Control	22.4%	-16.5%
GO - State	21.5%	-5.0%	Power	25.5%	-9.3%
Pre-Re	1.5%	-0.3%	Single Family Housing	8.9%	-9.9%
Airport	48.2%	-13.7%	Tax revenue	42.5%	-7.0%
Education	26.7%	-10.4%	Tobacco	63.3%	-6.7%
Health	12.9%	-4.0%	Toll & Turnpike	44.2%	-10.5%
Hospitals	38.1%	-16.7%	Transportation	45.3%	-3.5%
Industrial Development Rev	57.8%	-9.1%	Utilities - Other	24.4%	-10.9%
Leasing COPS & Appropriations	25.7%	-10.9%	Water & Sewer	27.4%	-9.0%

Source: BofA Global Research, ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Trade activity

Most actively traded CUSIPs for the week

The most actively traded CUSIP over the last week by total volume and number of trades was 59465PEL8, totaling $138.1mn; these are newly issued rental housing revenue bonds issued by the Michigan State Housing Development Authority, due in 2058.

Exhibit 36: Most actively traded muni CUSIPs over the week ending 8 March
59465PEL8 was the most frequently traded CUSIP. [1]Last trade.

CUSIP	Short Name	ST	Coupon	Maturity	Issue	Price[1]	Yield[1]	Size[1] (000s)	Spread	# of Trades	Volume ($mn)
59465PEL8	MI ST HSG DEV AUTH -A	MI	5.150	10/01/58	03/30/23	101.500	4.95	895	135	465	138.1
93878YCS6	WASHINGTON MET AREA-A	DC	4.125	07/15/47	03/14/23	99.409	4.16	25	65	138	117.6
876387FC0	TARRANT CO HOSP DT	TX	4.250	08/15/53	02/01/23	99.152	4.30	150	71	117	86.1
59465PEK0	MI ST HSG DEV AUTH -A	MI	5.100	10/01/53	03/30/23	101.500	4.90	120	131	355	82.5

Exhibit 36: Most actively traded muni CUSIPs over the week ending 8 March
59465PEL8 was the most frequently traded CUSIP. [1]Last trade.

CUSIP	Short Name	ST	Coupon	Maturity	Issue	Price[1]	Yield[1]	Size[1] (000s)	Spread	# of Trades	Volume ($mn)
74514L3T2	CVI-SUBSER CW NT	PR	0.000	11/01/43	03/15/22	38.300	4.76	0.528		117	79.8
692160UZ5	OYSTER BAY TWN	NY	5.000	03/08/24	03/08/23	101.881	3.05	1050	6	32	59.9
531127AC2	LIBERTY DEV GOLDMAN	NY	5.250	10/01/35	10/12/05	111.514	4.07	15	115	55	56.4
74514L3R6	RESTRUCTURED-CABS-SER	PR	0.000	07/01/33	07/01/21	52.000	6.45	0.234	379	91	55.3
469480AV9	JACKSONVILLE PUB EDU	AL	5.500	08/01/58	03/15/23	108.250	4.46	25	85	173	54.8
20775HYW7	CONNECTICUT ST HSG FI	CT	4.700	11/15/43	03/23/23	100.000	4.70	10	131	142	52.0
167593X72	CHICAGO -A-AMT	IL	4.500	01/01/48	10/04/22	97.590	--	5	114	176	50.7
20775HYX5	CONNECTICUT ST HSG FI	CT	4.850	05/15/48	03/23/23	100.000	4.85	15		225	46.4
254764KB8	DISTRICT OF COLUMBIA	DC	5.000	07/15/44	09/17/15	103.505	3.69	25	27	11	46.4
469480AT4	JACKSONVILLE PUB EDU	AL	5.250	08/01/53	03/15/23	106.410	4.44	50	85	62	45.2
709225GV2	PA TPK COMM	PA	5.000	12/01/33	03/16/23	114.907	3.27	25	58	12	42.6
4636324K2	IRVINE RANCH-VAR-B	CA	1.000	10/01/41	06/04/09	100.000	--	4800		11	41.5
914367DJ3	UNIV KS HOSP-REF-IMPT	KS	5.000	09/01/45	04/15/15	101.380	4.41	10	94	138	40.4
19648FVN1	CO HLTH FACS AUTH-E	CO	1.650	05/15/62	08/01/22	100.000	--	4700		8	39.4
4624674P3	IA FIN AUTH -A	IA	4.900	07/01/48	04/13/23	99.656	4.92	610	139	324	39.2
876387FB2	TARRANT CO HOSP DT	TX	4.250	08/15/48	02/01/23	98.604	4.34	225	80	58	39.1

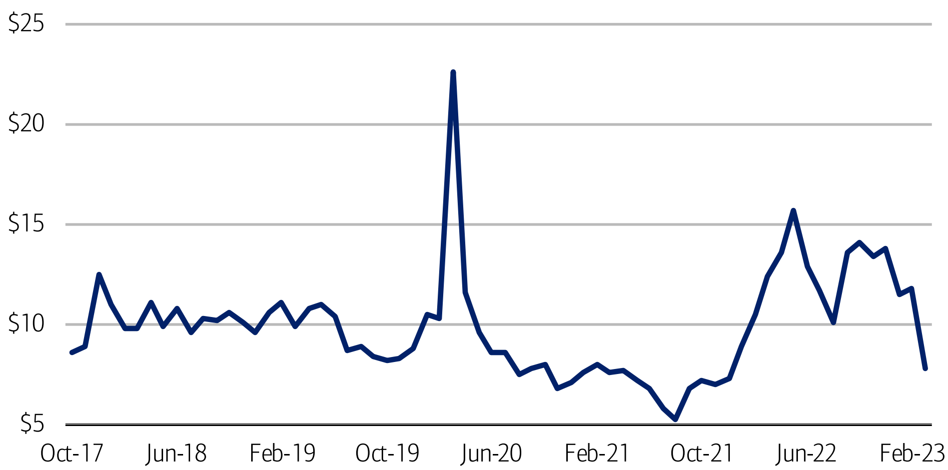
Source: Bloomberg

BofA GLOBAL RESEARCH

Avg daily secondary trading $7.8bn MTD in March

Secondary trading levels have moderated in March thus far relative to February's levels: for the MTD as of 8 March, $46.7bn of muni bond par value traded, with an average daily volume of $7.8bn. That daily average is about 34% lower than February's daily average of $11.8bn and is down about 37% vs March 2022's $12.4bn.

Exhibit 37: Daily avg secondary trading volume ($bn; as of 8 March 2023)
Mar-23 MTD daily avg volume of $7.8bn down 34% vs Feb-23's $11.8bn daily average



Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Credit corner

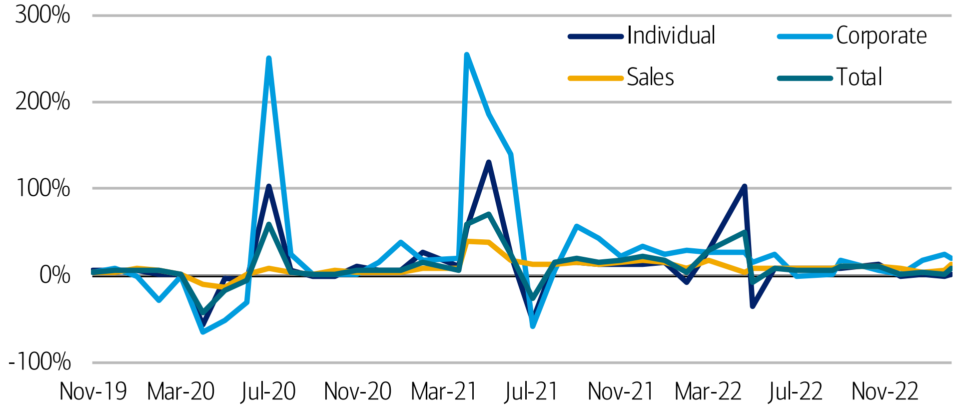
State & local governments

Feb medians stronger; growth should slow, but state's can handle it – Fitch

We now have data for 15 states' collections for the month of February. The data shows a stronger relative month to January, when median y/y growth among the 44 states we have data on was just 1.5%. For February, personal income collections are up 3% y/y on median, while sales collections are up 13%. Corporate collections are up 19% on median. While these medians are still early, we have more confidence that they will hold as additional states report, and should stay within a percentage point or two of current medians.

Exhibit 38: States' median year-over-year % change by source

For earliest 14-reporting states, February collections up 9% on median y/y



Source: BofA Global Research, various state reports.

BofA GLOBAL RESEARCH

We highlight here a 7 March report from Fitch in which the rating agency notes that while "[s]tate coffers continue to benefit from a strong labor market and nominal growth in consumer spending" – and indeed, based on their review, Fitch sees state tax revenues are up 6% on average from July through February (note, our own data shows a similar average) – "signs are mounting that the unprecedented tax revenue growth of the past couple years will soon moderate." Fitch points to decelerating sales tax growth, which is tracking a similar decline in inflation, expectations of lower consumption with the end of pandemic-era assistance programs and lower personal savings levels, and weak capital market performance in 2022, which "will drive down non-withholding collections considerably compared with enormous gains in 2021."

Still, Fitch expects the states to be able to "comfortably absorb softening revenue growth without affecting their credit quality as most states have improved their fiscal resiliency by building up robust reserves and paying down liabilities." The rating agency, noting NASBO data on median state rainy day fund balances as a percentage of general fund spending of 12%, expects "reserves will grow further by FYE23 given revenue performance to date."

WV's governor signs "largest tax cut" in state history into law

On Tuesday, WV's governor signed the "largest tax cut in West Virginia history" into law, according to a 7 March press release, including a significant reduction in personal income taxes. Per a fiscal note to the law, the top rate for tax years beginning on and after 1 January 2023 is 5.12% – a 21% y/y reduction. A provision in the law would also provide for future personal income tax reductions if actual adjusted collections exceed an inflation adjusted target, however cannot decline by more than 10% in any given year. According to the governor, these provisions "put West Virginia on a pathway toward complete elimination of the personal income tax." The fiscal note estimates that the 21% decrease in personal income tax rates would result in a reduction in general fund revenues of up to $115mn in FY23, $696mn in FY24, $610mn in FY25 and $634mn in FY26, with even larger increases in out years "due to underlying tax base growth." Those exclude impacts from future tax reductions based on the law's language because "t is not possible to accurately determine the timing and amount of future tax reductions based on currently available data." Note that, per the WV Budget Office's February 2023 general revenue fund report, actual FYTD collections of $4.08bn are exceeding estimated amounts by $1.11bn; personal income tax collections are 114% of expected amounts, sales taxes are 115% of expected amounts, corporate net income taxes are 241% of expected amounts and severance taxes are 435% of expected amounts.

A relatively quiet week in Puerto Rico

News was relatively light coming out of the commonwealth this week as we await next week's omnibus hearing. That said, we note that TSA balances of $7.0bn as of 24 February were down $98mn w/w, and FYTD General Fund collections of $7.8bn that were up 3.0% versus adopted liquidity plan levels. We also highlight (a) cement sales – which is a bellwether for construction on-island – were up 3.8% y/y in January, though down modestly on a m/m basis. Meanwhile, data shows that electricity generation in January was down 6.2% y/y and down 5% m/m. And, lastly, we point out that the Caribbean Tourism Organization, as part of its "Tourism Performance and Outlook Report", said that Puerto Rico is among a number of other destinations in which tourism is "already surpassing pre-pandemic levels."

IA's OK of state funding for private schools neg for public districts – Moody's

In a 1 March note, Moody's stated that a recently-enacted IA law providing state funding for K-12 students for tuition and expenses for private schools is "credit negative for Iowa public school districts because the program will be funded in large part by diverting state funding from public schools." Per the rating agency, a public school "district's loss in state funding will be determined by the number of students attending private schools using ESA money. To provide a partial cushion against the loss, districts will receive aid (around $1,200 per pupil in 2023-24) for each student who leaves for a private school; the aid amount will also change annually." According to Bloomberg data, IA's school districts have about $3.9bn of debt outstanding.

Healthcare

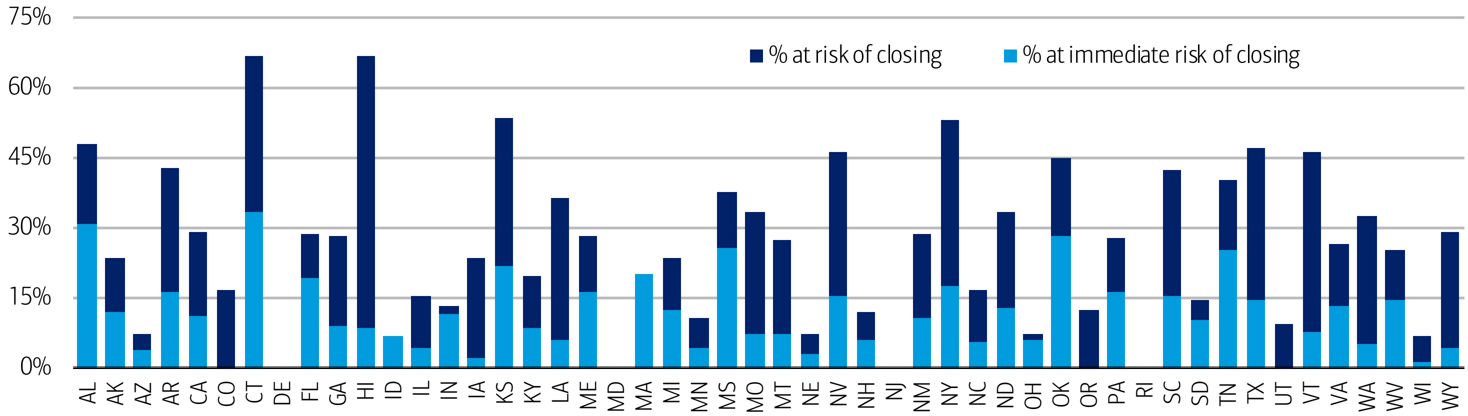
NFP hospital medians deteriorate, will continue to do so – Fitch

Early medians for not-for-profit hospitals show "materially weaker profitability and liquidity relative to FY21 due to expense increases and investment market losses," according to a 2 March report from Fitch. The rating agency expects medians to worsen even more when all rated hospitals report as those with "later FYEs bore the full brunt of intensifying financial pressures in 2022, including labor inflation and market volatility." Some key points from Fitch's report include: (1) still profitable operations, "but the initial FY22 median margin eroded to barely breakeven, 0.9%, from 3.8% for the same cohort in FY21"; (2) expense growth is still outpacing revenue growth; (3) "patient volumes and associated revenue are increasing, but revenue growth is … hampered by staffing-related capacity constraints and slower patient throughput"; (4) cash on hand down to 221 days in FY22 vs 266 days in FY21; (5) cash to adjusted debt "still robust" at roughly 158% vs a high of 190%; and, (6) debt-to-EBITDA was up to 3.9x vs 2.5x in FY21 reflecting a "combination of increased debt and lighter cash flow generation."

251 rural hospitals in US at immediate risk of closure – CHQPR

Per the Center for Healthcare Quality and Payment Reform (CHQPR), 627 rural hospitals (30% of all rural hospitals in the US) are at immediate of closure, with 251 at immediate risk of closing. According to CHQPR, "[i]n more than half of the states, 25% or more of the rural hospitals are at risk of closing, and in 12 states, 40% or more are at risk." Those 12 states are: AL, AR, CT, HI, KS, NV, NY, OK, SC, TN, TX and VT. For those 627 hospitals, "persistent financial losses on patient services" and "low financial reserves" are the key drivers. For that subset of 251 rural hospitals at immediate risk of closure, the drivers are "inadequate revenues to cover expenses" and "very low financial reserves." These hospitals' debt is greater than their assets, or their net assets could offset their losses for at most 2 to 3 yrs. In contrast, those hospitals at risk of closure but not "immediate" risk have net assets that could offset losses for up to 6 years.

Exhibit 39: Rural hospitals at risk of closure and immediate risk of closure, by state
In 12 states, 40% or more of rural hospitals are at risk of closure, per CHQPR



Source: Center for Healthcare Quality and Payment Reform

BofA GLOBAL RESEARCH

Higher education

Public school K-12 enrollments disappoint more than expectations: The Western Interstate Commission for Higher Education (WICHE) recently released its annual "Knocking at the College Door" report chronicling K-12 enrollment across the US. As enrollment trends at the university level continue to disappoint, K-12 enrollments provide a glimpse at future trends as less students enroll and, by extension, graduate high school. Declining enrollment levels were not created by the pandemic, but were certainly exacerbated by it. Public schools reported a decline of 3% in student enrollment from first through fifth grade in fall 2019; 18.17million, down from 18.75mn in fall 2015. WICHE found that, "833,000 fewer students enrolled in public schools in fall 2021 than had been predicted, which was an unexpected 2% decline."

Airports

Debt, leverage and spending to rise, but not to a dangerous level per Moody's: Recent reporting from Moody's highlights the increase passenger demands across the US, with growth rising above pre-pandemic numbers. Requisite spending and improvements have begun, fueling rising costs and increased debt funding. However, not to a level of concern or to the degree that would affect airport credit quality. Moody's does note that "continued inflation or stronger-than-expected passenger growth could lead to higher debt loads and a resulting weakening of credit quality for some airports." As many airports put projects on hold during the pandemic, with just $4.6bn in net debt issuance in FY21, down from a projected $10.5bn, Moody's expects ample debt issuance from FY22 to continue in the coming year as inflation remains high and continues to drive up budgets. Airlines hoping to continue accessing some of these airports will have to pay higher amounts, with the fees paid by airlines in FY26 projected to be 35% higher than those paid in FY19. Expectations remain that these increased costs will be passed along to passengers.

Defaults, distress & HY

Rising star vs fallen angel potential screen

It has been nearly 2 months since we last screened for S&P rated bonds that we characterize as having rising star (rated BB or BB+ with a positive outlook) or fallen angel (BBB or BBB- with a negative outlook) potential. Our current screen results in $1.5bn of rising star potential vs $3.6bn of fallen angel potential as of 7 March, both higher from our late January 2023 screen.

Exhibit 39 below shows the aggregate outstanding debt on CUSIPs we see with fallen angel or rising star potential by borrower and limited to the largest 15.

Exhibit 40: Borrowers with the largest amount of CUSIP aggregate debt outstanding we identified as having fallen angel or rising star potential ($mn)
Fallen angel potential dominated by healthcare/hospital and higher education borrowers

Rising star				Fallen angel			
Borrower	**Amt out**	**Rating**	**Outlook**	**Borrower**	**Amt out**	**Rating**	**Outlook**
Legacy Traditional School Obl. Group	374.1	BB+	Pos	Montefiore Obl. Group	640.5	BBB-	Neg
City of Detroit MI	346.9	BB	Pos	Westchester County Health Care Corp Obl. Group	368.8	BBB-	Neg
Bard College	247.5	BB+	Pos	Arizona Industrial Development Authority	303.4	BBB	Neg
Bd of Managers Joint Guadalupe Cnty-City of Seguin Hospital	102.8	BB	Pos	Longwood Housing Foundation LLC	261.6	BBB-	Neg
Nevada Charter Academies	47.1	BB	Pos	Northbay Healthcare Group Obl. Group	250.6	BBB-	Neg
City of Scranton PA	45.1	BB+	Pos	Garnet Health Medical Center Obl. Group	249.9	BBB-	Neg
CHF-Collegiate Housing College Station I LLC	37.7	BB+	Pos	Northern Light Health Obl. Group	170.8	BBB	Neg
TLC Academy	36.6	BB	Pos	University of Hartford/The	154.5	BBB-	Neg
Tapestry Charter School	32.2	BB+	Pos	Franklin County Convention Facilities Authority	151.8	BBB-	Neg
Mater Academy of Nevada Obl. Group	29.0	BB	Pos	Antelope Valley Healthcare District Obl. Group	110.8	BBB	Neg
City of Atlantic City NJ	28.0	BB	Pos	BSLC Obl. Group	107.7	BBB-	Neg
Arizona Autism Charter Schools Obl. Group	25.9	BB	Pos	Springfield College	106.0	BBB	Neg
Scranton Redevelopment Authority	22.5	BB+	Pos	State of New Jersey Motor Vehicle Surcharge Revenue	104.3	BBB	Neg
Paterson Charter School for Science and Technology Inc	15.3	BB	Pos	St Edward's University Inc	79.1	BBB	Neg
Detroit Service Learning Academy	14.8	BB	Pos	City of Jackson MS	67.9	BBB	Neg
All others*	65.3	BB	Pos	All others*	506.0	BBB-	Neg

Note: Data as of 7 March 2023. *Weighted average rating by par amount outstanding.
Source: BofA Global Research, S&P Global Ratings, Bloomberg

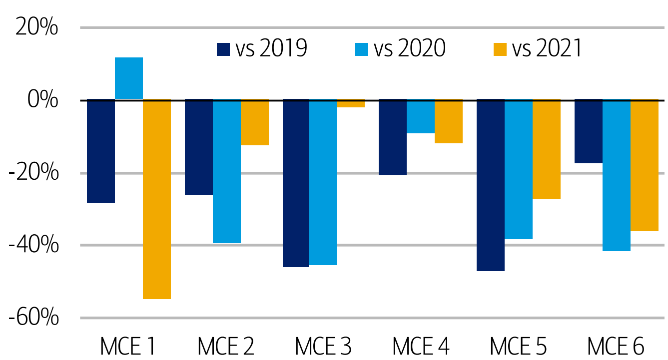
BofA GLOBAL RESEARCH

It is important to bear in mind that our criteria includes current outlooks; so, if S&P revises its outlook on either a potential rising star or fallen angel to stable, for example, it would fall off our screen. We also caution that the below should not be read that a borrower's CUSIPs will become a fallen angel nor a rising star; it is also not a recommendation to buy or sell a particular borrower, or the group as a whole.

Tracking: material credit event and Ch. 9 filings

We note that for the week ending 8 March, our tracking of those Moody's-defined material credit events (MCEs) shows 19 postings, up 11 on a w/w basis, with the MTD total of 24 as of 8 March. See Exhibit 42. Our review of the MSRB's data on those event disclosure filings from its 2022 Fact Book published at the start of March shows they were down in the aggregate 24% y/y, totaling 555 in 2022. See Exhibit 41.

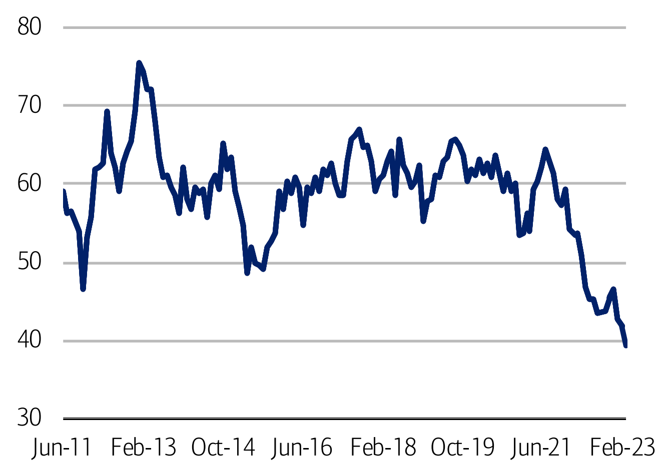
Exhibit 41: Material credit event filings, by type, 2022 vs '19, '20 & '21
Overall, MCE filings fell 23% y/y in 2022



Note: Material credit events (MCE) reflect: 1. bankruptcy, insolvency, receivership or similar event, 2. financial obligation-event reflecting financial difficulties, 3. nonpayment related default, 4. principal/interest payment delinquency, 5. unscheduled draw on credit enhancement reflecting financial difficulties, and 6. unscheduled draw on debt service reserve reflecting financial difficulties.
Source: Municipal Securities Rulemaking Board

BofA GLOBAL RESEARCH

Exhibit 42: 6-mo mov avg of material credit events posted to EMMA
Filings posted to EMMA have declined greatly since last March

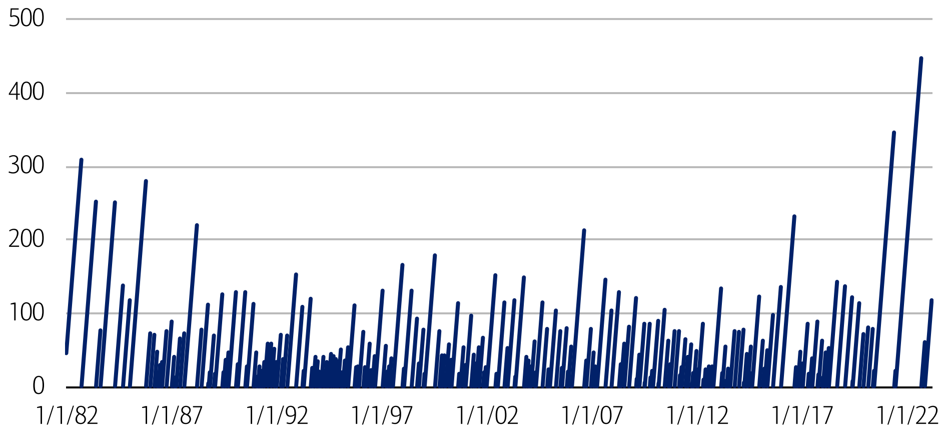


Note: Data as of 1 March 2023.
Source: EMMA

BofA GLOBAL RESEARCH

Meanwhile, we note there were no new Chapter 9 bankruptcy petitions filed for the week ending on 8 March and, as a result, it's been 118 days since the last bankruptcy petition was filed by Chester, PA on 10 November 2022. Since 1982, the average period between bankruptcy filings is 52 days. Note that, over this period, the time between Chapter 9 filings exceeded 100 days on only 43 other occasions.

Exhibit 43: Calendar days since last Chapter 9 petition filed
It's been 118 days since Chester, PA filed for bankruptcy protection on 10 Nov 2022



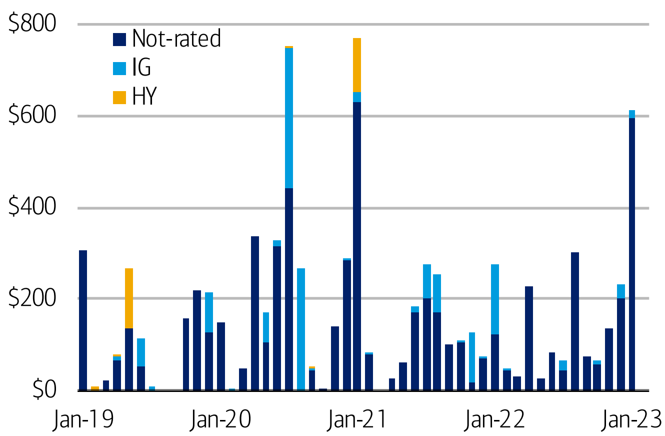
Note: Data as of 8 March 2023.
Source: BofA Global Research, PACER, US Courts

BofA GLOBAL RESEARCH

After no Feb defaults, YTD totals $611mn

As we noted in our last Weekly, data shows there were no first-time payment defaults or first-time distress reported for February, at least thus far. As a result, for the YTD, a total of $611mn of defaults were reported, which is up 89% y/y; $130mn of first-time distressed debt was reported YTD, which is down 57%. Note that, historically, default volumes during the month of February are not particularly high relative to other months of the year.

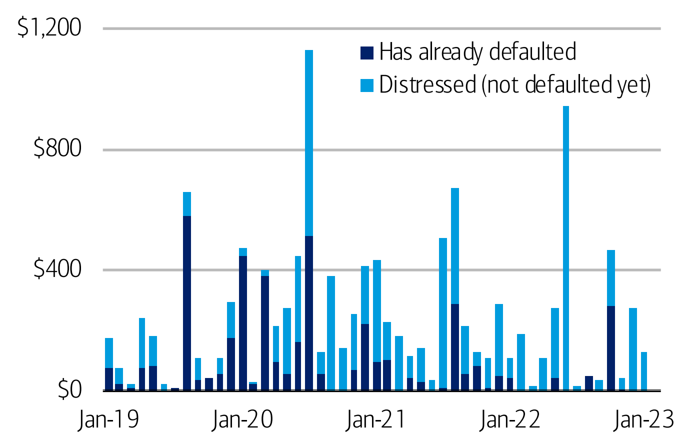
Exhibit 44: Monthly first-time defaults ($mn) by avg rating at issue
No first-time defaults reported in Feb 2023; YTD totals $611mn, up 89% y/y



Note: We may revise data if Bloomberg revises its data.
Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 45: Monthly first-time distressed* debt ($mn)
No first-time distressed debt reported in Feb 2023; YTD total down 57% y/y



Note: We may revise data if Bloomberg revises its data.
Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Again, we expect defaults to tick up some in 2023, with our estimate for the year at $1.7bn-$2.1bn. In general, we expect more defaults from cumulative distressed, but not yet defaulted debt, concentrated in the Nursing Home, Hospital, Student Housing and Industrial Development sectors.

Cross currency equivalent yields

Taxable munis look attractive for most countries on a cross-currency equivalent basis, with only a few exceptions: 5-year, 10-year 30-year taxable munis remain less attractive for Italy and 5-year South Korea.

Exhibit 46: Cross currency equivalent yields as of 9 March 2023

Taxable munis are attractive for foreign investors, though 5yr, 10yr and 30yr taxables are less so for Italy and 5yr taxables for South Korea

	Government bonds yield (in investor country's currency)			Cross currency equivalent yield*						Can foreign investors buy?					
				US Treasury			US AAA taxable municipal bond			US Treasury			US AAA taxable municipal bond		
Country	5 year	10 year	30 year	5 year (4.205)	10 year (3.919)	30 year (3.864)	5 year (4.74)	10 year (4.68)	30 year (4.88)	5 year	10 year	30 year	5 year	10 year	30 year
Canada	3.489	3.186	3.072	3.534	3.435	3.641	4.071	4.192	4.645	Yes	Yes	Yes	Yes	Yes	Yes
United Kingdom	3.677	3.791	4.117	4.069	3.783	3.801	4.590	4.542	4.813	Yes			Yes	Yes	Yes
France	3.101	3.134	3.354	3.059	2.959	3.422	3.583	3.713	4.417			Yes	Yes	Yes	Yes
Germany	2.783	2.633	2.579	3.059	2.959	3.422	3.583	3.713	4.417	Yes	Yes	Yes	Yes	Yes	Yes
Italy	3.967	4.379	4.493	3.059	2.959	3.422	3.583	3.713	4.417						
Spain	3.373	3.637	3.992	3.059	2.959	3.422	3.583	3.713	4.417				Yes	Yes	Yes
Portugal	3.209	3.472	3.869	3.059	2.959	3.422	3.583	3.713	4.417				Yes	Yes	Yes
Netherlands	2.942	2.986	2.784	3.059	2.959	3.422	3.583	3.713	4.417	Yes		Yes	Yes	Yes	Yes
Switzerland	1.398	1.366	1.204	3.059	2.959	3.422	3.583	3.713	4.417	Yes	Yes	Yes	Yes	Yes	Yes
Japan	0.220	0.498	1.443	-0.076	0.303	2.206	0.436	1.001	3.150			Yes	Yes	Yes	Yes
Australia	3.495	3.705	4.017	4.055	4.444	4.105	4.584	5.200	5.121	Yes	Yes	Yes	Yes	Yes	Yes
South Korea	3.757	3.691	3.565	2.501	2.979	3.434	3.018	3.735	4.427					Yes	Yes
China	2.678	2.881	3.277	3.678	3.462	3.665	3.894	4.245	4.668	Yes	Yes	Yes	Yes	Yes	Yes
Taiwan	1.152	1.136	1.632	1.389	2.385	3.164	1.916	3.135	4.140	Yes	Yes	Yes	Yes	Yes	Yes
Singapore	3.362	3.372	2.757	3.613	3.599	3.716	4.146	4.357	4.723	Yes	Yes	Yes	Yes	Yes	Yes

Note: *Cross currency equivalent yield is the yield for an international buyer to purchase US bond in dollar and convert back to its own country's currency.

Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Acronyms

Exhibit 47: Common acronyms used in our Municipals reports

This list is subject to change

Acronym	Definition	Acronym	Definition	Acronym	Definition
1Q	First Quarter	HOSP	Hospital	PA	Pennsylvania
2Q	Second Quarter	HY	High Yield	PC	Pollution Control
3Q	Third Quarter	IA	Iowa	PL	Plains
4Q	Fourth Quarter	ICE	Intercontinental Exchange	PPFI	Milliman's Public Pension Funding Index
AIR	Airport	ICMA	International Capital Market Association	Ppt	Percentage point
AK	Alaska	ID	Idaho	PR	Puerto Rico
AL	Alabama	IDR	Industrial Development Revenue	PRE-RE	Pre-refunded
AMT	Alternative Minimum Tax	IG	Investment Grade	PRHTA	Puerto Rico Highway & Transportation Authority
Apr	April	IL	Illinois	PROMESA	Puerto Rico Oversight, Management, and Economic Stability Act
AR	Arkansas	IN	Indiana	PWR	Power
ARPA	American Rescue Plan Act	INT	Intermediate term	Q/Q	Quarter-over-quarter
Aug	August	Jan	January	QTD	Quarter-to-date
Avg	Average	Jun	June	R	Rich
AZ	Arizona	KS	Kansas	RI	Rhode Island
BEA	Bureau of Economic Analysis	KY	Kentucky	RM	Rocky Mountain
BLS	Bureau of Labor Statistics	LA	Louisiana	S&L	State and Local
BofA	Bank of America	LCA	Leases, COPs & Appropriations	S&P	Standard & Poor's
Bp	Basis points	LT	Long term	SC	South Carolina
BTN	Back-to-Normal Index	M	Mideast	SD	South Dakota
C	Cheap	M/M	Month-over-month	SE	Southeast
CA	California	MA	Massachusetts	Sep	September
CARES	Coronavirus Aid, Relief, and Economic Security Act	Mar	March	SFH	Single Family Housing
CB	Census Bureau	MD	Maryland	ST	Short term
CO	Colorado	ME	Maine	SW	Southwest
COPs	Certificates of Participation	MFH	Multi-Family Housing	T&T	Toll & Turnpike
CPI	Consumer Price Index	MI	Michigan	TAX	Tax Revenue
CT	Connecticut	MISC	Miscellaneous	TBCO	Tobacco
CUSIP	Committee on Uniform Security Identification Procedures	MMD	Municipal Market Data	TEU	Twenty-Foot Equivalent Units
DC	District of Columbia	MN	Minnesota	TN	Tennessee
DE	Delaware	MO	Missouri	TRAN	Transportation - other
Dec	December	MS	Mississippi	TSA	For Puerto Rico, Treasury Single Account; otherwise, Transportation Security Administration
EAI	Puerto Rico Economic Activity Index	MSA	Metropolitan Statistical Area	TX	Texas

Exhibit 47: Common acronyms used in our Municipals reports

This list is subject to change

Acronym	Definition	Acronym	Definition	Acronym	Definition
EDU	Education	MT	Montana	US	United States
ESG	Environmental, Social, Governance	MTD	Month-to-date	USVI	US Virgin Islands
ETF	Exchange Traded Fund	N	Neutral	UT	Utah
ETM	Escrowed to Maturity	NASBO	National Association of State Budget Officers	UTL	Utilities - other
Feb	February	NC	North Carolina	VA	Virginia
Fed	Federal Reserve	ND	North Dakota	VC	Very Cheap
FEMA	Federal Emergency Management Agency	NE	Nebraska	VPIP	Value of construction put in place
FL	Florida	NED	New England	VR	Very Rich
FOMB	Financial Oversight & Management Board for Puerto Rico	NH	New Hampshire	VRDO	Variable Rate Demand Obligation
FW	Far West	NJ	New Jersey	VT	Vermont
FY	Fiscal year	NM	New Mexico	W&S	Water & Sewer
GA	Georgia	Nov	November	W/W	Week-over-week
GDP	Gross Domestic Product	NV	Nevada	WA	Washington
GL	Great Lakes	NY	New York	WI	Wisconsin
GO	General Obligation	OAS	Option Adjusted Spread	WV	West Virginia
GO-L	Local GO	Oct	October	WY	Wyoming
GO-S	State GO	OH	Ohio	Y/Y	Year-over-year
Govt	Government	OK	Oklahoma	YTD	Year-to-date
HI	Hawaii	OR	Oregon	YTM	Yield to Maturity
HLTH	Healthcare	P&C	Property & Casualty insurance company	YTW	Yield to Worst

Source: BofA Global Research

BofA GLOBAL RESEARCH

Disclosures

Important Disclosures

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.
BofA Securities fixed income analysts regularly interact with sales and trading desk personnel in connection with their research, including to ascertain pricing and liquidity in the fixed income markets.

Other Important Disclosures

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.
The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

This report may refer to fixed income securities or other financial instruments that may not be offered or sold in one or more states or jurisdictions, or to certain categories of investors, including retail investors. Readers of this report are advised that any discussion, recommendation or other mention of such instruments is not a solicitation or offer to transact in such instruments. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor for information relating to such instruments.
Rule 144A securities may be offered or sold only to persons in the U.S. who are Qualified Institutional Buyers within the meaning of Rule 144A under the Securities Act of 1933, as amended.
SECURITIES OR OTHER FINANCIAL INSTRUMENTS DISCUSSED HEREIN MAY BE RATED BELOW INVESTMENT GRADE AND SHOULD THEREFORE ONLY BE CONSIDERED FOR INCLUSION IN ACCOUNTS QUALIFIED FOR SPECULATIVE INVESTMENT.
Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.
The securities or other financial instruments discussed in this report may be traded over-the-counter. Retail sales and/or distribution of this report may be made only in states where these instruments are exempt from registration or have been qualified for sale.
Officers of BofAS or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.
This report, and the securities or other financial instruments discussed herein, may not be eligible for distribution or sale in all countries or to certain categories of investors, including retail investors.
Refer to BofA Global Research policies relating to conflicts of interest.
"BofA Securities" includes BofA Securities, Inc. ("BofAS") and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.
Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:
BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at www.bofaml.com/BofASEdisclaimer; BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSFC); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Investment Industry Regulatory Organization of Canada; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; Merrill Lynch (Argentina): Merrill Lynch Argentina SA, regulated by Comisión Nacional de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.
This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSFC; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the Electronic Communications Disclaimers for further information.
This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in

respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

BofA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned in this report. Investors in such securities and instruments effectively assume currency risk.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

Copyright and General Information:

Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BofA Securities nor any officer or employee of BofA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.

Research Analysts

Yingchen Li
Municipal Research Strategist
BofAS
yingchen.li@bofa.com

Ian Rogow
Municipal Research Strategist
BofAS
ian.rogow@bofa.com

John Lombardi
Municipal Research Strategist
BofAS
jlombardi3@bofa.com

Sophie Yan
Municipal Research Strategist
BofAS
sophie.yan@bofa.com

John Reilly
Municipal Research Strategist
BofAS
john.reilly2@bofa.com