

## Municipals Weekly

## Range bound through July

## Industry Overview

## Key takeaways

- We expect muni rates to move to the lower boundaries of ranges defined by prior five months.
- Pre-res retraced 35% of the debt limit-driven widening; a full retracement should be expected.
- Fed flow of funds data show outstanding munis at \$4.02tn; US banks' holdings fell 2.33% q/q in 1Q23.

## Extension of range bound pattern

Muni rates' range bound pattern will likely continue in June and July while the Fed stays in a hawkish posture. Muni rates should move to the lower bounds of their ranges that define the prior five months. For muni rates break below these multi-month ranges, Treasuries need to break below their similar multi-month ranges first.

## Pre-Res recover 35% of debt limit-driven widening

As concerns over the debt limit mounted, Pre-Res spread to the AAA muni index cheapened. With the debt limit now raised, the spread is richening, and has already retraced 35% of its widening. We expect it to retrace further and see a full recovery as a likely outcome.

## Flow of Funds data shows households' holdings grow

The muni market stood at \$4.02tn as of 1Q23 per Flow of Funds data. While US banks' muni holdings fell 2.3% q/q in 1Q23, households & nonprofits' increased 3.7% to \$1.67tn. Mutual fund holdings grew 3.2% and "Rest of World" holdings grew 3.1%.

## Key figures: issuance, returns, spreads &amp; fund flows

**Supply:** MTD issuance through 7 June totals \$11.5bn, up 31% y/y; YTD issuance of \$150bn is down 21% y/y. YTD issuance is 86% tax-exempt and 12% taxable; 76% is new money and 24% is refundings.

**Returns:** For the week ending 7 June, the Muni Master index (U0A0) returned 0.37%, outperforming both govies and corporates. The Muni High Yield index (U0HY) returned 0.34%. YTD total returns are 2.29% and 2.05%, respectively. By rating, BBBs' returns for the week were strongest at 0.54%; by sector, Toll & Turnpike's 0.50% is strongest. Taxables' return for the week was -0.84%.

**Spreads:** For the week ending 7 June, IG spreads were unchanged at 25bp while HY spreads widened 13bp to 202bp.

**Flows:** For the week ending 7 June, all municipal bond fund outflows were \$0.77bn; IG outflows were \$1.01bn, while HY inflows were \$0.24bn. Money market fund inflows were \$3.09bn for the week.

BofA Securities does and seeks to do business with issuers covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. Refer to important disclosures on page 20 to 21.

12567354

Timestamp: 09 June 2023 07:30AM EDT

09 June 2023

Municipals  
United States

## Table of Contents

Market views & strategies	2
Performance	5
Curve	7
Supply & demand	8
Relative value	10
Trade activity	12
Credit corner	13
Defaults, distress & HY	17
Cross currency equivalent yields	18
Acronyms	19
Research Analysts	23

**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: Munis are a buy again 02 June 2023](#)

[Municipals Educational Series: Primer on Municipal Bonds 25 May 2023](#)

[Monthly Municipal ESG Monitor: April 2023 23 May 2023](#)

[Municipals Weekly: Muni market trading with a soft landing in mind 19 May 2023](#)

[Municipals Weekly: Look to the long end as hedging eases 12 May 2023](#)

**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) AMT bonds\*
- Neutral: BBBs and high yield
- Underweight: (1) the territories; (2) small private colleges; (3) rural, single-facility hospitals

**Tactical views**

- TXMB/COAO 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 \$400bn; \$320bn of new money and \$80bn of refundings
- 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 1.65% area; 30yr to 2.20%. 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

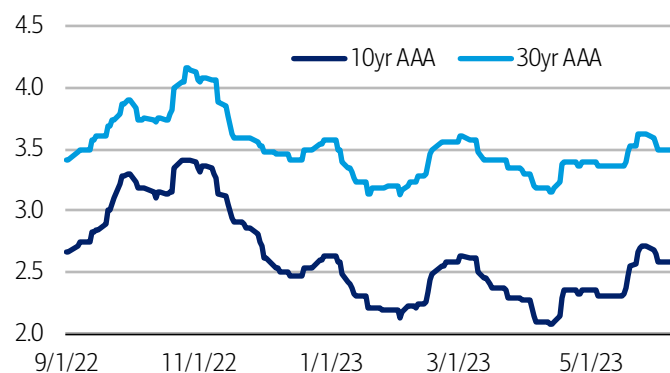
## Market views & strategies

### Extension of range bound pattern

Post-debt limit resolution, a gradually forming consensus is that a Fed pause in June is *not* an indication that the Fed's tightening cycle is complete. Rather, current market pricing indicates a very high probability of another hike in July. This new focus of the bond market will extend through June and July, while economic data and market moves may provide some day-to-day volatility. It is clear by now that the muni market likely will remain within ranges that defined the prior five months of the year (see Exhibit 2), while muni/Treasury ratios remain in low ranges. For the past few weeks, market levels hovered near the upper bounds of the multi-month ranges. We recommended that muni investors buy last week in anticipation that muni rates are likely to move toward the lower bounds in June/July. For munis to break below this multi-month pattern, perhaps Treasuries need to break below first. Either inflation gauges fall enough to reverse the hawkish Fed posture or some other factors will do it.

**Exhibit 2: 10- and 30-year muni AAA rates (%)**

Both have been in tight ranges in 2023

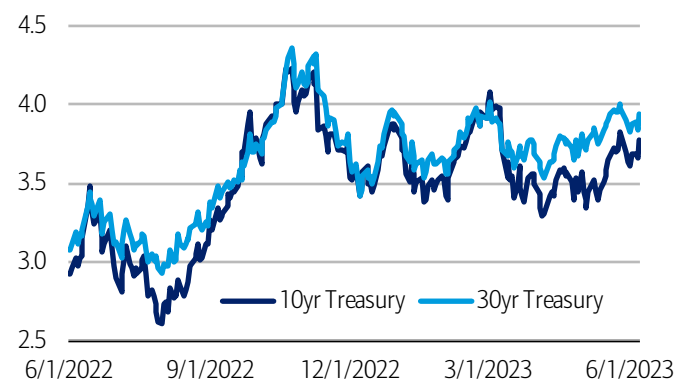


**Source:** Refinitiv

BofA GLOBAL RESEARCH

**Exhibit 3: 10- and 30-year Treasury rates (%)**

Both have been in tight ranges in 2023



**Source:** Bloomberg

BofA GLOBAL RESEARCH

As we discussed several weeks ago, a strong Fed ensures inflation will continue to decline and yield curves to flatten. For the muni market, curve flattening likely will continue into the first few months of the next Fed easing cycle. Given the outsized and exceptional 1s10s AAA curve inversion and a stubbornly steep 10s30s AAA curve, it is only sensible to expect the 10s30s will flatten to some reasonable level.

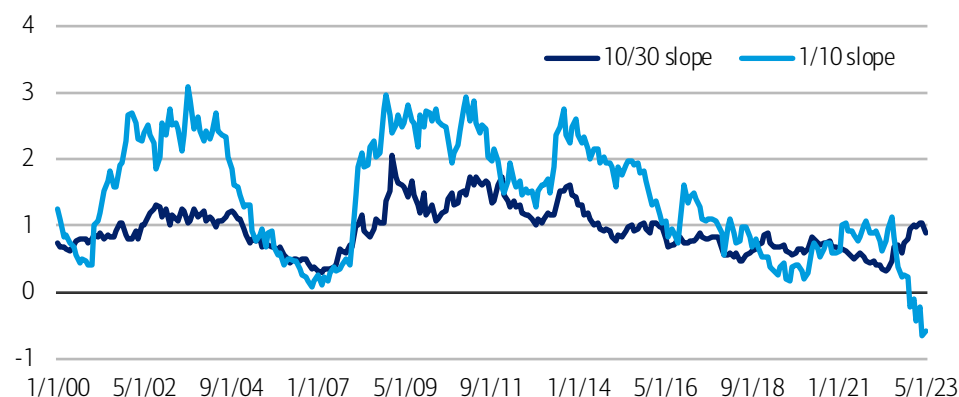
The 1s10s AAA inversion is unique to this Fed cycle; there is no other episode of such inversion in the muni market's history. In normal times, the 10-year area of the muni

curve is generally more liquidity driven, and follows the Treasury market closer than the longer part of the muni curve. This year, the range bound market has been particularly perplexing, and the 10-year area has become the common ground of interest for both retail and institutional investors who do not want to stay in very short duration paper.

The 10s30s steepness may reflect direct retail buyers' fear of long-term interest rates, while institutional interest in the long-term vs intermediate term paper does not appear to have shifted. YTD, accumulated inflows to long-term muni mutual funds total \$4bn, while inflows to intermediate term mutual funds totals only \$0.7bn.

#### Exhibit 4: 10/30 muni AAA slope is as steep as 2015 (%)

1/10 inversion is unique in muni market history



Source: Refinitiv

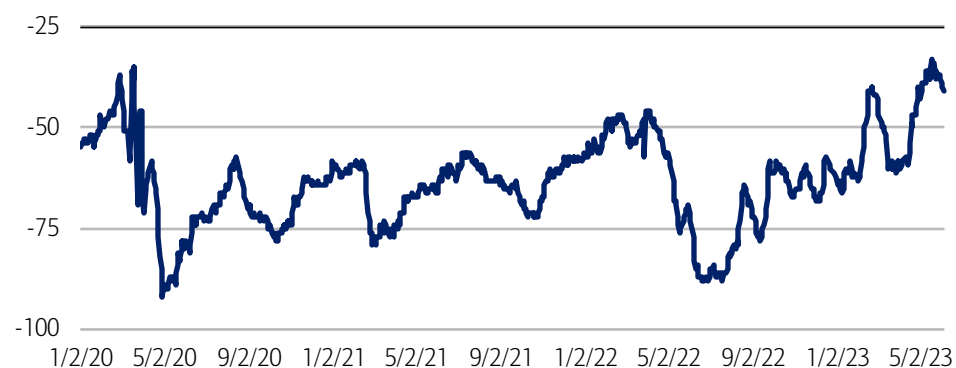
BofA GLOBAL RESEARCH

#### Pre-Res recover 35% of spread widening; more to come

We highlighted cheapened Pre-Res spreads in our 12 May Municipals Weekly, noting there that the YTW spread of the ICE BofA US Pre-Refunded Municipal Securities Index (UOAF) to the ICE BofA AAA US Municipal Securities Index (UOA1) as of 10 May of -38bp was the cheapest level since the height of the COVID crisis in March 2020. Much of that cheapening was due to the concerns over the debt ceiling and, to that end, we suggested that those spread levels were attractive to the extent an investor believed a debt ceiling resolution was likely before the government reached default.

#### Exhibit 5: Pre-Res YTW spread to AAA muni index (bp)

After reaching cheapest level since peak of COVID crisis in Mar-20



Source: BofA Global Research, ICE Data Indices, LLC

BofA GLOBAL RESEARCH

As Exhibit 2 shows, spreads continued to cheapen through 18 May, reaching -33bp. That was the cheapest level since later 2006 and early 2007. In total, from mid-April when debt ceiling concerns came to the fore through 18 May, Pre-Res' spreads cheapened by 26bp. Since 18 May, however, they retraced about 9bp of widening, or roughly 35%. As we put the debt ceiling issue further in the rearview, we expect these spreads to continue to widen; we view a 100% recovery as a likely outcome.



## Muni market stands at \$4.0tn as of 1Q23

The Fed released updated flow of funds data for the 1Q23 on 8 June. The muni market stood at \$4.02tn as of 1Q23, up just \$4bn q/q. As Exhibit 6 shows, households' municipal securities holdings grew the most on a q/q basis in 1Q23, increasing by 3.7% to \$1.67tn. Conversely, Brokers & dealers' muni holdings fell the most q/q in 1Q23, declining by 8.9% to \$11bn. 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 down 1% to \$567bn.

### Exhibit 6: Change in muni holdings by investor group (\$bn)

1Q23's holdings versus 4Q17's (when TCJA enacted), 1Q20 (start of COVID) and on a y/y & q/q basis

	1Q23 holdings	vs 4Q17	vs 1Q20	vs 1Q22	vs 4Q22
Households & nonprofits	1,668.5	-13.6%	-11.8%	1.4%	3.7%
US banks	566.7	-1.0%	6.5%	-7.0%	-2.3%
P&C insurers	242.8	-28.3%	-13.6%	-10.7%	-1.3%
Life insurers	195.2	-1.3%	-9.1%	-9.3%	1.5%
Money market funds	114.4	-17.2%	-15.7%	0.8%	-3.0%
Mutual funds	769.7	11.9%	-2.1%	-15.5%	3.2%
Closed-end funds	84.4	-6.2%	-5.6%	-6.2%	2.4%
ETFs	106.0	252.8%	119.2%	27.6%	1.5%
Brokers & dealers	11.0	-58.9%	-20.0%	-0.8%	-8.9%
Rest of world	112.4	6.3%	4.1%	-0.8%	3.1%

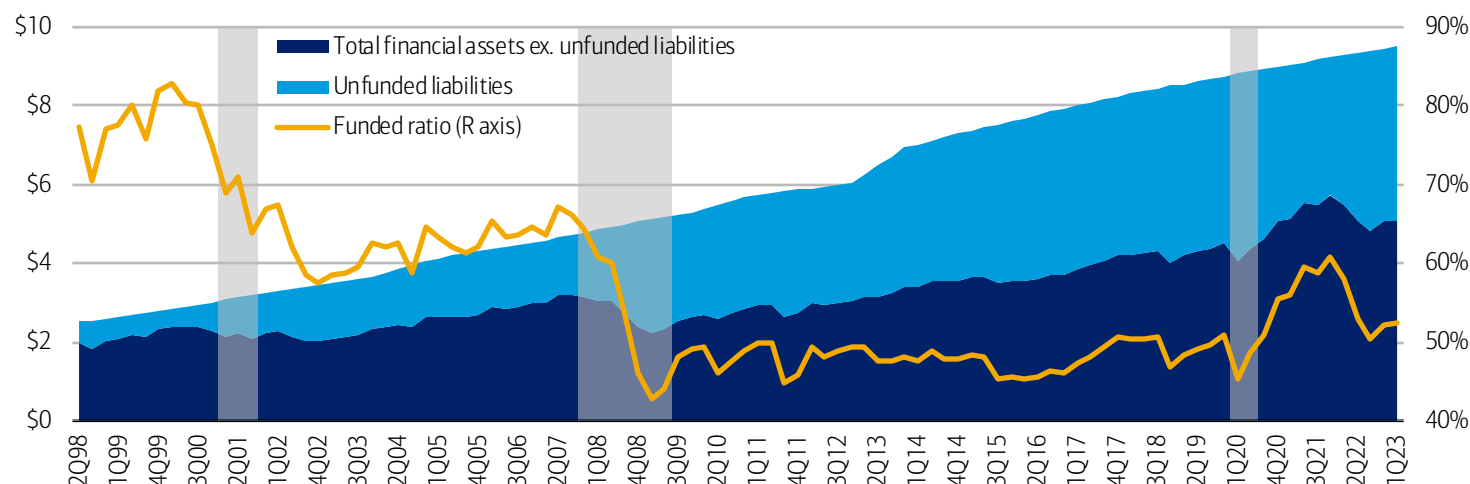
Source: BofA Global Research, Fed Flow of Funds

BofA GLOBAL RESEARCH

Unfunded defined benefit public pension liabilities stood at roughly \$4.4tn in 1Q23, which is a \$14.6bn or 0.3% increase q/q. On a y/y basis, 1Q23's unfunded amounts are \$628.6bn, or 16.5% larger. Funded ratios increased 0.1ppt q/q but decreased 5.6ppt y/y to 52.3% on a projected benefit obligation (PBO) basis – well off the post-financial crisis highs reached in 4Q21.

### Exhibit 7: State & local govt defined benefit retirement plans financial assets, unfunded liabilities & funded ratio (2Q98–1Q23) (\$tn);

Funded ratio based on Fed data climbs to 0.1ppt q/q to 52.3%; down 5.6ppt y/y



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 1Q23's 74.5% 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 are directionally consistent.

# Performance

## Munis start of June with strong outperformance

After turning in a historically bad May, munis looked to turn the page to start June. Thus far, munis performed well relative to corporates and govies, as muni rates held steady as Treasuries sold off. For the week ending 7 June, exempt IG returned 37bp, outperforming govies by 116bp and corporates by 95bp; exempts also outperformed taxables by 121bp. And, for the second week in a row, exempt muni IG outperformed HY, this week by just 3bp. For the YTD, exempt IG munis are outperforming govies by 73bp but are underperforming corporates by 6bp and taxables by 144bp. Again, BBBs were the strongest performing rating bracket for the week, with 54bp of returns. That marks the second consecutive weeks of BBB's performing best, and 9<sup>th</sup> in the last 11 weeks. AAs and single-As were the weakest performing brackets, each with 37bp of returns for the week. GOs and revenue bonds performed largely in line, though revenue bonds edged out GO bonds by 3bp. Among the muni bond sectors, the Toll & Turnpike sector had the strongest week, with 50bp of returns. For the YTD, Industrial Development Revenue's 382bp of returns are strongest.

### Exhibit 8: Municipal total returns (%) monitor, as of 7 June 2023

While Treasury rates sold off for wk of 7 June, munis held steady, leading to outperformance

Index	Ticker	1d	1wk	MTD	1mo	3mo	YTD	1yr
Govt Master	GOAO	-0.534	-0.790	-0.790	-2.028	1.793	1.556	-2.524
Corporate Master	COAO	-0.554	-0.574	-0.574	-1.404	1.520	2.349	-1.243
<b>IG munis</b>	<b>UOAO</b>	<b>-0.112</b>	<b>0.372</b>	<b>0.372</b>	<b>-0.818</b>	<b>1.676</b>	<b>2.290</b>	<b>0.723</b>
AAA	UOA1	-0.128	0.338	0.338	-0.860	1.477	1.740	0.309
AA	UOA2	-0.117	0.365	0.365	-0.872	1.548	1.979	0.732
A	UOA3	-0.100	0.365	0.365	-0.769	1.829	2.796	1.019
BBB	UOA4	-0.086	0.535	0.535	-0.460	2.507	3.904	0.713
1-3yr	U1A0	-0.022	0.203	0.203	-0.148	0.598	0.703	0.553
3-7yr	U2A0	-0.080	0.286	0.286	-0.949	0.801	0.885	0.442
7-12yr	U3A0	-0.093	0.364	0.364	-1.161	1.080	1.572	1.958
12-22yr	U4A0	-0.127	0.390	0.390	-0.781	2.040	2.939	1.342
22+yr	U5A0	-0.176	0.501	0.501	-0.901	2.856	3.911	-0.464
<b>HY munis</b>	<b>UOHY</b>	<b>-0.103</b>	<b>0.340</b>	<b>0.340</b>	<b>-0.553</b>	<b>1.177</b>	<b>2.050</b>	<b>-1.296</b>
Non-rated	UONR	-0.087	0.396	0.396	-0.076	2.033	3.519	-0.171
<b>General Obligation</b>	<b>UOAG</b>	<b>-0.111</b>	<b>0.349</b>	<b>0.349</b>	<b>-0.852</b>	<b>1.436</b>	<b>1.802</b>	<b>0.773</b>
AAA	UGA1	-0.125	0.384	0.384	-0.897	1.457	1.370	0.003
AA	UGA2	-0.120	0.347	0.347	-0.879	1.341	1.677	0.826
A	UGA3	-0.020	0.287	0.287	-0.636	1.389	1.601	1.105
BBB	UGA4	-0.024	0.316	0.316	-0.409	3.082	5.521	3.403
State	UOAA	-0.088	0.338	0.338	-0.777	1.212	1.716	1.097
Local	UOAB	-0.138	0.361	0.361	-0.943	1.709	1.905	0.348
<b>Revenue</b>	<b>UOAR</b>	<b>-0.112</b>	<b>0.380</b>	<b>0.380</b>	<b>-0.806</b>	<b>1.757</b>	<b>2.455</b>	<b>0.708</b>
AAA	URA1	-0.130	0.306	0.306	-0.833	1.491	2.010	0.531
AA	URA2	-0.115	0.373	0.373	-0.869	1.641	2.116	0.689
A	URA3	-0.108	0.373	0.373	-0.782	1.877	2.877	1.035
BBB	URA4	-0.091	0.552	0.552	-0.464	2.354	3.473	0.160
Airport	UOAV	-0.094	0.379	0.379	-0.646	1.898	3.224	1.454
Education	UOAE	-0.124	0.363	0.363	-1.001	1.762	2.244	0.426
Health	UOHL	-0.111	0.463	0.463	-0.306	1.289	0.442	-4.113
Hospital	UOAH	-0.138	0.403	0.403	-1.114	1.891	2.387	0.051
Industrial Development Rev	UOID	-0.102	0.401	0.401	-0.543	2.246	3.816	1.315
Leases, COPs & Appropriations	UOAL	-0.104	0.347	0.347	-0.786	1.567	1.804	0.662
Miscellaneous	UOAM	-0.103	0.419	0.419	-0.837	1.304	1.716	0.407
Multi-family Housing	UOAU	-0.150	0.445	0.445	-1.069	1.420	2.094	-1.264
Pollution Control	UOAQ	-0.093	0.351	0.351	-0.733	1.065	1.505	0.693
Power	UOAP	-0.083	0.336	0.336	-0.714	1.418	1.884	0.643
Single-family Housing	UOAS	-0.117	0.318	0.318	-1.224	1.012	0.796	-1.474
Tax Revenue	UOTX	-0.124	0.360	0.360	-0.826	1.799	2.424	0.918
Tobacco	UOTB	-0.058	0.296	0.296	-0.180	1.600	3.371	1.815
Toll & Turnpike	UOTL	-0.116	0.500	0.500	-0.643	1.955	2.676	1.127
Transportation - other	UOAT	-0.107	0.429	0.429	-0.700	2.117	3.460	1.522
Utilities - other	UOUT	-0.088	0.205	0.205	-0.857	1.322	2.219	0.452
Water & Sewer	UOAW	-0.101	0.398	0.398	-0.623	1.672	2.168	0.745

**Exhibit 8: Municipal total returns (%) monitor, as of 7 June 2023**

While Treasury rates sold off for wk of 7 June, munis held steady, leading to outperformance

Index	Ticker	1d	1wk	MTD	1mo	3mo	YTD	1yr
<b>Taxable</b>	<b>TXMB</b>	<b>-0.733</b>	<b>-0.840</b>	<b>-0.840</b>	<b>-2.183</b>	<b>1.070</b>	<b>3.731</b>	<b>-1.331</b>
Build America Bonds	BABS	-0.732	-0.818	-0.818	-2.263	0.753	3.283	-1.496
<b>VRDOs</b>	<b>VRDO</b>	<b>0.008</b>	<b>0.061</b>	<b>0.061</b>	<b>0.274</b>	<b>0.579</b>	<b>0.845</b>	<b>1.719</b>
Daily reset	VRDD	0.006	0.052	0.052	0.259	0.535	0.737	1.484
Weekly reset	VRDW	0.009	0.066	0.066	0.282	0.603	0.903	1.843

Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

Exhibit 9 shows that BBBs in the 3%-4% coupon bracket (i.e., 3s) between 5-10yrs had the strongest week, with 110bp of returns, followed by 10-15yr AA 3s and 25-30yr single-A 4s. The weakest performers for the week were 0-5yr single-A 4s, followed by 5-10yr single-A 4s and 15-20yr AAA 4s.

**Exhibit 9: Weekly total returns by coupon, rating and maturity brackets (% , as of 7 June 2023).**

5-10yr BBB 3s strongest performer for the week, with 110bp of total returns

	0-5yr				5-10yr				10-15yr				15-20yr				20-25yr				25-30yr			
	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB
3s	0.32	0.34	0.21	0.23	0.49	0.58	0.42	1.10	0.95	1.02	0.91	0.80	0.84	0.91	0.95	0.53	0.56	0.73	0.34	0.19	0.33	0.55	0.52	0.90
4s	0.23	0.21	0.07	0.23	0.20	0.22	0.08	0.60	0.18	0.32	0.33	0.59	0.17	0.47	0.76	0.74	0.52	0.48	0.88	0.90	0.62	0.71	0.97	0.84
5s	0.25	0.25	0.24	0.26	0.33	0.33	0.25	0.34	0.32	0.35	0.33	0.30	0.26	0.32	0.24	0.31	0.31	0.29	0.24	0.36	0.32	0.29	0.32	0.59

Source: ICE Data Indices, LLC

BofA GLOBAL RESEARCH

**Muni IG and HY spreads tightened w/w**

Muni IG spreads were flat w/w at 25bp, while Muni HY spreads widened 13bp to 202bp and are at the 71<sup>st</sup> percentile of their 52-wk wide. Non-rated spreads widened 2bp w/w. GO spreads tightened 3bp overall w/w, with double-A GO spreads tightening 1bp. Revenue bond spreads were flat w/w overall. Among muni IG revenue bond sectors, Pollution Control widened 15bp w/w, while Transportation-other narrowed by 3bp.

**Exhibit 10: Muni YTW spread monitor as of 7 June**

IG spreads flat w/w overall while HY spreads widened 13bp

	52wk				Current 6/7/23	Change from				Current as %		
	Tights	Wides	T-1wk	T-1d		Tights	Wides	T-1wk	T-1d	of 52wk range	Price	Yield
<b>Investment Grade</b>	<b>24</b>	<b>39</b>	<b>25</b>	<b>27</b>	<b>25</b>	<b>1</b>	<b>-14</b>	<b>0</b>	<b>-2</b>	<b>7</b>	<b>100</b>	<b>3.68</b>
AA	5	21	7	7	6	1	-15	-1	-1	6	101	3.49
A	56	79	57	59	57	1	-22	0	-2	4	98	4.00
BBB	94	142	115	117	116	22	-26	1	-1	46	93	4.59
<b>High Yield</b>	<b>153</b>	<b>222</b>	<b>189</b>	<b>194</b>	<b>202</b>	<b>49</b>	<b>-20</b>	<b>13</b>	<b>8</b>	<b>71</b>	<b>93</b>	<b>5.45</b>
Non-rated	193	298	212	215	214	21	-84	2	-1	20	64	5.57
<b>General Obligation</b>	<b>-9</b>	<b>1</b>	<b>-7</b>	<b>-7</b>	<b>-8</b>	<b>1</b>	<b>-9</b>	<b>-1</b>	<b>-1</b>	<b>10</b>	<b>101</b>	<b>3.35</b>
AA	-15	1	-12	-12	-13	2	-14	-1	-1	12	101	3.30
A	-15	29	11	13	11	26	-18	0	-2	59	104	3.54
BBB	40	122	76	80	77	37	-45	1	-3	45	96	4.20
State	-28	-9	-23	-23	-24	4	-15	-1	-1	21	105	3.19
Local	12	19	12	14	12	0	-7	0	-2	0	97	3.55
<b>Revenue</b>	<b>35</b>	<b>52</b>	<b>37</b>	<b>38</b>	<b>37</b>	<b>2</b>	<b>-15</b>	<b>0</b>	<b>-1</b>	<b>12</b>	<b>100</b>	<b>3.80</b>
AA	14	30	15	16	15	1	-15	0	-1	6	102	3.58
A	60	83	62	63	62	2	-21	0	-1	9	98	4.05
BBB	103	147	118	120	119	16	-28	1	-1	36	93	4.62
Airport	61	98	65	67	66	5	-32	1	-1	14	103	4.09
Education	14	44	18	19	18	4	-26	0	-1	13	103	3.61
Health	104	174	145	147	146	42	-28	1	-1	60	91	4.89
Hospital	69	97	72	74	73	4	-24	1	-1	14	98	4.16
Industrial Development Rev	88	130	93	95	94	6	-36	1	-1	14	99	4.37
Leases, COPs & Appropriations	1	23	4	4	3	2	-20	-1	-1	9	102	3.46
Miscellaneous	1	13	8	9	8	7	-5	0	-1	58	99	3.51
Multi-family Housing	65	90	87	87	87	22	-3	0	0	88	91	4.30
Pollution Control	26	58	30	46	45	19	-13	15	-1	59	99	3.88
Power	18	39	30	30	30	12	-9	0	0	57	102	3.73
Single-family Housing	59	89	87	89	88	29	-1	1	-1	97	95	4.31

**Exhibit 10: Muni YTW spread monitor as of 7 June**

IG spreads flat w/w overall while HY spreads widened 13bp

	52wk		T-1wk	T-1d	Current 6/7/23	Change from				Current as % of 52wk range	Price	Yield
	Tights	Wides				Tights	Wides	T-1wk	T-1d			
Tax Revenue	7	32	8	9	8	1	-24	0	-1	4	99	3.51
Tobacco	7	78	12	14	12	5	-66	0	-2	7	101	3.55
Toll & Turnpike	33	50	35	35	35	2	-15	0	0	12	97	3.78
Transportation - other	33	62	38	36	35	2	-27	-3	-1	7	98	3.78
Utilities - other	55	105	72	77	76	21	-29	4	-1	42	102	4.19
Water & Sewer	10	21	12	11	10	0	-11	-2	-1	0	103	3.53

**Note:** YTW spread to the ICE BofA AAA US Municipal Securities Index (UOA1).**Source:** BofA Global Research, ICE Data Indices, LLC

BofA GLOBAL RESEARCH

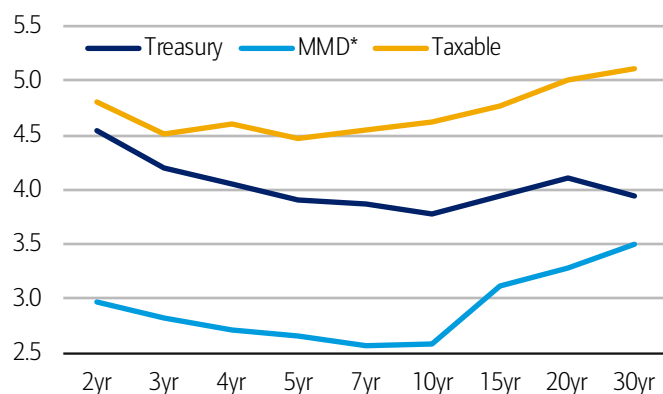
## Curve

**Curve shifts down 8bp on avg w/w**

The AAA MMD curve richened 8bp w/w on average, but cheapened by 28bp m/m. For the week, both the 1s5s slope and 5s10s slope became less inverted, while the 10s20s slope steepened 1bp. The 20s30s was unchanged w/w. Investors should continue to position for a bull flattener.

**Exhibit 11: AAA GO muni, Treasury and taxable yield curves (%)**

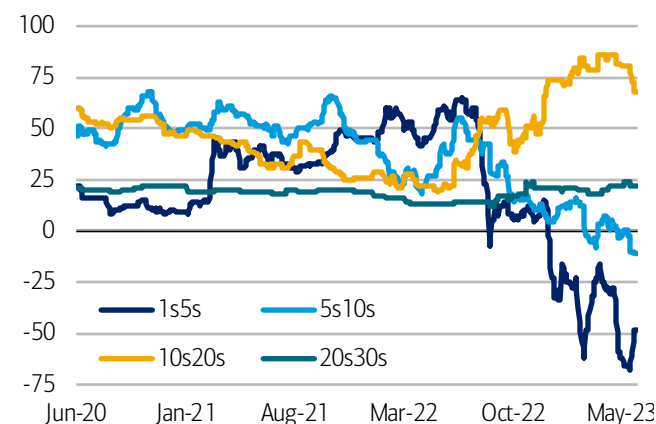
Tsy, and taxable cheapened while MMD richened on average w/w

**Note:** \*MMD AAA GO yield curve. As of 7 June 2023.**Source:** BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

**Exhibit 12: Curve slope (bp)**

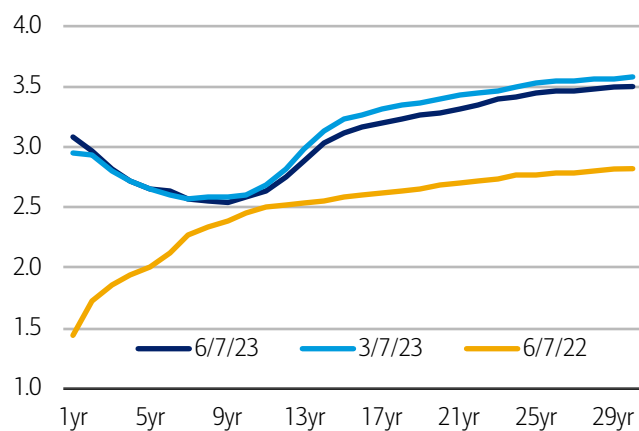
1s5s undid some inversion as 20s30s were flat w/w

**Source:** Refinitiv

BofA GLOBAL RESEARCH

**Exhibit 13: AAA GO municipal curve movement (%)**

AAA is richer than 3 months ago between 8yr and 30yr

**Source:** Refinitiv

BofA GLOBAL RESEARCH



# Supply & demand

## YTD issuance totals \$150bn, down 21% y/y

MTD issuance as of 7 June 2023 totals \$11.5bn, up 31% y/y. YTD issuance of \$150.3bn is down 21% y/y. Thus far, 76% of YTD issuance is new money, while 24% is refundings. New money volumes are down 20% y/y while refunding volumes are down 21%.

### Exhibit 14: Issuance summary (\$mn)

YTD issuance of \$150.3bn is down 21% y/y; new money down 20% y/y and refundings down 21%

	Month-to-date			Year-to-date		
	6/7/23	6/7/22	y/y % Δ	6/7/23	6/7/22	y/y % Δ
<b>Total</b>	<b>11,525.3</b>	<b>8,766.1</b>	<b>31%</b>	<b>150,302.1</b>	<b>189,231.6</b>	<b>-21%</b>
New Money	9,907.3	6,777.0	46%	114,304.3	143,702.6	-20%
Total Refunding	1,618.0	1,989.1	-19%	35,997.8	45,528.9	-21%
Advanced refunding	0.0	0.0	-	1,380.9	1,256.3	10%
Unknown refunding	1,618.0	1,626.6	-1%	33,184.0	39,875.7	-17%
Current & Forward refunding	0.0	362.5	-100%	1,432.8	4,397.0	-67%
Insured	413.9	388.2	7%	12,439.7	15,168.8	-18%
Fixed Rate	9,632.0	7,378.5	31%	134,751.0	177,631.5	-24%
Variable Rate Long	1,891.3	1,029.0	84%	10,933.0	6,454.5	69%
Variable Rate Short	0.0	309.8	-100%	4,126.4	3,335.6	24%
Zero Coupon	2.1	3.9	-47%	197.7	452.3	-56%
Linked Rate	0.0	45.0	-100%	270.0	1,041.7	-74%
Convertible	0.0	0.0	-	18.1	315.9	-94%
Variable rate no put	-	-	-	-	-	-
Tax Exempt	9,512.7	7,925.6	20%	128,999.0	148,557.4	-13%
Taxable	1,486.3	648.4	129%	17,472.6	31,471.4	-44%
Alternate Minimum Tax	526.3	192.2	174%	3,830.4	9,202.8	-58%
General Purpose	4,583.2	947.4	384%	40,121.6	47,236.8	-15%
Education	1,661.6	2,868.8	-42%	43,552.7	49,697.1	-12%
Utilities	1,561.5	1,659.7	-6%	19,882.8	24,047.8	-17%
Healthcare	1,141.6	267.1	327%	5,819.7	15,776.9	-63%
Transportation	1,113.5	723.5	54%	14,871.5	23,984.1	-38%
Housing	648.5	1,864.7	-65%	12,346.2	14,079.2	-12%
Electric Power	361.1	135.0	167%	6,570.1	5,537.7	19%
Public Facilities	272.1	35.4	669%	1,969.9	3,719.7	-47%
Environmental Facilities	100.0	78.4	28%	1,155.4	1,151.7	0%
Development	82.2	186.1	-56%	4,012.1	4,000.7	0%
Muni-backed corporates	71.5	1.0	7050%	2,368.1	10,387.1	-77%

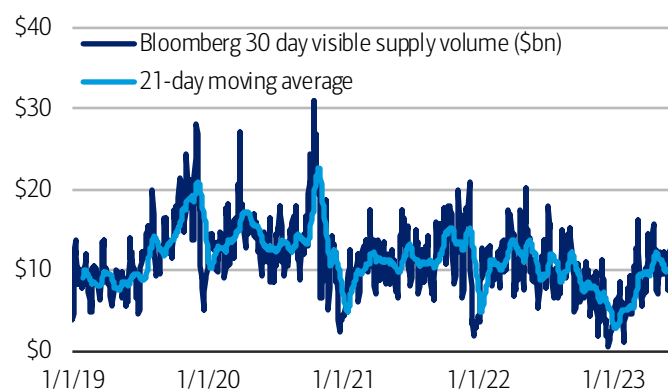
**Note:** Long-term bonds only. Reflects any data revisions by Refinitiv or Bloomberg.

**Source:** BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

### Exhibit 15: Bloomberg 30-day visible supply (\$bn)

30-day visible supply was \$8.8bn as of 8 June 2023



**Note:** Data as of 8 June 2023.

**Source:** Bloomberg

BofA GLOBAL RESEARCH

### Exhibit 16: 2023 gross issuance, redemption forecasts vs actuals (\$bn)

Gross issuance forecast of \$400bn vs \$564bn of prin. & cpn. redemptions

Month	Issuance		Prin. & cpn redemptions	
	Forecast	Actual	Forecast	Actual
January	\$23	\$23	\$42	\$39
February	20	20	45	42
March	32	32	39	36
April <sup>1</sup>	29	33	32	29
May	33	27	45	45
June	43	12*	65	
July	31		59	
August	36		62	
September	34		37	
October	45		40	
November	34		41	
December	39		56	-

**Note:** Totals may not add up due to rounding. Data as of 7 June 2023. January-March data are actuals. <sup>1</sup>Monthly issuance forecasts revised from April onward.

**Source:** BofA Global Research, Refinitiv, Bloomberg

BofA GLOBAL RESEARCH

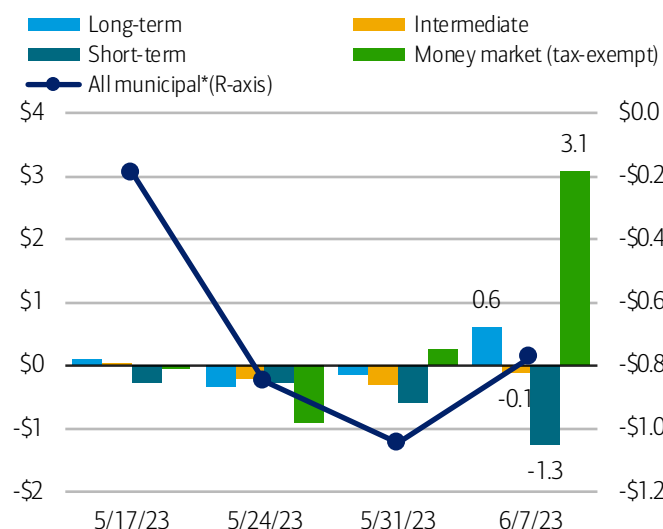


## Mutual fund outflows total \$0.77bn; ETF outflows \$0.12bn

Mutual fund flows were negative this week, with outflows totaling \$0.77bn, coming mostly from short-term funds. There were \$1.01bn of outflows from investment grade funds against \$0.24bn of inflows from high yield funds. YTD, investment grade outflows total \$8.5bn versus \$0.1bn of inflows to high yield. ETF fund flows were negative for the week, with outflows totaling almost \$0.12bn. Overall, our flow strength indicator measured by the 2-year trailing z-score suggests this week's flow strength was normal.

### Exhibit 17: Flows by maturity brackets (\$bn)

Muni outflows of \$0.77bn, money market inflows of \$3.09bn



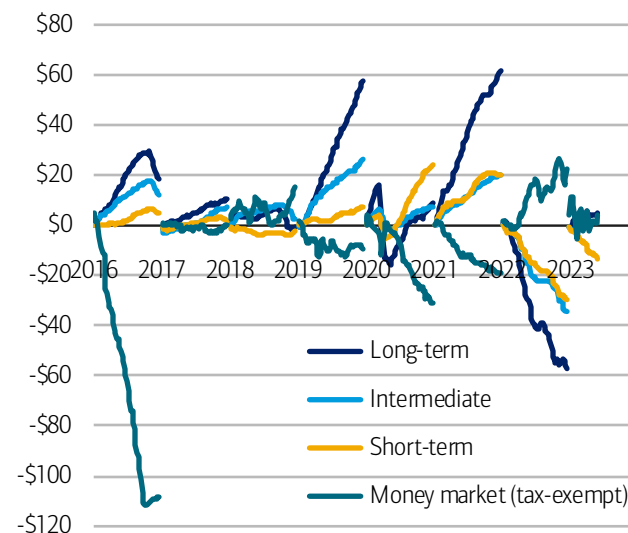
**Note:** ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 7 June 2023.

**Source:** Refinitiv Lipper

BofA GLOBAL RESEARCH

### Exhibit 18: YTD cumulative flows (\$bn)

2023 flow: LT: \$4.6bn, INT: \$0.6bn, ST: -\$13.6bn, MM: \$4.1bn



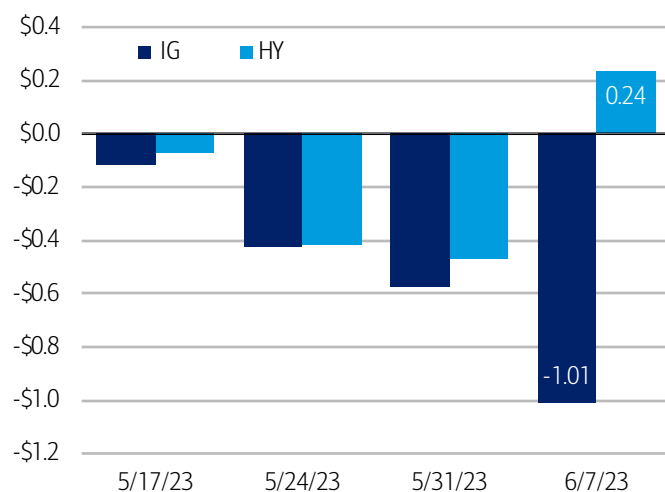
**Note:** ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 7 June 2023.

**Source:** Refinitiv Lipper

BofA GLOBAL RESEARCH

### Exhibit 19: IG vs HY muni fund flows (\$bn)

IG outflows of \$1.01bn vs \$0.24bn of HY inflows for the wk of 7 Jun



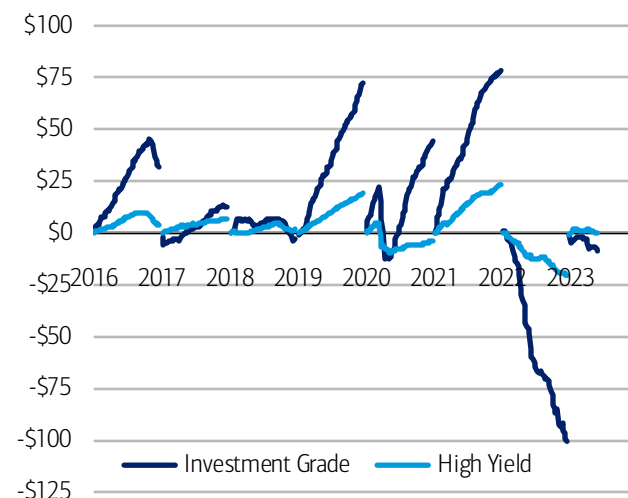
**Note:** ETFs included. All Municipal = IG+HY. Data includes both weekly and monthly reporting funds as of 7 June 2023.

**Source:** Refinitiv Lipper

BofA GLOBAL RESEARCH

### Exhibit 20: Year-to-date cumulative flows (\$bn)

2023 flow: IG: -\$8.5bn, HY: \$0.1bn



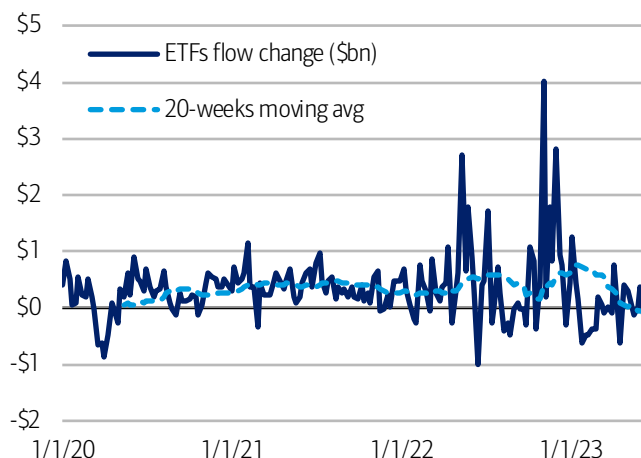
**Note:** ETFs included. All Municipal = IG+HY. Data includes both weekly and monthly reporting funds as of 7 June 2023.

**Source:** Refinitiv Lipper

BofA GLOBAL RESEARCH

**Exhibit 21: Municipal ETF fund flows (\$bn)**

ETF outflows were \$0.12bn for the week of 7 June 2023



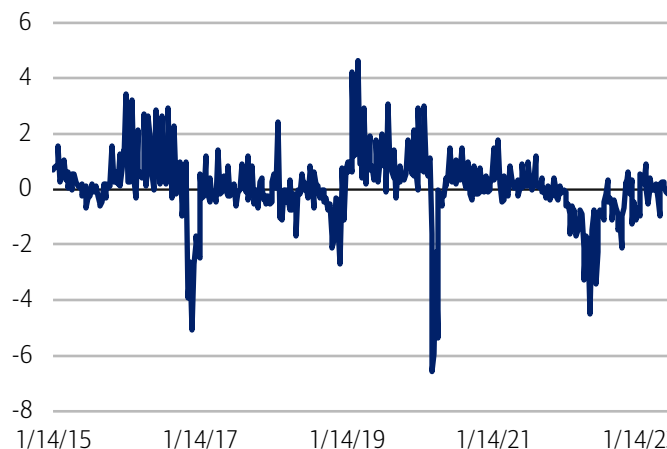
**Note:** ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 7 June 2023.

**Source:** Refinitiv Lipper

BofA GLOBAL RESEARCH

**Exhibit 22: Flow strength indicator**

Flow strength was Normal with -0.05 z-score for the week of 7 Jun



**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 7 June 2023.

**Source:** Refinitiv Lipper

BofA GLOBAL RESEARCH

## Relative value

### Ratios neutral, curves largely very flat on long-term basis

We screen the muni market for parts of the curve, sectors and ratings that are rich or cheap. Exhibit 23 shows that muni/Treasury ratios are Cheap at the 10yr on a short-term basis, but Neutral there and at other spots on both a short-term and long-term basis. Exhibit 24 shows that the 10s30s slope is Steep while other slopes are Very Flat on a long-term basis. On a short-term basis, the 10s30s is Flat while others are Neutral.

**Exhibit 23: Rich/cheap analysis of MMD\*/Treasury ratios as of 7 June 2023**

The muni market is Cheap at 10yr on a ST basis and Neutral for the rest on both a ST and LT basis

Maturity	Current Tsy	Muni/Tsy	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	4.201%	67.1%	Neutral	75.0%	55.5%	64.9%	Neutral	164.2%	26.7%	68.9%
5yr	3.914%	68.0%	Neutral	74.0%	57.6%	65.9%	Neutral	150.6%	39.3%	67.9%
10yr	3.778%	68.6%	Cheap	72.9%	59.7%	67.0%	Neutral	141.4%	54.7%	80.8%
30yr	3.935%	89.0%	Neutral	95.2%	85.0%	90.2%	Neutral	119.9%	63.5%	89.6%

**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 24: Rich/cheap analysis of MMD\* slopes (bp) as of 7 June 2023**

The 10s30s curve is Steep on LT basis while the rest are Very Flat/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
1s5s	-43	Neutral	-16	-68	-42	Very Flat	65	-68	19
1s10s	-50	Neutral	-13	-74	-44	Very Flat	120	-74	57
10s30s	91	Flat	108	90	102	Steep	108	32	65
1s30s	41	Neutral	91	26	58	Very Flat	170	26	122

**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. 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

## Screening for cheap OAS

At the 7-12yr part of the curve, we consider Single-A Health, BBB Health, BBB Lease COPs & Appropriation, AAA Utilities and Single-A Utilities' OAS Cheap. See Exhibit 26. At the 22+yr part of the curve, we consider BBB Health Very Cheap, Single-A Health, AAA

Higher Ed, AAA Lease COPs & Appropriation and Single-A Pollution Control sectors' OAS Cheap. Conversely, we consider BBB Utilities' OAS at the 22+yr part of the curve to be Very Rich. See Exhibit 29.

#### Exhibit 25: OAS, 7-12yr indexes (bp)

BBB Health at 179bp

Sector	AAA	AA	A	BBB
Airports		33	21	30
Higher Education	-13	-15	31	
GO Local	-8	-1	51	110
GO State	-18	-16	50	0
Health		-19	136	179
Hospital		17	33	97
IDR		26	70	87
Leases COPS & Appr.		2	35	237
Pollution Control	-2		81	
Power	-25	-18	23	
Tax Revenues	-9	-4	59	123
Tobacco			37	
Toll & Turnpike		21	9	103
Transportation - Other	14	4	51	82
Utilities - Other	0	7	83	
Water & Sewer	-16	-15	3	110

**Note:** Data as of 6 June 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

**Source:** ICE Data Indices, LLC

BofA GLOBAL RESEARCH

#### Exhibit 26: 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	N	R	N	N
GO State	R	R	N	R
Health		R	C	C
Hospital		N	N	N
IDR		N	N	N
Leases COPS & Appr.		N	N	C
Pollution Control	N		N	
Power	R	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	C	
Water & Sewer	R	R	N	N

**Note:** Data as of 6 June 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

**Source:** ICE Data Indices, LLC

BofA GLOBAL RESEARCH

#### Exhibit 27: 3-yr avg OAS, 7-12 year (bp)

...against its 3yr OAS avg of 113bp

Sector	AAA	AA	A	BBB
Airports		40	44	85
Higher Education	-5	3	55	
GO Local	2	15	52	137
GO State	-2	3	49	140
Health		30	71	113
Hospital		24	53	107
IDR		49	62	96
Leases COPS & Appr.		17	46	121
Pollution Control	1		84	
Power	4	1	31	
Tax Revenues	13	14	61	141
Tobacco			60	
Toll & Turnpike		27	32	95
Transportation - Other	7	23	82	111
Utilities - Other	-3	5	46	
Water & Sewer	1	-1	23	117

**Note:** Data as of 6 June 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

**Source:** ICE Data Indices, LLC

BofA GLOBAL RESEARCH

#### Exhibit 28: Current OAS, 22yr+ indexes (bp)

BBB Health at 221bp

Sector	AAA	AA	A	BBB
Airports		37	27	-8
Higher Education	44	-3	28	111
GO Local	4	8	14	79
GO State	-4	-12		0
Health		-31	81	221
Hospital		23	39	83
IDR			69	90
Leases COPS & Appr.	19	1	42	44
Pollution Control			40	
Power		-4	24	91
Tax Revenues	10	7	61	79
Tobacco				105
Toll & Turnpike			15	38
Transportation - Other		0	23	68
Utilities - Other		8	39	0
Water & Sewer	-17	-13	9	

**Note:** Data as of 6 June 2023. Only includes non-prerefunded securities. Benchmark is 3-yr avg.

**Source:** ICE Data Indices, LLC

BofA GLOBAL RESEARCH

#### Exhibit 29: Rich/Cheap OAS analysis, 22yr+

...is Very Cheap right now at 22+ years

Sector	AAA	AA	A	BBB
Airports		N	N	N
Higher Education	C	N	N	N
GO Local	N	N	N	N
GO State	N	N		R
Health		N	C	VC
Hospital		N	N	N
IDR			N	N
Leases COPS & Appr.	C	N	N	N
Pollution Control			C	
Power		N	N	N
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 6 June 2023. Only includes non-prerefunded securities. Benchmark is 3-yr avg.

**Source:** ICE Data Indices, LLC

BofA GLOBAL RESEARCH

#### Exhibit 30: 3-yr avg OAS, 22yr+ (bp)

...against its 3yr OAS avg of 104bp

Sector	AAA	AA	A	BBB
Airports		34	38	42
Higher Education	18	-1	30	86
GO Local	-11	4	31	108
GO State	-25	-15		109
Health		-1	37	104
Hospital		10	32	63
IDR			55	83
Leases COPS & Appr.	-6	0	40	69
Pollution Control			11	
Power		-4	22	55
Tax Revenues	10	10	64	94
Tobacco				87
Toll & Turnpike			21	57
Transportation - Other		18	54	67
Utilities - Other	-9	-7	29	76
Water & Sewer	-17	-9	9	

**Note:** Data as of 6 June 2023. Only includes non-prerefunded securities. Benchmark is 3-yr avg.

**Source:** ICE Data Indices, LLC

BofA GLOBAL RESEARCH

## MWIs in the underpriced space

Our market width indicator (MWI), 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 most sectors' MWIs had increases over the past week but still within underpriced space (below 20%). The ETM, Pre-re, Airport, Pollution Control and Power are the lowest. For w/w, Industrial Development Rev, Tax Revenue and Tobacco had the biggest decreases.



**Exhibit 31: MWIs – sector momentum (%) as of 6 June 2023**

Most the sectors had increases over the past week and are in underpriced spaces

Sector	MWI	w/w Δ	Sector	MWI	w/w Δ
<b>UOAO Index</b>	<b>10.8%</b>	<b>7.8%</b>	Miscellaneous	6.3%	5.5%
ETM	4.4%	2.2%	Multi-Family Housing	6.9%	6.3%
GO - Local	10.5%	7.0%	Pollution Control	6.1%	-1.1%
GO - State	7.7%	4.2%	Power	5.2%	4.0%
Pre-Re	1.2%	0.8%	Single Family Housing	3.4%	2.4%
Airport	6.6%	5.8%	Tax revenue	15.9%	13.3%
Education	8.6%	5.8%	Tobacco	25.0%	21.8%
Health	9.1%	3.4%	Toll & Turnpike	17.5%	14.3%
Hospitals	9.7%	7.5%	Transportation	18.9%	11.8%
Industrial Development Rev	20.0%	10.9%	Utilities - Other	17.8%	12.5%
Leasing COPS & Appropriations	10.3%	6.8%	Water & Sewer	11.7%	8.7%

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 was 73358XJB9 totaling \$348.1mn. These are newly-issued NJ & NJ Port Authority bonds due in 2053. By trades it was 467578LX6, totaling 456 trades. These are newly-issued special obligation bonds from Jackson County, Missouri due in 2053.

**Exhibit 32: Most actively traded muni CUSIPs over the week ending 7 June 2023**

467578LX6 was the most frequently traded CUSIP. <sup>1</sup>Last trade.

CUSIP	Short name	ST	Coupon	Maturity	Issue	Price <sup>1</sup>	Yield <sup>1</sup>	Size <sup>1</sup> (000s)	Spread	# of trades	Volume (\$mn)
73358XJB9	NY & NJ PORT AUTH-239	NY	5.072	07/15/53	06/14/23	100.000	5.07	5	113	151	348.1
46360XAQ7	IRVINE FACS FING AUTH	CA	4.250	05/01/53	06/14/23	99.777	4.26	10	73	280	147.6
64966Q2C3	NEW YORK	NY	5.000	08/01/25	06/13/23	103.826	3.13	2875	26	270	139.9
751100NP9	RALEIGH	NC	4.000	09/01/53	06/15/23	99.708	4.02	5	48	393	125.9
45470YFK2	INDIANA FIN AUTH-A	IN	5.000	10/01/53	07/06/23	106.422	4.22	1000	69	36	117.8
64613CDQ8	NJ ST TRANSPRTN TRUST	NJ	4.250	06/15/44	06/01/23	98.902	4.33	2000	98	209	86.4
6133408D3	MONTGOMERY CO-E	MD	2.950	11/01/37	12/19/17	100.000	--	2725		35	82.4
59334DLV4	MIAMI-DADE CO WTR&SWR	FL	4.000	10/01/49	11/06/19	97.471	4.16	10	65	193	64.9
56035DEE8	MAIN STREET NATURAL-B	GA	5.000	12/01/52	08/03/22	102.857	--	4700	186	22	64.2
45528U6T3	INDIANAPOLIS BD BK	IN	4.125	02/01/52	06/13/23	99.071	4.18	10	65	235	58.7
786005H92	SACRAMENTO MUNI UTIL	CA	5.000	08/15/53	06/22/23	109.844	3.82	500	28	42	56.2
64966LLS8	NYC-ADJ-1-SUBSER I-2	NY	3.000	03/01/40	03/25/14	100.000	--	150		19	54.7
46360XAN4	IRVINE FACS FING AUTH	CA	5.250	05/01/43	06/14/23	104.611	3.55	50	-11	61	53.2
64613CCU0	NJ TRANSPRTN TRUST-A	NJ	4.250	06/15/40	06/01/23	101.362	4.08	5	89	247	49.1
64972GC85	NYC MUNI WTR FIN-BB-2	NY	3.000	06/15/53	02/16/23	100.000	--	5M+		16	47.7
73358XHZ8	PORT AUTH OF NY & NJ	NY	5.000	07/15/39	06/14/23	107.798	4.05	50	90	29	46.8
83712D2W5	SC ST HSG FIN & DEV	SC	4.950	07/01/53	06/29/23	103.375	4.49	20	96	412	46.1
74514L3T2	CVI-SUBSER CW NT	PR	0.000	11/01/43	03/15/22	46.647	3.81	2,056		85	44.1
467578LX6	JACKSON CO-A-REV	MO	4.250	12/01/53	05/25/23	97.287	4.41	20	88	456	43.3
73358XHY1	PORT AUTH OF NY & NJ	NY	5.000	07/15/38	06/14/23	108.056	4.02	15	91	23	42.9

Source: Bloomberg

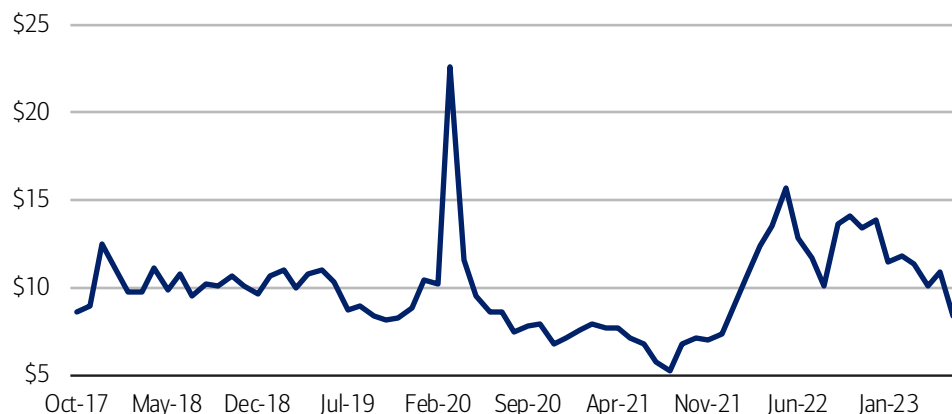
BofA GLOBAL RESEARCH

### Avg daily secondary trading \$8.4bn MTD in June

With debt limit-driven volatility subsiding, June's average daily secondary trading volume fell to \$8.4bn to start the month, or almost 23% below May's average. It is also down 35% versus June 2022's average. MTD, only \$42.0bn of muni bond par value traded.

**Exhibit 33: Daily avg secondary trading volume (\$bn; as of 7 June 2023)**

Jun-23 MTD daily avg volume of \$8.4bn down 23% vs May-23's daily average



Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

## Credit corner

### Rating activity

#### S&P's May upgrades accelerate vs downgrades, with 4.8 to 1 ratio

S&P's May rating activity was even more positive than April's on a ratio basis, with 76 ratings upgraded versus 16 downgraded for an upgrade to downgrade ratio of 4.8 to 1; April's ratio was 4.1 to 1. Local governments again accounted for the most upgrades with 55, but also the most downgrades, with 11. For outlook revisions, S&P revised 13 outlooks to stable, 7 to positive but 16 to negative. May marks the 6th month in the last 7 in which negative outlook revisions outnumbered those to positive. Still, unfavorable outlook and CreditWatch changes were outpaced favorable changes during the month – 17 unfavorable vs 20 favorable. As noted in our [Municipals Year Ahead 2023](#), we expect that 1H23 rating activity will stay skewed to the positive; however, we look for upgrade to downgrade ratios to moderate towards more neutral levels as 2023 closes given our economists' recession view beginning in 3Q23.

### State & local governments

#### Early May collection medians show a rebound from April

13 states reported May collections thus far. Their y/y growth medians certainly show some improvement versus April's, which were dragged down by weaker-than-expected personal income taxes. For those 13 states, we see median overall y/y growth of 1.3%. We also see personal income tax collections are up, on median, 3.2% versus those collected in May 2022, while corporate collections are up 16.7% and sales tax collections are up 2.5%.

#### CT's governor, legislature reach agreement on budget, tax cut

CT's governor announced on 5 June that his administration and state legislative leaders reached an agreement on a biennial budget for FY24 and FY25 totaling over \$51bn that "provides significant increases in funding for K-12 and childcare programs, builds thousands of new housing units, and increases support for nonprofit providers," per a press release from the governor's office. It also provides for the "largest income tax cut for working and middle-class individuals and families in Connecticut history." Under the agreement, the state's 5% rate will be lowered to 4.5% and the 3% rate will be lowered to 2% for income year 2024. The benefits will be capped at \$150,000 for single filers and \$300,000 for joint filers. Per the governor, 82% of the benefit of the tax reduction will flow to those making less than \$150,000. The tax reduction "is not a temporary tax cut – it is designed to be sustainable for years to come." According to a Fiscal Note to the budget bill, reducing these tax rates will lower revenues by \$186mn in FY24, \$412mn in FY25, \$428mn in FY26, \$448mn in FY27 and \$465mn in FY28.



### Judge Swain hears opening arguments on PREPA unsecured net revenue claim

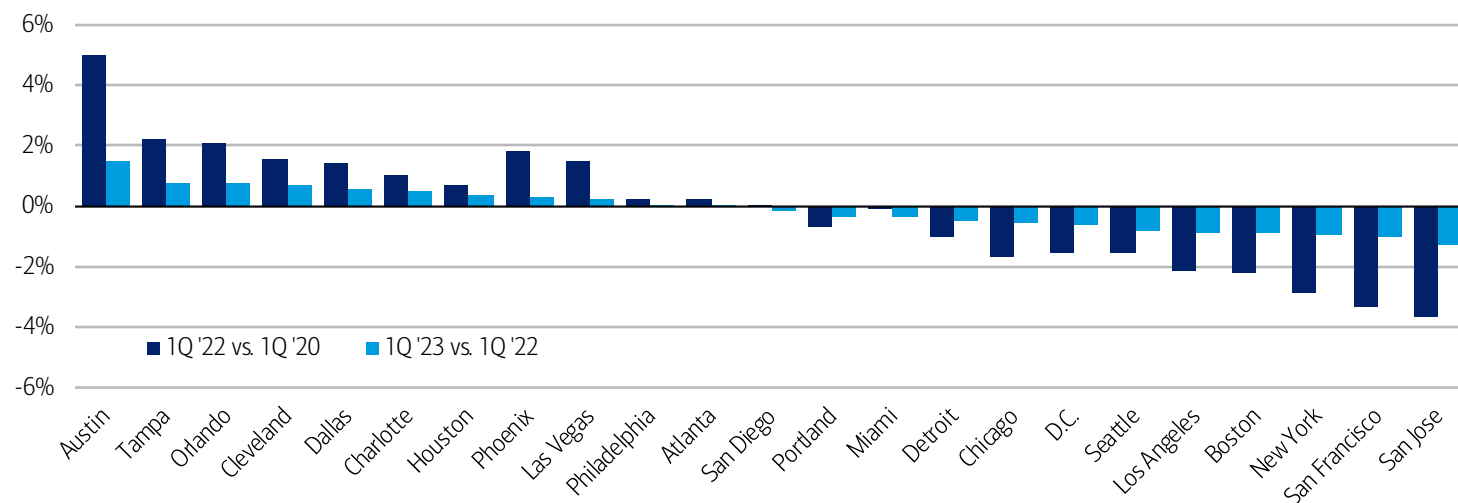
Opening arguments were made before Judge Swain on estimating PREPA bondholders' unsecured net revenue claim this week, focused, primarily, on which party carries the burden of proof, the temporal scope of the claim and how to value the claim. The arguments made were legally technical in nature, and spanned both bankruptcy and local law. The judge also received a preview of both sides' expert testimony, and challenges to the opposing side's experts. Otherwise, we highlight (a) TSA balances of \$7.2bn as of 26 May were up \$147mn w/w, and are now just 0.7% below adopted liquidity plan levels, (b) FYTD General Fund collections through 26 May of \$11.9bn that are up 2.4% vs adopted liquidity plan levels, (c) government and instrumentality bank account balances totaling \$19.1bn as of the end of April, up 6% m/m and 10% on a y/y basis; and, (d) cement sales – a bellwether for construction on-island – that were up almost 18% m/m and 6% y/y.

### Bank of America Institute: pandemic migration trends haven't reversed

The [Bank of America Institute's latest report](#) uses internal Bank of America data to look at near real-time domestic migration flows. Using that data, they found that "pandemic migration trends are not reversing" and that there remains "faster population inflow into sunbelt cities like Austin and Tampa." As Exhibit 34 shows, "San Jose, San Francisco and New York saw the biggest outflow of people during the early years of the pandemic and the rate of decline in 2023 continues to be the highest among major MSAs."

#### Exhibit 34: Net population change in major MSAs, according to Bank of America internal data (%change, positive means net inflow, negative means net outflow, ranked by the %change between 1Q '23 and 1Q '22)

Austin saw the largest net inflow of people both during the first two years of the pandemic and over the past four quarters



Source: Bank of America Institute

BofA GLOBAL RESEARCH

Demographics, as we always say, are destiny. The Bank of America Institute suggested that "demographics play a critical role in the long term" for cities. One aspect of that is the composition of the population, with "but two generations are especially important right now: Baby Boomers and Millennials." For Baby Boomers, the most popular destinations are Las Vegas, Phoenix, Tampa and Orlando while they are leaving Bay area cities, New York and Seattle. For Millennials, the top destinations are Austin, followed by Cleveland, Tampa and Dallas. They, too, are leaving Bay area cities and New York, though the outward pace "has slowed in the past year compared with the early years of the pandemic."

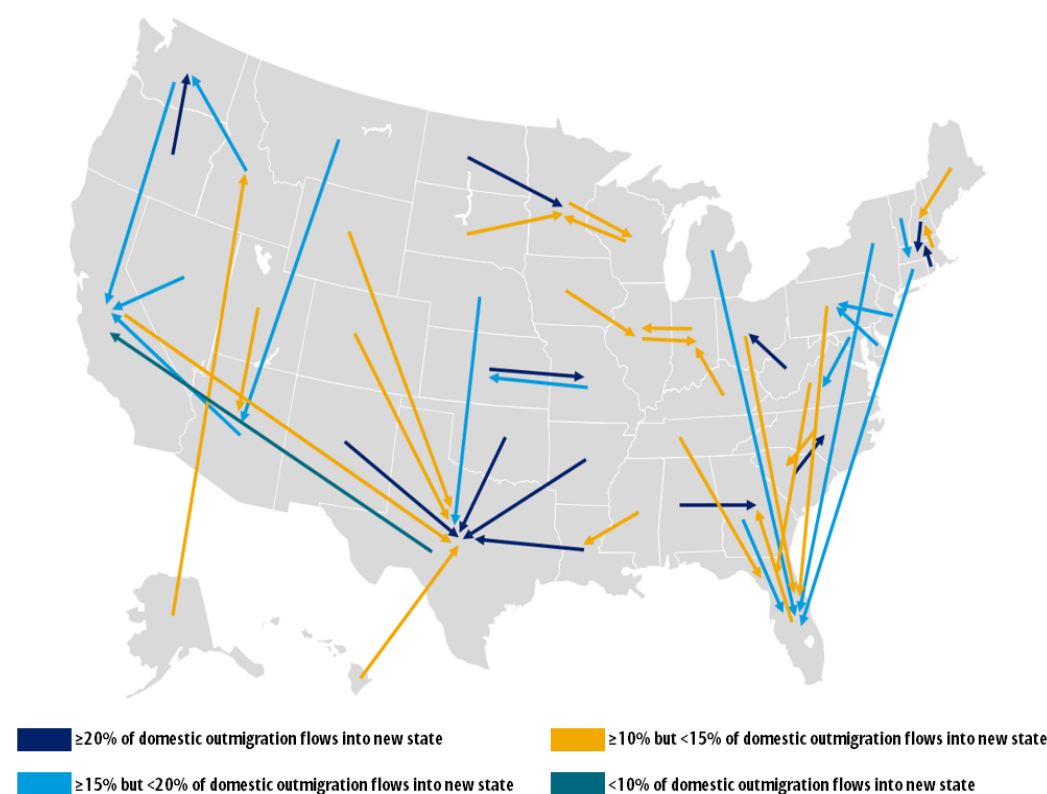
### Census' 2021 state-to-state migration data points to TX and FL

This week, the US Census Bureau released American Community Survey state-to-state migration flow results for 2021, the most recent data available. The primary beneficiary of domestic outmigration for each of the states is shown in Exhibit 35, below. Texas, Florida and California are the most popular destinations for those moving from one state

to another, being the primary beneficiary of 9, 8 and 4 states' outmigration, respectively. Only 22 states were primary beneficiaries of a states' outmigration; that shows how concentrated migration flows actually are.

### Exhibit 35: Concentration of state-to-state migration in 2021

FL, TX and CA were the primary destinations for the most states' outmigrants



Source: BofA Global Research, US Census Bureau

BofA GLOBAL RESEARCH

### Lawsuit filed against FEMA over NFIP's rate hikes

10 states along with a host of local governments filed suit in a New Orleans federal court last week challenging FEMA's Risk Rating 2.0 pricing plan for the National Flood Insurance Program (NFIP). Under the plan, flood insurance premiums will rise, and in some states, more than 100%. Increases are even more substantial in some risk-prone counties: of the 819 counties across the US that would see rates rise by over 100%, 60% come from just 15 states, including WV, KY, MO, IA, VA, TN, PA, AL, MN, CA, IL, FL, NC, GA and LA. According to LA's Attorney General, the FEMA "policy is completely disrupting to the housing market and business climate of" LA and could price some residents out of their homes. In our view, higher insurance premiums in risk-prone areas could pose affordability challenges for many residents and drive them out of those high risk area; in turn, that could reduce taxable values and pressure tax collections.

### State & local payrolls climb in May, raising recovery to 82%

The May jobs report surprised to the upside, with the US adding 339,000 jobs during the month, but with the US unemployment rate rising 0.3ppt to 3.7%. March's payroll increase was revised up by 52,000 while April's estimate was revised up by 41,000. In May, state and local government payrolls grew 49,000 m/m in the aggregate (state payrolls up 19,000 m/m and local payrolls up 30,000 m/m). Of the 49,000 state and local government jobs added during the month, over 24,000 were education jobs, per Bureau of Labor Statistics data. Overall, state and local governments' nonfarm payroll recovery of jobs lost during the peak of the COVID crisis is 82%, with local governments' recovery at 85% and state governments at 65%. On a combined basis, state and local government education payrolls recovered 80% of jobs lost – lower than the 86% for non-education.

As it stands, May 2023's education payrolls equal 98% of February 2020's and non-education equals 99%.

## Essential services

### Fitch upgrades JEA's electric and water & sewer bonds

JEA's electric utility system saw its AA rating affirmed with a stable outlook on the back of its strong operating margins and declining debt levels; debt levels are down \$1.3bn since 2014. Similar to its water and sewer systems, JEA maintains strong positioning as primary service provider with a strong and growing revenue base, with rates 95% of 2021 state averages, as well as the ability to set rates upon the vote of the JEA board, independent of regulatory approval. The expansion of Unit 3 at Georgia's Plant Vogtle, where JEA has a purchase power agreement, is set to be commercially operational later in June and will provide a diverse energy source to the region JEA services. Further expansion of a Unit 4 looks to be completed and in operation by early 2024. Rating sensitivities remain should operational issues or delays occur with Plant Vogtle projects.

Meanwhile, JEA, which provides water and sewer service to Jacksonville and parts of three neighboring counties, had its Water and District Energy System revenue bonds upgraded from AA to AA+ by Fitch. JEA retains its role as a central provider of water and sewer services to a broad and growing customer base, with low operating costs, leading to years long strong margins and resulting low leverage levels. Covering the entirety of the Jacksonville area servicing roughly 1.7 million customers, JEA's singular management over the water and sewer space serves as a strong basis for reliable and consistent operation with Fitch reporting customer growth over 2% a year since 2013.

## Ports

### Labor negotiations continue with calls for Federal intervention

The International Longshore and Warehouse Union and the Pacific Maritime Association continue their labor contract negotiations that began over a year ago, amid slowdowns and closures across West Coast ports. Both sides indicated that they intend to reach a deal, but some third parties remain concerned one has not yet been agreed upon as select West Coast ports experience some workers no-showing assigned shifts resulting in closures and slowdowns. The National Rail Federation called for intervention by the Biden administration, urging "the administration to mediate to ensure the parties quickly finalize a new contract without additional disruptions," and the executive director of the Port of Long Beach echoed the National Rail Federation's desire for the two parties to reach a deal in a 2 June statement, emphasizing that the "national economy relies on an outcome that keeps goods moving through the San Pedro Bay ports, the most important gateway for trans-Pacific trade."

## Defaults, distress & HY

### Tracking: material credit events and Ch. 9 filings

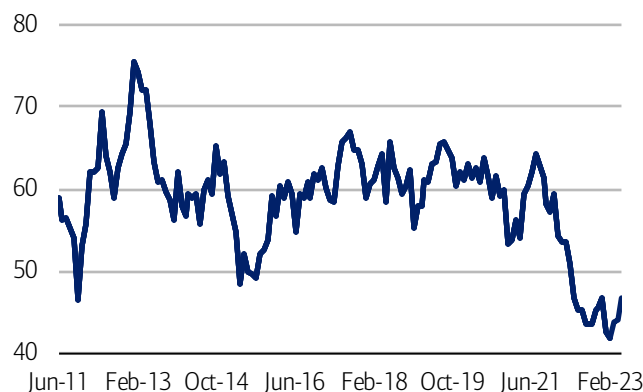
For the week ending 7 June, our tracking of those Moody's-defined material credit events (MCEs) shows 29 postings, up 16 on a w/w basis, with the MTD total of 29 as of 7 June. See Exhibit 37.

Meanwhile, we note there were no new Chapter 9 bankruptcy petitions filed for the week ending on 7 June and, as a result, it's been 15 days since the last bankruptcy petition was filed by Hazel Hawkins Memorial Hospital on 23 May 2023. Since 1982, the average period between bankruptcy filings is 52 days.



**Exhibit 36: 6-mo mov avg of material credit events posted to EMMA**

Filings posted to EMMA have decreased since last June



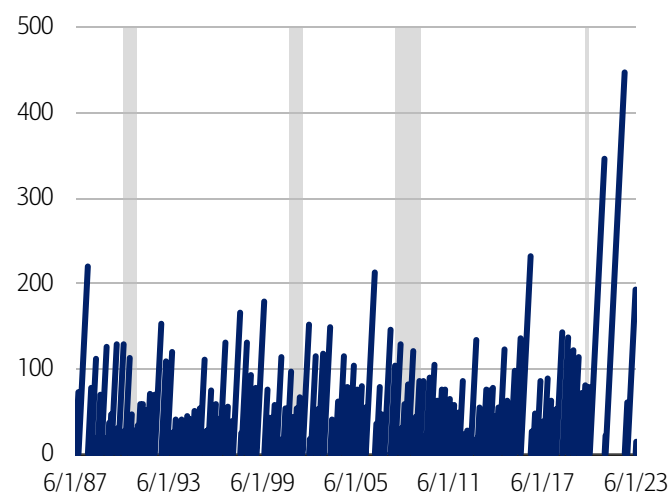
Note: Data as of 7 June 2023. Material credit events (MCE) reflect: 1. bankruptcy, insolvency, receivership or similar event, 2. financial obligation-event reflecting financial difficulties, 3. nonpayment related default, 4. principal/interest payment delinquency, 5. unscheduled draw on credit enhancement reflecting financial difficulties, and 6. unscheduled draw on debt service reserve reflecting financial difficulties.

Source: EMMA

BofA GLOBAL RESEARCH

**Exhibit 37: Calendar days since last Chapter 9 petition filed**

15 days since Hazel Hawkins Memorial Hosp. filed Ch. 9 petition



Source: BofA Global Research, PACER, US Courts

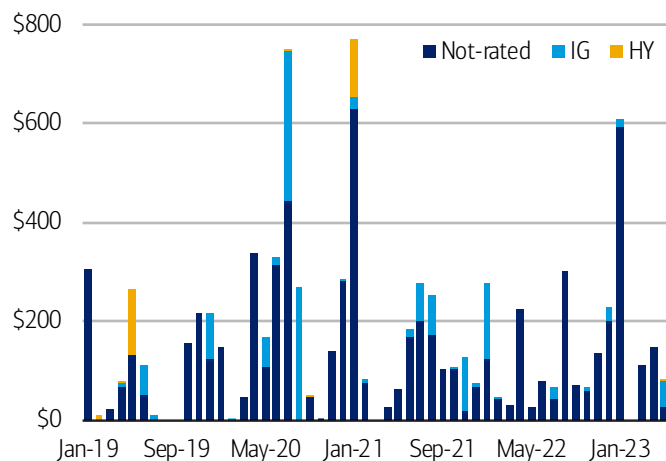
BofA GLOBAL RESEARCH

**YTD defaults up 58% y/y thru May**

As a reminder, first-time payment defaults totaled \$85mn in May, bringing the YTD total to \$958mn, up 58% y/y. The Nursing Home/Senior Living sector continues to default in YTD-23, as we projected earlier. We continue to hold a cautious view on this sector. First-time distressed debt totaled \$140mn in May, bringing the YTD total to \$981mn, up 40% y/y. The total cumulative first-time distressed debt since 2019 totals \$12.8bn; of that, 35% defaulted while 7% currently exited distressed status. As we noted in our [Municipals Year Ahead 2023](#), we expect defaults to tick up some in 2023, with our estimate for the year at \$1.7bn-\$2.1bn. Going forward, we expect defaults to be concentrated in the Nursing Home, Hospital, Student Housing and Industrial Development sectors.

**Exhibit 38: Monthly first-time defaults (\$mn) by avg rating at issue**

First-time defaults \$85mn in May; YTD-23 totals \$958mn, up 58% y/y



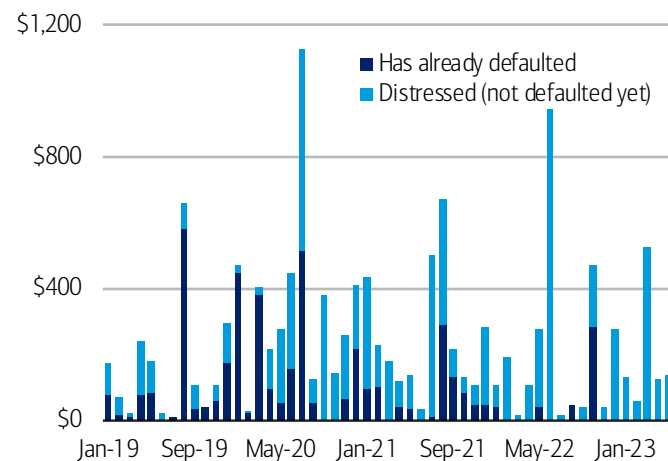
Note: We may revise data if Bloomberg revises its data.

Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

**Exhibit 39: Monthly first-time distressed debt (\$mn)**

First-time distressed \$140mn in May; YTD-23 totals \$981mn, up 40 % y/y



Note: We may revise data if Bloomberg revises its data.

Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

**Cross currency equivalent yields**

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



**Exhibit 40: Cross currency equivalent yields as of 8 June 2023**

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

Country	Government bond 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		
	5 year	10 year	30 year	5 year (3.856)	10 year (3.718)	30 year (3.884)	5 year (4.47)	10 year (4.63)	30 year (5.11)	5 year	10 year	30 year	5 year	10 year	30 year
Canada	3.678	3.384	3.261	3.881	3.695	3.874	4.494	4.608	5.100	Yes	Yes	Yes	Yes	Yes	Yes
United Kingdom	4.197	4.226	4.479	4.499	4.134	4.080	5.114	5.052	5.317	Yes			Yes	Yes	Yes
France	2.754	2.945	3.363	2.762	2.741	3.435	3.372	3.648	4.636	Yes		Yes	Yes	Yes	Yes
Germany	2.414	2.398	2.557	2.762	2.741	3.435	3.372	3.648	4.636	Yes	Yes	Yes	Yes	Yes	Yes
Italy	3.585	4.172	4.469	2.762	2.741	3.435	3.372	3.648	4.636						Yes
Spain	3.048	3.392	4.001	2.762	2.741	3.435	3.372	3.648	4.636				Yes	Yes	Yes
Portugal	2.744	3.099	3.642	2.762	2.741	3.435	3.372	3.648	4.636	Yes			Yes	Yes	Yes
Netherlands	2.614	2.758	2.807	2.762	2.741	3.435	3.372	3.648	4.636	Yes		Yes	Yes	Yes	Yes
Switzerland	0.854	0.891	0.912	2.762	2.741	3.435	3.372	3.648	4.636	Yes	Yes	Yes	Yes	Yes	Yes
Japan	0.075	0.433	1.258	-0.349	-0.028	2.184	0.251	0.866	3.321			Yes	Yes	Yes	Yes
Australia	3.840	4.008	4.339	4.311	4.664	4.321	4.926	5.579	5.563	Yes	Yes		Yes	Yes	Yes
South Korea	3.490	3.598	3.672	2.351	2.896	3.527	2.960	3.802	4.706					Yes	Yes
China	2.423	2.702	3.061	4.801	4.245	4.125	5.416	5.156	5.358	Yes	Yes	Yes	Yes	Yes	Yes
Taiwan	1.075	1.177	1.593	1.000	2.163	3.171	1.604	3.062	4.347		Yes	Yes	Yes	Yes	Yes
Singapore	2.975	2.960	2.356	3.368	3.454	3.761	3.980	4.363	4.977	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 41: 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 41: 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.bofam.com/BofASEdiscclaimer](http://www.bofam.com/BofASEdiscclaimer); 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 (HKSCF); 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 HKSCF; 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:

Copyright 2023 Bank of America Corporation. All rights reserved. iQdatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities.

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 or 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](mailto:yingchen.li@bofa.com)

**Ian Rogow**

Municipal Research Strategist  
BofAS  
[ian.rogow@bofa.com](mailto:ian.rogow@bofa.com)

**John Lombardi**

Municipal Research Strategist  
BofAS  
[jlombardi3@bofa.com](mailto:jlombardi3@bofa.com)

**Sophie Yan**

Municipal Research Strategist  
BofAS  
[sophie.yan@bofa.com](mailto:sophie.yan@bofa.com)

**John Reilly**

Municipal Research Strategist  
BofAS  
[john.reilly2@bofa.com](mailto:john.reilly2@bofa.com)