

## Municipals Weekly

## Lower rates &amp; credit spreads ahead

## Industry Overview

## Key takeaways

- Muni rates should move to their lower bounds of 1H23 after soft inflation data and a resilient economy.
- The recent outperformance of long end exempts indicates less relative value at this point.
- Muni credit remains strong with more 1H23 upgrades than downgrades in the Muni Master Index.

## Lower muni rates and narrower credit spreads to come

Soft June inflation data, together with a resilient GDP growth outlook, suggests muni rates should move to their lower bounds of 1H23. Muni credit spreads may move much narrower than we have expected.

## Long end exempts not as attractive currently

22+yr munis' YTW richened 16bp YTD, more than the ICE BofA Build America Bond Index's, 15+ Year US Corporate Index's and the Current 30-Year US Treasury Index's. Meanwhile, the YTW ratio of the ICE BofA 15+ year Tax Exempt Muni Index to the 15+ year Taxable Muni Index shows long exempts offer less relative value at this point due to recent outperformance.

## UOA0's 1H23 rating changes: more ups than downs

Our review of the ICE BofA Muni Master Index's YTD rating changes shows that only 1.2% of the total outstanding debt was downgraded; 5.3% was upgraded; and 93.5% had no change in average rating, supporting our view that muni credit remains strong, though peak credit is likely already in.

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

Supply: MTD issuance through 12 July totals \$5.6bn, down 45% y/y; YTD issuance of \$184.8bn is down 19% y/y. YTD issuance is 86% tax-exempt and 11% taxable; 77% is new money and 23% is refundings. Returns: For the week ending 12 July, the Muni Master index (UOA0) returned -0.21%, underperforming govies, corporates and taxables after exempts were unable to keep pace with the rally in taxable rates. The Muni High Yield index (UOHY) returned -0.23%. By rating, AAs' returns for the week were strongest at -0.20%; by sector, Power's -0.12% is strongest. Taxables' return for the week was 0.57%. Spreads: For the week ending 12 July, IG spreads sat at 26bp while HY spreads remained at 193bp. Flows: For the week ending 12 July, all municipal bond fund outflows were \$0.48bn; IG outflows were \$0.7bn, while HY inflows were \$0.21bn. Money market fund outflows were \$0.39bn for the week.

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## Recent Municipals Research

[Municipals Quarterly: 2023 in review 06 July 2023](#)

[Municipals Weekly: A mid-year check in on our forecasts 30 June 2023](#)

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

[Municipals Weekly: Front end richens, back end cheapens 23 June 2023](#)

[Municipals Educational Series: State and local tax treatment of municipal bonds, by state 16 June 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 10/30 curve flattening and stable credit spreads in 2H23
- 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

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## Market views & strategies

### Lower muni rates and tighter credit spreads after CPI

The macro market spent the past few weeks absorbing a renewed Fed hawkishness, with Treasury rates breaking briefly above their 1H23 ranges. The June CPI report showed some downside surprise, which may keep the bearish Treasury move somewhat controlled. Muni AAA rates, meanwhile, are still comfortably within their 1H23 ranges.

The Fed's hawkishness has been based on two economic facts: resilient GDP growth and a slower-than-expected decline of inflation. All through 1H23, each time speculation about a recession prevailed, market yields would approach their lower bounds. This was the case for January when the market carried over negative sentiment from 2022. It was also the case in March/April when problems with regional banks inspired seemingly more credible recession speculation. Both times, the speculation turned out to be false.

This week's move, however, is based on a more pleasant downside surprise of CPI. If this is confirmed by other inflation measures, yields should move again to those lower bounds from 1H23. If so, the economy appears to be in a sweet spot: resilient growth and, possibly, not-so-sticky inflation. Not only would muni AAA rates move to their 1H23 lower bounds, but muni credit spreads may also narrow more than we have expected since the end of 2022.

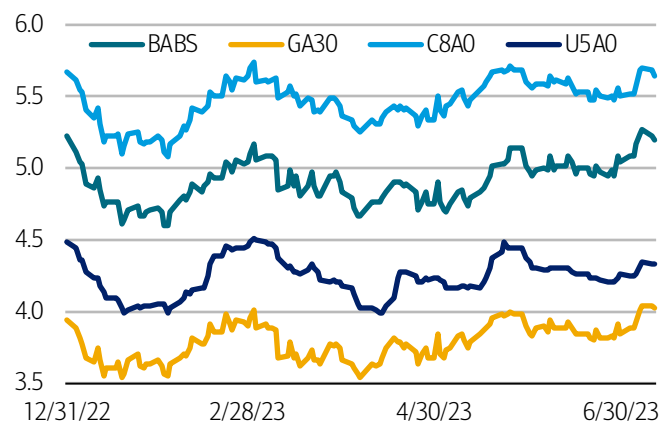
### Long end relative value of tax-exempt munis

In examining the ICE BofA Build America Bond Index (BABS), 15+ Year US Corporate Index (C8A0), 22+ Year US Municipal Securities Index (U5A0) and the Current 30-Year US Treasury Index (GA30) since the end of 2022, we see that the yield decrease of tax-exempt bonds in 2023 has been the largest of the four indexes, from 4.49% to 4.33%, a 16bp decrease. Both the BABS and C8A0 indexes richened 2bp YTD, while the Treasury Index cheapened 8bp as of 11 July.

We think long-term tax-exempt munis offer less value relative to long-term taxable rates at this point largely due to recent outperformance. As of 11 July, the 30yr muni/Treasury ratio stood at 88.6% - or about 3 ratios less than late June. Meanwhile, Exhibit 4 shows the ratio of the ICE BofA 15+ year Tax Exempt Muni Index's (U8AX) yield to worst to the ICE BofA 15+ year Taxable Muni Index's (D8TM). While the ratio is off its recent lows, it is still nevertheless relatively rich.

**Exhibit 2: YTD YTW for BABS, GA30, C8A0 and U5A0 indexes**

U5A0's richened 15bp YTD while GA30's cheapened 8bp

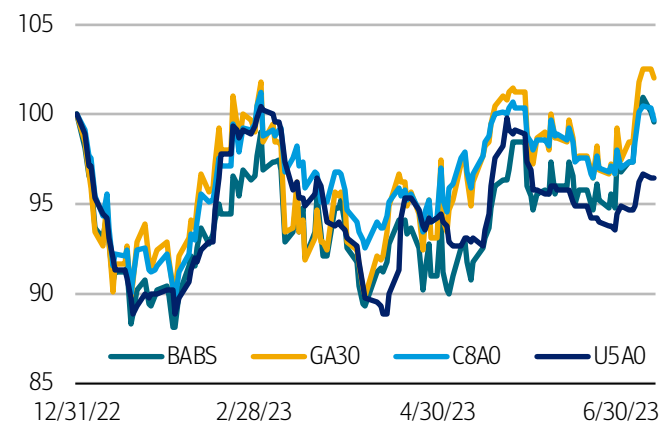


Source: ICE Data Indices, LLC

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**Exhibit 3: YTW YTD indexes for BABS, GA30, C8A0 and U5A0**

31 Dec 2022 = 100; U5A0's YTW outperformed recently

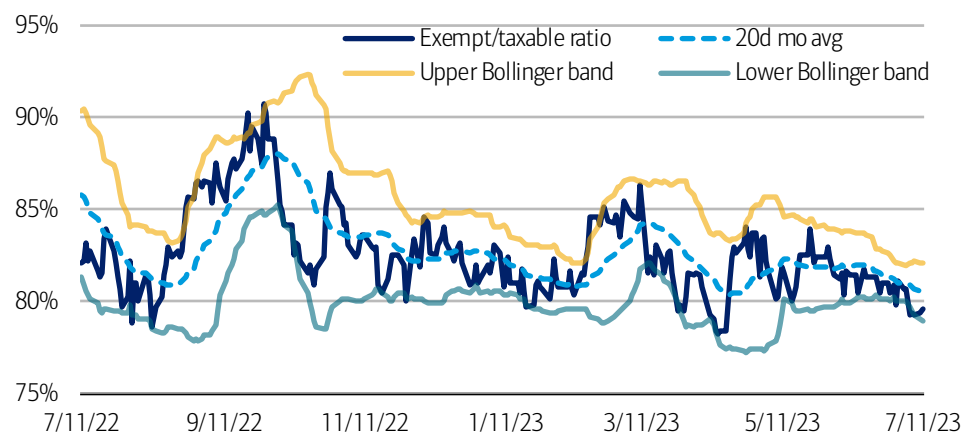


Source: BofA Global Research, ICE Data Indices, LLC

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**Exhibit 4: YTW ratio of U8AX (15+yr tax-exempt muni) to D8TM (15+yr taxable muni)**

YTW ratio is relatively rich right now



Source: BofA Global Research, ICE Data Indices, LLC

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**U0A0's 1H23 rating changes – ups more than downs**

Here, we examine 1H23 ratings changes on bonds in the ICE BofA Muni Master Index (U0A0). We use only changes in average rating (as calculated by ICE, based on an average of Moody's, S&P and Fitch). Additionally, we examine only uninsured bonds to remove effects of insurance on ratings and spreads. Our uninsured sample of bonds represents \$945bn in outstanding debt; it contains only bonds that were in U0A0 on both 30 June 2023 and 31 December 2022 and rated investment grade.

From our sample, we find that only 1.2% of the total outstanding debt was downgraded; 5.3% was upgraded; and 93.5% had no change in average rating during 1H23. Exhibit 5 shows the results by sector, along with the total debt outstanding and average rating of the sample of bonds. We find that the transportation, industrial development revenue and state GO sectors had the greatest proportion of upgrades. Exhibit 6 additionally shows the data by notch change in average rating as a percent of total outstanding debt by sector. As an example, an average rating notch change of 1 would be equivalent to a one-notch upgrade in the average rating on the bond. Exhibit 6 shows that, of the total debt outstanding downgraded for in 1H23, it was all by an average of one notch.

Note that only three sectors' downgrades outpaced their upgrades in 1H23: hospitals (4.8% of outstanding debt downgraded vs 1.7% upgraded), local GOs (2.1% of

outstanding debt downgraded vs 1.6% upgraded) and power (0.3% of outstanding debt downgraded vs 0% upgraded).

#### Exhibit 5: % of debt outstanding based on change in avg rating

5.3% of UOAO's debt outstanding upgraded YTD vs 1.2% downgraded

Sector	Up	None	Down	Amt out \$	*Avg rating
TRAN	24.2	74.4	1.4	60.0	A1
IDR	14.9	79.3	5.8	13.1	BBB1
GO-S	11.3	88.6	0.2	127.8	AA2
UTL	7.4	92.6		40.2	A2
PRE-RE	7.0	92.6	0.4	29.2	AA2
<b>Total</b>	<b>5.3</b>	<b>93.5</b>	<b>1.2</b>	<b>947.7</b>	<b>AA3</b>
LCA	4.6	95.1	0.2	33.9	AA3
EDU	4.1	93.1	2.8	51.8	AA3
MISC	3.1	95.5	1.4	7.4	AA2
AIR	2.8	97.2		51.2	A1
MFH	2.7	95.2	2.1	16.7	AA3
TAX	2.7	97.2	0.1	125.1	AA1
T&T	2.1	97.9		53.7	A2
SFH	1.9	98.1		12.4	AA1
HOSP	1.7	93.5	4.8	98.0	A1
GO-L	1.6	96.3	2.1	101.6	AA2
W&S	0.9	98.9	0.2	65.5	AA2
HLTH	0.8	99.2		4.4	A3
PWR		99.7	0.3	40.2	A1
TBCO		100.0		6.8	A3
PC		100.0		4.2	A1
ETM		100.0		4.3	AA1

**Note:** See Exhibit 47 for sector definitions. \*Weighted avg rating by amount outstanding.

**Source:** BofA Global Research, ICE Data Indices, LLC, Bloomberg

#### Exhibit 6: % of debt outstanding based on notch change in avg rating

All upgrades were one notch in 1H23; most downgrades were one notch

Sector	1	0	-1	-2
TRAN	24.2	74.4	1.4	
IDR	14.9	79.3	4.4	1.4
GO-S	11.3	88.6	0.2	
UTL	7.4	92.6		
PRE-RE	7.0	92.6	0.4	
<b>Total</b>	<b>5.3</b>	<b>93.5</b>	<b>1.1</b>	<b>0.1</b>
LCA	4.6	95.1	0.2	
EDU	4.1	93.1	2.8	
MISC	3.1	95.5	1.4	
AIR	2.8	97.2		
MFH	2.7	95.2	2.1	
TAX	2.7	97.2	0.1	
T&T	2.1	97.9		
SFH	1.9	98.1		
HOSP	1.7	93.5	4.4	0.4
GO-L	1.6	96.3	2.1	
W&S	0.9	98.9	0.2	
HLTH	0.8	99.2		
PWR		99.7	0.1	0.2
TBCO		100.0		
PC		100.0		
ETM		100.0		

**Note:** See Exhibit 47 for sector definitions.

**Source:** BofA Global Research, ICE Data Indices, LLC, Bloomberg

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These data support our view that, in general, muni credit fundamentals remain strong, though peak credit is likely already in. To that end, a similar study we conducted in 1H22 showed 8% of UOAO was upgraded versus just 0.5% downgraded. We believe the 2H23 rating environment will stay positive, but to a lesser degree than in 2022 and 1H23.

#### Sector focus: healthcare and hospitals

Combining the healthcare and hospital sectors' underlying data from Exhibit 5 above, the sectors saw 1.7% of their outstanding debt upgraded, 4.6% downgraded and 93.7% with no change in 1H23. Here, we examine relative value in these sectors on a combined basis, which in the aggregate, comprises approximately 10% of all bonds in the Muni Master Index, or \$111.5bn of full market value.

#### Exhibit 7: Weighted-average YTW spread and MDW for all munis ex-healthcare & hospital sectors vs. combined healthcare & hospitals

Healthcare & hospitals spread on average 40bps wider

UOAO ex-healthcare & hospitals				Healthcare & hospitals		
Rating	FMV \$bn	Spread (bp)	MDW	FMV \$bn	Spread (bp)	MDW
AA1	206.6	2	6.1	5.5	41	5.8
AA2	195.1	-2	5.6	15.0	51	8.3
AA3	151.9	13	5.8	28.1	40	7.8
A1	89.1	37	5.4	17.2	66	8.0
A2	76.7	56	5.8	20.0	90	8.0
A3	64.2	66	5.5	13.9	97	7.4
BBB1	24.5	88	8.2	4.3	132	7.8
BBB2	18.0	108	6.5	4.8	168	8.7
BBB3	13.5	130	6.4	2.6	173	8.9

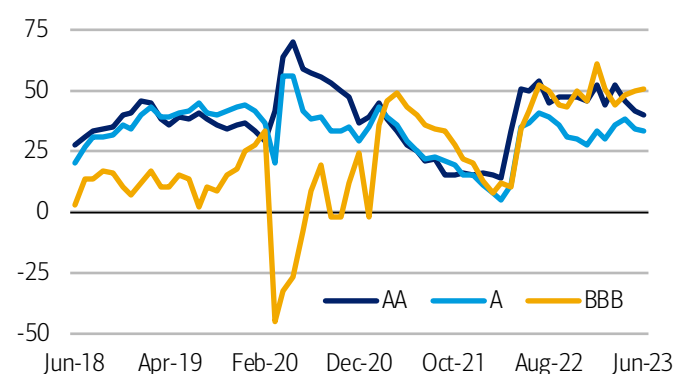
**Note:** FMV = full market value, in billions. MDW = modified duration to worst.

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

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#### Exhibit 8: Healthcare & hospital combined YTW spread to all munis ex-healthcare & hospitals' (bp)

BBB spreads cheap as of 30 June while AA and single-A neutral



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

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Exhibit 7 shows the market value, weighted-average yield to-worst-spread to the ICE BofA US Municipal Securities Index (UOA1) and modified duration-to-worst for bonds rated below AAA in UOA0 versus combined healthcare and hospital bonds as of 30 June 2023. As Exhibit 7 shows, AA1 through BBB3 healthcare and hospital munis trade, on average, 40bp wider than similarly-rated non-healthcare and hospital credits. Note that healthcare and hospital bonds tend to be lower-rated than the market as a whole, with 43.5% of bonds in the AA rating category versus 56.3% of all bonds in UOA0 exclusive of healthcare and hospital bonds in the AA category. Exhibit 8, meanwhile, shows the yield-to-worst spread of combined healthcare and hospitals to all other munis in UOA0 for AA, single-A and BBB-rated bonds. As of 30 June, the AA spread is 40bp, the single-A spread is 33bp and the BBB spread is 51bp. Versus the period dating back to June 2018, we consider those AA and single-A spreads neutral, but the BBB spread to be cheap based on a z-score analysis.

#### Exhibit 9: YTW spread (bp) of combined HY healthcare & hospitals to IG healthcare & hospitals

Spread of HY to HG healthcare & hospitals widened significantly since the start of 2022



Source: BofA Global Research, ICE Data Indices, LLC

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Exhibit 9 shows the yield-to-worst spread of high yield combined healthcare and hospitals to their high grade counterparts. At 225bp as of 30 June, we consider that very cheap compared to the June 2018 to present period.

Hospitals/healthcare continues to be a space we are most negative on from a credit perspective. While each of the rating agencies maintain a negative outlook, for our part we noted in our [last Weekly](#) that we anticipate that defaults from recently distressed debt will be concentrated here. All the same, there are investible names in this space. We continue to favor large, multiple-hospital systems servicing stronger demographic areas across different states and regions with large amounts of liquidity and least favor small, stand-alone and/or rural hospitals, as well as senior and assisted living facilities.

## Performance

### Exempts can't keep pace, underperform this week

Taxable rates rallied this week, leaving exempt muni behind. All in, exempt IG munis lost 21bp of returns this week, underperforming govies and corporates by 68bp and 78bp, respectively. They also underperformed taxables by 78bp. Still, exempt muni IG ever-so-slightly outperformed HY this week, which lost 23bp of returns. Despite that, HY remains the better performer vs IG for the last month, and YTD, outpacing IG returns by 54bp and 32bp over those periods.

#### Exhibit 10: Municipal total returns (%) monitor, as of 12 July 2023

Exempt IG munis couldn't keep pace with taxable rate rallies this week, and underperformed as a result

Index	Ticker	1d	1wk	MTD	1mo	3mo	YTD	1yr
Govt Master	GOAO	0.692	0.471	-0.111	-0.450	-2.078	1.519	-2.517



**Exhibit 10: Municipal total returns (%) monitor, as of 12 July 2023**

Exempt IG munis couldn't keep pace with taxable rate rallies this week, and underperformed as a result

Index	Ticker	1d	1wk	MTD	1mo	3mo	YTD	1yr
Corporate Master	COA0	0.819	0.574	0.077	0.564	-0.842	3.312	1.079
<b>IG munis</b>	<b>U0A0</b>	<b>0.120</b>	<b>-0.208</b>	<b>-0.165</b>	<b>0.274</b>	<b>-1.367</b>	<b>2.671</b>	<b>1.521</b>
AAA	U0A1	0.104	-0.208	-0.155	0.217	-1.621	2.072	1.040
AA	U0A2	0.117	-0.202	-0.156	0.242	-1.482	2.330	1.372
A	U0A3	0.124	-0.217	-0.183	0.313	-1.199	3.195	1.910
BBB	U0A4	0.160	-0.231	-0.193	0.508	-0.538	4.567	2.329
1-3yr	U1A0	0.042	-0.003	0.072	0.278	-0.376	1.061	0.682
3-7yr	U2A0	0.093	-0.098	-0.011	0.243	-1.564	1.196	0.495
7-12yr	U3A0	0.083	-0.197	-0.130	0.196	-1.905	1.842	2.207
12-22yr	U4A0	0.133	-0.210	-0.168	0.320	-1.205	3.365	2.464
22+yr	U5A0	0.187	-0.396	-0.419	0.284	-1.588	4.366	1.237
<b>HY munis</b>	<b>U0HY</b>	<b>0.117</b>	<b>-0.226</b>	<b>-0.144</b>	<b>0.816</b>	<b>-0.357</b>	<b>2.987</b>	<b>1.059</b>
Non-rated	UONR	0.232	-0.282	-0.307	0.831	0.473	4.519	1.891
<b>General Obligation</b>	<b>U0AG</b>	<b>0.114</b>	<b>-0.205</b>	<b>-0.155</b>	<b>0.207</b>	<b>-1.499</b>	<b>2.112</b>	<b>1.255</b>
AAA	UGA1	0.105	-0.250	-0.204	0.154	-1.689	1.621	0.477
AA	UGA2	0.118	-0.195	-0.145	0.215	-1.513	1.997	1.301
A	UGA3	0.105	-0.176	-0.125	0.185	-1.193	1.885	1.437
BBB	UGA4	0.101	-0.183	-0.121	0.633	-0.037	6.302	4.436
State	U0AA	0.105	-0.164	-0.093	0.205	-1.408	2.007	1.336
Local	U0AB	0.124	-0.253	-0.229	0.210	-1.608	2.238	1.137
<b>Revenue</b>	<b>U0AR</b>	<b>0.122</b>	<b>-0.209</b>	<b>-0.168</b>	<b>0.297</b>	<b>-1.322</b>	<b>2.859</b>	<b>1.613</b>
AAA	URA1	0.103	-0.179	-0.120	0.261	-1.572	2.399	1.455
AA	URA2	0.117	-0.205	-0.161	0.254	-1.468	2.480	1.406
A	URA3	0.125	-0.221	-0.188	0.325	-1.199	3.287	1.960
BBB	URA4	0.164	-0.235	-0.199	0.497	-0.574	4.123	1.894
Airport	U0AV	0.121	-0.232	-0.195	0.324	-1.188	3.641	2.243
Education	U0AE	0.135	-0.224	-0.201	0.273	-1.650	2.644	1.406
Health	U0HL	0.089	-0.375	-0.298	0.675	-0.611	1.294	-2.038
Hospital	U0AH	0.161	-0.290	-0.267	0.401	-1.633	2.913	1.289
Industrial Development Rev	U0ID	0.181	-0.213	-0.148	0.612	-0.543	4.538	2.907
Leases, COPs & Appropriations	U0AL	0.096	-0.213	-0.165	0.239	-1.356	2.146	1.270
Miscellaneous	U0AM	0.086	-0.230	-0.179	0.188	-1.700	2.002	0.998
Multi-family Housing	U0AU	0.089	-0.257	-0.208	0.334	-1.848	2.543	-0.379
Pollution Control	U0AQ	0.102	-0.244	-0.195	0.244	-1.473	1.816	1.101
Power	U0AP	0.107	-0.119	-0.074	0.236	-1.171	2.198	1.300
Single-family Housing	U0AS	0.107	-0.196	-0.126	0.367	-1.929	1.275	-0.541
Tax Revenue	U0TX	0.130	-0.151	-0.098	0.302	-1.454	2.870	1.896
Tobacco	U0TB	0.115	-0.216	-0.148	0.515	-0.129	3.899	2.851
Toll & Turnpike	U0TL	0.108	-0.226	-0.193	0.225	-1.176	3.040	2.054
Transportation - other	U0AT	0.129	-0.191	-0.134	0.313	-1.201	3.814	2.456
Utilities - other	U0UT	0.082	-0.246	-0.221	0.194	-0.742	2.487	1.014
Water & Sewer	U0AW	0.103	-0.199	-0.162	0.207	-1.218	2.467	1.390
<b>Taxable</b>	<b>TXMB</b>	<b>0.850</b>	<b>0.574</b>	<b>-0.347</b>	<b>-0.153</b>	<b>-1.290</b>	<b>4.258</b>	<b>-0.928</b>
Build America Bonds	BABS	0.830	0.535	-0.421	-0.134	-1.354	3.930	-0.814
<b>VRDOs</b>	<b>VRDO</b>	<b>0.006</b>	<b>0.050</b>	<b>0.099</b>	<b>0.277</b>	<b>0.587</b>	<b>1.160</b>	<b>1.964</b>
Daily reset	VRDD	0.004	0.037	0.081	0.263	0.542	1.034	1.733
Weekly reset	VRDW	0.007	0.058	0.109	0.284	0.612	1.228	2.088

Source: ICE Data Indices, LLC

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Among the IG rating indexes, AAs were the strongest performing rating bracket for the week, with 20bp of losses. That marks the second consecutive week that a rating bracket other than BBB performed best; BBBs were the best performing rating bracket in 12<sup>th</sup> of the prior 14 weeks. Instead, BBBs were the weakest performing bracket with 23bp of losses for the week. GO bonds narrowly outperformed Revenues by less than 1bp this week; AAA GOs underperformed AAA revenues, while AA, single-A and BBB GOs outperformed their revenue bond counterparts. Among the muni bond sectors, the Power sector had the strongest week, with 12bp of losses. For the YTD, Industrial Development Revenue's 454bp of returns are the strongest. This week, the shortest maturities performed best for the week: the 1-3yr index lost less than 1bp. That is about 39bp better than the 22yr+ maturity index's returns. Still, for the YTD, the 22+yr index is outperforming the 1-3yr index by 331bp.

## Muni IG and HY spreads were flat w/w

Muni IG spreads remained at 26bp w/w, while muni HY spreads remained at 193bp and sit at the 58th percentile of their 52-wk wide. Non-rated spreads stood at 214bp w/w. GO spreads tightened 2bp overall w/w, though BBB GO spreads widened 1bp. Revenue bond spreads narrowed 1bp w/w. Among muni IG revenue bond sectors, Multi-family Housing narrowed 2bp while Utilities-other widened 1bp w/w.

### Exhibit 11: Muni YTW spread monitor as of 12 July 2023

Both IG and HY spreads tighten were flat w/w overall

	52wk		T-1wk	T-1d	Current 7/12/23	Change from				Current as % of 52wk range	Price	Yield
	Tights	Wides				Tights	Wides	T-1wk	T-1d			
<b>Investment Grade</b>	<b>24</b>	<b>39</b>	<b>26</b>	<b>26</b>	<b>26</b>	<b>2</b>	<b>-13</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>100</b>	<b>3.68</b>
AA	5	18	8	8	7	2	-11	-1	-1	15	102	3.49
A	56	79	58	58	57	1	-22	-1	-1	4	99	3.99
BBB	94	142	115	115	115	21	-27	0	0	44	93	4.57
<b>High Yield</b>	<b>153</b>	<b>222</b>	<b>193</b>	<b>193</b>	<b>193</b>	<b>40</b>	<b>-29</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>94</b>	<b>5.35</b>
Non-rated	194	298	214	214	214	20	-84	0	0	19	64	5.56
<b>General Obligation</b>	<b>-9</b>	<b>1</b>	<b>-6</b>	<b>-7</b>	<b>-8</b>	<b>1</b>	<b>-9</b>	<b>-2</b>	<b>-1</b>	<b>10</b>	<b>101</b>	<b>3.34</b>
AA	-15	-5	-12	-11	-12	3	-7	0	-1	30	101	3.30
A	-15	29	13	5	3	18	-26	-10	-2	41	104	3.45
BBB	40	122	72	74	73	33	-49	1	-1	40	96	4.15
State	-28	-12	-23	-24	-25	3	-13	-2	-1	19	105	3.17
Local	11	19	13	13	13	2	-6	0	0	25	97	3.55
<b>Revenue</b>	<b>35</b>	<b>51</b>	<b>38</b>	<b>38</b>	<b>37</b>	<b>2</b>	<b>-14</b>	<b>-1</b>	<b>-1</b>	<b>13</b>	<b>100</b>	<b>3.79</b>
AA	13	28	17	17	16	3	-12	-1	-1	20	102	3.58
A	60	83	62	63	62	2	-21	0	-1	9	98	4.04
BBB	104	147	119	119	118	14	-29	-1	-1	33	93	4.60
Airport	61	96	66	67	66	5	-30	0	-1	14	103	4.08
Education	14	39	17	16	16	2	-23	-1	0	8	103	3.58
Health	107	174	140	140	140	33	-34	0	0	49	92	4.82
Hospital	69	92	72	72	71	2	-21	-1	-1	9	98	4.13
Industrial Development Rev	88	130	92	92	91	3	-39	-1	-1	7	99	4.33
Leases, COPs & Appropriations	1	19	7	7	7	6	-12	0	0	33	102	3.49
Miscellaneous	1	13	11	11	11	10	-2	0	0	83	100	3.53
Multi-family Housing	65	90	86	84	84	19	-6	-2	0	76	92	4.26
Pollution Control	30	58	46	47	46	16	-12	0	-1	57	99	3.88
Power	20	39	31	31	30	10	-9	-1	-1	53	102	3.72
Single-family Housing	59	89	86	86	86	27	-3	0	0	90	95	4.28
Tax Revenue	7	30	9	9	8	1	-22	-1	-1	4	100	3.50
Tobacco	7	78	12	12	11	4	-67	-1	-1	6	101	3.53
Toll & Turnpike	33	50	36	36	36	3	-14	0	0	18	97	3.78
Transportation - other	33	62	35	35	35	2	-27	0	0	7	99	3.77
Utilities - other	55	105	80	82	81	26	-24	1	-1	52	102	4.23
Water & Sewer	3	21	12	12	12	9	-9	0	0	50	103	3.54

**Note:** YTW spread to the ICE BofA AAA US Municipal Securities Index (UOA1).

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

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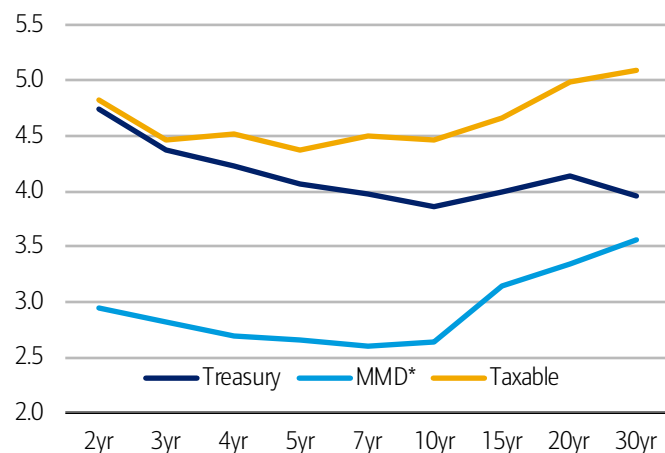
## Curve

### Curve shifts up 5bp on avg w/w

The AAA MMD curve cheapened 5bp w/w on average, and richened by 19bp m/m. For the week, the 1s5s slope undid some inversion by 1bp w/w to -42bp and is 98bp flatter than it was one year ago; the 5s10s slope also undid some inversion, by 5bp to -1bp and is 45bp flatter than it was one year ago; the 10s20s slope flattened 1bp w/w to 70bp and is 30bp steeper than it was one year ago, while the 20s30s slope remained flat at 22bp. Investors should continue to position for a flattener led by the back end.

**Exhibit 12: AAA GO muni, Treasury and taxable yield curves (%)**

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



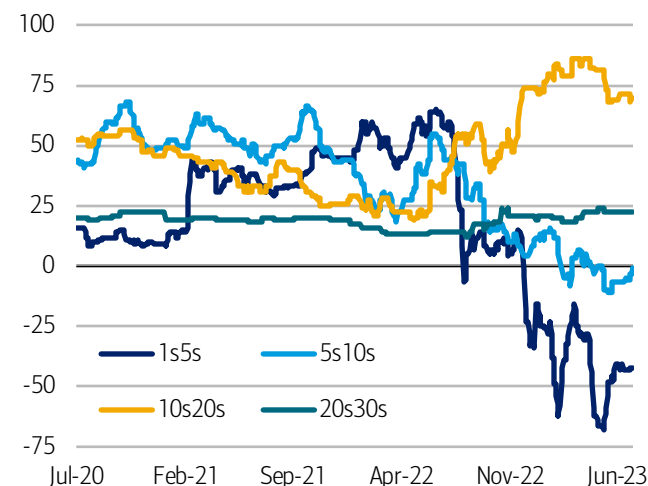
Note: \*MMD AAA GO yield curve. As of 12 July 2023.

Source: BofA Global Research, Refinitiv, Bloomberg

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**Exhibit 13: Curve slope (bp)**

The 1s5s and 5s10s undid some inversion while 20s30s slope was flat w/w

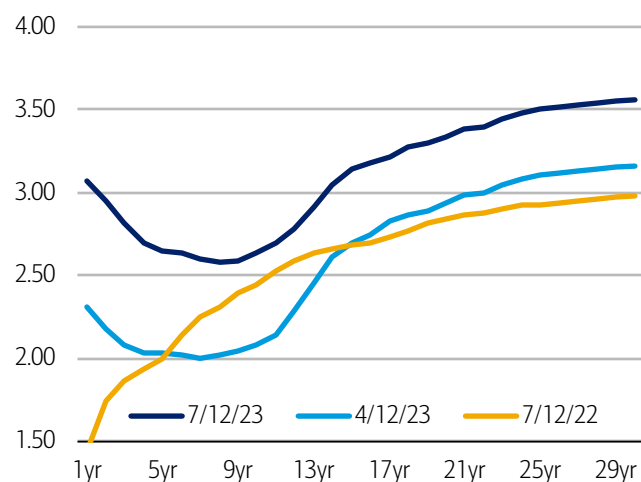


Source: Refinitiv

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**Exhibit 14: AAA GO municipal curve movement (%)**

AAA is cheaper than three months ago across the curve



Source: Refinitiv

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## Supply & demand

**YTD issuance totals \$184.8bn, down 19% y/y**

MTD issuance as of 12 July 2023 totals \$5.6bn, down 45% y/y. YTD issuance of \$184.8bn is down 19% y/y. Thus far, 77% of YTD issuance is new money, while 23% is refundings. New money volumes are down 20% y/y while refunding volumes are down 16%.

**Exhibit 15: Issuance summary (\$mn)**

YTD issuance of \$184.8bn is down 19% y/y; new money down 20% y/y and refundings down 16%

	Month-to-date			Year-to-date		
	7/12/23	7/12/22	y/y % Δ	7/12/23	7/12/22	y/y % Δ
<b>Total</b>	<b>5,547.1</b>	<b>10,076.0</b>	<b>-45%</b>	<b>184,820.1</b>	<b>228,316.0</b>	<b>-19%</b>
New Money	4,928.5	8,459.1	-42%	141,438.7	176,950.8	-20%
Total Refunding	618.6	1,616.9	-62%	43,381.4	51,365.1	-16%
Advanced refunding	0.0	0.0	-	1,380.9	1,385.7	0%
Unknown refunding	618.6	1,588.7	-61%	40,301.8	45,056.2	-11%
Current & Forward refunding	0.0	28.3	-100%	1,698.7	4,923.2	-65%



**Exhibit 15: Issuance summary (\$mn)**

YTD issuance of \$184.8bn is down 19% y/y; new money down 20% y/y and refundings down 16%

	Month-to-date			Year-to-date		
	7/12/23	7/12/22	y/y % Δ	7/12/23	7/12/22	y/y % Δ
Insured	415.0	912.5	-55%	15,976.2	18,601.1	-14%
Fixed Rate	5,360.2	9,181.8	-42%	164,925.8	212,427.1	-22%
Variable Rate Long	174.4	648.2	-73%	13,969.8	8,482.9	65%
Variable Rate Short	11.6	183.0	-94%	5,333.0	4,865.1	10%
Zero Coupon	0.8	0.0	-	281.4	732.0	-62%
Linked Rate	0.0	63.0	-100%	292.0	1,201.7	-76%
Convertible	0.0	0.0	-	18.1	607.2	-97%
Variable rate no put	-	-	-	-	-	-
Tax Exempt	4,899.9	6,393.1	-23%	159,565.1	180,488.9	-12%
Taxable	647.2	2,047.1	-68%	20,296.7	36,255.8	-44%
Alternate Minimum Tax	0.0	1,635.8	-100%	4,958.2	11,571.3	-57%
Education	2,612.5	1,490.5	75%	53,186.0	58,663.6	-9%
General Purpose	776.5	2,327.7	-67%	47,976.2	57,431.6	-16%
Housing	677.7	343.1	98%	16,867.3	16,497.4	2%
Utilities	473.5	1,944.1	-76%	24,106.0	28,671.3	-16%
Healthcare	449.2	331.3	36%	7,111.8	18,374.9	-61%
Electric Power	341.0	61.1	459%	8,680.7	8,021.8	8%
Development	120.9	327.7	-63%	4,736.0	5,562.9	-15%
Public Facilities	50.9	52.9	-4%	2,774.6	4,094.7	-32%
Transportation	44.8	3,152.8	-99%	17,375.4	29,579.9	-41%
Environmental Facilities	0.0	44.9	-100%	2,006.1	1,418.1	41%
Muni-backed corporates	0.0	0.0	-	3,221.8	11,682.6	-72%

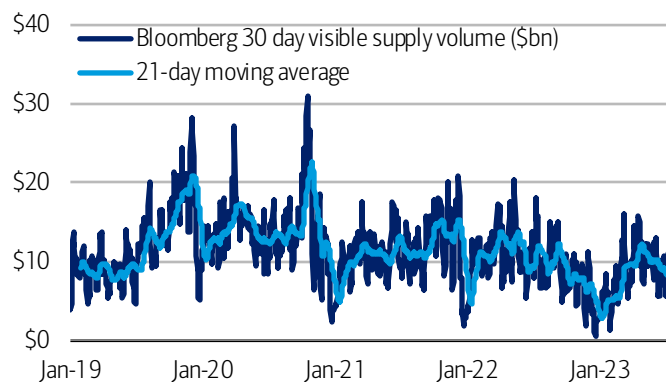
**Note:** Long-term bonds only. Reflects any data revisions by Refinitiv or Bloomberg.

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

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**Exhibit 16: Bloomberg 30-day visible supply (\$bn)**

30-day visible supply was \$9.9bn as of 13 July 2023



**Note:** Data as of 13 July 2023.

**Source:** Bloomberg

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**Exhibit 17: 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	38	65	64
July	31	6	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 12 July 2023. January-March data are actuals. <sup>1</sup>Monthly issuance forecasts revised from April onward.

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

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**Exhibit 18: Muni market total debt outstanding (\$tn)**

Muni market size at \$3.85tn as of 12 July 2023



Source: Bloomberg

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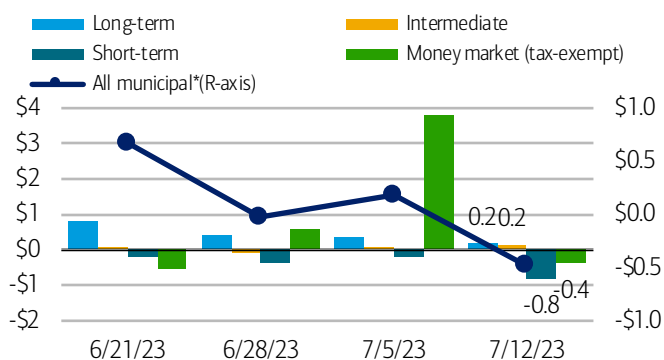
**Mutual fund outflows total \$0.48bn; ETF outflows \$0.13bn**

Mutual fund flows were negative this week, with outflows totaling \$0.48bn coming mostly from short-term funds. There were \$0.7bn of outflows from investment grade funds against \$0.21bn of inflows into high yield funds. YTD, investment grade outflows total \$9.1bn versus \$0.7bn of inflows into high yield.

ETF fund flows were negative for the week, totaling almost \$0.13bn. Overall, our flow strength indicator measured by the 2-year trailing z-score suggests this week's flow strength was normal.

**Exhibit 19: Flows by maturity brackets (\$bn)**

Muni outflows of \$0.48bn, money market outflows of \$0.39bn



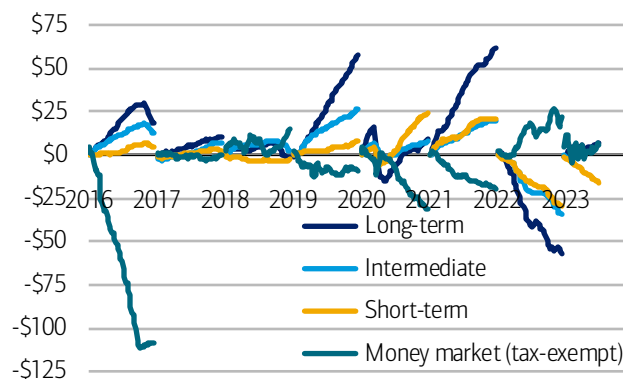
Note: ETFs included. All Municipal = LT+INT+ST. Data includes both weekly and monthly reporting funds as of 12 July 2023.

Source: Refinitiv Lipper

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**Exhibit 20: YTD cumulative flows (\$bn)**

2023 flow: LT: \$6.6bn, INT: \$0.8bn, ST: -\$15.8bn, MM: \$6.2bn



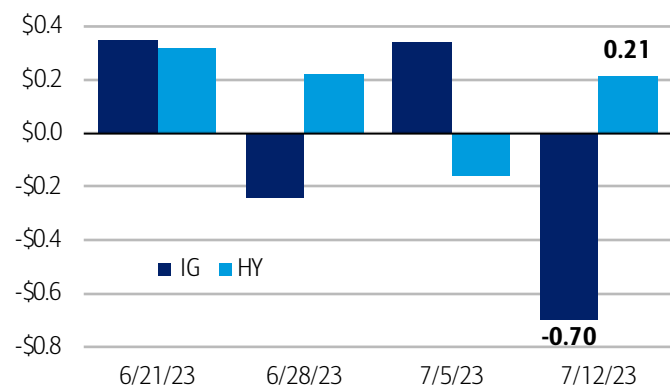
Note: ETFs included. Data includes both weekly and monthly reporting funds as of 12 July 2023.

Source: Refinitiv Lipper

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**Exhibit 21: IG vs HY muni fund flows (\$bn)**

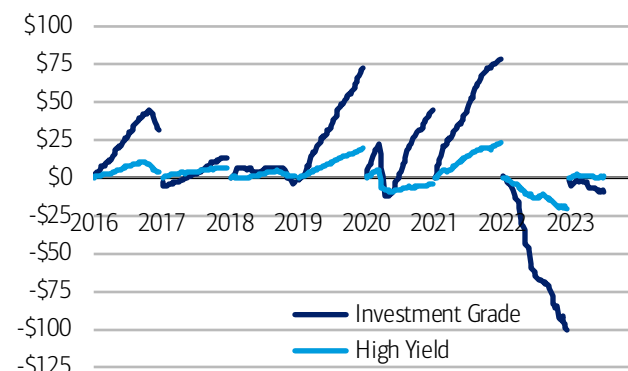
IG outflows of \$0.70bn vs \$0.21bn of HY inflows for the wk of 12 July

**Note:** ETFs included. Data includes both weekly and monthly reporting funds as of 12 July 2023.**Source:** Refinitiv Lipper

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**Exhibit 22: Year-to-date cumulative flows (\$bn)**

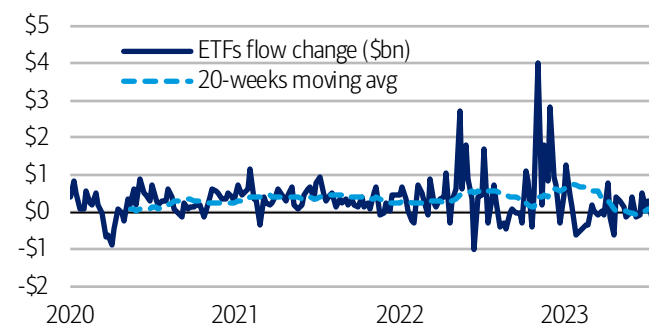
2023 flow: IG: -\$9.1bn, HY: \$0.7bn

**Note:** ETFs included. Data includes both weekly and monthly reporting funds as of 12 July 2023.**Source:** Refinitiv Lipper

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**Exhibit 23: Municipal ETF fund flows (\$bn)**

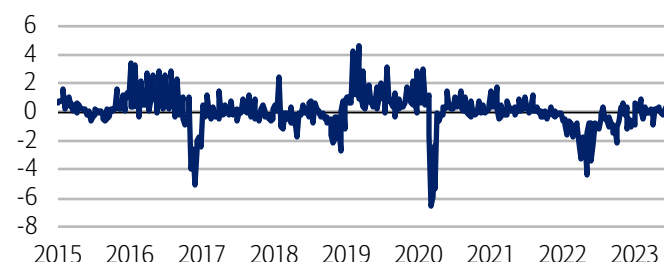
ETF outflows were \$0.13bn for the week of 12 July 2023

**Note:** ETFs included. Data includes both weekly and monthly reporting funds as of 12 July 2023.**Source:** Refinitiv Lipper

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**Exhibit 24: Flow strength indicator**

Flow strength was Normal with 0.13 z-score for the week of 12 July

**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 12 July 2023.**Source:** Refinitiv Lipper

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## Relative value

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

We screen the muni market for parts of the curve, sectors and ratings that are rich or cheap. Muni/Treasury ratios are Neutral on both a short-term and long-term basis. Meanwhile, the 10s30s slope is Steep while other slopes are Flat or Very Flat on a long-term basis. On a short-term basis, the curve is Neutral.

**Exhibit 25: Rich/cheap analysis of MMD\*/Treasury ratios as of 12 July 2023**

The muni market Neutral 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	4.376%	64.4%	Neutral	75.0%	55.5%	65.7%	Neutral	162.8%	26.7%	66.9%
5yr	4.068%	65.1%	Neutral	74.0%	57.6%	66.3%	Neutral	150.6%	39.3%	66.1%
10yr	3.859%	68.4%	Neutral	72.9%	59.7%	67.3%	Neutral	140.8%	54.7%	79.0%
30yr	3.948%	90.2%	Neutral	92.3%	85.0%	89.6%	Neutral	119.9%	63.5%	89.0%

**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

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**Exhibit 26: Rich/cheap analysis of MMD\* slopes (bp) as of 12 July 2023**

The 10s30s curve is Steep on LT basis while the rest are Flat/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	-42	Neutral	-28	-68	-48	Flat	65	-68	18



**Exhibit 26: Rich/cheap analysis of MMD\* slopes (bp) as of 12 July 2023**

The 10s30s curve is Steep on LT basis while the rest are Flat/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
1/10s	-45	Neutral	-23	-74	-53	Flat	120	-74	53
10/30s	92	Neutral	108	90	98	Steep	108	32	66
1/30s	47	Neutral	85	26	46	Very Flat	170	26	119

**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

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**Screening for cheap OAS**

At the 7-12yr part of the curve, AA Utilities is Very Cheap while Single-A Health, BBB Health, BBB Lease COPs & Appropriation, AAA Utilities and Single-A Utilities' OAS are Cheap. At the 22+yr part of the curve, AAA Higher Education is Very Cheap; Single-A Health, BBB Health, AAA Local GO, AAA Lease COPs & Appropriation and Single-A Pollution Control sectors' OAS are Cheap. Conversely, BBB Utilities' OAS at the 22+yr part of the curve is considered to be Very Rich.

**Exhibit 27: Rich/cheap analysis of 7-12yr indexes' OAS (bp)**

AA Utilities' current OAS of 64bp at 7-12yrs is currently Very Cheap against its 3yr OAS average of 5bp

Sector	Current OAS				Rich/cheap analysis				3yr OAS average			
	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB
Airports		35	21	34		N	N	N		39	44	85
Higher Education	-13	-15	30		R	R	N		-5	3	55	
GO Local	-5	-1	48	110	N	R	N	N	2	15	52	137
GO State	-13	-16	47	0	N	R	N	R	-2	3	49	140
Health		-12	129	169		R	C	C		30	71	113
Hospital		19	32	104		N	N	N		24	53	107
IDR		31	74	84		N	N	N		49	62	96
Leases COPS & Appr.		0	33	236		R	N	C		17	46	121
Pollution Control	-4		82		N		N		1		84	
Power	-29	-17	42		R	N	N		4	1	31	
Tax Revenues	-9	-5	51	124	R	R	N	N	13	14	61	141
Tobacco			33				R				60	
Toll & Turnpike		18	10	95		N	N	N		27	32	95
Transportation - Other	11	5	53	75	N	N	N	N	7	23	82	111
Utilities - Other	0	64	82		C	VC	C		-3	5	46	
Water & Sewer	-20	-17	4	86	R	R	N	VR	1	-1	23	117

**Note:** Data as of 11 July 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

**Source:** ICE Data Indices, LLC

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**Exhibit 28: Rich/cheap analysis of 22yr+ indexes' OAS (bp)**

AAA Higher Education's current OAS of 49bp at 7-12yrs is currently Cheap against its 3yr OAS average of 18bp

Sector	Current OAS				Rich/cheap analysis				3yr OAS average			
	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB
Airports		38	29	12		N	N	N		32	38	42
Higher Education	49	-1	29	112	VC	N	N	N	18	-1	30	86
GO Local	10	12	16	57	C	N	N	N	-11	4	31	108
GO State	-7	-7		0	N	N		R	-25	-15		109
Health		-28	82	213		N	C	C		-1	37	104
Hospital		26	39	81		N	N	N		10	32	63
IDR			71	83			N	N			55	83
Leases COPS & Appr.	15	2	46	50	C	N	N	N	-6	0	40	69
Pollution Control			46				C				11	
Power		1	29	91		N	N	N		-4	22	55
Tax Revenues	13	10	61	78	N	N	N	N	10	10	64	94
Tobacco				104				N				87
Toll & Turnpike			16	38			N	N			21	57
Transportation - Other		0	24	69		N	N	N		18	54	67
Utilities - Other		11	42	0		N	N	VR	-9	-7	29	76
Water & Sewer	-11	-8	13		N	N	N		-17	-9	9	

**Note:** Data as of 11 July 2023. Only includes non-prerefunded bonds. Benchmark is 3-yr avg.

**Exhibit 28: Rich/cheap analysis of 22yr+ indexes' OAS (bp)**

AAA Higher Education's current OAS of 49bp at 7-12yrs is currently Cheap against its 3yr OAS average of 18bp

Sector	Current OAS				Rich/cheap analysis				3yr OAS average			
	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB

Source: ICE Data Indices, LLC

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**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 decreased into the underpriced space. The ETM, Pre-Re, Airport, Education, Leasing COPS & Appropriations, Miscellaneous, Pollution Control, Power and Single-Family Housing sectors' MWIs are the lowest.

**Exhibit 29: MWIs – sector momentum (%) as of 11 July 2023**

Most of the sectors had decreases over the past week

Sector	MWI	w/w Δ	Sector	MWI	w/w Δ
<b>U0A0 Index</b>	<b>10.4%</b>	<b>-8.4%</b>	Miscellaneous	6.9%	-6.7%
ETM	2.2%	-2.1%	Multi-Family Housing	11.1%	-0.8%
GO - Local	9.3%	-11.9%	Pollution Control	6.5%	-0.8%
GO - State	5.8%	-6.3%	Power	6.9%	-4.7%
Pre-Re	0.5%	-0.4%	Single Family Housing	3.0%	-2.8%
Airport	6.2%	-11.4%	Tax revenue	16.5%	-7.9%
Education	9.8%	-8.2%	Tobacco	20.5%	-12.1%
Health	20.5%	4.0%	Toll & Turnpike	16.9%	-11.8%
Hospitals	11.3%	-7.7%	Transportation	16.1%	-10.6%
Industrial Development Rev	22.7%	-12.0%	Utilities - Other	15.9%	-12.5%
Leasing COPS & Appropriations	8.6%	-8.8%	Water & Sewer	10.6%	-10.2%

Source: BofA Global Research, ICE Data Indices, LLC

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**State GO spreads cheap on LT basis**

Based on our z-score analysis of 10yr spreads to AAA MMD for state GOs, there are several we view as Very Cheap or Cheap – on a short-term basis: MA and OR; on an intermediate-term basis: FL, NM and WV; and on a long-term basis: AR, CO, IA, ID, IN, KY, ME, MS, NM, OK, SC, WV and WY. See Exhibit 30.

**Exhibit 30: 10yr state GO spreads to AAA MMD (bp)**

Several states' spreads are currently Very Cheap or Cheap

State	Rating	Spread	ST	3mo max	3mo avg	3mo min	IT	1yr max	1yr avg	1yr min	LT	3yr max	3yr avg	3yr min
AK	Aa3/AA-/A+	24	Neutral	24	24	24	Neutral	27	24	22	Neutral	45	21	16
AL	Aa1/AA/AA+	15	Neutral	15	15	15	Neutral	21	17	15	Neutral	21	15	10
AR	Aa1/AA/-	21	Neutral	21	21	21	Neutral	21	20	16	Cheap	21	16	14
AZ	Aa1/AA/-*	22	Neutral	22	22	22	Neutral	27	23	22	Neutral	27	20	18
CA	Aa2/AA-/AA	6	Rich	13	9	4	Neutral	20	8	1	Neutral	32	11	1
CO	Aa1/AA/-*	22	Neutral	22	22	22	Neutral	25	22	20	Cheap	25	17	14
CT	Aa3/AA-/AA-	27	Rich	32	31	27	Very Rich	36	33	27	Neutral	58	32	15
DE	Aaa/AAA/AAA	13	Neutral	15	13	10	Neutral	18	14	10	Neutral	18	11	7
FL	Aaa/AAA/AAA	9	Neutral	9	9	7	Cheap	9	7	3	Neutral	15	8	3
GA	Aaa/AAA/AAA	0	Neutral	0	0	0	Neutral	2	0	0	Neutral	3	0	0
HI	Aa2/AA+/AA	21	Neutral	21	21	21	Neutral	24	21	19	Neutral	24	19	15
IA	Aaa/AAA/AAA*	17	Neutral	17	17	17	Neutral	17	17	17	Cheap	17	12	8
ID	Aaa/AA+/AAA*	18	Neutral	18	18	18	Neutral	18	18	18	Cheap	18	15	12
IL	A3/A-/BBB+	105	Neutral	125	108	105	Rich	173	139	105	Neutral	314	133	58
IN	Aaa/AAA/AAA*	15	Neutral	15	15	15	Neutral	15	15	15	Cheap	15	12	10
KS	Aa2/AA-/A*	17	Neutral	17	17	17	Neutral	20	18	17	Neutral	20	18	17
KY	Aa3/A+/AA*	25	Neutral	25	25	25	Neutral	25	25	25	Cheap	25	23	22
LA	Aa2/AA-/AA-	16	Neutral	21	17	16	Rich	24	21	16	Neutral	38	19	13
MA	Aa1/AA+/AA+	11	Very Cheap	11	9	9	Neutral	15	11	8	Neutral	17	11	7
MD	Aaa/AAA/AAA	5	Neutral	5	5	2	Neutral	9	6	2	Neutral	10	6	2
ME	Aa2/AA/-	14	Neutral	14	14	14	Neutral	14	14	14	Cheap	14	12	10
MI	Aa1/AA/AA+	15	Neutral	15	15	15	Neutral	15	15	15	Neutral	17	13	12
MN	Aaa/AAA/AAA	8	Neutral	9	8	8	Neutral	11	9	6	Neutral	12	6	2
MO	Aaa/AAA/AAA	6	Neutral	6	6	6	Neutral	6	6	6	Neutral	6	6	5

**Exhibit 30: 10yr state GO spreads to AAA MMD (bp)**

Several states' spreads are currently Very Cheap or Cheap

State	Rating	Spread	ST	3mo max	3mo avg	3mo min	IT	1yr max	1yr avg	1yr min	LT	3yr max	3yr avg	3yr min
MS	Aa2/AA/AA	22	Neutral	22	22	22	Neutral	22	22	22	Cheap	22	19	16
MT	Aa1/AA/AA+	17	Neutral	17	17	17	Neutral	17	17	17	Neutral	19	17	16
NC	Aaa/AAA/AAA	0	Neutral	0	0	0	Neutral	0	0	0	Neutral	0	0	0
ND	Aa1/AA+/-*	17	Neutral	17	17	17	Neutral	17	17	17	Neutral	19	17	16
NE	Aa1/AAA/-*	15	Neutral	15	15	15	Neutral	15	15	15	Neutral	16	15	15
NH	Aa1/AA/AA+	10	Neutral	10	10	10	Rich	12	11	10	Neutral	13	9	5
NJ	A1/A/A+	35	Neutral	35	35	35	Rich	55	44	33	Neutral	110	50	30
NM	Aa2/AA/-	20	Neutral	20	19	13	Cheap	20	15	13	Very Cheap	20	14	10
NV	Aa1/AA+/AA+	17	Neutral	17	17	17	Neutral	17	17	17	Neutral	19	16	14
NY	Aa1/AA+/AA+	16	Neutral	16	16	16	Neutral	20	17	16	Neutral	25	12	6
OH	Aa1/AA+/AAA	14	Neutral	14	14	14	Neutral	17	15	12	Neutral	17	11	6
OK	Aa2/AA/AA	20	Neutral	20	20	20	Neutral	20	20	20	Cheap	20	19	18
OR	Aa1/AA+/AA+	8	Cheap	8	7	7	Neutral	17	12	7	Neutral	17	9	5
PA	Aa3/A+/AA-	25	Neutral	25	25	25	Neutral	28	25	22	Neutral	37	24	14
RI	Aa2/AA/AA	18	Neutral	18	18	18	Neutral	18	18	15	Neutral	18	14	8
SC	Aaa/AA+/AAA	5	Neutral	5	5	5	Neutral	5	5	3	Cheap	5	4	3
SD	Aaa/AAA/AAA	9	Neutral	9	9	9	Neutral	9	9	9	Neutral	12	9	9
TN	Aaa/AAA/AAA	0	Neutral	0	0	0	Neutral	0	0	0	Neutral	0	0	0
TX	Aaa/AAA/AAA	11	Neutral	11	11	11	Neutral	13	11	11	Neutral	15	11	8
UT	Aaa/AAA/AAA	0	Neutral	0	0	0	Neutral	0	0	0	Neutral	0	0	0
VA	Aaa/AAA/AAA	0	Neutral	0	0	0	Neutral	0	0	0	Neutral	0	0	0
VT	Aa1/AA+/AA+	6	Neutral	6	6	6	Neutral	6	6	6	Neutral	8	4	2
WA	Aaa/AA+/AA+	12	Rich	17	14	12	Rich	22	15	11	Neutral	22	13	7
WI	Aa1/AA+/AA+	11	Neutral	11	10	5	Neutral	19	12	5	Neutral	21	10	5
WV	Aa2/AA-/AA	24	Neutral	24	24	24	Cheap	24	22	20	Cheap	24	17	13
WY	NR/AA/-*	14	Neutral	14	14	14	Neutral	14	14	14	Cheap	14	12	10

Note: Ratings are Moody's/S&amp;P/Fitch. \*Denotes an issuer rating. ST = short-term. IT = intermediate-term. LT = long-term. Data as of 11 July 2023.

Source: BofA Global Research, Refinitiv, Bloomberg

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## Trade activity

### Most actively traded CUSIPs for the week

The most actively traded CUSIP over the last week by total volume was 88258MAA3, totaling \$158.5mn. These are Texas Natural Gas Customer Rate Relief bonds in response to Winter Storm Uri due in 2035. By trades it was 253363C94, totaling 169 trades. These are newly-issued Galveston County, TX Dickinson Independent School District bonds due in 2048.

**Exhibit 31: Most actively traded muni CUSIPs over the week ending 12 July 2023**253363C94 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)
88258MAA3	TX NATURAL GAS SECZ	TX	5.102	04/01/35	03/23/23	100.960	4.99	100	109	36	158.5
249002MC7	DENTON ISD	TX	5.000	08/15/53	07/15/23	108.700	3.94	4750	38	55	133.8
249002MB9	DENTON ISD	TX	5.000	08/15/48	07/15/23	109.219	3.88	5000	38	64	133.7
118217CZ9	BUCKEYE OH TOBACCO-B2	OH	5.000	06/01/55	03/04/20	92.656	5.49	4000	194	51	79.2
471146XB1	JARRELL ISD	TX	4.250	02/15/53	08/01/23	99.960	4.25	50	70	152	66.3
19672MDA3	COLORADO ST-TRANS-A	CO	5.000	06/28/24	07/20/23	101.520	3.33	250	31	17	65.2
74529JPX7	PR SALES TAX FING-A1	PR	5.000	07/01/58	08/01/18	96.013	5.25	53	169	74	61.9
253363C94	DICKINSON ISD	TX	4.125	02/15/48	08/01/23	98.250	4.24	20	76	169	60.7
45884AF73	INTERMOUNTAIN PWR AGY	UT	5.000	07/01/41	08/15/23	109.598	3.72	5000	47	22	54.2
45884AF81	INTERMOUNTAIN PWR AGY	UT	5.000	07/01/42	08/15/23	109.281	3.76	5M+	47	31	47.9
79771FDP9	SAN FRANCISCO PUB UTL	CA	5.250	11/01/52	07/27/23	111.589	3.87	250	31	31	43.7
45884AF40	INTERMOUNTAIN PWR AGY	UT	5.000	07/01/38	08/15/23	111.762	3.45	4500	33	23	42.4
74529JQG3	PR SALES TAX FING-A1	PR	0.000	07/01/46	08/01/18	27.387	5.72	43	227	66	42.0
60535QJ92	MISSISSIPPI HOME CORP	MS	4.650	12/01/48	08/09/23	101.800	4.40	20	90	122	40.4
45884AF32	INTERMOUNTAIN PWR AGY	UT	5.000	07/01/37	08/15/23	112.740	3.33	3500	29	29	40.1
45203MQC8	IL ST HSG DEV AUTH	IL	4.750	10/01/48	08/03/23	99.375	4.79	25	129	153	39.7
45884AF24	INTERMOUNTAIN PWR AGY	UT	5.000	07/01/36	08/15/23	113.563	3.23	1000	32	27	37.8
45884AF65	INTERMOUNTAIN PWR AGY	UT	5.000	07/01/40	08/15/23	109.915	3.68	5M+	48	12	36.9
45884AF99	INTERMOUNTAIN PWR AGY	UT	5.250	07/01/43	08/15/23	111.233	3.75	1000	43	15	36.4
92812WKY9	VA HSG DEV AUTH-D	VA	4.875	08/01/65	08/03/23	100.820	4.76	500	121	88	35.8

Source: Bloomberg



**Exhibit 31: Most actively traded muni CUSIPs over the week ending 12 July 2023**253363C94 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)
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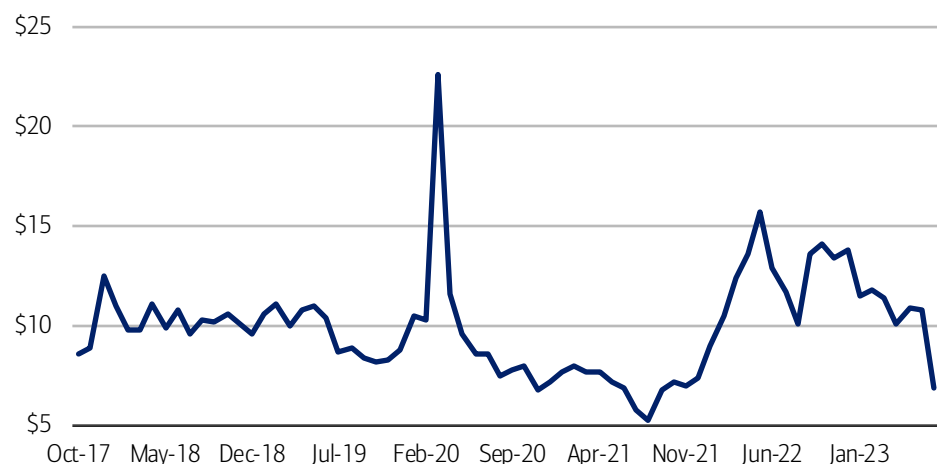
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**Avg daily secondary trading \$6.9bn MTD in July**

July's average daily secondary trading volume started slow with the holiday-shortened week last week, and improved only slightly this week. As of 12 July, the daily average stands at \$6.9bn. That is 36% or so below June's average, and also 41% lower vs July 2022's average. MTD, just \$48bn of muni bond par value traded.

**Exhibit 32: Daily avg secondary trading volume (\$bn; as of 12 July 2023)**

Jul-23 MTD daily avg volume of \$6.9bn down 36% vs June-23's daily average



Source: BofA Global Research, Bloomberg

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**Credit corner****Rating activity****S&P's June upgrades exceed downgrades 3.1 to 1**

S&P's June rating activity stayed positive, with 95 ratings upgraded versus 31 downgraded, for an upgrade to downgrade ratio of 3.1 to 1. Local governments again accounted for the most upgrades with 63, but also the most downgrades, tied with Education with 11. For outlook revisions, S&P revised 13 outlooks to stable, 13 to positive, but 23 to negative. June marks the 9th month in the last 12 in which negative outlook revisions outnumbered those to positive. All told, unfavorable outlook and CreditWatch changes far outpaced favorable changes during the month – 28 unfavorable vs 23 favorable.

When combined with April and May activity, we see a 2Q23 upgrade to downgrade ratio of 3.8 to 1. For the YTD through June, we see a ratio of 3.2 to 1; we also see, however, that unfavorable outlook and CreditWatch changes are outpacing favorable changes 2.1 to 1. As noted in our [Municipals Year Ahead 2023](#), we expect 2023 rating activity to stay skewed to the positive, though we look for upgrade to downgrade ratios to moderate as 2023 closes.

**State & local governments****Earliest-reporting states' collection growth medians negative in June**

We now have data for 16 states' collections for the month of June. The data shows a stronger relative month to both April and May on a median y/y growth basis, though y/y growth medians are still negative. For June, state collections overall are down on median 1.9%, weighed down by both personal income and corporate collections that are down 3.7% and 4.0% y/y on median, respectively. Mitigating that decline is sales collections that are up 3.7%. While these medians are still relatively early, we have a level of



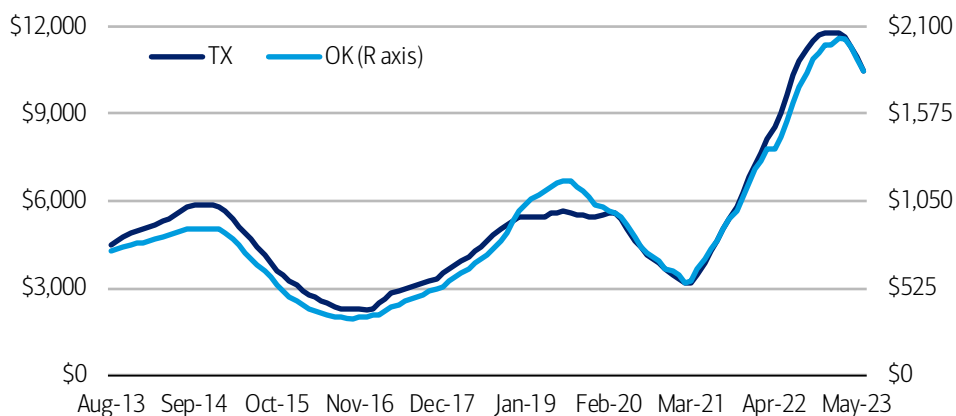
confidence that they will hold as additional states report and should stay within a percentage point or two of current medians.

### TX's and OK's production taxes continue to moderate

Over the last 12 months, Texas collected \$10.5bn in oil and natural gas production taxes, while Oklahoma collected just over \$1.8bn. Both states' collections clearly topped out in 1Q23. Even still, as Exhibit 33 shows, collections certainly remain elevated. Our commodities analysts expect WTI to average \$75/bbl this year, down from roughly \$96/bbl last year, before averaging \$85/bbl in 2024.

#### Exhibit 33: 12-mo cumulative oil & natural gas production tax collections for TX and OK (\$mn)

Y/y growth has slowed significantly, and both states' 12-mo totals show signs of topping



Source: BofA Global Research, state reports

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### San Francisco's outlook revised to negative by Moody's

Moody's revised its outlook on San Francisco's Aaa long-term ratings to negative on 5 July, pointing to the city and county's expected reserve draws in FY24 and FY25 and outyear deficits through FY28. Per Moody's, the "deficits largely reflect the underlying sluggish performance of the city's economic recovery, particularly its downtown. Prolonged weakness in the city's commercial real estate market, stubbornly slow to rebound office worker attendance, and low downtown utilization continue to weigh on the broad economic vitality of San Francisco's core business, retail, and tourism districts. The tepid post-pandemic economic progress informs a sluggish forecast for core revenue performance outpaced by expenditure growth in the coming years." Per Kastle's Back to Work Barometer, just 46.5% of workers returned to San Francisco offices as of 28 June; that's below the 49.8% average across major cities, including New York's, which stood at 49.1%. Meanwhile, data from JLL shows San Francisco's total square feet of office vacancy as of 1Q23 stood at 26.4%, over 10ppt higher than New York's.

### Puerto Rico's EAI increases 1.8% y/y

Puerto Rico's Economic Development Bank (EDB) released its May Economic Activity Index (EAI) data recently showing a 1.8% y/y increase and a 0.8% m/m increase. Nevertheless, the EDB notes that for the FYTD through May, the EAI is flat to the previous year. Other recently released data from the EDB include cruise ship passengers and air traffic passengers. Cruise ship data shows a total of 523,800 visitors in 1Q23 – up 327% y/y and the highest 1Q total since 1Q15. Air passenger data shows inbound passengers totaling 1.63 million in 1Q23, up 23% y/y and the highest 1Q total since at least 2014. Note, however, that outbound traffic narrowly exceeded inbound traffic in 1Q23 by 2,900, marking the first net negative balance in a 1Q since 1Q20. Otherwise, we highlight: (a) TSA balances of \$8.1bn as of 16 June were up \$130mn w/w, and are now 13.2% above adopted liquidity plan levels, and (b) FYTD General Fund collections through 16 June of \$12.7bn that are up 3.2% vs adopted liquidity plan levels.

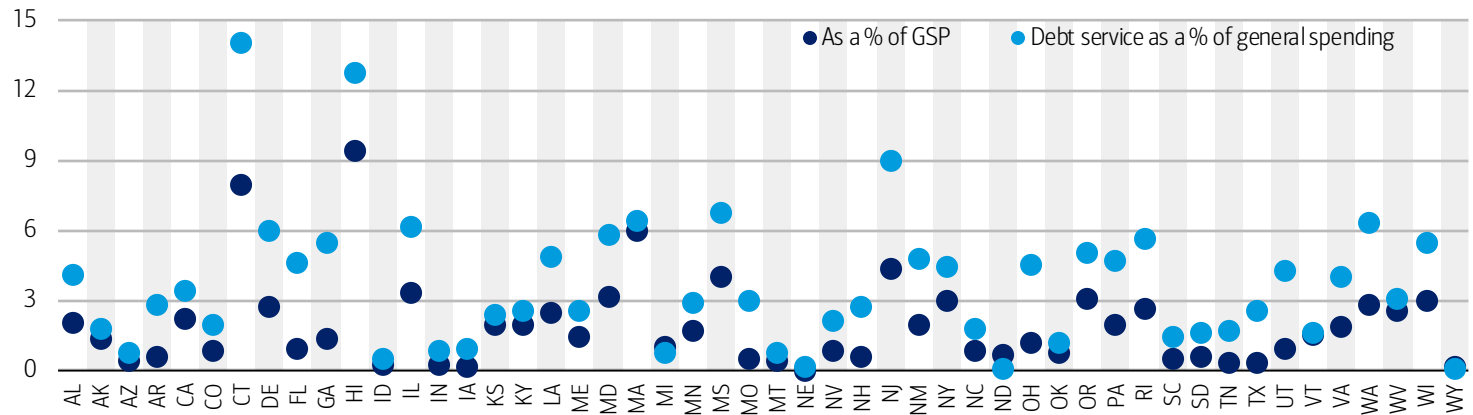


### Debt service costs still highest in CT, HI, MA and NJ according to S&P data

S&P reported on 10 July that state tax-supported debt remained “relatively flat in fiscal 2022 compared with 2021, declining a modest 0.2%,” resulting from “quickly rising borrowing costs and record reserves, coupled with federal COVID-19-relief stimulus [that allowed] state governments to leverage pay-as-you-go financing.” S&P notes that state debt metrics are moderate to low and are expected to remain so for the near-to-medium term. Looking at S&P’s data, we can see that CT, HI, MA and NJ still have the highest debt ratios. See Exhibit 34.

#### Exhibit 34: State tax supported debt as a percentage (%) of GSP and general spending, FY22

CT, HI, MA and NJ debt service costs are the largest as % of GSP and general spending as of FY22



Note: GSP = gross state product.

Source: S&P Global Ratings

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### State & local payrolls climb in June, raising recovery to 85%

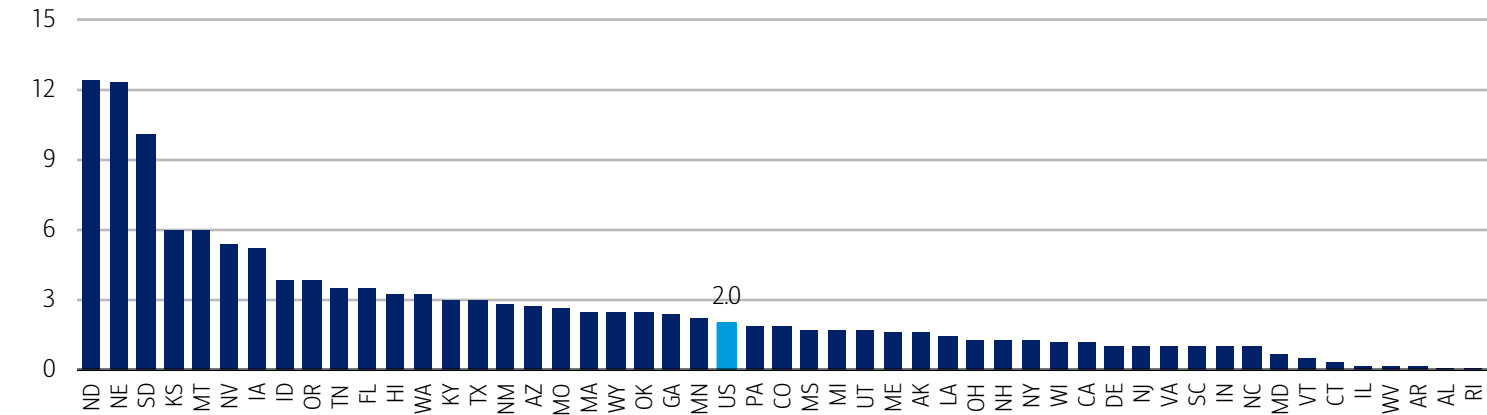
The June jobs report surprised to the downside, with the US adding 209,000 jobs during the month, with the US unemployment rate little changed at 3.6%. April’s payroll increase was revised down by 77,000 while May’s estimate was revised down by 33,000. In June, state and local government payrolls grew 59,000 m/m in the aggregate (state payrolls up 27,000 m/m and local payrolls up 32,000 m/m). Of the 59,000 state and local government jobs added during the month, nearly 37,000 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 85.3%, with local governments’ recovery at 88.3% and state governments at 70.8%. On a combined basis, state and local government education payrolls recovered 83.1% of jobs lost – lower than the 88.8% for non-education. As it stands, June 2023’s education payrolls equal 98.5% of February 2020’s and non-education equals 99.4%.

### Real GDP expands in all 50 states and DC in 1 Q23, led by ND

Real GDP decreased in all states in the first quarter of 2023, per a 30 June Bureau of Economic Analysis report. As Exhibit 35 shows, growth ranged from a low of 0.1% at annual rates in RI and AL to a high of 12.4% in ND. The leading contributor to ND’s increase was agriculture, forestry, fishing, and hunting; conversely, finance and insurance decreased in all 50 states and DC, and was the “leading offset to growth in Rhode Island, one of the states with the smallest increase in real GDP,” per the BEA.

Exhibit 35: 1Q23 real GDP growth, at annual rates, by state (%)

1Q23 growth was strongest in ND and weakest in RI and AL



Source: Bureau of Economic Analysis

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US real GDP continued to be highly concentrated in 1Q23. Indeed, just eight states (CA, 14.4%; TX, 9.5%; NY, 7.8%; FL, 5.4%; IL, 3.9%; PA, 3.6%; OH, 3.2%; and GA, 3.0%) accounted for over 50% of the US' economy.

Tax Changes that took effect at the beginning of July

Several tax changes took effect on 1 July 2023; 32 changes in total across 18 states, many centered on sales excises taxes, synching up with the new fiscal year. An additional 22 tax changes across 11 states have also been implemented, retroactive to 1 January 2023. The Tax Foundation highlights the “sales tax rate reductions in New Mexico and South Dakota, a repeal of the corporate franchise (capital stock) tax in Oklahoma, the implementation of a payroll tax in Washington, and the implementation of taxes on newly legalized sales of cannabis products in Maryland and Minnesota.”

Exhibit 36: Notable tax changes across the country

New Mexico and South Dakota cut sales tax while Washington adds a payroll tax

States	Changes to:
California	Tobacco, Vapor and Cannabis Tax, Transportation Tax
Colorado	Transportation Tax
Idaho	Tobacco, Vapor and Cannabis Tax
Illinois	Sales and Use Tax, Transportation Tax
Indiana	Income Tax, Sales and Use Tax, Property Tax, Tobacco Vapor, and Cannabis Tax, Transportation Tax
Kentucky	Transportation Tax
Louisiana	Tobacco, Vapor and Cannabis Tax
Maryland	Tobacco, Vapor and Cannabis Tax, Transportation Tax
Minnesota	Tobacco, Vapor and Cannabis Tax
Missouri	Transportation Tax
Montana	Transportation Tax
New Mexico	Sales and Use Tax
Oklahoma	Capital Stock Tax
South Dakota	Sales and Use Tax
Tennessee	Tobacco, Vapor and Cannabis Tax, Sports Betting
Utah	Transportation Tax
Virginia	Transportation Tax
Washington	Payroll Tax

Source: Tax Foundation

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Mass Transit

APTA's 1Q23 national ridership report shows signs of improvement

The American Public Transportation Association's (APTA) 1Q23 national ridership report estimates a 24% y/y increase in ridership across the country through 1Q23. Among heavy rail providers, the Washington Metropolitan Area Transit Authority (WMATA) was up 67% y/y; Washington D.C. light rail and streetcar ridership was up 139% y/y; and



Alexandria, VA commuter rail was up 114% y/y. APTA estimates that NY MTA's heavy rail was up 26% y/y and Metro North up 40% over the same period, while Long Island Rail Road saw ridership improve 35% y/y.

## Higher Education

### S&P's FY22 medians highlight stability despite enrollment pressures

Both public and private colleges and universities saw enrollment pressures continue in FY22. Public institutions saw median full-time enrollment (FTE) fall 1.9% y/y, while Private institutions saw median FTE rise 0.3%. Per S&P, median FTE rose in AAA and AA rated institutions, while it declined in A, BBB and below rated schools. Of the 273 private schools that S&P rates, as of 1 June 2023, 10% had negative outlooks, down from 16% of rated private schools y/y. Median cash on hand and investments fell 9.4% in FY22, down from a 24.8% increase in fiscal 2021. However, S&P notes that for "fiscal 2023, with the exhaustion of relief funds combined with rising expenses, we anticipate that overall operating margins will be weaker, which could depress financial resources." S&P rates 141 public colleges and universities, with 91% of rated institutions holding a stable outlook, up from 84% in FY21. The 1.9% median drop in FTE was the largest in the past five years. Large public universities remain positioned to adapt to sector wide challenges using their resources to meet new student demands and enrollment challenges.

### Stubborn inflation will remain a challenge for Higher Ed – Moody's

Rising wage expenses, food, utilities, and capital improvement costs amid increased inflation will prove to be a key challenge for higher education institutions at least through FY24 per recent reporting from Moody's. With labor occupying nearly two thirds of higher ed budgets, increased labor costs due to inflation and pandemic wage pressures will lead to further pressure on institutions to meet employee compensation demands. The Higher Education Price Index (HEPI) trailed CPI 5.2% to 9.1% in FY22, one of the few times the HEPI has ever been outpaced by inflation. Private sector employees saw wage growth of 5.4% in FY22 while faculty salaries rose just 2.1% over the same time, per Moody's. The failure to increase wages across the sector has led to teacher strikes and breakdowns in new contract negotiations. Public institutions inability to singularly increase tuition and fees will result in operating stress as pandemic era aid runs out and state appropriations fail to keep up with rising costs. Moody's notes that private schools, "may raise gross tuition enough to counter inflation, most will be forced to provide higher financial aid as students focus on affordability and competition limits pricing power."

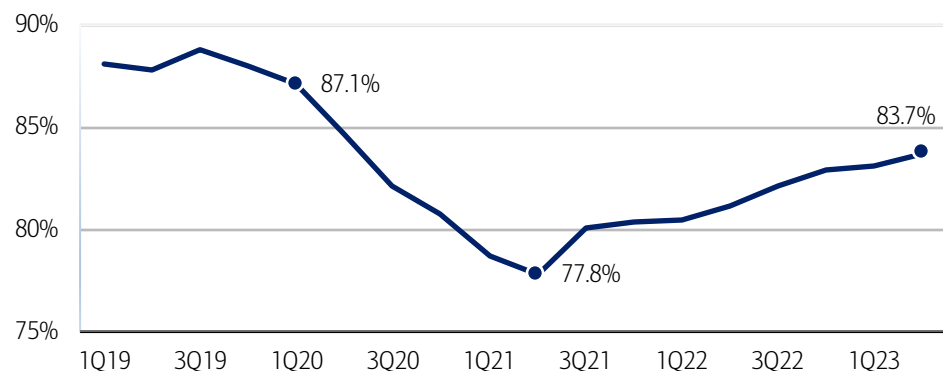
## Healthcare

### Senior housing occupancy improves for 8<sup>th</sup> consecutive quarter to 83.7%

National Investment Center for Seniors Housing & Care (NIC) data shows that 2Q23 senior housing occupancy rose to 83.7% from 83.1% the prior quarter, marking the eighth straight quarter of improvement and the highest level since the COVID-19 pandemic. Occupancy improved 2.5ppt y/y but is still down 3.6ppt versus 1Q20. Contributing to the continued recovery improvement has been solid demand coupled with relatively slow growth in inventory. NIC noted that construction levels were at their lowest since 2014. Of the 31 metro areas within NIC's data, Boston (89.0%), Baltimore (87.5%) and Portland, OR (86.9%) had the highest senior housing occupancy rates. Houston (78.7%), Cleveland (80.8%) and Atlanta (80.9%) had the lowest. By property type, assisted living occupancy gained 0.8ppt to 82.0%, while independent living increased 0.3ppt to 85.4% and nursing care grew 0.6ppt to 81.9%.

**Exhibit 37: US senior housing occupancy (%)**

Occupancy rose in 2Q23 for the eighth consecutive quarter



Source: National Investment Center for Seniors Housing and Care

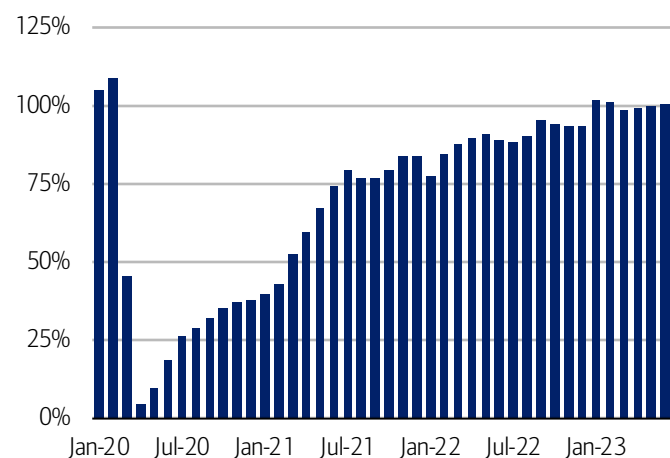
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**Airports****Air travelers hit pre-pandemic numbers for second straight month**

The air travel recovery remained stable in June, with traveler numbers matching pre-pandemic levels for the second consecutive month. June saw 76.9 million travelers versus 76.6 million travelers in June 2019. With 68.2 million travelers in June 2022, the number of travelers was up 12.9%. M/m checkpoint growth was up 3.7% and the 12-month rolling average recovery level continued its climb and improved 1ppt to 96%. At this time last year, the recovery was 11ppt lower at 89%. For the YTD, passenger levels are up 0.2% compared to 2019 and 15.2% compared to last year.

**Exhibit 38: Monthly TSA checkpoint travel numbers versus 2019**

For the second consecutive month, June hit pre-pandemic levels

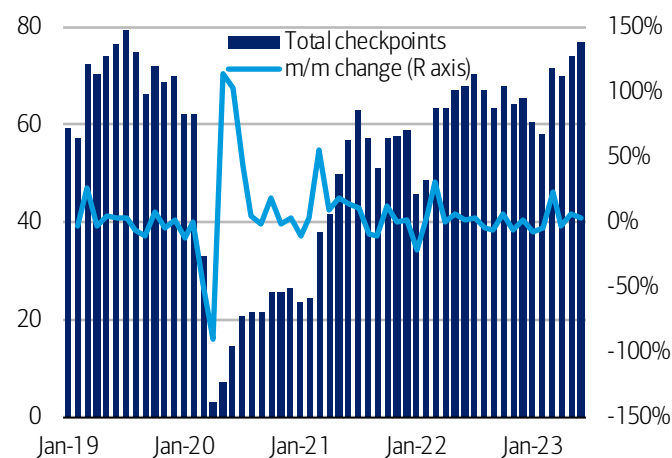


Source: Transportation Security Administration

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**Exhibit 39: Monthly TSA checkpoint travel numbers (millions)**

June checkpoints up 3.7% m/m and 12.9% y/y



Source: Transportation Security Administration

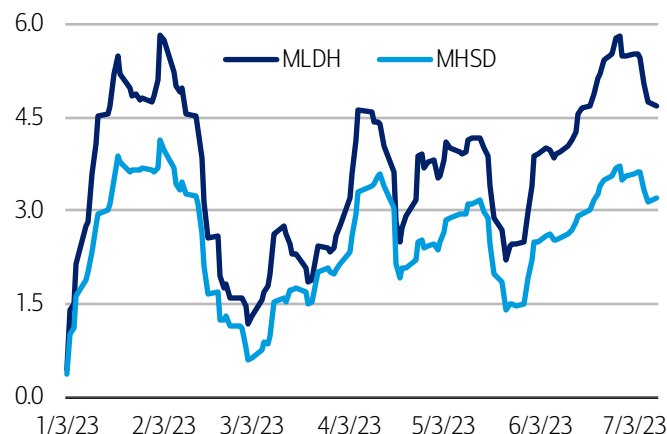
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**Defaults, distress & HY****Larger HY deals outperforming smaller deals YTD**

We compared returns for the ICE High Yield & Unrated Large Deal Municipal Bond Index (MLDH) and the ICE High Yield & Unrated Small Deal Municipal Bond Index (MHSD). Included in MLDH are securities that are part of a deal with an original offering size of at least \$100mn; MHSD includes those from a deal with an original offering size of between \$20mn and less than \$100mn. For the YTD as of 10 July, MLDH is outperforming MHSD by 146bp (4.67% returns for MLDH vs 3.21% for MHSD).

**Exhibit 40: YTD total return (%), MLDH vs MHSD**

MLDH is outperforming MHSD by 146bp YTD



Source: ICE Data Indices, LLC

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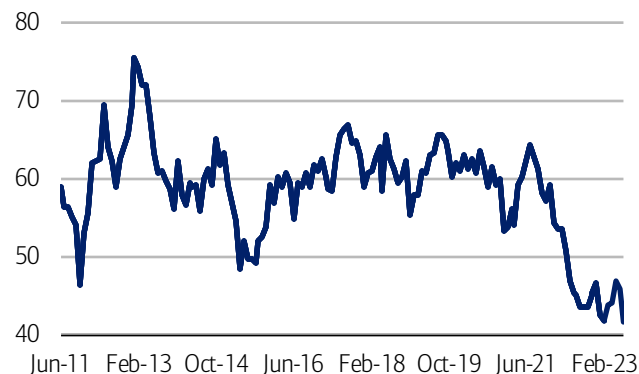
While some of this outperformance is likely due to MLDH's longer duration and lower credit, we attribute the bulk of the outperformance to MLDH's larger spread narrowing relative to MHSD's (MLDH's YTW spread to the ICE BofA AAA US Municipal Securities Index, UOA1, narrowed 38bp YTD while MHSD's narrowed 16bp). To the extent a recession does not materialize in the 2H23, we would expect this trend – MLDH outperforming MHSD – to continue.

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

For the week ending 12 July, our tracking of those Moody's-defined material credit events (MCEs) shows 10 postings, down 12 on a w/w basis, with the MTD total of 19 as of 12 July. See Exhibit 42. Meanwhile, we note there were no new Chapter 9 bankruptcy petitions filed for the week ending on 12 July and, as a result, it has been 50 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 42: 6-mo mov avg of material credit events posted to EMMA**

Filings posted to EMMA have decreased since last July



Note: Data as of 12 July 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

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**YTD defaults total \$993mn; distress totals \$981mn**

As noted in our [last Weekly](#), YTD first-time payment defaults through June total \$993mn, up 44% y/y, while YTD newly-distressed debt totals \$981mn, which is down 40% y/y.

**Exhibit 41: Index characteristics, MLDH vs MHSD**

MLDH has longer duration, lower coupon and lower credit than MHSD

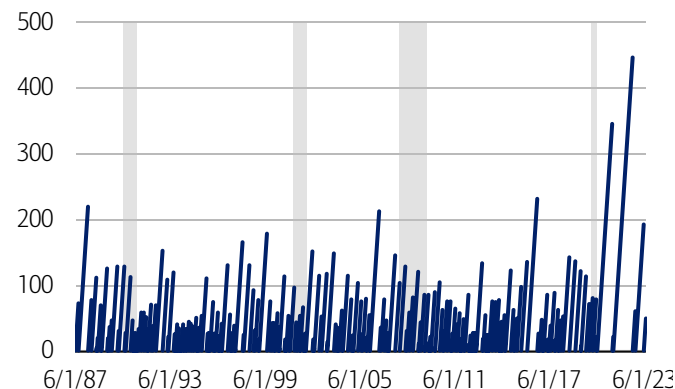
	MLDH	MHSD
# of bonds	1,689	3,632
Par value (\$bn)	170.1	51.3
Market value (\$bn)	97.6	46.0
Coupon	2.64	5.07
Maturity	19.8	19.7
Price	56.96	88.77
YTW	5.51	6.89
OAS	166	231
Mod duration to worst	10.2	8.4
Rating	BB3	BB2
Total return	4.67	3.21
Price return	2.17	0.21
Yield return	2.50	3.00

Source: ICE Data Indices, LLC, BofA Global Research

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**Exhibit 43: Calendar days since last Chapter 9 petition filed**

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



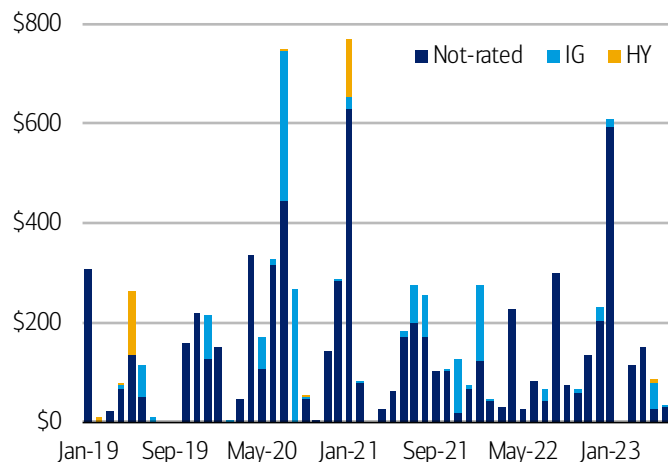
Source: BofA Global Research, PACER, US Courts

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The total cumulative first-time distressed debt since 2019 totals \$12.8bn; of that, 35% defaulted while 7% exited distressed status. Going forward, we expect defaults from this distress to be concentrated in the Nursing Home, Hospital, Student Housing and Industrial Development sectors. As noted in our [Municipals Year Ahead 2023](#), we expect defaults to tick up some in 2023, with our original estimate for the year at \$1.7bn-\$2.1bn. With current defaults cumulating at \$139mn-\$156mn per month on average, 2023 defaults could finish 2023 somewhere closer to \$1.8bn-\$1.9bn.

#### Exhibit 44: Monthly first-time defaults (\$mn) by avg rating at issue

YTD-23 totals \$993mn, up 44% y/y



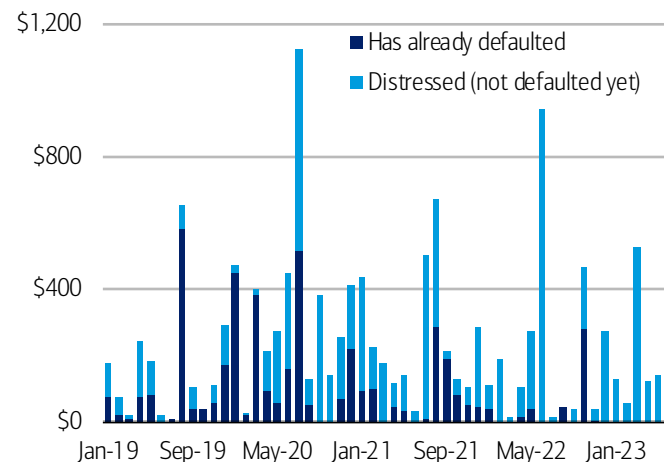
Note: We may revise data if Bloomberg revises its data.

Source: BofA Global Research, Bloomberg

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#### Exhibit 45: Monthly first-time distressed debt (\$mn)

YTD-23 totals \$981mn, down 40% y/y



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

Source: BofA Global Research, Bloomberg

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## 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; and 5-yr and 10-yr taxables for South Korea.

#### Exhibit 46: Cross currency equivalent yields as of 13 July 2023

Taxable munis are attractive for foreign investors, though 5yr and 10yr taxables are less so for Italy; and 5yr and 10yr 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 (3.940)	10 year (3.765)	30 year (3.896)	5 year (4.37)	10 year (4.46)	30 year (5.09)	5 year	10 year	30 year	5 year	10 year	30 year
Canada	3.764	3.355	3.236	3.888	3.668	3.852	4.317	4.364	5.044	Yes	Yes	Yes	Yes	Yes	Yes
United Kingdom	4.548	4.413	4.529	4.927	4.373	4.180	5.355	5.073	5.391	Yes			Yes	Yes	Yes
France	2.922	3.000	3.387	2.945	2.853	3.476	3.371	3.546	4.649	Yes			Yes	Yes	Yes
Germany	2.555	2.469	2.521	2.945	2.853	3.476	3.371	3.546	4.649	Yes	Yes	Yes	Yes	Yes	Yes
Italy	3.728	4.132	4.543	2.945	2.853	3.476	3.371	3.546	4.649						Yes
Spain	3.228	3.486	3.919	2.945	2.853	3.476	3.371	3.546	4.649				Yes	Yes	Yes
Portugal	2.943	3.156	3.578	2.945	2.853	3.476	3.371	3.546	4.649	Yes			Yes	Yes	Yes
Netherlands	2.775	2.809	2.757	2.945	2.853	3.476	3.371	3.546	4.649	Yes	Yes	Yes	Yes	Yes	Yes
Switzerland	0.947	0.951	0.880	2.945	2.853	3.476	3.371	3.546	4.649	Yes	Yes	Yes	Yes	Yes	Yes
Japan	0.117	0.463	1.338	-0.257	0.099	2.230	0.188	0.780	3.340				Yes	Yes	Yes
Australia	3.928	4.046	4.317	4.318	4.654	4.310	4.764	5.350	5.518	Yes	Yes		Yes	Yes	Yes
South Korea	3.572	3.634	3.581	2.319	2.873	3.488	2.745	3.563	4.655						Yes
China	2.405	2.639	2.998	4.801	4.263	4.123	5.230	4.957	5.321	Yes	Yes	Yes	Yes	Yes	Yes
Taiwan	1.075	1.160	1.577	1.118	2.219	3.191	1.541	2.904	4.337	Yes	Yes	Yes	Yes	Yes	Yes
Singapore	3.050	3.045	2.504	3.386	3.465	3.758	3.814	4.157	4.940	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

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# 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
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	VPI	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

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