



Considerations for Leveraging Potential Energy Cost Reduction, Firm Update, and Market Snapshot

February 11, 2020



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Section 1

Considerations for Leveraging Potential Energy Cost Reduction

Our Understanding

Memphis' Power Supply situation continues to be studied and will be further studied in great detail going forward ...

- Friends of the Earth commissioned The Brattle Group (Jan. 2019) - Power to Memphis – Options for a Reliable, Affordable and Greener Future
- GDS Associates (Feb. 2019) - Evaluation of Long-Term Power Supply Alternatives
- Power Supply Advisory Team (PSAT) remains active with its last meeting held on January 23, 2020
- MLGW has initiated a formal Integrated Resource Plan (IRP) – Preliminary Report due in May, 2020
- After several attempts to increase electric rates, the City Council adopted a multi-year electric rate increase to fund critical infrastructure of 4.2%, 1.5% and 1.5% effective July, 2020, Jan 2021 and Jan 2022 respectively on January 21, 2020
- Significant undertaking as it relates primarily to the Long-term Community Impact - followed closely by the Engineering and Financial Impact
- Any further infrastructure financing would be dependent on securing iron-clad long term power purchase agreements which would take effect after the TVA cancellation period which is assumed to be 5 years
- In addition, the rate structure for MLGW electric customers would have to be re-balanced between the base rate and the pass-through of power purchases
- UBS has included two scenarios within our presentation that we believe are compliant with the Tennessee Revenue Bond Law and Local Government Public Obligations Act but would require the State Comptroller to approve the plan of finance

Scenario 1: \$1 Billion 5-Year Convertible CABs

Sources and Uses of Funds

		Year	Savings A	Original Principal B	Accreted Interest C	Current Interest D	Net Debt Service E = B+C+D	Payments to the City F	Potential Rate Payer Reduction G = A-E-F
Sources									
	Amount								
Par Amount	\$799,875,203	2021	-	-	-	-	-	-	-
Premium	206,527,738	2022	-	-	-	-	-	-	-
Total	\$1,006,402,941	2023	-	-	-	-	-	-	-
		2024	-	-	-	-	-	-	-
		2025	-	-	-	-	-	-	-
Uses									
	Amount								
Project Fund	\$1,000,000,000	2026	350,000,000	52,154,908	16,710,092	24,682,125	93,547,125	208,900,000	47,552,875
Cost of Issuance	6,399,002	2027	350,000,000	34,319,315	10,995,685	48,231,375	93,546,375	208,900,000	47,553,625
Additional Proceeds	3,939	2028	350,000,000	36,076,367	11,558,633	45,907,625	93,542,625	208,900,000	47,557,375
Total	\$1,006,402,941	2029	350,000,000	37,928,088	12,151,912	43,464,750	93,544,750	208,900,000	47,555,250
		2030	350,000,000	39,874,478	12,775,523	40,896,500	93,546,500	208,900,000	47,553,500
		2031	350,000,000	41,919,323	13,430,678	38,196,500	93,546,500	208,900,000	47,553,500
		2032	350,000,000	44,066,410	14,118,590	35,358,125	93,543,125	208,900,000	47,556,875
		2033	350,000,000	46,327,100	14,842,901	32,374,250	93,544,250	208,900,000	47,555,750
		2034	350,000,000	48,705,179	15,604,822	29,237,250	93,547,250	208,900,000	47,552,750
		2035	350,000,000	51,200,647	16,404,353	25,939,375	93,544,375	208,900,000	47,555,625
		2036	350,000,000	53,824,865	17,245,136	22,472,500	93,542,500	208,900,000	47,557,500
		2037	350,000,000	56,585,405	18,129,595	18,827,875	93,542,875	208,900,000	47,557,125
		2038	350,000,000	59,489,843	19,060,158	14,996,250	93,546,250	208,900,000	47,553,750
		2039	350,000,000	62,538,176	20,036,824	10,968,125	93,543,125	208,900,000	47,556,875
		2040	350,000,000	65,745,554	21,064,447	6,733,500	93,543,500	208,900,000	47,556,500
		2041	350,000,000	69,119,548	22,145,452	2,281,625	93,546,625	208,900,000	47,553,375
		Total	\$5,600,000,000	\$799,875,203	\$256,274,798	\$440,567,750	\$1,496,717,750	\$3,342,400,000	\$760,882,250

Structuring Assumptions

- Debt service accretes during 5-year cancellation period then converts to current interest
- 15 bps for market penalty for one issuance of \$1 billion
- Requires iron-clad power purchase agreements starting in year 6
- Assumes MLGW rebalances base rates and whole sale power cost pass through



Scenario 2: \$500 Million 5-Year Convertible CABs; \$500 Million in CIBs

Sources and Uses of Funds

Sources and Uses of Funds		Year	Savings A	Original Principal B	Accreted Interest C	Net Current Interest D	Net Debt Service E = B+C+D	Payments to the City F	Potential Rate Payer Reduction G = A-E-F
Sources	Amount								
Bond Proceeds	\$838,130,638	2021	-	-	-	-	-	-	-
Premium	232,839,559	2022	-	-	-	-	-	-	-
Total	\$1,070,970,197	2023	-	-	-	-	-	-	-
		2024	-	-	-	-	-	-	-
		2025	-	-	-	-	-	-	-
Uses	Amount	2026	350,000,000	25,712,033	8,237,968	23,263,000	57,213,000	208,900,000	83,887,000
Project Fund	\$1,000,000,000	2027	350,000,000	37,289,199	5,420,801	45,458,250	88,168,250	208,900,000	52,931,750
Capitalized Interest Fund	64,259,484	2028	350,000,000	39,201,365	5,698,635	43,268,000	88,168,000	208,900,000	52,932,000
Cost of Issuance	6,705,045	2029	350,000,000	41,208,972	5,991,029	40,965,500	88,165,500	208,900,000	52,934,500
Additional Proceeds	5,668	2030	350,000,000	43,322,019	6,297,981	38,545,000	88,165,000	208,900,000	52,935,000
Total	\$1,070,970,197	2031	350,000,000	45,544,295	6,620,705	36,000,375	88,165,375	208,900,000	52,934,625
		2032	350,000,000	47,879,585	6,960,415	33,325,250	88,165,250	208,900,000	52,934,750
		2033	350,000,000	50,332,889	7,317,111	30,513,000	88,163,000	208,900,000	52,937,000
		2034	350,000,000	52,917,995	7,692,005	27,556,500	88,166,500	208,900,000	52,933,500
		2035	350,000,000	55,632,476	8,087,525	24,448,250	88,168,250	208,900,000	52,931,750
		2036	350,000,000	58,483,757	8,501,243	21,180,625	88,165,625	208,900,000	52,934,375
		2037	350,000,000	61,481,987	8,938,013	17,745,500	88,165,500	208,900,000	52,934,500
		2038	350,000,000	64,638,379	9,396,621	14,134,125	88,169,125	208,900,000	52,930,875
		2039	350,000,000	67,951,719	9,878,282	10,337,500	88,167,500	208,900,000	52,932,500
		2040	350,000,000	71,435,793	10,384,207	6,346,250	88,166,250	208,900,000	52,933,750
		2041	350,000,000	75,098,177	10,916,824	2,150,375	88,165,375	208,900,000	52,934,625
Total	\$5,600,000,000	Total	\$5,600,000,000	\$838,130,638	\$126,339,362	\$415,237,500	\$1,379,707,500	\$3,342,400,000	\$877,892,500

Structuring Assumptions

- Two tranches: \$500MM convertible CABs issued in 2020; \$500MM CIBs issued in 2022 with 3 years CAPI
- Requires iron-clad power purchase agreements starting in year 6
- Assumes MLGW rebalances base rates and whole sale power cost pass through

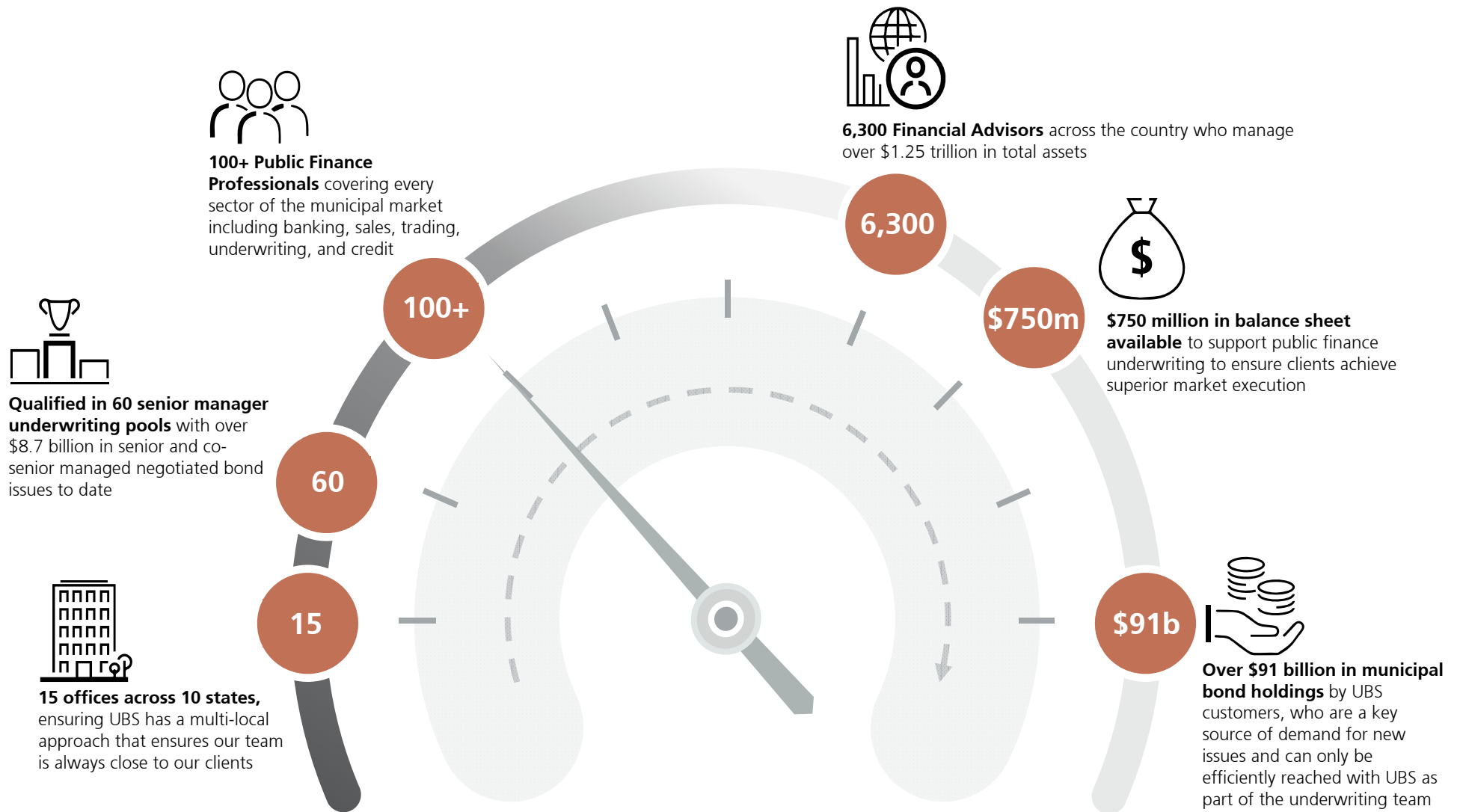


Section 2

UBS Public Finance Update


UBS Provides Best-in-Class Capabilities to Municipal Clients

A look at UBS's reinvigorated Public Finance platform by the numbers




Dedication to Memphis and the State of Tennessee

- UBS is dedicated to the City of Memphis and the State of Tennessee
- UBS maintains a wealth management office in the City of Memphis, located at 6070 Poplar Avenue, that includes 31 financial advisors that manage approximately \$4.3 billion in total assets
- Across Tennessee, UBS has nine branch offices with 129 financial advisors managing approximately \$2.1 billion in municipal bonds
- UBS is a strong community leader in Memphis through employee giving and business-related contribution programs and UBS employee volunteering
- In 2018, UBS and its employees donated to 42 organizations in Memphis and employees volunteered over 70 hours supporting local Memphis not-for-profits
- Since 2018, UBS has served as an underwriter on 17 transactions for Tennessee issuers totaling approximately \$1.4 billion in total par, including the City's \$35.8 million Storm Water Revenue Bonds
- UBS was also recently named to the Metro Nashville's Senior Manager underwriting pool

City of Memphis
Storm Water System Revenue Bonds
Series 2019
\$38 million
October 2019
Co-Manager



Metropolitan Nashville Airport Authority
Subordinate Airport Revenue Bonds
Series 2019AB
\$919 million
December 2019
Co-Manager



Shelby County
GO Public Improvement and School Bonds
2019 Series A
\$181 million
February 2019
Co-Manager



Sports Authority of the Metro Govt of Nashville and Davidson County
Public Impt Revenue Bonds (MLS Project) Series 2020
\$225 million*
TBD
Co-Manager

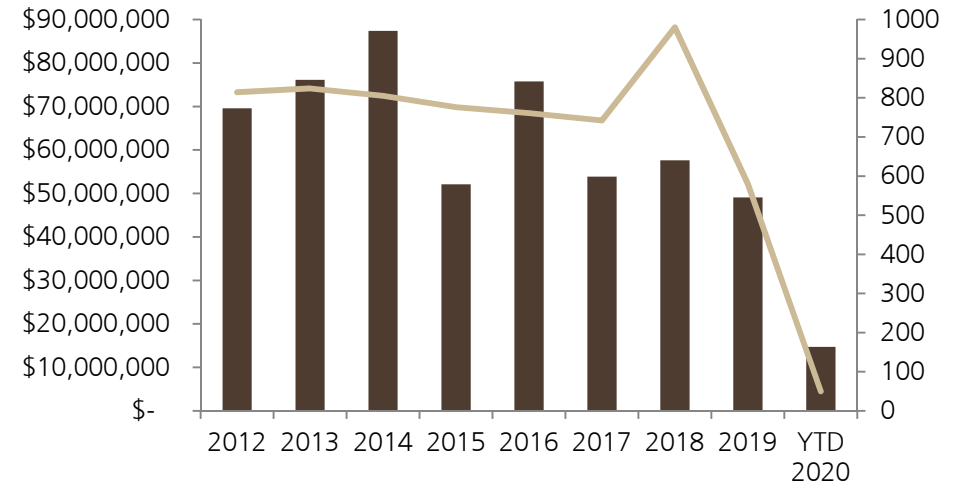
Support for Memphis Bonds

UBS is a top holder of Memphis bonds and provides support and liquidity on the secondary market

- UBS clients have provided significant secondary market support for Memphis bonds, trading over **\$536 million** in total volume of the bonds 2012
- When compared with publicly reporting institutions, UBS would rank among the top holders of various Memphis area credits. In total, **UBS holds over \$61.7 million** of Memphis bonds including the G.O., Sanitary Sewer, Sports Authority, Airport, and MLGW

UBS Trade Volume: Memphis-area Credits

Total volume, \$; # of Trades



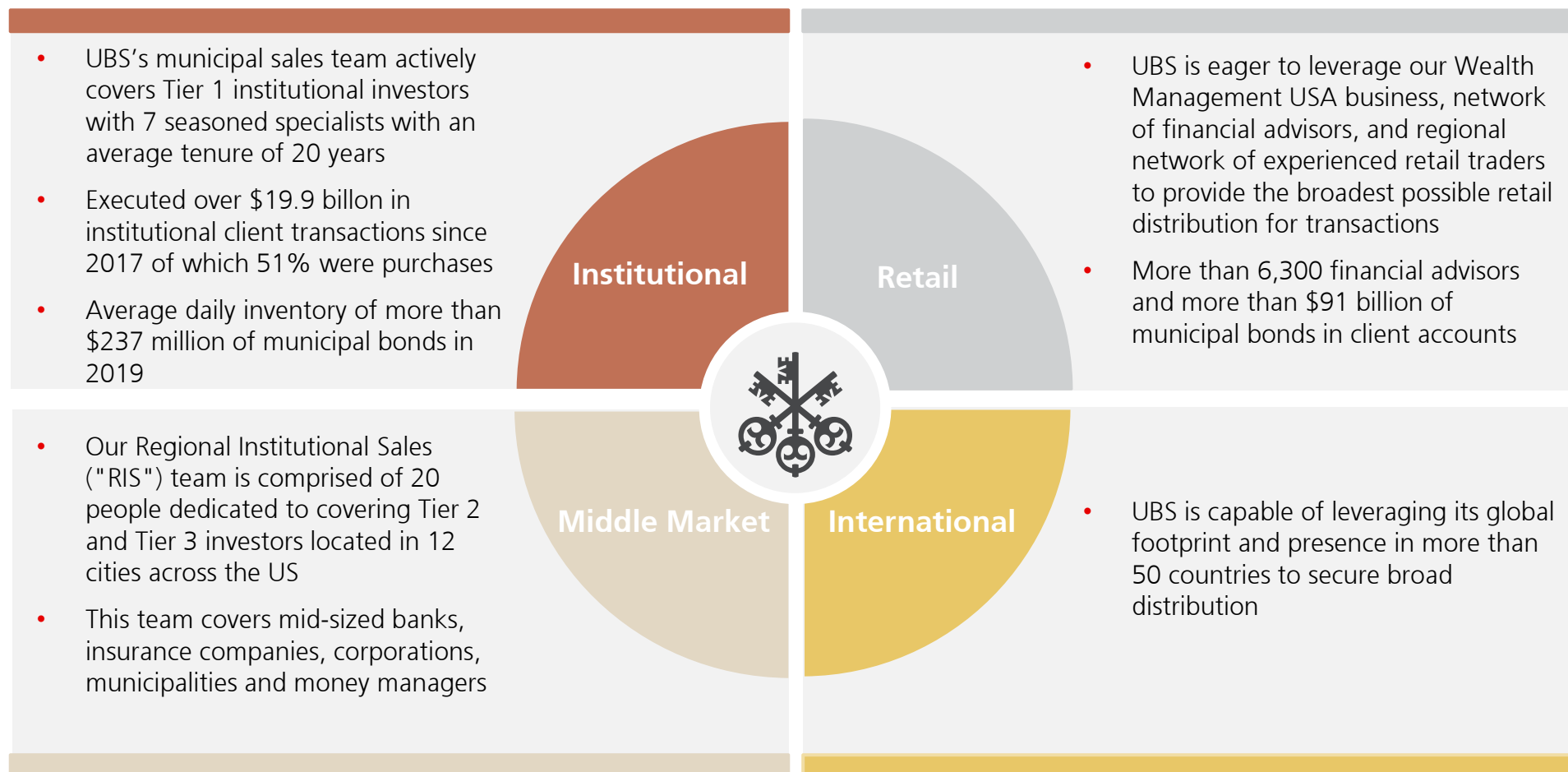
■ Total Volume — Total Trades

Memphis G.O			Memphis Sanitary Sewer			Memphis Sports Authority			Memphis Shelby Airport			MLGW		
#	Institution	Holdings	#	Institution	Holdings	#	Institution	Holdings	#	Institution	Holdings	#	Institution	Holdings
1	Babson Capital Mgt.	\$48,030	1	Vanguard Group	\$ 8,955	1	Nuveen	\$ 8,580,	1	Franklin Advisers	\$40,065	1	State Farm Insurance Co	\$32,020
2	Franklin Advisers	\$41,740	2	American Equity Inv. Life Ins	\$ 8,080	2	UBS	\$ 8,110	2	Fidelity Investments	\$21,675	2	The Travelers Companies	\$18,900
3	UBS	\$36,025	3	UBS	\$ 4,260	3	BlackRock	\$ 6,105	3	Nuveen	\$19,045	3	Tennessee Farmers Ins.	\$ 9,310
4	USAA	\$28,325	4	Guggenheim Partners	\$ 3,200	4	Mercury Casualty Co	\$ 5,770	4	Eaton Vance Mgt.	\$17,730,	4	UBS	\$ 5,480
5	Dimensional Fund	\$25,727	5	New England Asset Mgt.	\$ 2,100	5	Franklin Advisers	\$ 5,000	5	Berkley Dean & Co	\$15,815	5	Dupree & Company, Inc.	\$ 4,360
6	Deutsche Bank	\$21,295	6	Citizens Inc.	\$ 1,580	6	Tennessee Farmers Ins.	\$ 3,000	6	Tennessee Farmers Ins.	\$12,500	6	Vanguard Group	\$ 4,315
7	Tennessee Farmers Ins.	\$21,000	7	Synovus Financial Corp	\$ 1,000	7	MFS Investment Mgt.	\$ 2,500	7	Western Asset Mgt.	\$11,186	7	Cincinnati Financial Corp	\$ 3,215
8	Vanguard Group	\$18,120	8	Greater Beneficial Union of Pitts.	\$ 1,000	8	Central Mutual Ins.	\$ 2,000	8	Waddell & Reed Inv.	\$ 8,615	8	Nuveen	\$ 2,910
9	PIMCO	\$15,762	9	Texas Farm Bureau Mutual Ins.	\$ 865	9	Delphi Capital Mgt.	\$ 1,800	9	Capital Research & Mgt.	\$ 7,680	9	Franklin Advisers	\$ 2,000
10	Loews Corporation	\$13,210	10	AQS Asset Management LLC	\$ 850	10	Frost Investment Advisor	\$ 1,800	10	OppenheimerFunds	\$ 7,250	10	Liberty Mutual Insurance	\$ 1,350
									11	UBS	\$ 6,415			



UBS Provides Full Sales, Marketing & Distribution Capabilities

UBS is one of the only firms in the industry with four major channels of municipal bond distribution

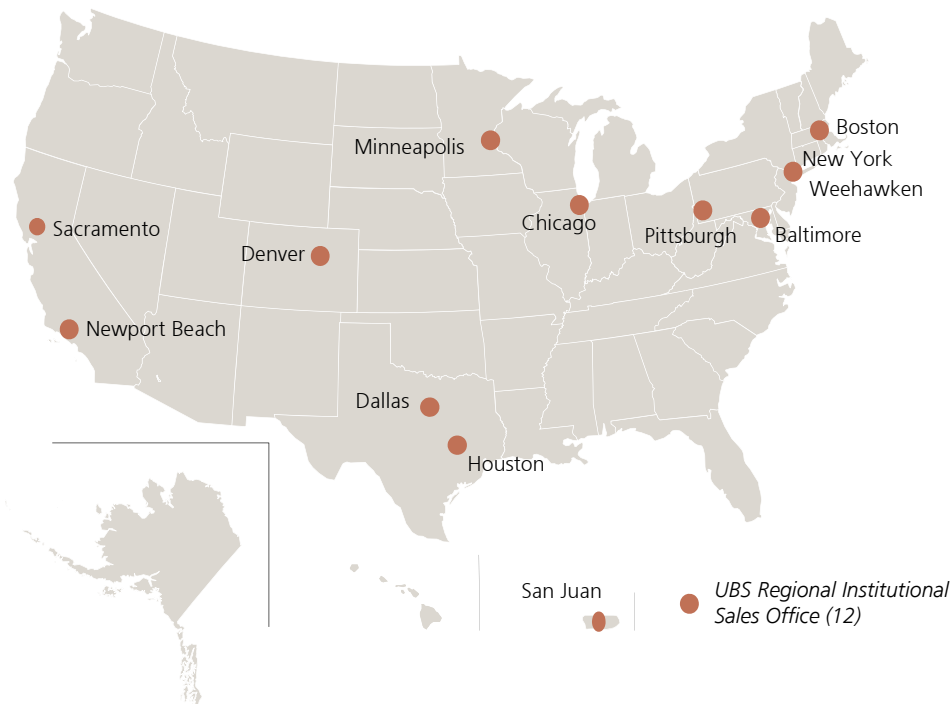


UBS's Middle Market Presence Is a Strong Differentiator

UBS has a robust middle market platform which differentiates our distribution capabilities to further broaden the buyer base for the City's debt offerings

- 27 Regional Institutional Sales representatives in 14 locations servicing clients with AuMs of \$500 million to \$5 billion – buyers often overlooked by sales desks focused on the largest institutional investors
- Cover over 900 accounts, largely comprised of pension and endowment funds, RIAs, insurance companies and asset managers
- True "buy and hold" accounts with typical order size of \$2 million - \$25 million, offering additional depth of demand

UBS Middle Market Offices Across the United States



UBS Tennessee Middle Market Coverage



Section 3

Market Snapshot

UBS Municipal Market Minute

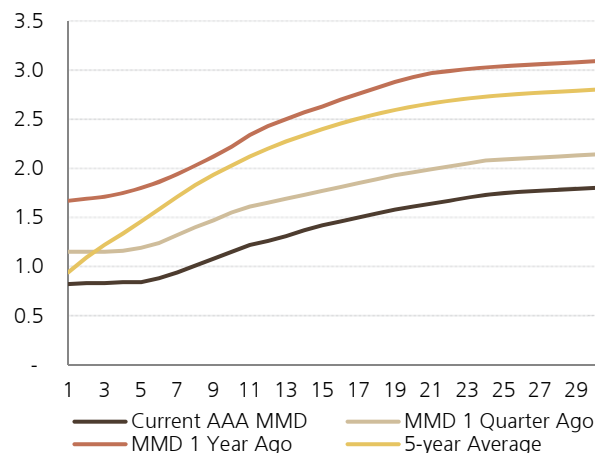
Week of February 3rd, 2020

Key Highlights

- Broader Market.** The coronavirus was the main driver of last week's risk-off move. The World Health Organization declared the coronavirus a global health emergency on Thursday, but expressed confidence in China's ability to contain the outbreak and commended their containment efforts thus far. Chinese stocks have plunged 8% (CSI Index) on the first day mainland investors had to trade since January 23rd (due to the extended Lunar New Year holiday). It's expected China will lower its 2020 economic growth expectations.
- Treasuries.** US Treasuries continued their rally through last week, with yields ending 14-17 bps lower in a bull steepener. The 30-year yield dropped below 2.00% on Friday, the lowest it's been since October.
- Equities.** US stocks sold off last week, as coronavirus fears outweighed largely positive corporate earnings. The Dow was down 700pts over the week.
- Municipal Market.** Municipals rallied throughout the week in a flattening move, with long end yields (10yrs+) finishing 8 bps lower. However, the market was not able to keep up with the significant rally in treasuries, leading to a second week of ratio widening, particularly on the short end. The 2-year and 5-year ratios closed the week at 63% and 64% respectively, nearly 6 and 7 ratios higher than a week earlier.
- Volume.** Total supply this week is estimated to be approximately \$8.3 billion, consisting of \$5.30 billion in tax-exempt transactions and \$3.00 billion in taxable underwritings.
- Municipal Bond Funds.** U.S. municipal bond funds reported \$1.82 billion of net inflows in the week ended Jan. 29th, a decrease from the \$2.0 billion in inflows from the previous week. This marks the 56th consecutive week of inflows, a record in the municipal market. The four-week moving average remained positive at \$2.26 billion.
- Short-Term Update.**
 - 1M LIBOR reset at 1.66% (no week over week change)
 - SOFRA reset at 1.58% (+5 bps week over week)
 - SIFMA reset at 0.94% (+12 bps week over week)

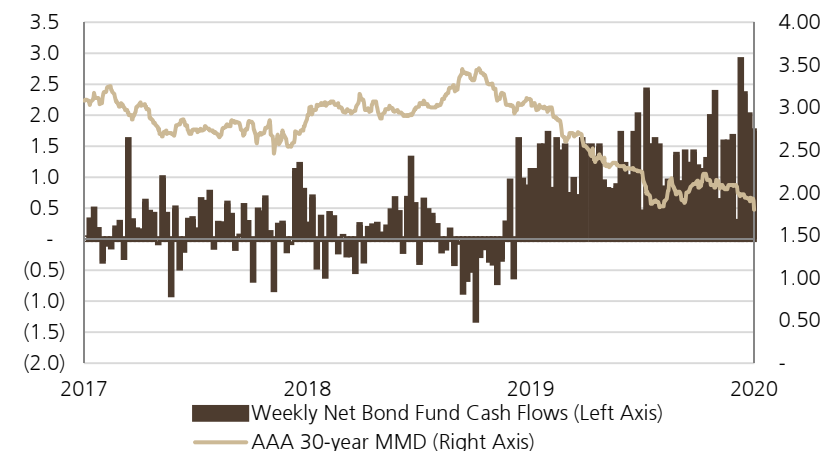
AAA MMD Yield Curves (%)

Yield (y), Years to Maturity (x)



Tax-Exempt Municipal Bond Fund Flows

In \$bn (left), In % (right)



Current Rates and Ratios

Maturity Year	Current AAA MMD	1-week Change	Current UST	1-week Change	Current MMD / UST	1-week Change	5-year Average
2-year	0.83%	-2 bps	1.32%	-17 bps	62.88%	+5.83%	73.12%
5-year	0.84%	-2 bps	1.32%	-19 bps	63.64%	+6.69%	74.12%
10-year	1.15%	-8 bps	1.51%	-19 bps	76.16%	+3.81%	84.93%
30-year	1.80%	-8 bps	2.00%	-14 bps	90.00%	+2.15%	95.12%

Largest Negotiated Transactions of Last Week

Sale Date	Issuer / Borrower	State	Par (\$000)	Tax Status	Ratings (M/S/F/K)	Final Maturity				
						Call Date	Maturity	Coupon (%)	Yield (%)	Spread to MMD / UST
1/28/2020	NYU Langone Hospitals Center ^{4,5}	NY	1,057,885	TX TE	A3/A/NR	MWC ³ 7/1/2030	7/1/2055 7/1/2053	3.380 4.000	3.380 2.480	+128 bps +65 bps
1/28/2020	State of Wisconsin	WI	623,320	TX	Aa2/NR/AA	MWC ¹	5/1/2032	2.499	2.499	+85 bps
1/28/2020	Escambia County Health Facilities Authority (Baptist Health Care Corporation)	FL	610,305	TE / TX	Baa2/BBB+/BBB	2/15/2030	8/15/2050 ² 8/15/2050	3.000 4.000	3.000 2.780	+117 bps +95 bps

1) Make-whole call +15bps 2) 3% 2050 Maturity AGM insured A2/AA/BBB 3) Make-whole call +20bps 4) Multiple series shown combined; 5) Corporate CUSIP

Note: Dividing line (_____) above indicates differential in tax status



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