

CDIAC

**CALIFORNIA
DEBT AND
INVESTMENT
ADVISORY
COMMISSION**

Municipal Debt Essentials

Accessing the Market: Marketing and Pricing

Day Three Session Three

February 14, 2019

Presentation by:

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Finance, Citigroup Global Markets, Inc.


Mesirow Financial[®]

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Innovative Solutions.


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What This Session Teaches

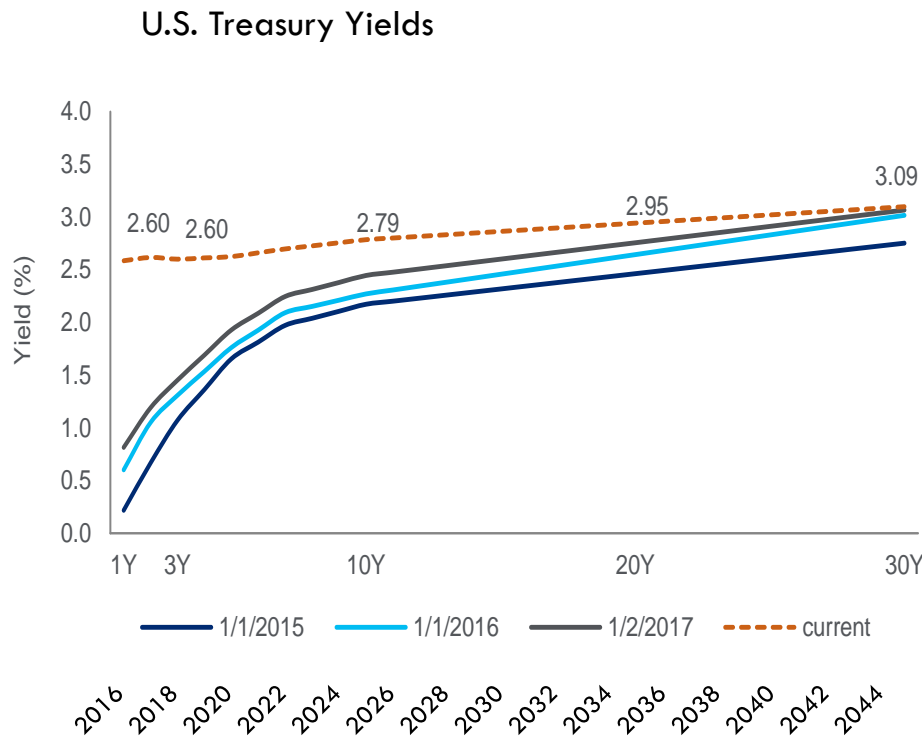
- In this session you will learn the basic concepts and processes associated with selling bonds in the primary market
- This material can be grouped into five broad categories
 1. Interest rates
 2. Spreads to benchmarks
 3. Setting your bond price
 4. Identifying investors
 5. The sale process

Interest Rates

- We will focus on fixed rate, current interest bonds
- We'll consider big picture items that drive interest rates:
 1. Yield Curve
 2. Coupons
 3. Yields
 4. Prices
 5. Early Redemption
- We're going to walk through how this information is used to price bonds in the primary market

Yield Curve

The Starting Point is the 30 Year US Treasury Curve



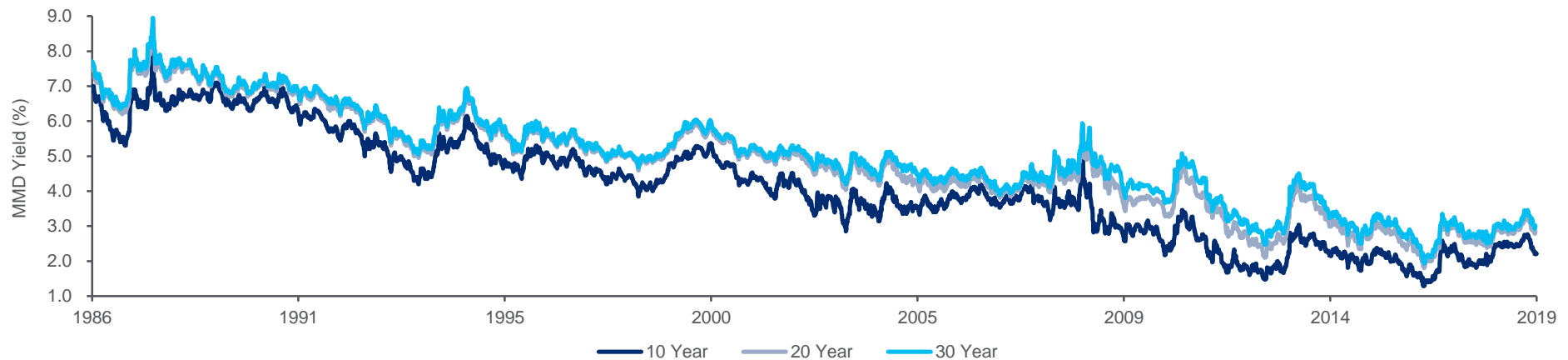
- **The Curve** is interest rates plotted over a set timeframe – typically 30-years
- The Federal Reserve Board (the “Fed”) controls the short end of the curve, the rest is driven by investor expectations
- The “shape” of the yield curve tells you the market’s expectations of future conditions
- A typical yield curve is upward sloping, with lower interest rates at the beginning of the curve and higher interest rates at the end of the curve

Municipal Market Data (MMD) Yield Curve

The Thomson Reuters MMD AAA Curve is an index of AAA rated general obligation bonds that acts as a proxy for treasuries in the tax-exempt market

- The municipal market benchmark is MMD, a tax exempt yield curve which translates muni yields into a *percentage of Treasuries*
- It's an opinion of value on which municipal new issues can be priced and compared
- Published each afternoon, subscription based

AAA G.O. MMD Yields (June 1, 1986 – January 18, 2019)



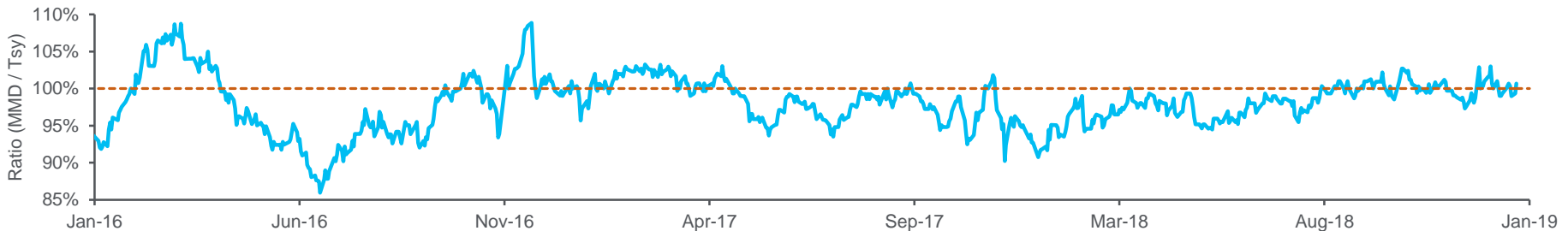
1. Thomson Reuters and Bloomberg, rates as of January 18, 2019.

MMD to Treasury Ratio

Historically, tax-exempt interest rates have moved in sympathy with Treasury rates

- The relationship of tax-exempt interest rates to Treasuries is worth noting
- Historically, tax-exempt interest rates are about 80% of comparable maturity Treasury rates
- *Given the fed raised rates 4 times in 2018 and tax exempt investors continue to prefer bonds with short maturities vs long maturities; the muni/treasury relationship is lower in the front end and higher in the long end*
- Treasury rates have exhibited abrupt movements in response to global economic headlines and announcements, with municipals moving in sympathy, but typically in a more muted fashion.

30-Year MMD/Treasury Ratio
2016 – 2019 Year To Date



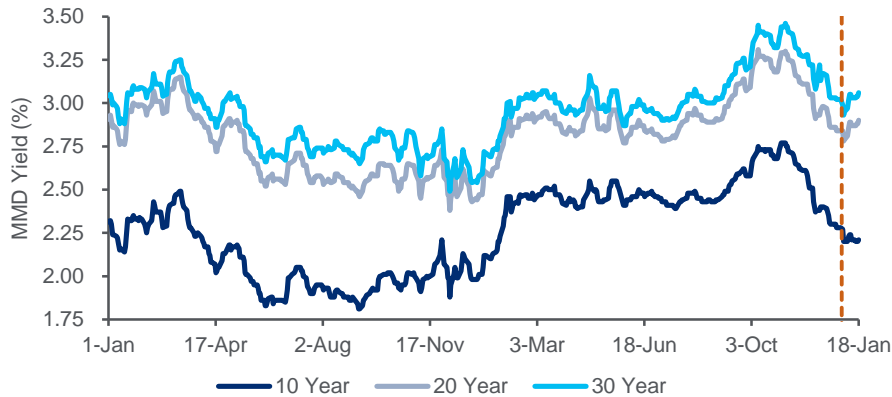
Source: Thomson Reuters and Bloomberg, data as of January 18, 2019.

Day Three - Session Three

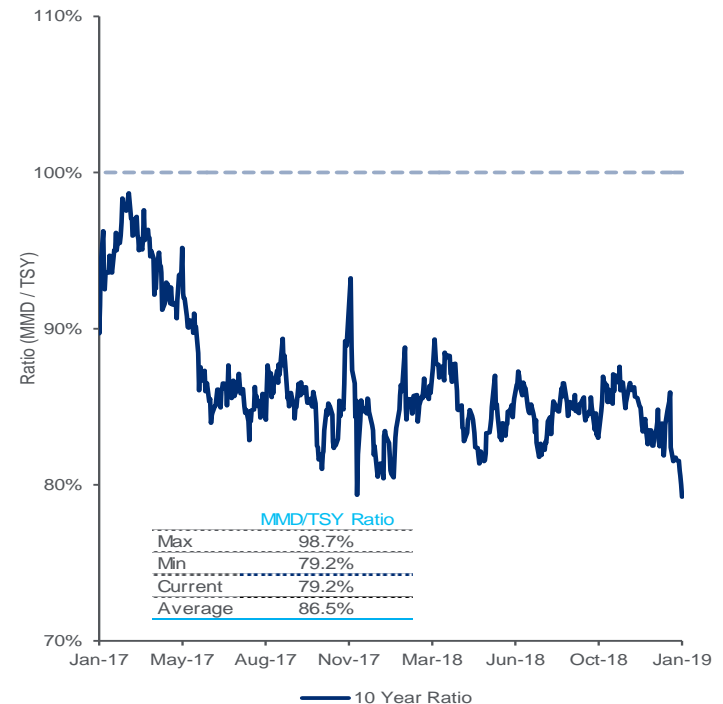
Current Market Context

Recent municipal market developments have included the expectation of an increase in 2019 supply against a backdrop of relatively flat credit spreads in line with averages, and mixed fund flows amid 2019 rate uncertainty.

Municipal Rates¹
2017 – 2019YTD



10-Year MMD/10-Year Treasury Ratio
Prior Two Years



Source: Thomson Reuters and Bloomberg, data as of January 18, 2019.

Factors Influencing Treasury and Tax Exempt Yields

Multiple internal and external factors influence new issue yields

Treasury Yields

- Economic Indicators
- Inflationary Expectations
- Monetary Policy
- Treasury Auctions
- Global Events

Tax Exempt Yields

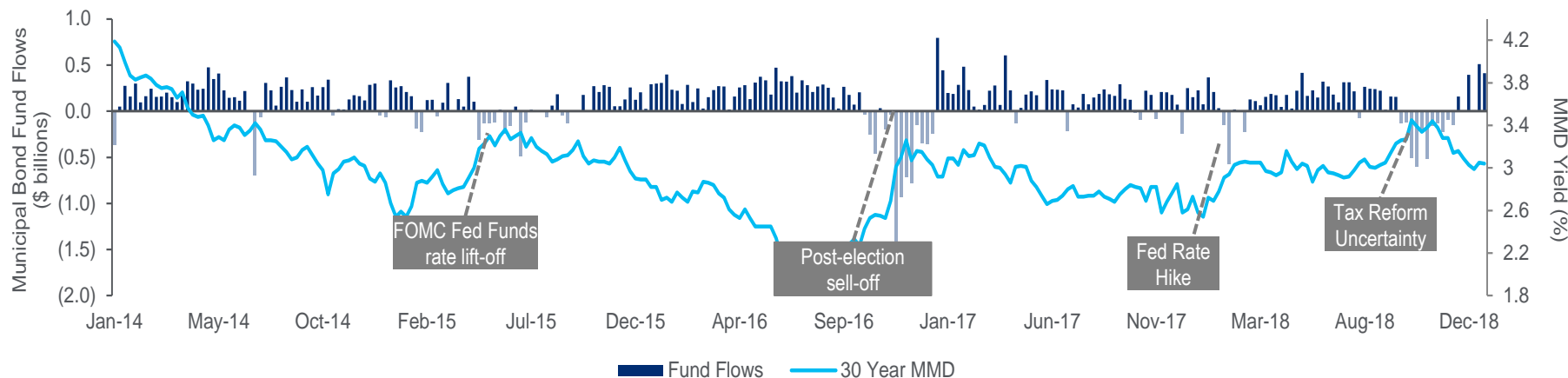
- Tax Policy
- Supply and Demand
- Credit Rating/Sector
- Call Features
- Comparable Securities
- Specific Features of Financing

Municipal Fund Flow History

Marketing and Pricing

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While overall demand is steady, market events can trigger sell-offs



Tax-Exempt MMF Flows

2019YTD	▲	\$0.9bn
2018	▲	\$11.6bn
2017	▼	-\$0.1bn
2016	▼	-\$92.1bn

As of the weekly reporting date 12/26/2018

Data Source: EPFR Global Fund Flows and Allocations Data – All Muni Funds (Retail and Institutional Funds).

Coupon, Price and Yield - Defined

- **Principal** is the corpus due each year on the loan
- **Coupon** is the interest rate the municipality pays on a particular bond with a particular maturity
- **Yield** is the annual return the investor receives on a bond
- **Price** (not shown) is the amount the investor pays to purchase the bond
- **Calls** – option to refund bonds early, elimination of advance refundings has given rise to more optionality in call dates

All Screenshots herein are for illustrative purposes only

MATURITY SCHEDULE

\$84,005,000 Serial Bonds




Maturity (June 1)	Principal Amount	Interest Rate	Yield	Price	CUSIP [†]
2025	\$510,000	5.000%	2.360%	116.007	AF3
2026	4,715,000	5.000	2.470	117.396	AG1
2027	4,950,000	5.000	2.590	118.439	AH9
2028	5,195,000	5.000	2.690	119.397	AJ5
2029	5,455,000	5.000	2.830	118.100*	AK2
2030	5,730,000	5.000	2.930	117.184*	AL0
2031	6,015,000	5.000	3.030	116.276*	AM8
2032	6,315,000	5.000	3.130	115.377*	AN6
2033	6,635,000	5.000	3.230	114.486*	AP1
2034	6,965,000	5.000	3.320	113.690*	AQ9
2035	7,315,000	5.000	3.400	112.989*	AR7
2036	7,680,000	5.000	3.450	112.554*	AS5
2037	8,060,000	5.000	3.480	112.293*	AT3
2038	8,465,000	5.000	3.510	112.034*	AU0

\$49,120,000 5.000% Term Bonds due June 1, 2043; Yield: 3.600%; Price: 111.259*; CUSIP[†] 786073AV8
 \$62,690,000 5.000% Term Bonds due June 1, 2048; Yield: 3.680%; Price: 110.575*; CUSIP[†] 786073AW6

*Yield to par call on June 1, 2028

Coupon, Price and Yield - Impact

Examples:

Maturity	Principal	Coupon	Yield	Price		
2026	\$215,000	4.000%	2.590%	113.444%		premium bond
2027	\$225,000	3.000%	3.000%	100.000%		par bond
2028	\$230,000	3.000%	3.044%	99.500%		discount bond

Price X Principal = Amount Investor Pays and Amount Municipality Receives

Examples:

Maturity	Principal	Price	Dollar Price
2026	\$215,000	113.444%	\$243,904.60
2027	\$225,000	100.000%	\$225,000.00
2028	\$230,000	99.500%	\$228,850.00

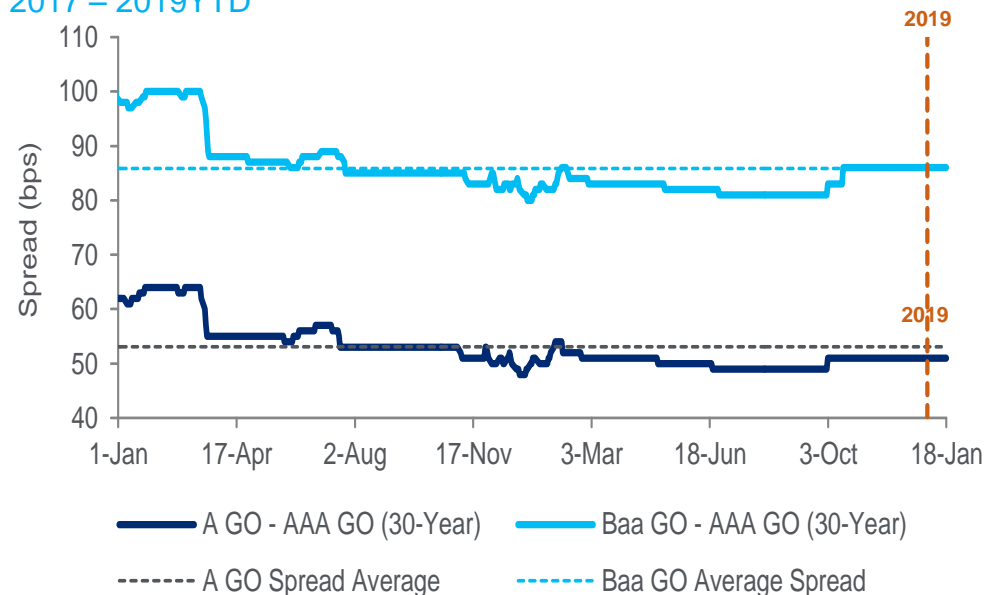
To a large degree, investor demand will determine how a particular financing is couponed

Spread to MMD

A primary reason bonds price at a spread (or difference) to the benchmark is credit

- Credit spreads are a means of compensating investors as the level of perceived risk increases.
- Credit spreads can vary over time
- Credit spreads can be different for similarly rated credits in different sectors

30 Year Credit Spreads¹
2017 – 2019YTD



1. Thomson Reuters, rates as of January 18, 2019; monthly spread data as of the first of each month

Credit Spreads Between Sectors

The municipal market has a variety of security structures and sectors and each prices differently

- General obligation bonds and essential service utilities have the “tightest” spreads
- Revenue bonds vary by sector based on pledged revenues
- Not-for-Profits, Health Care and Land Secured tend to have the highest spreads

	Illustrative 10-Year Spot for MMD		
	AA	A	BBB
General Obligation Bond	+20	+55	+80
Essential Service Utility	+35	+70	+90
Airport Revenue Bond	+50	+65	+90
Sales Tax Revenue Bond	+40	+60	+85
Tax Allocation Bond	+40	+75	+120
Certificates of Participation	+60	+75	+135
Lease Revenue Bond	+60	+75	+100
Not-for-Profit	+35	+65	+90
Health Care	+35	+75	+100

Comparables

- A “comparable” is a similarly rated, often similarly secured transaction that has been recently priced in the primary market
- Due to scarcity and granularity in the municipal market, it is difficult to find a “perfect” comparable, although with certain security structures, such as general obligation bonds issued by California school districts, one can come close
- The more comparables one can find, the better to tell the pricing “story”
- The more “unique” a particular credit is, the more difficult it will be to find comparable securities

Comparable

Marketing and Pricing

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Underwriter

Par
Issuer
Series
Ratings
Sale Date

Aa1/AA+/NR 11/8/2017

Aa2/AA-/NR 11/7/2017

Maturity	Par (\$000)	Coupon	Yield	Spread	Yield to Maturity
2018	102,245	2.00%	1.00%	-3	1.00%
2019	7,875	2.00%	1.06%	-6	1.06%
2020					
2021					
2022	8,035	3.00%	1.33%	-5	1.33%
2023	8,275	3.00%	1.45%	-4	1.45%
2024	8,520	4.00%	1.52%	-6	1.52%
2025	8,865	4.00%	1.62%	-6	1.62%
2026	9,220	5.00%	1.72%	-7	1.72%
2027	9,680	5.00%	1.82%	-7	1.82%
2028	10,165	5.00%	1.93%	-6	2.16%
2029	10,670	4.00%	2.27%	21	2.51%
2030	11,095	4.00%	2.39%	27	2.70%
2031	11,540	4.00%	2.50%	32	2.86%
2032	12,005	4.00%	2.58%	35	2.98%
2033	12,485	4.00%	2.66%	38	3.08%
2034	12,980	4.00%	2.71%	38	3.15%
2035	13,505	4.00%	2.76%	38	3.22%
2036	14,045	4.00%	2.84%	42	3.30%
2037	14,605	4.00%	2.87%	42	3.34%
2038	15,190	3% / 4%	3.25% / 2.88%	78 / 41	3.25% / 3.37%
2039	15,695	4.00%	2.90%	41	3.40%
2040					
2041	33,305	4.00%	2.94%	42	3.45%
2042					

Par (\$000)	Coupon	Yield	Spread	Yield to Maturity
12,100	3.00%	0.99%	-4	0.99%
13,350	4.00%	1.08%	-4	1.08%
10,790	4.00%	1.14%	-6	1.14%
160	3.00%	1.48%	-2	1.48%
335	4.00%	1.57%	-2	1.57%
530	5.00%	1.67%	-2	1.67%
740	5.00%	1.74%	-6	1.74%
970	5.00%	1.84%	-6	1.84%
1,220	5.00%	1.96%	-4	2.19%
1,490	5.00%	2.10%	3	2.49%
1,780	5.00%	2.23%	9	2.75%
2,095	4.00%	2.62%	42	2.95%
2,415	4.00%	2.73%	48	3.09%
2,755	4.00%	2.78%	48	3.16%
3,120	4.00%	2.83%	48	3.23%
3,510	3.00%	3.10%	70	3.10%
3,890	4.00%	2.95%	51	3.36%
4,330	4.00%	2.99%	52	3.41%
4,800	4.00%	3.01%	52	3.44%
5,300	4.00%	3.04%	53	3.47%
5,835	3.125%	3.26%	74	3.26%
13,300	4.00%	3.06%	51	3.52%

Pricing a Bond Issue

Recap of things covered so far...

- We covered interest rates and yield curve
- We covered coupon, price and yield
- We covered credit spreads
- We've covered comparables

Next we're going to walk through the process of a negotiated bond sale in the public markets...

What the Underwriter Considers

When pricing a transaction, the underwriter considers a variety of factors intended to generate the most demand and best prices for the bonds

- Credit quality
- The size of the transaction and the individual maturities
- The final maturity relative to the shape of the yield curve
- Redemption features
- Yields for comparable securities
- Likely investors in the bonds
- Attractive coupon structure for investors
- Feedback from syndicate co-managers
- Other transactions in the market at the same time

Investors and Investor Classes

Maturity	Par	Coupon	Yield	Tier	Types of Investors	Attributes
10/1/2017	1,525	4.000%	1.180%	Tier III	<ul style="list-style-type: none"> • Small Bank Trust Depts. • High Net Worth • Directed Accounts • SMAs • Smaller Corporations • Retail Investors 	<ul style="list-style-type: none"> • Par bonds vs. premium bonds • Small Blocks • Least Sophisticated • Buy and Hold • Quality and Name Driven
10/1/2018	1,790	4.000%	1.310%			
10/1/2019	1,880	4.000%	1.440%			
10/1/2020	1,975	4.000%	1.570%			
10/1/2021	2,075	4.000%	1.700%			
10/1/2022	2,180	4.000%	1.830%			
10/1/2023	2,285	5.000%	1.970%			
10/1/2024	2,400	5.000%	2.120%			
10/1/2025	2,520	5.000%	2.230%			
10/1/2026	2,645	5.000%	2.340%			
10/1/2027	2,780	5.000%	2.470%	Tier II	<ul style="list-style-type: none"> • High Net Worth • Smaller Mutual Funds • Smaller Insurance Cos. • Smaller Pension Funds • Smaller Money Mngrs. • Directed Accounts 	<ul style="list-style-type: none"> • Medium Blocks • Sophisticated • Typically Buy and Hold
10/1/2028	2,920	5.000%	2.600%			
10/1/2029	3,065	5.000%	2.680%			
10/1/2030	3,215	5.000%	2.750%			
10/1/2031	3,375	5.000%	2.810%			
10/1/2032	3,440	5.000%	2.870%	Tier I	<ul style="list-style-type: none"> • Major Mutual Funds • Large Pension Funds • Insurance Companies • Large Trust Funds • Large Money Managers 	<ul style="list-style-type: none"> • Buy Large Blocks • Highly Sophisticated • Price and Duration • Actively Managed
10/1/2033	3,525	5.000%	2.920%			
10/1/2034	3,680	5.000%	2.970%			
10/1/2035	3,815	5.000%	3.010%			
10/1/2036	3,975	5.000%	3.050%			
10/1/2041	21,350	5.000%	3.190%			
10/1/2046	28,615	5.000%	3.300%			

Benefits of Retail Participation

Increasing retail participation in the municipal market may benefit both issuers and investors alike.

Marketing and Pricing

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Issuer Benefits

Retail investors expand overall buyer base, with potential to **increase demand** and **lower interest costs**

Retail can “**set the tone**” for pricing and sharpen institutional demand

Outreach and accommodations to local constituents can be **politically powerful message**

Engaging retail is **relatively straightforward**

Retail investors tend to be relatively **loyal to one brokerage firm**

Each firm that has retail investors adds distinct buyers

Retail Priorities

While many retail investors prefer par bonds, some more sophisticated participants in the municipal market understand and seek out premium and/or discount structures

Bifurcation of maturities can attract retail investors

Sufficient time and strong allocations are key drivers that keep retail investors engaged in the market

Putting retail first is a powerful message

Retail order period gives retail investors time to participate

Priority matters: Discouraging for retail investors when allocations are cut back or unfilled

Syndicate policies

Senior Manager, Municipal Advisor and Issuer work together to set syndicate policies that synthesize issuer's goals and market demand

- Retail priority
 - ▣ Local?
 - ▣ In state
 - ▣ National
- Professional Retail
- Group Net vs Net Designated

Pre-Marketing: Structure Wire

- Three or four days prior to the sale date, the underwriter will put out a “structure wire”
- The primary purpose is to give the market a sense of maturity structure, rating and call features
- The wire goes out electronically to all other underwriters on the transaction as well as investors

UNLIMITED TAX SCHOOL BUILDING BONDS, SERIES 2019

STRUCTURE - WE ANTICIPATE PRICING THIS ISSUE ON WEDNESDAY JANUARY 30TH

** UNDERLYING RATINGS SHOULD BE CONFIRMED LATER TODAY **

POS LINK: <http://www.i-dealprospectus.com/api/PdfDownload/81526?action=Get>

MOODY'S: Aaa S&P: FITCH: AAA
Aa2 Expected AA Expected

Permanent School Fund Guarantee Program Insured

DATED:01/15/2019 FIRST COUPON:08/15/2019 INTEREST ACCRUES:02/21/2019

DUE: 08/15

MATURITY	AMOUNT*	COUPON
08/15/2027	450M	
08/15/2028	4,200M	
08/15/2029	895M	
08/15/2030	2,325M	
08/15/2031	2,080M	
08/15/2032	1,825M	
08/15/2033	1,550M	
08/15/2034	16,905M	
08/15/2035	17,780M	
08/15/2036	18,135M	
08/15/2037	18,820M	
08/15/2038	19,600M	
08/15/2039	20,590M	
08/15/2043	105,620M	

CALL FEATURES: Optional call in 02/15/2028 @ 100.00

Sinking Fund Schedule

2043 Term Bond

08/15/2040	21,635M
08/15/2041	22,790M
08/15/2042	23,880M
08/15/2043	27,975M

* - APPROXIMATE SUBJECT TO CHANGE

Retail Wire/Pre-Marketing Scale

- With spreads in hand, a Retail Wire (if there's a retail order period) or the pre-pricing scale, and indications of interest are officially placed
- The primary purpose is to take retail orders ahead of institutional orders and to aggressively seek institutional investor feedback

We have a release for the Retail order Period. We will take orders until 5:00PM, Eastern.

 POS Link: <https://www.munios.com/munios-notice.aspx?i=KYI8FoU1xUr4>

Investor Roadshow Link: <https://www.munios.com/munios-notice.aspx?i=KYI8F2R0xUr4>

\$ 237,820,000*
 2018 Series B

MOODY'S: Aa2 S&P: AA FITCH: AA

DATED:11/01/2018 FIRST COUPON:01/01/2019

DUE: 01/01 & 07/01

MATURITY	AMOUNT*	COUPON	PRICE	ADD'L TAKEDOWN (Pts)
01/01/2022	10,000M	4.00%	2.00	0.15
	(Approx. \$ Price PTC 12/01/2021		105.950	Approx. YTM 2.049)
01/01/2022	65,000M	5.00%	2.00	0.15
	(Approx. \$ Price PTC 12/01/2021		108.925	Approx. YTM 2.073)
01/01/2023	40,705M	5.00%	2.08	0.15
	(Approx. \$ Price PTC 12/01/2022		111.372	Approx. YTM 2.132)
01/01/2024	5,000M	3.00%	2.17	0.15
	(Approx. \$ Price PTC 12/01/2023		103.973	Approx. YTM 2.182)
01/01/2024	35,705M	5.00%	2.17	0.15
	(Approx. \$ Price PTC 12/01/2023		113.549	Approx. YTM 2.210)
07/01/2025	40,705M	5.00%	2.29	0.15
	(Approx. \$ Price PTC 06/01/2025		116.471	Approx. YTM 2.319)
07/01/2026	5,000M	3.00%	2.40	0.15
	(Approx. \$ Price PTC 06/01/2026		104.136	Approx. YTM 2.406)
07/01/2026	35,705M	5.00%	2.40	0.15
	(Approx. \$ Price PTC 06/01/2026		117.926	Approx. YTM 2.423)

CALL FEATURES:

EXCEPT:

01/01/2022	Optional call in 12/01/2021 @ 100.00	Coupon: 4.000
01/01/2022	Optional call in 12/01/2021 @ 100.00	Coupon: 5.000
01/01/2023	Optional call in 12/01/2022 @ 100.00	
01/01/2024	Optional call in 12/01/2023 @ 100.00	Coupon: 3.000
01/01/2024	Optional call in 12/01/2023 @ 100.00	Coupon: 5.000
07/01/2025	Optional call in 06/01/2025 @ 100.00	
07/01/2026	Optional call in 06/01/2026 @ 100.00	Coupon: 3.000
07/01/2026	Optional call in 06/01/2026 @ 100.00	Coupon: 5.000

Preliminary Pricing Wire

- The preliminary pricing wire – which is published first thing on the morning of pricing – officially opens the order period to all investors
- The underwriter will accept orders for bonds at these prices and yields
- Market demand may alter coupon or yield for any given maturity

WE HAVE A RELEASE FOR THE PRELIMINARY PRICING. WE WILL ACCEPT ORDERS UNTIL 10:00AM, EASTERN.

POS Link: <https://www.munios.com/munios-notice.aspx?i=KY18FoU1xUr4>

Investor Roadshow Link: <https://www.munios.com/munios-notice.aspx?i=KY18F2R0xUr4>

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01/01/2023 Optional call in 12/01/2022 @ 100.00

Order Monitor

- Most underwriting firms subscribe to Ipreo, an electronic securities platform providing a number of tools for the capital markets
- Underwriters will use Ipreo to accept and monitor orders, among other things
- Issuers gain access to the platform on the internet through their underwriter, allowing them and their advisors to monitor the book of business as it's developing throughout the pricing

Order Monitor – Book of Business

Marketing and Pricing

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Maturity	Amount	Total Member Retail (\$000's)	Total Member Non-Retail (\$000's)	Total Member (\$000's)	Total (\$000's)	Balance (\$000's)
08/01/2018 16	\$ 685.00	\$ -	\$ 2,190.00	\$ 2,190.00	\$ 2,190.00	\$ (1,505.00)
08/01/2019 16	\$ 470.00	\$ -	\$ 2,165.00	\$ 2,165.00	\$ 2,165.00	\$ (1,695.00)
08/01/2020 16	\$ 480.00	\$ -	\$ 1,115.00	\$ 1,115.00	\$ 1,115.00	\$ (635.00)
08/01/2021 16	\$ 265.00	\$ -	\$ 1,075.00	\$ 1,075.00	\$ 1,075.00	\$ (810.00)
08/01/2022 16	\$ 275.00	\$ -	\$ 650.00	\$ 650.00	\$ 650.00	\$ (375.00)
08/01/2023 16	\$ 285.00	\$ -	\$ 320.00	\$ 320.00	\$ 320.00	\$ (35.00)
08/01/2024 16	\$ 300.00	\$ -	\$ 515.00	\$ 515.00	\$ 515.00	\$ (215.00)
08/01/2025 16	\$ 310.00	\$ -	\$ 1,200.00	\$ 1,200.00	\$ 1,200.00	\$ (890.00)
08/01/2026 16	\$ 320.00	\$ -	\$ 1,060.00	\$ 1,060.00	\$ 1,060.00	\$ (740.00)
08/01/2027 16	\$ 335.00	\$ -	\$ 1,185.00	\$ 1,185.00	\$ 1,185.00	\$ (850.00)
08/01/2028 16	\$ 350.00	\$ -	\$ 780.00	\$ 780.00	\$ 780.00	\$ (430.00)
08/01/2029 16	\$ 370.00	\$ -	\$ 200.00	\$ 200.00	\$ 200.00	\$ 170.00
08/01/2030 16	\$ 6,085.00	\$ -	\$ 13,140.00	\$ 13,140.00	\$ 13,140.00	\$ (7,055.00)
08/01/2031 16	\$ 6,385.00	\$ -	\$ 29,455.00	\$ 29,455.00	\$ 29,455.00	\$ (23,070.00)
08/01/2032 16	\$ 6,705.00	\$ -	\$ 25,755.00	\$ 25,755.00	\$ 25,755.00	\$ (19,050.00)
08/01/2033 16	\$ 7,045.00	\$ -	\$ 36,635.00	\$ 36,635.00	\$ 36,635.00	\$ (29,590.00)
08/01/2034 16	\$ 7,395.00	\$ -	\$ 31,685.00	\$ 31,685.00	\$ 31,685.00	\$ (24,290.00)
08/01/2035 16	\$ 7,765.00	\$ -	\$ 48,635.00	\$ 48,635.00	\$ 48,635.00	\$ (40,870.00)
08/01/2036 16	\$ 8,155.00	\$ -	\$ 76,490.00	\$ 76,490.00	\$ 76,490.00	\$ (68,335.00)
08/01/2042 16	\$ 56,760.00	\$ -	\$ 323,195.00	\$ 323,195.00	\$ 323,195.00	\$ (266,435.00)
08/01/2047 16	\$ 58,625.00	\$ -	\$ 298,550.00	\$ 298,550.00	\$ 298,550.00	\$ (239,925.00)
08/01/2019 B	\$ 2,325.00	\$ 6,125.00	\$ -	\$ 6,125.00	\$ 6,125.00	\$ (3,800.00)
08/01/2020 B	\$ 2,370.00	\$ 7,750.00	\$ -	\$ 7,750.00	\$ 7,750.00	\$ (5,380.00)
08/01/2021 B	\$ 2,415.00	\$ 3,430.00	\$ -	\$ 3,430.00	\$ 3,430.00	\$ (1,015.00)
08/01/2022 B	\$ 2,475.00	\$ 7,500.00	\$ -	\$ 7,500.00	\$ 7,500.00	\$ (5,025.00)
08/01/2023 B	\$ 3,800.00	\$ 12,265.00	\$ -	\$ 12,265.00	\$ 12,265.00	\$ (8,465.00)
08/01/2024 B	\$ 4,125.00	\$ 5,000.00	\$ -	\$ 5,000.00	\$ 5,000.00	\$ (875.00)
08/01/2025 B	\$ 4,605.00	\$ 5,350.00	\$ -	\$ 5,350.00	\$ 5,350.00	\$ (745.00)
08/01/2026 B	\$ 4,535.00	\$ 12,880.00	\$ -	\$ 12,880.00	\$ 12,880.00	\$ (8,345.00)
08/01/2027 B	\$ 4,900.00	\$ 10,000.00	\$ -	\$ 10,000.00	\$ 10,000.00	\$ (5,100.00)
08/01/2028 B	\$ 5,265.00	\$ 3,990.00	\$ -	\$ 3,990.00	\$ 3,990.00	\$ 1,275.00
08/01/2029 B	\$ 5,605.00	\$ 3,540.00	\$ -	\$ 3,540.00	\$ 3,540.00	\$ 2,065.00
08/01/2030 B	\$ 3,200.00	\$ 2,450.00	\$ -	\$ 2,450.00	\$ 2,450.00	\$ 750.00
08/01/2031 B	\$ 2,815.00	\$ 8,365.00	\$ 2,815.00	\$ 11,180.00	\$ 11,180.00	\$ (8,365.00)
08/01/2032 B	\$ 4,500.00	\$ 27,950.00	\$ 4,500.00	\$ 32,450.00	\$ 32,450.00	\$ (27,950.00)
08/01/2033 B	\$ 4,990.00	\$ 25,170.00	\$ 4,990.00	\$ 30,160.00	\$ 30,160.00	\$ (25,170.00)
08/01/2034 B	\$ 5,115.00	\$ 15,615.00	\$ 5,115.00	\$ 20,730.00	\$ 20,730.00	\$ (15,615.00)
08/01/2035 B	\$ 5,325.00	\$ 15,875.00	\$ 5,325.00	\$ 21,200.00	\$ 21,200.00	\$ (15,875.00)
08/01/2036 B	\$ 5,610.00	\$ 23,370.00	\$ 5,610.00	\$ 28,980.00	\$ 28,980.00	\$ (23,370.00)
08/01/2040 B	\$ 23,025.00	\$ 33,950.00	\$ 23,025.00	\$ 56,975.00	\$ 56,975.00	\$ (33,950.00)

Price Adjustments Before Award

- As the book of business develops through the order period, the underwriter may recommend adjusting prices to address demand
- These price adjustments are discussed and negotiated on the pricing call

Sale Date		1/11/18										
		Preliminary Pricing Levels				Investor Orders		Final Pricing Levels				
Maturity	Par (\$000)	Coupon	Spread	Yield	YTM	Orders (\$000)	Subscription	Coupon Change	Spread Reduction	Yield	YTM	
8/1/2019	\$2,000	2.00%	- 5 bps	1.45%	1.45%	\$4,820	2.4x		- 7 bps	- 2 bps	1.43%	1.43%
8/1/2020	\$450	3.00%	- 5 bps	1.52%	1.52%	\$1,600	3.6x		- 8 bps	- 3 bps	1.49%	1.49%
8/1/2021	\$625	4.00%	- 5 bps	1.56%	1.56%	\$2,365	3.8x		- 8 bps	- 3 bps	1.53%	1.53%
8/1/2022	\$245	4.00%	+ 0 bps	1.65%	1.65%	\$795	3.2x		- 3 bps	- 3 bps	1.62%	1.62%
8/1/2023	\$250	4.00%	+ 1 bps	1.74%	1.74%	\$565	2.3x		- 1 bps	- 2 bps	1.72%	1.72%
8/1/2024	\$260	4.00%	+ 2 bps	1.83%	1.83%	\$600	2.3x		+ 0 bps	- 2 bps	1.81%	1.81%
8/1/2025	\$630	4.00%	+ 3 bps	1.94%	1.94%	\$2,885	4.6x		- 1 bps	- 4 bps	1.90%	1.90%
8/1/2026	\$300	5.00%	+ 4 bps	2.05%	2.05%	\$590	2.0x		+ 2 bps	- 2 bps	2.03%	2.03%
8/1/2027	\$310	5.00%	+ 5 bps	2.14%	2.14%	\$1,125	3.6x		+ 2 bps	- 3 bps	2.11%	2.11%
8/1/2028	\$245	5.00%	+ 7 bps	2.23%	2.44%	\$460	1.9x		+ 6 bps	- 1 bps	2.22%	2.43%
8/1/2029	\$370	5.00%	+ 9 bps	2.32%	2.69%	\$425	1.1x		+ 9 bps		2.32%	2.69%
8/1/2030	\$700	5.00%	+ 10 bps	2.39%	2.88%	\$710	1.0x		+ 10 bps		2.39%	2.88%
8/1/2031	\$335	4.00%	+ 35 bps	2.69%	3.01%	\$495	1.5x		+ 35 bps		2.69%	3.01%
8/1/2032	\$510	4.00%	+ 40 bps	2.79%	3.13%	\$490	1.0x		+ 40 bps		2.79%	3.13%
8/1/2033	\$880	4.00%	+ 45 bps	2.90%	3.25%	\$820	0.9x		+ 45 bps		2.90%	3.25%
8/1/2034	\$645	4.00%	+ 50 bps	2.99%	3.34%	\$410	0.6x		+ 50 bps		2.99%	3.34%
8/1/2035	\$785	4.00%	+ 53 bps	3.05%	3.41%	\$1,010	1.3x		+ 53 bps		3.05%	3.41%
8/1/2036	\$940	3.125%	+ 75 bps	3.30%	3.30%	\$3,280	3.5x		+ 72 bps	- 3 bps	3.27%	3.27%
8/1/2037	\$1,095	4.000%	+ 55 bps	3.13%	3.49%	\$1,090	1.0x	3.125%	+ 72 bps	NA	3.30%	3.30%
8/1/2038	\$1,250	3.125%	+ 75 bps	3.36%	3.36%	\$4,750	3.8x		+ 72 bps	- 3 bps	3.33%	3.33%
8/1/2043	\$9,695	4.00%	+ 60 bps	3.27%	3.64%	\$14,000	1.4x		+ 57 bps	- 3 bps	3.24%	3.63%
8/1/2047	\$32,480	4.00%	+ 60 bps	3.31%	3.69%	\$87,730	2.7x		+ 57 bps	- 3 bps	3.28%	3.67%
TOTAL	\$55,000					\$131,015	2.4x					

Final/Commitment Wire

- The final/commitment wire shows:
 - Time of execution
 - negotiated structure
 - Maturities
 - prices for the bonds
 - Takedown
 - CUSIPs

WE HAVE RECEIVED THE WRITTEN AWARD. PLEASE NOTE THE AMOUNTS ARE FINAL.

Initial Trade: 10/11/2018

Date of Execution: 10/11/2018

Time of Execution: 11:00AM Eastern

\$ 240,845,000
2018 Series B

MOODY'S: Aa2 S&P: AA FITCH: AA

DATED:11/01/2018 FIRST COUPON:01/01/2019

DUE: 01/01 & 07/01

INITIAL TRADE DATE: 10/11/2018 @ 11:00AM Eastern

MATURITY	AMOUNT	COUPON	PRICE	ADD'L TAKEDOWN (Pts)	CUSIP
01/01/2022	15,000M	4.00%	2.00	0.15	5444954T8
	(Approx. \$ Price PTC 12/01/2021 105.950 Approx.				
YTM 2.049)					
01/01/2022	103,505M	5.00%	2.00	0.15	5444954U5
	(Approx. \$ Price PTC 12/01/2021 108.925 Approx.				
YTM 2.073)					
01/01/2023	30,000M	5.00%	2.06	0.15	5444954V3
	(Approx. \$ Price PTC 12/01/2022 111.455 Approx.				
YTM 2.113)					
01/01/2024	1,960M	3.00%	2.15	0.15	5444954W1
	(Approx. \$ Price PTC 12/01/2023 104.071 Approx.				
YTM 2.163)					
01/01/2024	30,000M	5.00%	2.15	0.15	5444954X9
	(Approx. \$ Price PTC 12/01/2023 113.652 Approx.				
YTM 2.190)					
07/01/2025	30,000M	5.00%	2.27	0.15	5444954Y7
	(Approx. \$ Price PTC 06/01/2025 116.604 Approx.				
YTM 2.299)					
07/01/2026	380M	3.00%	2.38	0.15	5444955A8
	(Approx. \$ Price PTC 06/01/2026 104.277 Approx.				
YTM 2.386)					
07/01/2026	30,000M	5.00%	2.38	0.15	5444954Z4
	(Approx. \$ Price PTC 06/01/2026 118.078 Approx.				
YTM 2.404)					

Conclusion

- We covered a lot of ground
 - ✓ Yield Curves
 - ✓ Coupons
 - ✓ Yields
 - ✓ Prices
 - ✓ Factors Influencing Prices
 - ✓ Credit Spreads
 - ✓ MMD and Comparables
 - ✓ Marketing Process
 - ✓ Order Books and Investors



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Citi

Citigroup Inc.

Headquarters:	New York, New York
Founded:	1812
Employees:	209,000
Customers:	200 million
Countries:	160
Assets:	\$1.8 trillion
Type:	Public (NYSE: C)

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CITIGROUP GLOBAL MARKETS INC.

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