

September 28, 2022

CDIAC Debt Essentials Seminar

Session 4 - Group Exercise: Bond Pricing

Presented by:

Anna Sarabian, Principal
(949) 660-7308
asarabian@fieldman.com



Holly Vocal, Managing Director
(415) 913-2327
holly.vocal@bofa.com



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Outline

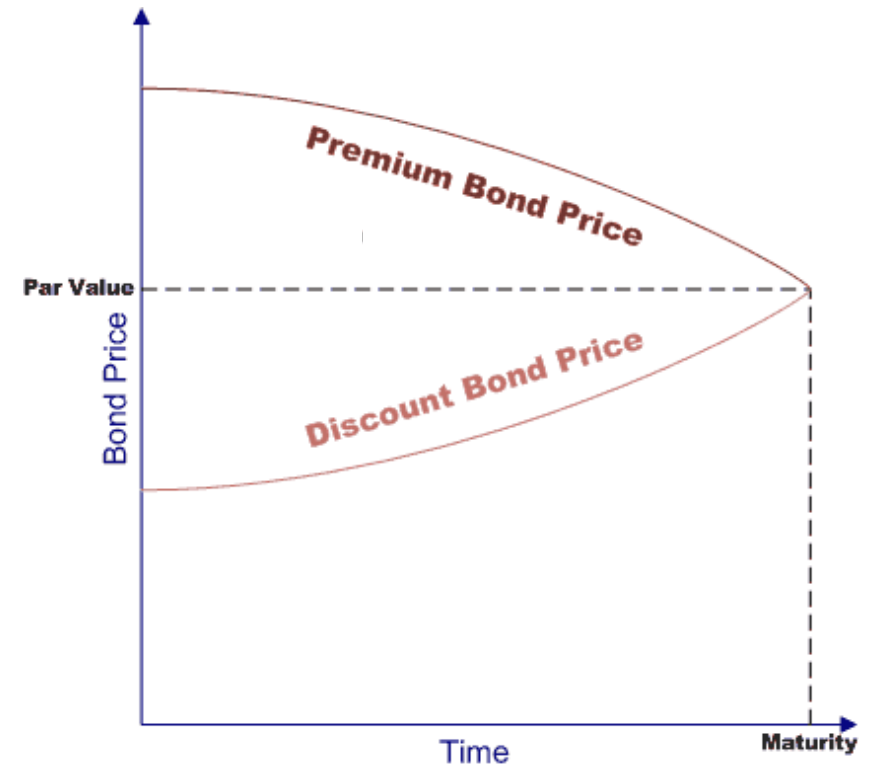
- I. Review of Fundamentals
- II. Pre-Pricing Day (Exercises A & B)
- III. Pricing Day (Exercise C)
- IV. Final Thoughts and Conclusion

Introduction

- ❖ Your perspective as an issuer
 - You must live with the issue on a long-term basis
 - The underwriter facilitates access to investors
 - Investor relations should play a role in the process

Review of Bond Pricing Terminology

- ❖ **“Price”** represents the discounted present value of debt service on an individual maturity
 - Debt service is calculated using the coupon, then discounted at the yield
- ❖ **“Yield”** is the rate that equates the present value of the future cash flows to the amount paid for the bond
 - “Yield-to-Maturity” (YTM)
 - “Yield-to-Call” (YTC)
 - Bonds are sold at the “Price-to-the-Worst”
- ❖ **“Premium Bonds”** - Coupon rate is greater than market yield. Price is greater than the par value of the bond
- ❖ **“Discount Bonds”** - Coupon rate is less than market yield. Price is less than the par value of the bond
- ❖ **“Par Bonds”** - Coupon rate equals market yield. Price is equal to the par value of the bond



Serial Bonds vs. Term Bonds

Serial Bonds	Term Bonds
Principal installments that mature every year over a period of consecutive years.	A series of principal installments that mature on a single date.
No sinking fund payments.	Annual sinking fund payments are made which are used to call bonds (selected by lot) prior to maturity at par.
Each serial bond is structured separately with a specific coupon / yield / price.	All the bonds are structured with the same coupon / yield / price.
Favored by retail & institutional investors.	Favored by institutional investors.

Overview of Pricing Process

1. Developing a Sense of the Market

- Economic, FOMC, political news
- Rates, indices, etc.
- Supply and demand

2. Preliminary Pricing

- Recent issues
- Secondary market trades
- Competition
- Benchmarks

3. The Order Process

- Who's playing; who's not
- Prices at which orders are entered
- Negotiating
- "Bid" to purchase

Identifying Market Trends

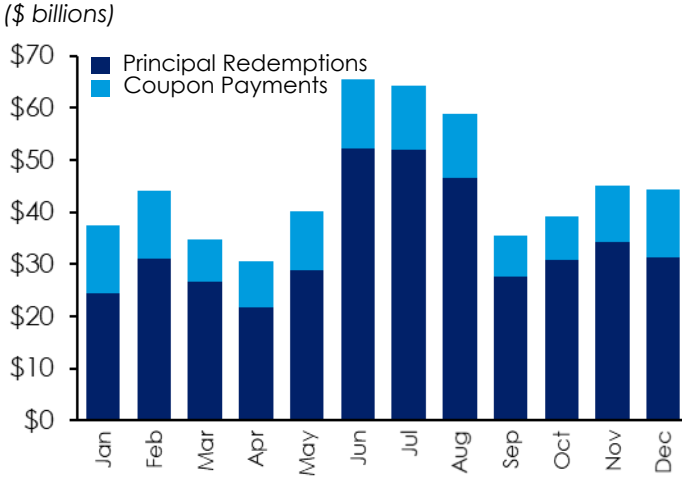
- ❖ Technical vs. fundamental factors
 - Technical = supply and demand
 - Fundamental = economics and interest rates
- ❖ Forward supply
 - Current inventory (what's currently for sale)
 - Visible supply ("snapshot" of what's coming in next 30 days)
- ❖ Distribution of issues in market
 - By rating
 - By region or state
 - By size
 - By tax status

Municipal Market Technicals

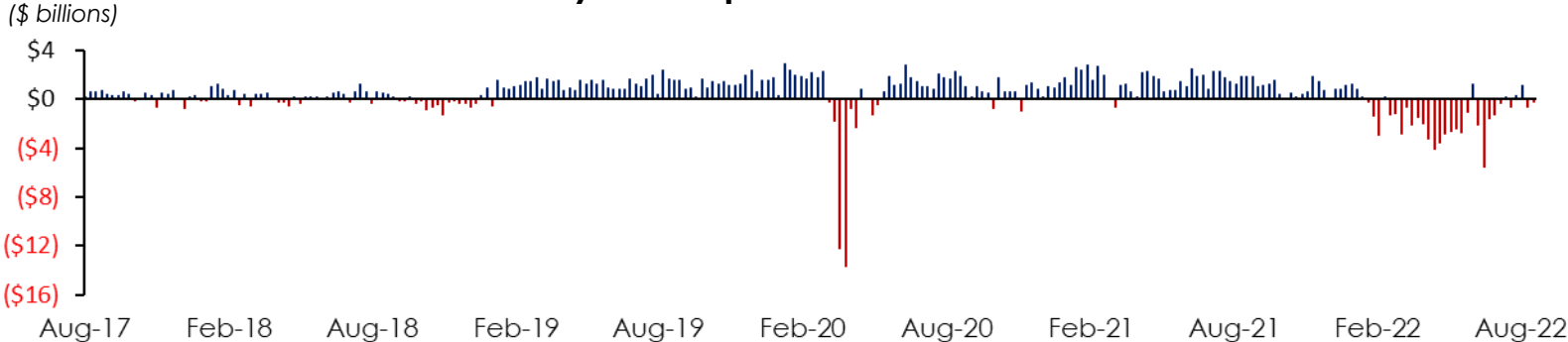
Projected Municipal Bond Issuance⁽¹⁾



Projected National Redemptions⁽¹⁾



Weekly Municipal Bond Fund Flows⁽²⁾



(1) Source: Thomson Reuters and IPREO calendar as of 8/19/22; excludes notes and private placements
 (2) Source: Lipper U.S. Fund Flows as of 8/19/22; data includes weekly reporting funds

Economic Calendar

August 2022						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

September 2022						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

■ Holiday

Source: BofA Securities
Global Research

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
22	23 New Home Sales	24 Durable Goods Orders Pending Home Sales	25 GDP	26 Advance Goods Trade Balance Personal Income & Outlays U. Of Mich Sentiment
29	30 S&P CoreLogic CS HPI Conference Board Confidence	31 ADP Employment Chicago PMI	September 1st Productivity & Costs IHS-Markit manufacturing ISM manufacturing Construction Spending Wards Auto Sales	2 Employment Report
5 Labor Day	6 IHS- Markit services ISM services	7 Trade Balance Fed's Beige Book	8 Consumer credit	9 Wholesale Inventories
12	13 NFIB Small Bus. Optimism Consumer Price Index Monthly Budget Statement	14 Producer Price Index	15 Retail Sales Empire Manufacturing Import Price Index Philly Fed Industrial Production Business Inventories	16 U. Of Mich Sentiment
19 NAHB Housing Index	20 Housing Starts & Permits	21 Existing Home Sales FOMC Rates Decision	22	23

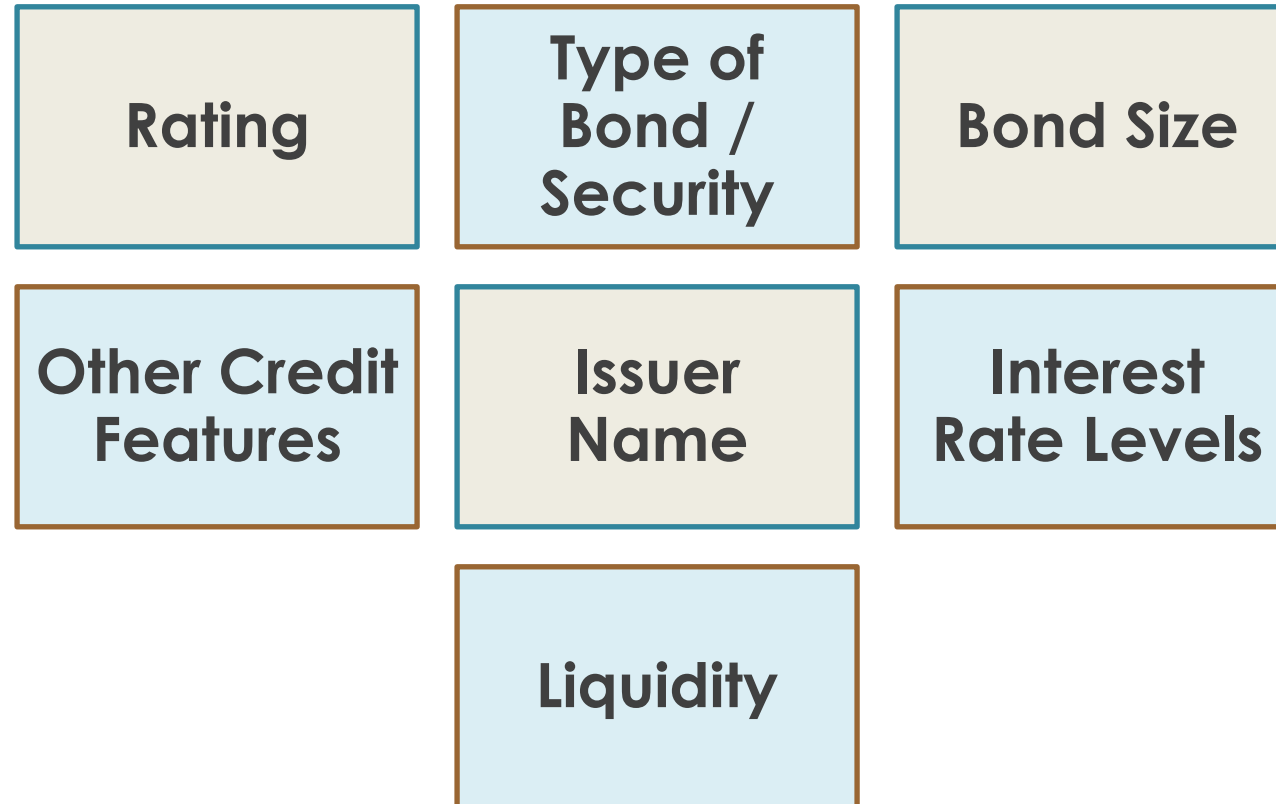
How Tax-Exempt Interest Rates are Set

$$\begin{array}{ccc} \begin{array}{c} \text{Comparable} \\ \text{"AAA" MMD} \\ \text{Rate} \\ \text{[A]} \end{array} & + & \begin{array}{c} \text{Additional} \\ \text{Interest Rate} \\ \text{Credit Spread} \\ \text{[B]} \end{array} & = & \begin{array}{c} \text{Tax-Exempt} \\ \text{Interest Rate} \\ \text{[A+B]} \end{array} \end{array}$$

- ❖ **"MMD"** – The benchmark interest rate for a "AAA" tax-exempt bond (interest earned by the investor is "triple tax-exempt")
 - Municipal Market Data is a private company
 - Compiled and adjusted on a daily basis
 - Released to the market after 12 noon (Pacific)
- ❖ **"Spread"** – The additional interest rate over MMD that investors require for the added risk associated with a particular bond

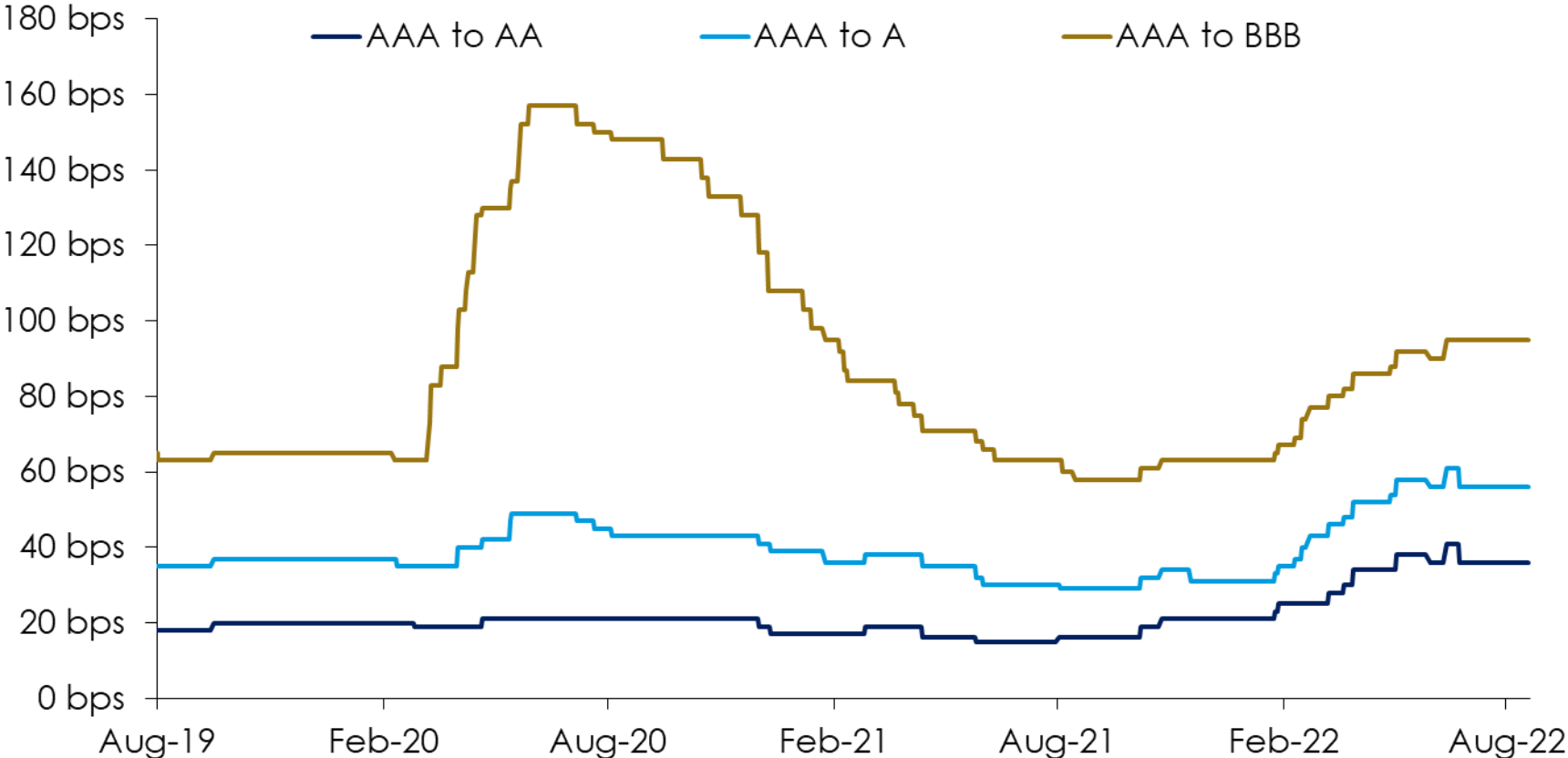
Factors that Impact Credit Spreads

- ❖ Several factors impact credit spreads, such as:



MMD Credit Spreads

Tax-Exempt Credit Spreads (30-Year)

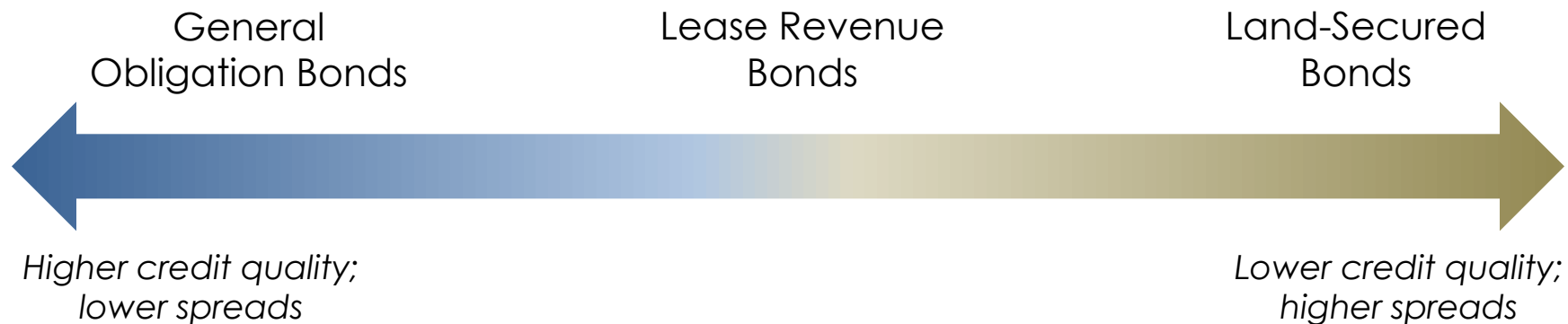


Source: Thomson Municipal Market Monitor

Spreads Between Types of Bonds

- ❖ In general, credit spreads can vary based on the type of bond (or security of the bond) for the same rating category

Types of Bonds – General Credit Spectrum



- ❖ Tax-exempt spread to MMD
- ❖ Taxable spread to U.S. Treasuries

How to Use Pricing Comparables

- ❖ Pricing comparables (or “pricing comps”) may help you evaluate the proposed and final market pricing levels for your bonds
- ❖ Relevant pricing comps have similar characteristics (bond type, rating, size, etc.) to your bonds
 - Understand “the story” behind comparable transactions
 - Timing of sales / sale date is important
- ❖ If similar financings are limited, other issues may be used as a comp based on spread relationships
- ❖ Pricing comparables may not be relevant based on market conditions

Understanding the Pricing Comps

- ❖ Comparison of **Spread to MMD** (tax-exempt) or **Spread to US Treasuries** (taxable)

Hypothetical Pricing Comparables

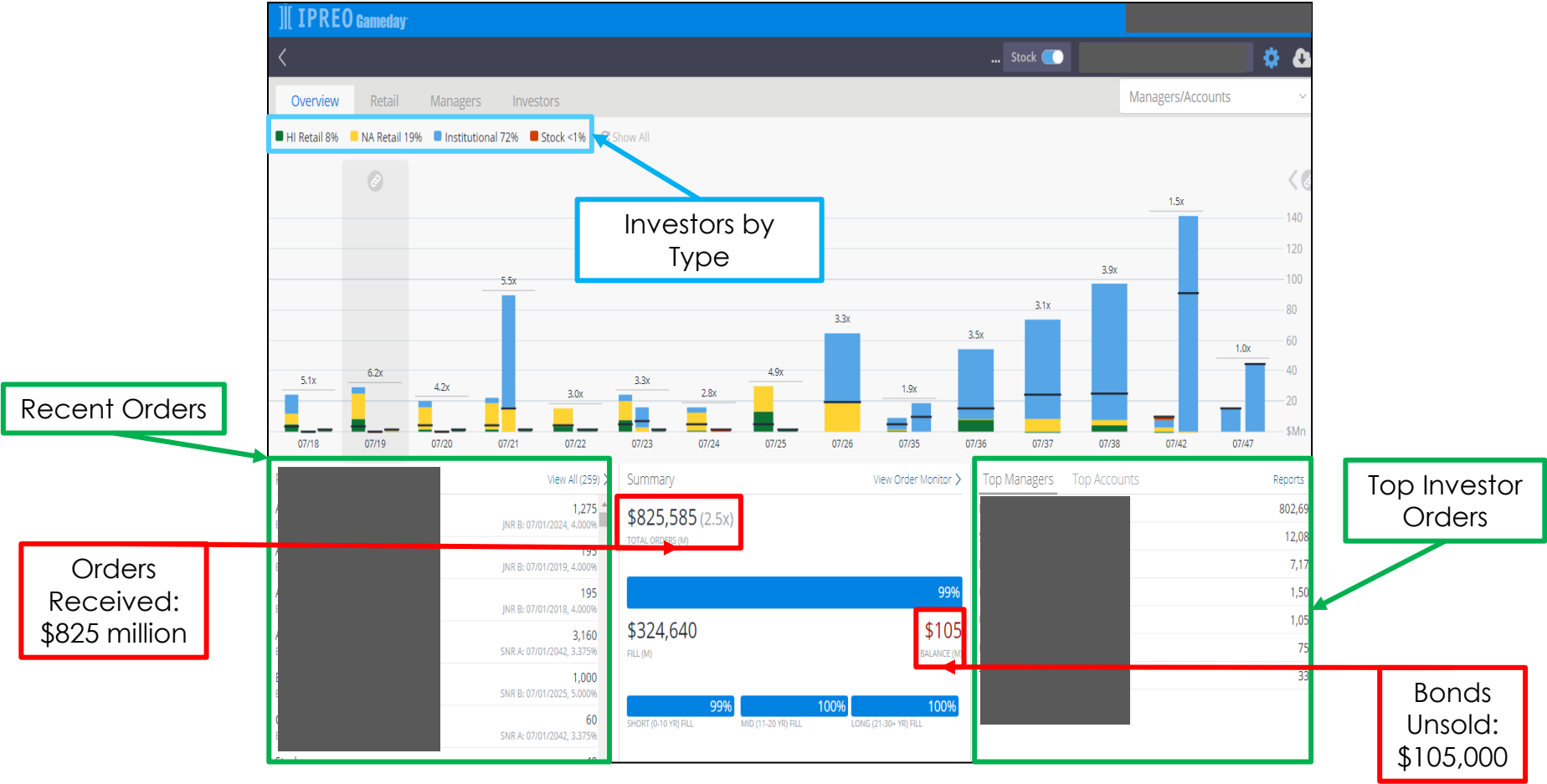
Par Amount		\$25,000,000			\$25,000,000			\$500,000,000			\$25,000,000		
Issue		General Obligation Bonds			General Obligation Bonds			General Obligation Bonds			General Obligation Bonds		
Issuer		California City A			California City B			California City C			California City D		
Tax Status		Tax-exempt			Tax-exempt			Tax-exempt			Tax-exempt		
Call Feature		2032 at 100%			2032 at 100%			2032 at 100%			2032 at 100%		
Principal Date		1-Jun			1-Jun			1-Jun			1-Jun		
Ratings		Aa/AA/AA			A2/A/A			A2/A/A			Baa2/BBB/BBB		
Maturity	MMD as of 8/26/22 ⁽¹⁾	Coupon	Yield	Spread to MMD (bps)	Coupon	Yield	Spread to MMD (bps)	Coupon	Yield	Spread to MMD (bps)	Coupon	Yield	Spread to MMD (bps)
2023	2.19%	5.00%	2.21%	2	5.00%	2.26%	7	5.00%	2.31%	12	5.00%	2.74%	55
2024	2.20%	5.00%	2.23%	3	5.00%	2.29%	9	5.00%	2.34%	14	5.00%	2.80%	60
2025	2.23%	5.00%	2.27%	4	5.00%	2.34%	11	5.00%	2.39%	16	5.00%	2.88%	65
2026	2.24%	5.00%	2.30%	6	5.00%	2.38%	14	5.00%	2.43%	19	5.00%	2.94%	70
2027	2.26%	5.00%	2.34%	8	5.00%	2.43%	17	5.00%	2.48%	22	5.00%	3.01%	75
2028	2.27%	5.00%	2.37%	10	5.00%	2.47%	20	5.00%	2.52%	25	5.00%	3.07%	80
2029	2.35%	5.00%	2.47%	12	5.00%	2.59%	24	5.00%	2.64%	29	5.00%	3.20%	85
2030	2.41%	5.00%	2.55%	14	5.00%	2.69%	28	5.00%	2.74%	33	5.00%	3.31%	90
2031	2.48%	5.00%	2.64%	16	5.00%	2.79%	31	5.00%	2.84%	36	5.00%	3.43%	95
2032	2.54%	5.00%	2.72%	18	5.00%	2.87%	33	5.00%	2.92%	38	5.00%	3.54%	100
2033	2.65%	5.00%	2.87%	22	5.00%	3.02%	37	5.00%	3.07%	42	5.00%	3.70%	105
2034	2.75%	5.00%	2.99%	24	5.00%	3.14%	39	5.00%	3.19%	44	5.00%	3.85%	110
2035	2.81%	5.00%	3.07%	26	5.00%	3.22%	41	5.00%	3.27%	46	5.00%	3.96%	115
2036	2.85%	5.00%	3.13%	28	5.00%	3.28%	43	5.00%	3.33%	48	5.00%	4.05%	120
2037	2.88%	5.00%	3.18%	30	5.00%	3.33%	45	5.00%	3.38%	50	5.00%	4.13%	125

(1) Source: Thomson Reuters
Interest rate spreads are shown for illustrative purposes. Preliminary; subject to change.

The Order Period

❖ Generally, issuers are able to monitor order flow during order period

Sample Municipal Monitor Order Book



Reviewing the Order Book

- ❖ After the order period, a final pricing proposal is made
- ❖ Final pricing proposal may reflect adjustments from the preliminary pricing scale based on market conditions, order book results and investor feedback

Maturities	Amounts (\$000's)	Orders (\$000's)	Subscription	Comments
2023 Serial	380	1,600	4.2x	Institutional (4 orders)
2024 Serial	410	1,390	3.4x	Retail (1 partial order); Institutional (3 orders)
2025 Serial	425	950	2.2x	Institutional (3 orders; 2 full)
2026 Serial	440	880	2.0x	Institutional (1 order)
2027 Serial	460	1,330	2.9x	Institutional (3 orders)
2028 Serial	475	475	1.0x	Institutional (1 order)
2029 Serial	500	500	1.0x	Institutional (1 order)

Receiving the Bid

- ❖ Critical information:
 - Strength of market
 - Quality of orders as well as quantity
 - How many bonds on the “street” after the award?
- ❖ What happens after the award is important
 - MSRB trade activity reporting system as a resource
 - Reports from the underwriter at syndicate/account closing

Typical Tax-Exempt Pricing Timeline

PRE-PRICING DAY

- **1:00 PM:** Underwriter Distributes Pre-Pricing Presentation (including Pricing Comps and Proposed Pre-Pricing Scale)
- **2:00 PM:** Hold Pre-Pricing Call with Issuer and Municipal Advisor

PRICING DAY

- **5:30 AM:** Review Market Conditions; Adjust Scale (as needed)
- **7:00 AM:** Release Scale; Open Bond Order Period
- **9:00 AM:** Close Bond Order Period
- **10:30AM:** Distribute Final Pricing Scale
- **11:00 AM:** Pricing Call; Receive “Verbal Award”
- **11:45 AM:** Receive Cash Flow Verification (in the case of a refunding)
- **12:00 PM:** Distribute Final Bond Cash Flows
- **12:00 PM:** Final Bond Purchase Agreement Distributed
- **12:30 PM:** Bond Purchase Agreement Signature Pages Released (“Written Award”); Orders Confirmed with All Investors

Pricing Process (Week of Pricing)

Review overall market conditions & municipal flows

Review recent bond comparables & trading levels

Develop “price thoughts” and provide market update to client

Pre-pricing call to develop consensus scale

Hold order period; review order book with client

Agree on final interest rate scale; confirm orders with investors

Questions?

