

February 14, 2019

CDIAC Debt Essentials Seminar

*Group Exercise and Discussion: Bond
Pricing*

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Outline

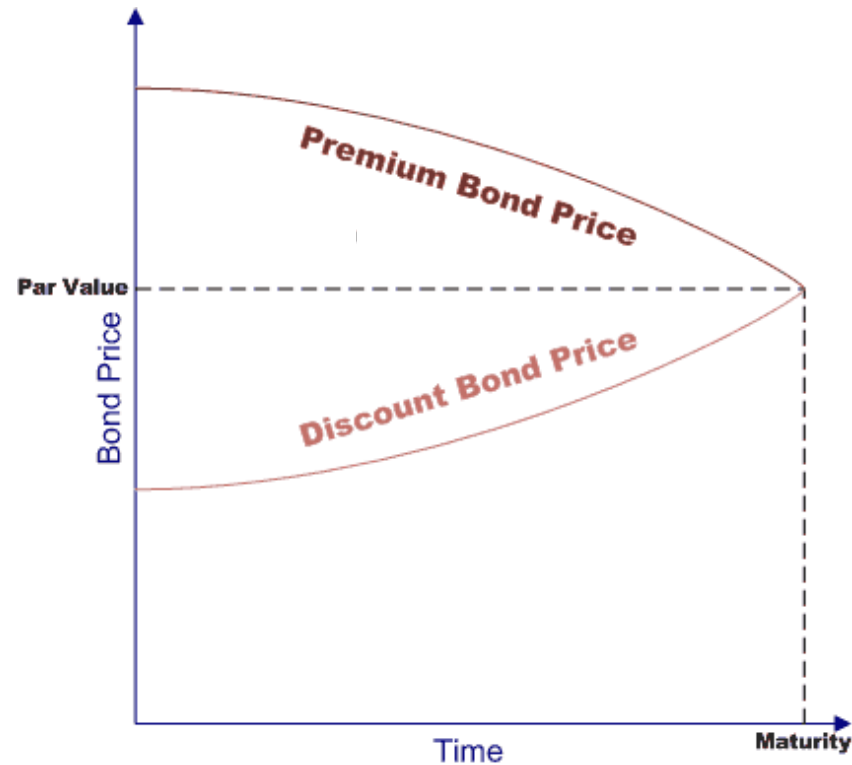
- I. Review of Fundamentals
- II. Pre-Pricing Day (Exercises A & B)
- III. Pricing Day (Exercise C)
- IV. Final Thoughts and Conclusion

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

- 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

Economic Calendar

January 2019						
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		

February 2019						
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		

■ Holiday

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
January 28 	29 Int'l Trade in Goods S&P Corelogic Case-Shiller HPI Consumer Confidence	30 ADP Employment Report GDP Pending Home Sales Index EIA Petroleum Status Report Fed Chair Press Conference FOMC Mtg Announcement	31 Jobless Claims Personal Income Employment Cost Index Chicago PMI EIA Natural Gas Report Fed Balance Sheet	February 1 Motor Vehicle Sales Employment Situation PMI Manufacturing Index ISM Mfg Index Construction Spending Consumer Sentiment
4 Factory Orders	5 Int'l Trade ISM Non-Mfg Index	6 Productivity and Costs EIA Petroleum Status Report	7 Jobless Claims EIA Natural Gas Report Fed Balance Sheet	8
11	12 JOLTS Treasury Budget	13 CPI EIA Petroleum Status Report	14 Jobless Claims PPI-FD EIA Natural Gas Report	15 Retail Sales Empire State Mfg Survey Import and Export Prices Industrial Production Business Inventories Consumer Sentiment Treasury Int'l Capital
18 Presidents' Day	19 Housing Market Index	20 Housing Starts FOMC Minutes	21 Jobless Claims Philly Fed Business Outlook Existing Home Sales EIA Natural Gas EIA Petroleum Status Report Fed Balance Sheet	22
25	25 S&P Corelogic Case-Shiller HPI New Home Sales Consumer Confidence	27 Durable Goods Orders Pending Home Sales Index EIA Petroleum Status Report	28 GDP Int'l Trade in Goods Jobless Claims Chicago PMI EIA Natural Gas Report	March 1 Motor Vehicle Sales Personal Income and Outlays PMI Manufacturing Index ISM Mfg Index Construction Spending Consumer Sentiment

Source: BofAML Global Research

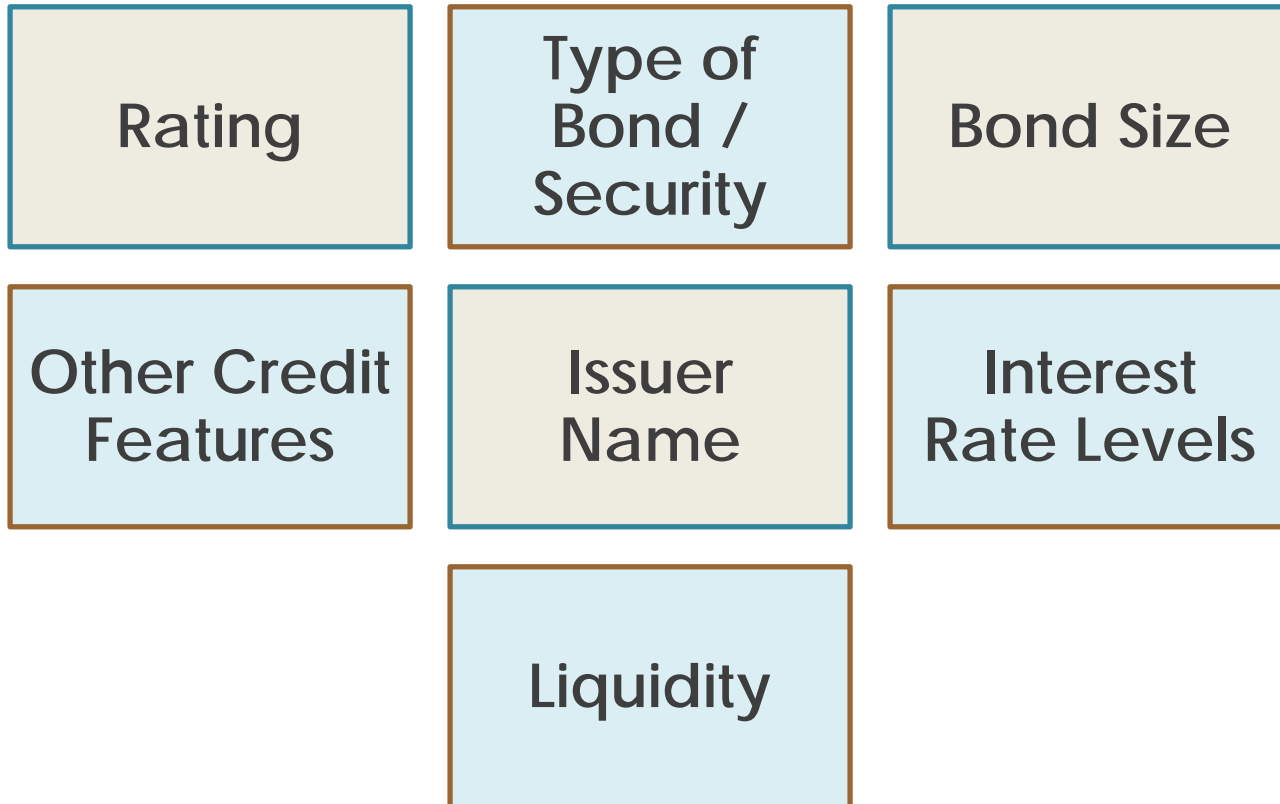
How Tax-Exempt Interest Rates are Set



- ❖ "MMD" – The benchmark interest rate for a "AAA" or a "perfect" 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

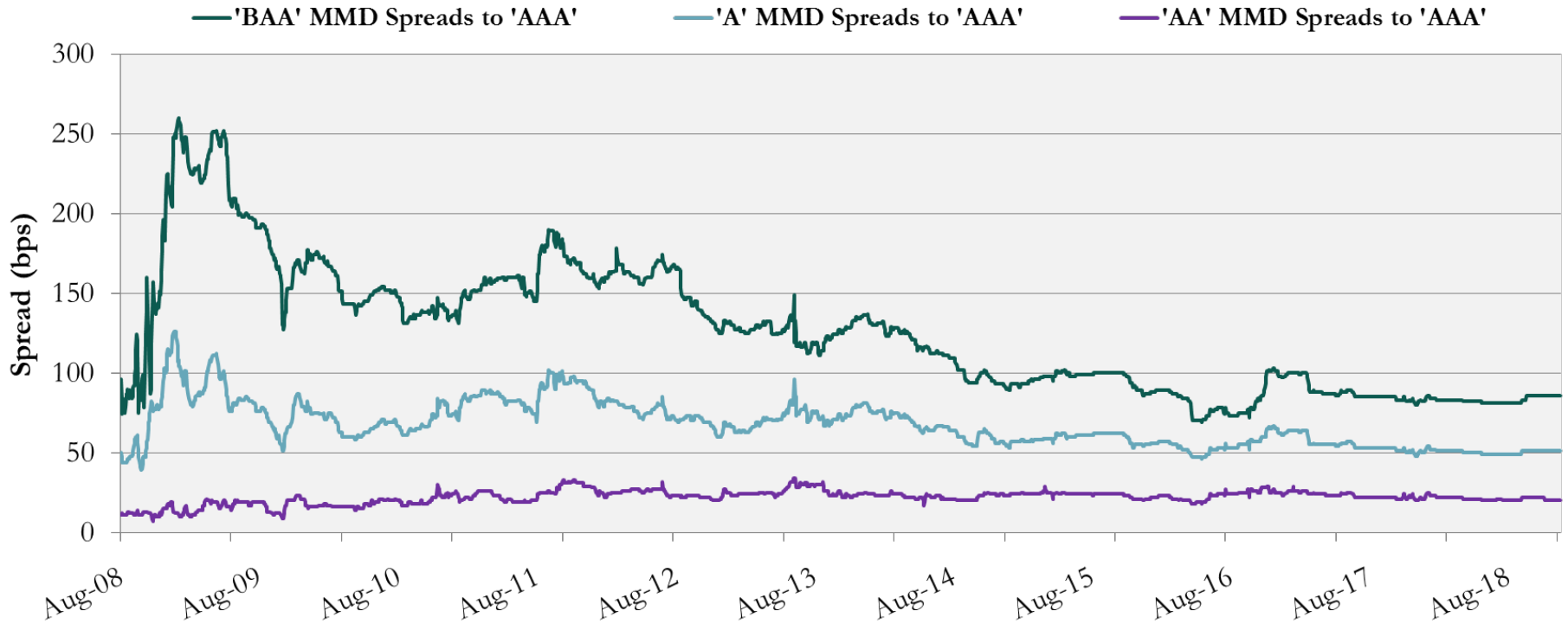
Factors that Impact Credit Spreads

- ❖ Several factors impact credit spreads, such as:



MMD Credit Spreads

30-Year MMD Credit Spreads (August 1, 2008 through January 18, 2019)



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 Treasuries

How to Use Pricing Comparables

- ❖ Pricing comparables (or “pricing comps”) 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

Understanding the Pricing Comps

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

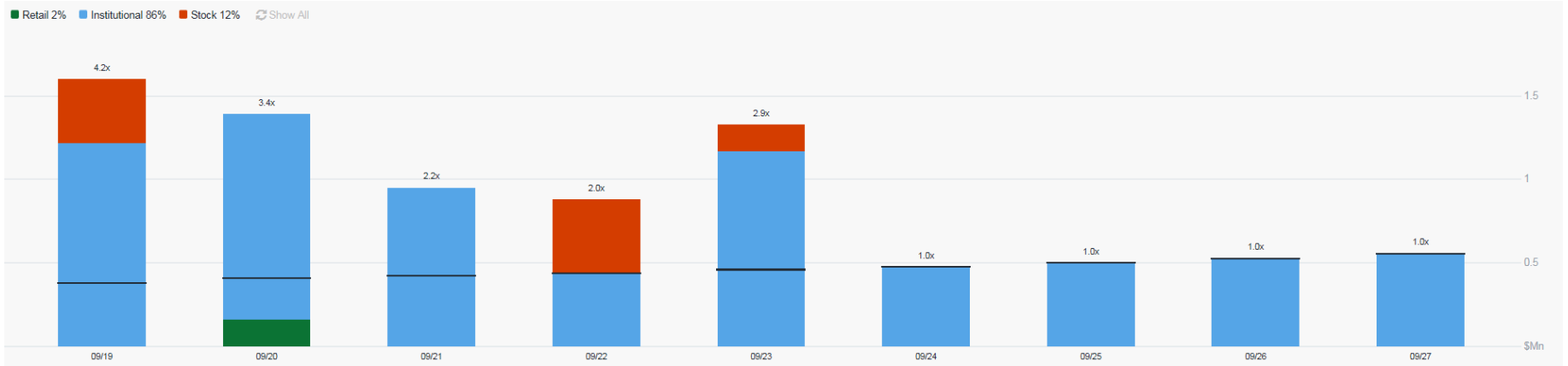
Hypothetical Pricing Comparables

Par Amount		\$25,000,000			\$25,000,000			\$300,000,000			\$25,000,000		
Issue		Lease Revenue Bonds			Lease Revenue Bonds			Lease Revenue Bonds			Lease Revenue 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		2029 at 100%			2029 at 100%			2029 at 100%			2029 at 100%		
Principal Date		1-Jun			1-Jun			1-Jun			1-Jun		
Ratings		Aa/AA/AA			A2/A/A			A2/A/A			Baa2/BB/BBB		
Maturity	MMD as of 1/31/2019	Coupon	Yield	Spread to MMD (bps)	Coupon	Yield	Spread to MMD (bps)	Coupon	Yield	Spread to MMD (bps)	Coupon	Yield	Spread to MMD (bps)
2020	1.63%	4.00%	1.51%	-12	4.00%	1.66%	3	4.00%	1.69%	6	4.00%	1.91%	28
2021	1.65%	5.00%	1.55%	-10	5.00%	1.70%	5	5.00%	1.73%	8	5.00%	1.95%	30
2022	1.67%	5.00%	1.59%	-8	5.00%	1.74%	7	5.00%	1.77%	10	5.00%	1.99%	32
2023	1.71%	5.00%	1.64%	-7	5.00%	1.79%	8	5.00%	1.82%	11	5.00%	2.04%	33
2024	1.76%	5.00%	1.71%	-5	5.00%	1.86%	10	5.00%	1.89%	13	5.00%	2.11%	35
2025	1.82%	5.00%	1.79%	-3	5.00%	1.94%	12	5.00%	1.97%	15	5.00%	2.19%	37
2026	1.89%	5.00%	1.89%	0	5.00%	2.04%	15	5.00%	2.07%	18	5.00%	2.29%	40
2027	1.98%	5.00%	2.01%	3	5.00%	2.16%	18	5.00%	2.19%	21	5.00%	2.41%	43
2028	2.07%	5.00%	2.14%	7	5.00%	2.29%	22	5.00%	2.32%	25	5.00%	2.54%	47
2029	2.17%	5.00%	2.27%	10	5.00%	2.42%	25	5.00%	2.45%	28	5.00%	2.67%	50

The Order Period

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

Sample Order Book



Recent Orders View All (22) >

First Foundation Advisors Piper Jaffray & Co	475 2019: 09/01/2024, 5.000%
First Foundation Advisors Piper Jaffray & Co	460 2019: 09/01/2023, 4.000%
First Foundation Advisors Piper Jaffray & Co	440 2019: 09/01/2022, 4.000%
First Foundation Advisors Piper Jaffray & Co	425 2019: 09/01/2021, 4.000%
First Foundation Advisors Piper Jaffray & Co	410 2019: 09/01/2020, 3.000%
First Foundation Advisors Piper Jaffray & Co	385 2019: 09/01/2019, 3.000%
US Trust Buyside	100

Summary View Order Monitor >

\$8,205 (2.0x)
TOTAL ORDERS (M)
\$4,170
FILL (M)
\$000
BALANCE (M)

Top Managers Top Accounts Reports >

First Foundation Advisors	2,595
WHITTIER TRUST COMPANY	1,285
BHII	1,080
Stock	985
FRANKLIN ADVISERS INC-SUBALOC	960
CNSI	790
Granite Capital Management, CA	250
Individuals	160
US Trust Buyside	100

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
2019 Serial	380	1,600	4.2x	Institutional (4 orders)
2020 Serial	410	1,390	3.4x	Retail (1 partial order); Institutional (3 orders)
2021 Serial	425	950	2.2x	Institutional (3 orders; 2 full)
2022 Serial	440	880	2.0x	Institutional (1 order)
2023 Serial	460	1,330	2.9x	Institutional (3 orders)
2024 Serial	475	475	1.0x	Institutional (1 order)
2025 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 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?

