

October 22, 2013

MUNICIPAL DEBT ESSENTIALS: BOND CONCEPTS AND OVERVIEW

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CDIAC

CALIFORNIA
DEBT AND
INVESTMENT
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Over 20 years in
government, law, investment
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Mergers & acquisitions,
general municipals, utilities,
K-12, transportation

California, Illinois, Michigan,
Ohio, Los Angeles, Detroit,
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government, financial
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General municipals, utilities,
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Today's
Discussion

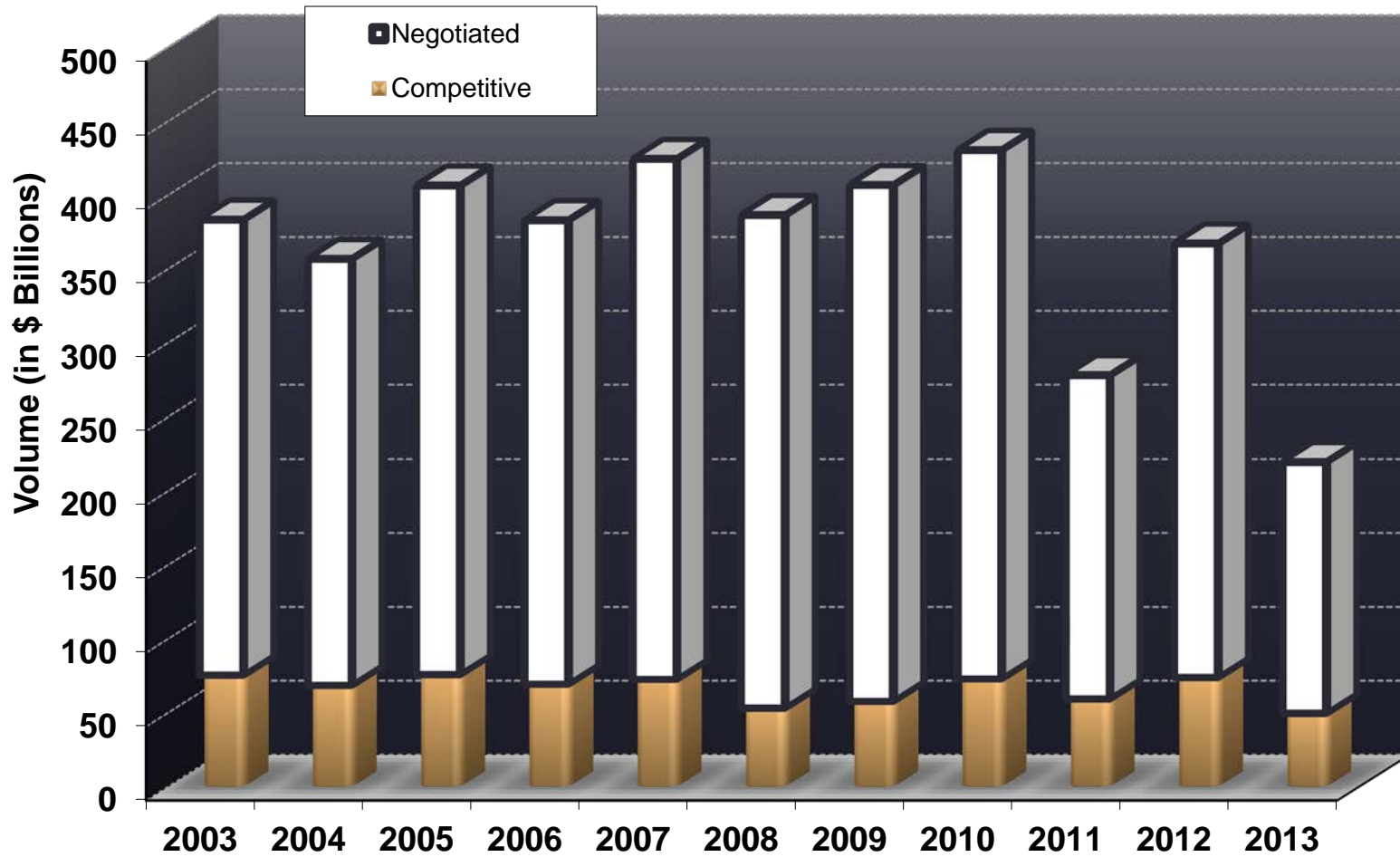


Municipal Market Overview

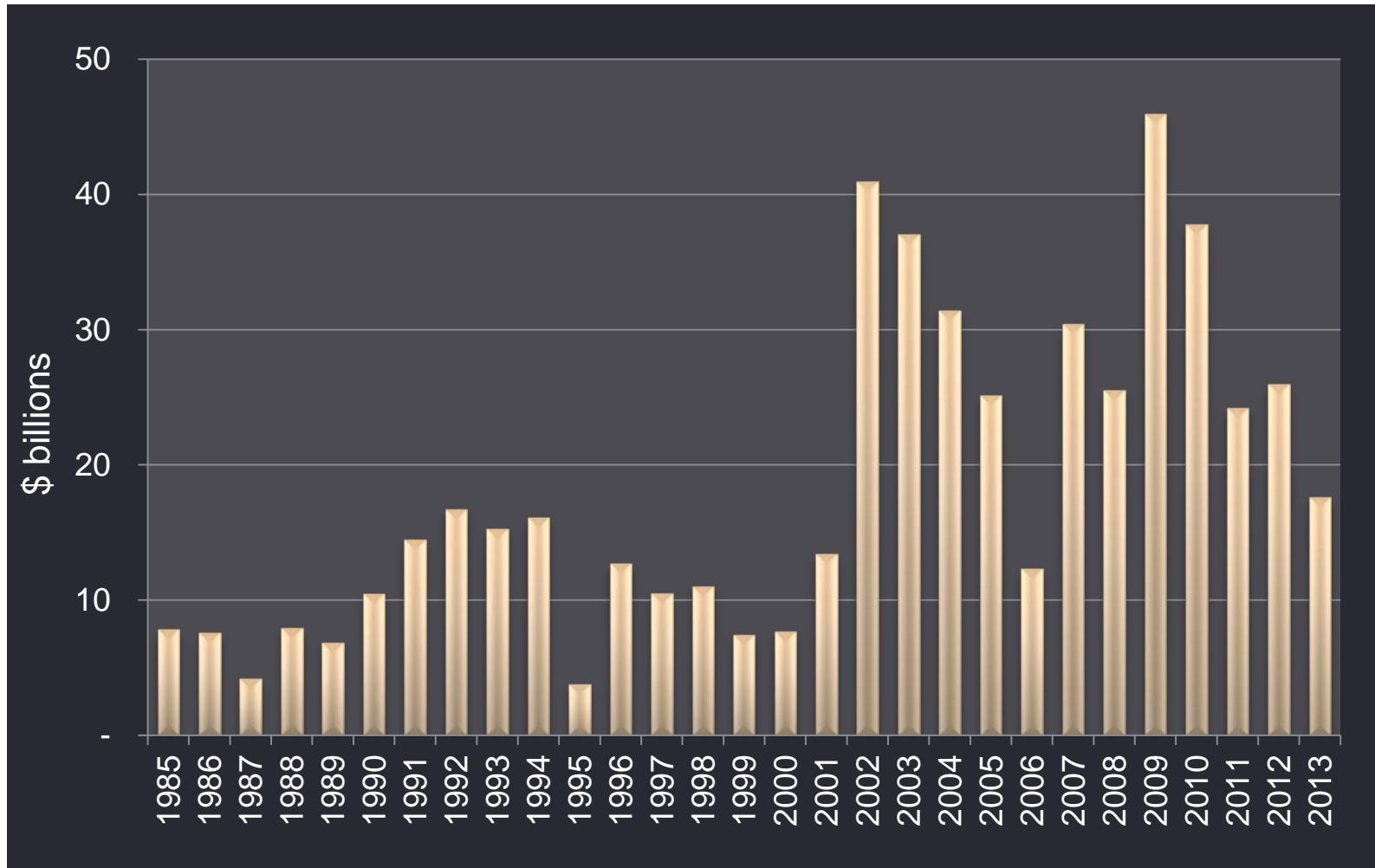
Introduction to
Municipal Bonds

Introduction to Bond
Math

Competitive and Negotiated Sales: 2003 through 08.31.2013

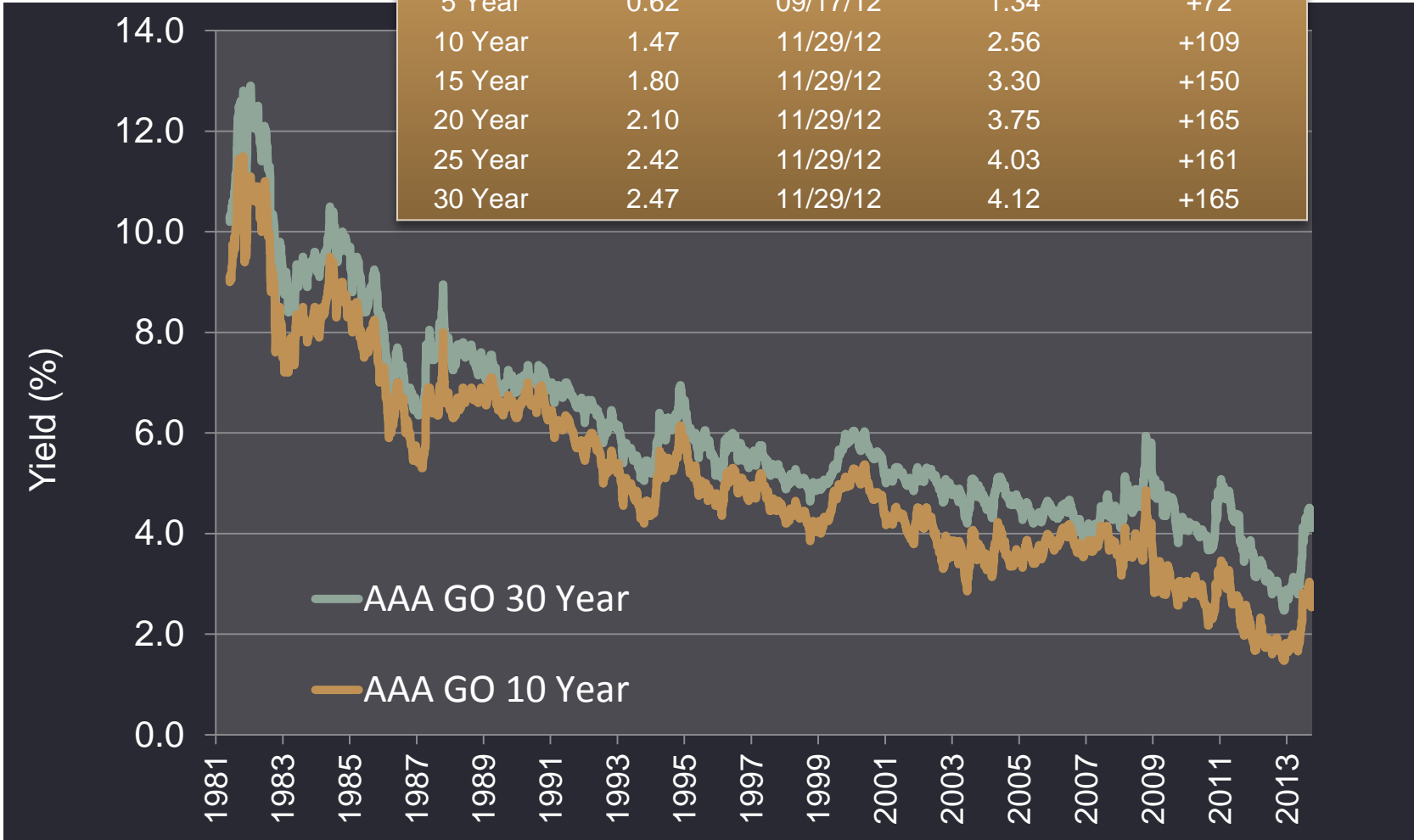


Volume: 1985 through 08.31.2013



Source: California Debt and Investment Advisory Commission

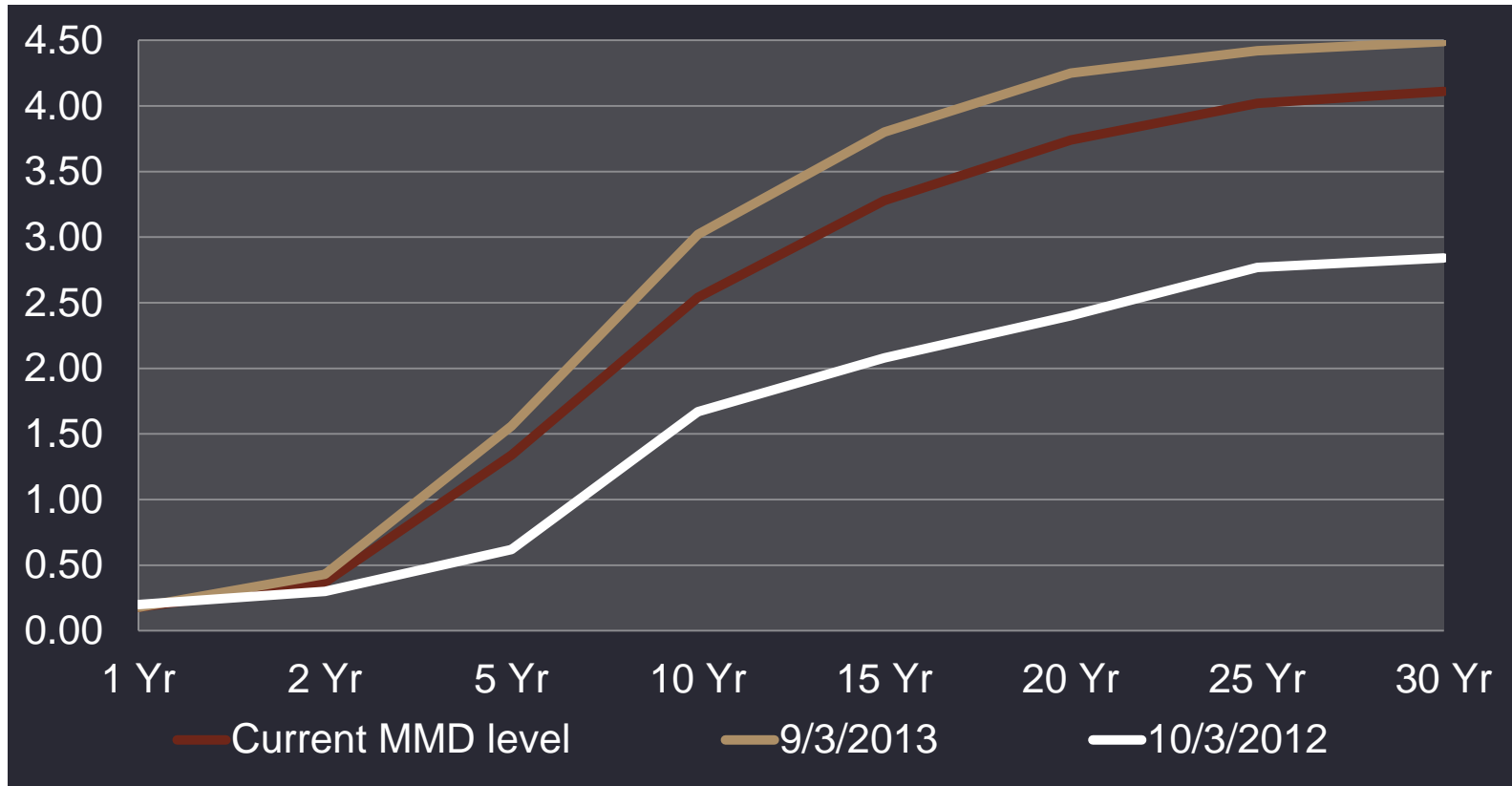
Maturity	Historic Low	Date Reached	Current MMD (10/01/13)	Difference (bps)
1 Year	0.18	02/02/12	0.18	+0
2 Year	0.26	02/17/12	0.37	+11
5 Year	0.62	09/17/12	1.34	+72
10 Year	1.47	11/29/12	2.56	+109
15 Year	1.80	11/29/12	3.30	+150
20 Year	2.10	11/29/12	3.75	+165
25 Year	2.42	11/29/12	4.03	+161
30 Year	2.47	11/29/12	4.12	+165



As of 9.3.2013

Current 30-year MMD is 164 bps above its all time low of 2.47%

- Municipal yields decreased in September post 4 months of yield increases
- Decreases largely attributable to FOMC's decision not to begin tapering its bond purchasing program thus slowing outflows from municipal bond funds



Today's
Discussion

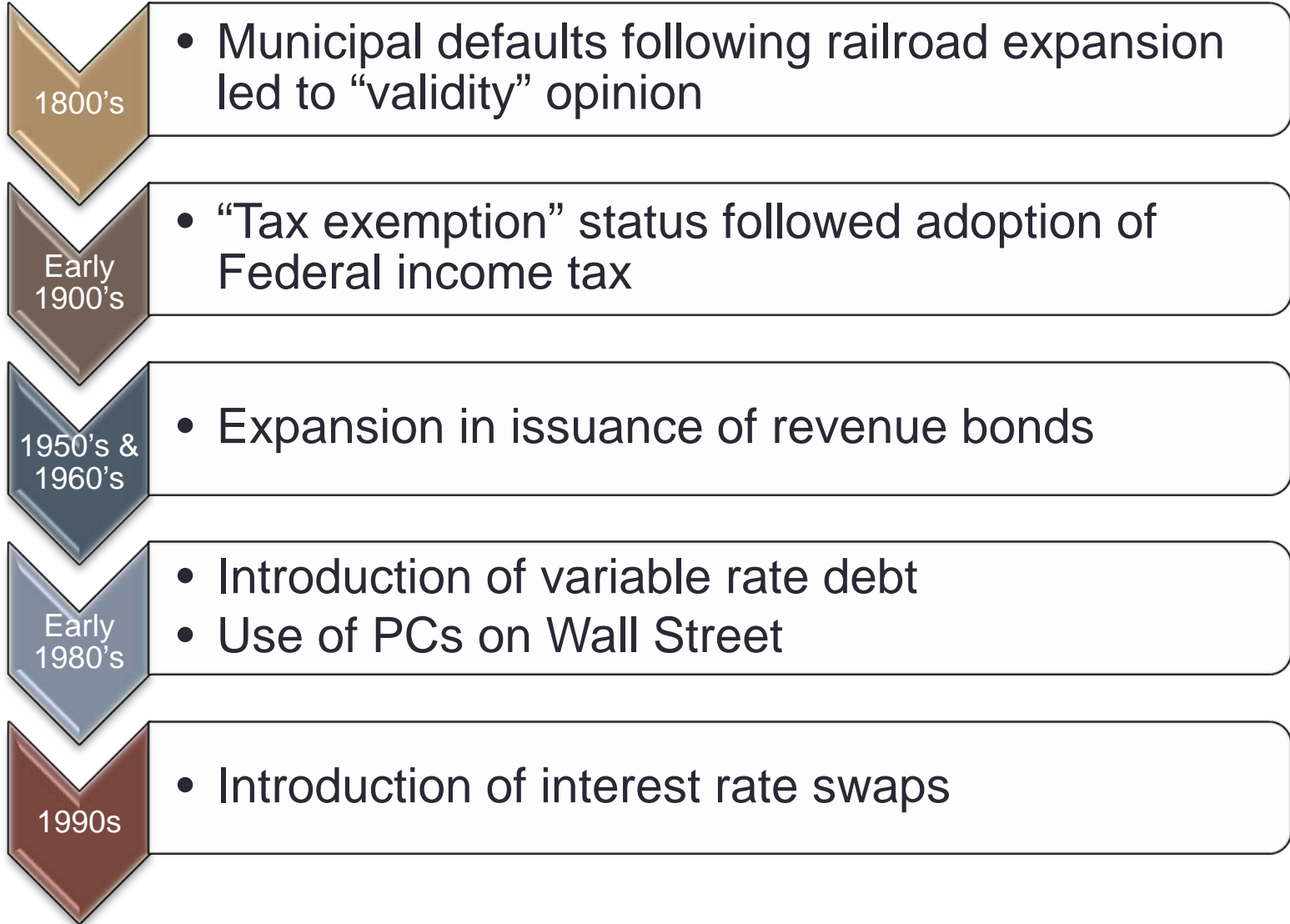
Municipal Market
Overview



Introduction to
Municipal Bonds

Introduction to Bond
Math

Local government in the U. S. have borrowed for several hundred years





What is a municipal bond?

- A **municipal bond** is a debt security issued by a public entity to finance (new money) or refinance (refunding) capital expenditures
- A municipal bond is a guaranteed series of **cash flows**
 - Cash flows made up of recurring “coupon” payments and a one-time “principal” payment
- **Coupon payments** compensate the investor for lending money to the bond issuer and are generally paid biannually on specified dates 6 months apart
- **Principal payment** returns the initial amount invested back to the investor on the bond’s maturity date

Why do we issue bonds?

- Pays for important infrastructure: communities we live in; schools our children attend; institutions that support our country
- More costly alternatives exist i.e., commercial banks
- Considerations: affordability, all users benefitting, share the cost



How do we issue bonds?

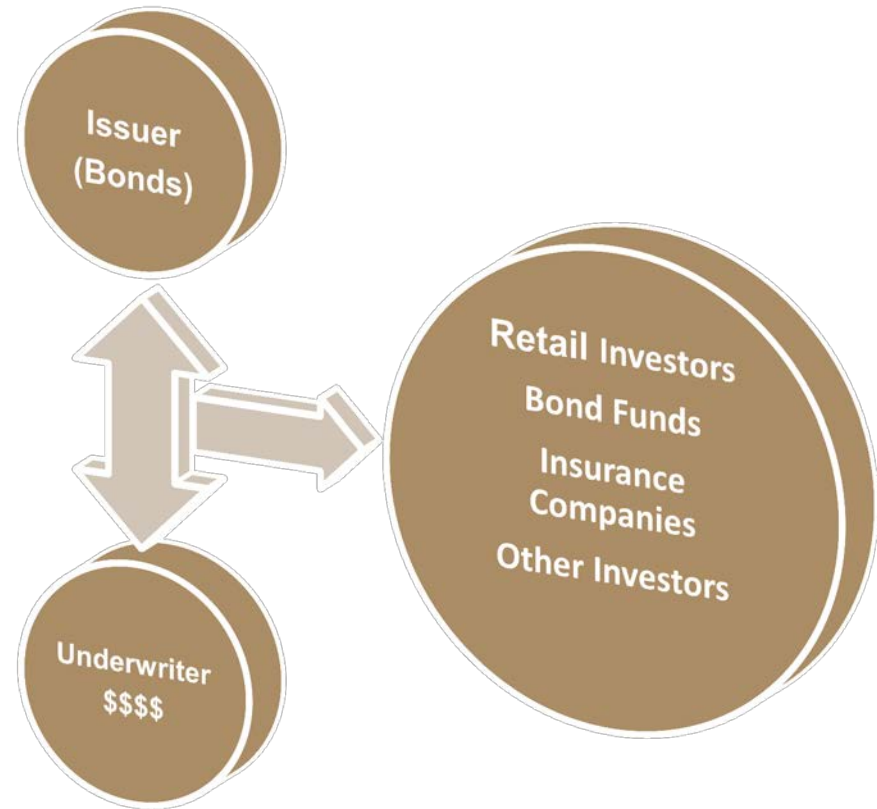
- Issuance of municipal bonds, a form of securities
- Issuers receive cash (proceeds) when bonds are issued in exchange for the payment of principal and interest over time
- Muni bonds sold in the public markets in \$5,000 increments
- Generally, the lowest cost of capital

Interest on Municipal Bonds is tax-exempt from Federal & State taxation

Tax-exempt interest more valuable to individuals in higher tax brackets

Process by which we issue bonds

- Financing team works to create marketable structure
- Legal framework establishes rights of bondholders and repayment process
- Disclosure provides information about the credit to potential investors
- Broker-dealers manage the sales process
 - Makes offer to issuer to buy bonds at certain prices on maturity-by maturity basis, based on investor demand



The issuer legally commits certain funds to repay the obligation

Tax Supported



- General Obligation
- Limited Obligation
- Special taxes (parcel)
- Mello Roos

Revenue Supported



- Water
- Electric
- Airport
- Sales Tax

Today's
Discussion

Municipal Market
Overview

Introduction to
Municipal Bonds



Introduction to Bond
Math

Understanding the math is important

Time value of money (PV, FV, compounding) and its applicability to pricing a bond

Understanding bond math will:

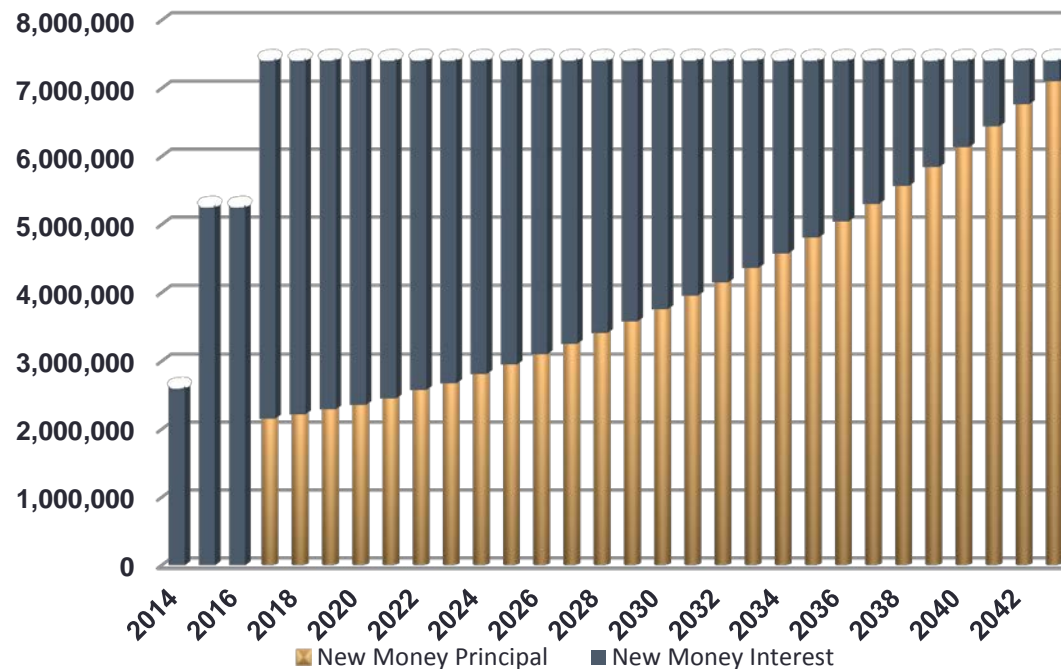
- ① Facilitate understanding of structuring options, and be able to compare the value of each alternative
- ② Enable customization of your plan of finance

Debt service concepts

- Principal: Par amount, face value, the amount to be repaid on the maturity date
 - ❑ Sold in principal denominations of \$,5000
- Maturity Date: Date on which principal payments are due
 - ❑ Bonds typically have maturing principal each year until the final maturity date (typically within 30 years)
- Coupon: Annual interest rate (%)
 - ❑ Typically different coupon rate for each maturity of a fixed rate bond
- Interest: Issuer's cost of borrowing money
 - ❑ Semi-annually for fixed rate bonds
 - ❑ More frequently for variable rate bonds
 - ❑ Interest calculated by multiplying principal by coupon (adjusted by period between payments)
- Yield: Percentage rate investor will earn; different than coupon rate based on price of bond
- Debt service: Sum of all principal and interest due

Amortization structures

1. **Level debt service** – most common (see chart below)
2. **Level principal** – may still be required in certain states
3. **Ascending** – typically used when revenues are expected to increase over time
4. **Descending** – infrequent. Makes for stronger debt structure



Current interest rates & investor preferences dictate modeling

- Premium bonds: > 100.0 (or above prevailing market rates)
 - ❑ Less price sensitive than bonds with lower coupons
 - ❑ Investor receives high current cash flows
- Discount bonds: < 100.0 (or below prevailing market rates)

Bond Pricing
2013 New Money

Level Debt Service

Maturity Date	Amount	Coupon	Yield	Price
6/1/2017	2,155,000	3.000%	0.960%	107.004
6/1/2018	2,220,000	3.000%	1.340%	107.225
6/1/2019	2,285,000	3.000%	1.650%	107.070
6/1/2020	2,355,000	4.000%	1.900%	112.783
6/1/2021	2,450,000	5.000%	2.180%	119.414
6/1/2022	2,570,000	4.000%	2.370%	112.482
6/1/2023	2,675,000	5.000%	2.540%	120.648
6/1/2024	2,810,000	5.000%	2.710%	120.805
6/1/2025	2,950,000	5.000%	2.860%	119.291
6/1/2026	3,095,000	5.000%	3.010%	117.801
6/1/2027	3,250,000	5.000%	3.150%	116.430
6/1/2028	3,410,000	5.000%	3.280%	115.174
6/1/2029	3,585,000	5.000%	3.410%	113.934

Rate investor earns

←

Premium Bonds

Serial and Term Bonds

- **Serial Bond:** A bond within an issue maturing on a specific date
- **Term Bond*:** A bond within an issue with multiple due dates, usually in consecutive years

Bond Component	Maturity Date	Principal	Coupon	Yield
Serial Bonds:	6/1/2025	2,950,000	5.000%	2.860%
	6/1/2026	3,095,000	5.000%	3.010%
	6/1/2027	3,250,000	5.000%	3.150%
	6/1/2028	3,410,000	5.000%	3.280%
	6/1/2029	3,585,000	5.000%	3.410%
	6/1/2030	3,760,000	5.000%	3.530%
	6/1/2031	3,950,000	5.000%	3.610%
	6/1/2032	4,150,000	5.000%	3.680%
Term Bonds 2038:	6/1/2033	4,355,000	5.000%	3.740%
	6/1/2034	4,575,000	5.000%	4.020%
	6/1/2035	4,800,000	5.000%	4.020%
	6/1/2036	5,040,000	5.000%	4.020%
	6/1/2037	5,295,000	5.000%	4.020%
	6/1/2038	5,560,000	5.000%	4.020%

**Issuer makes periodic payments to partially redeem sinking fund payments prior to maturity*

Mathematical models are used to develop debt service structure

Dated/Delivery Date: 12/31/13

Project Cost: \$100 million

Annual Debt Service: Level

Project Fund: Even draws: 24 mos.

Capitalized Interest: 24 months +

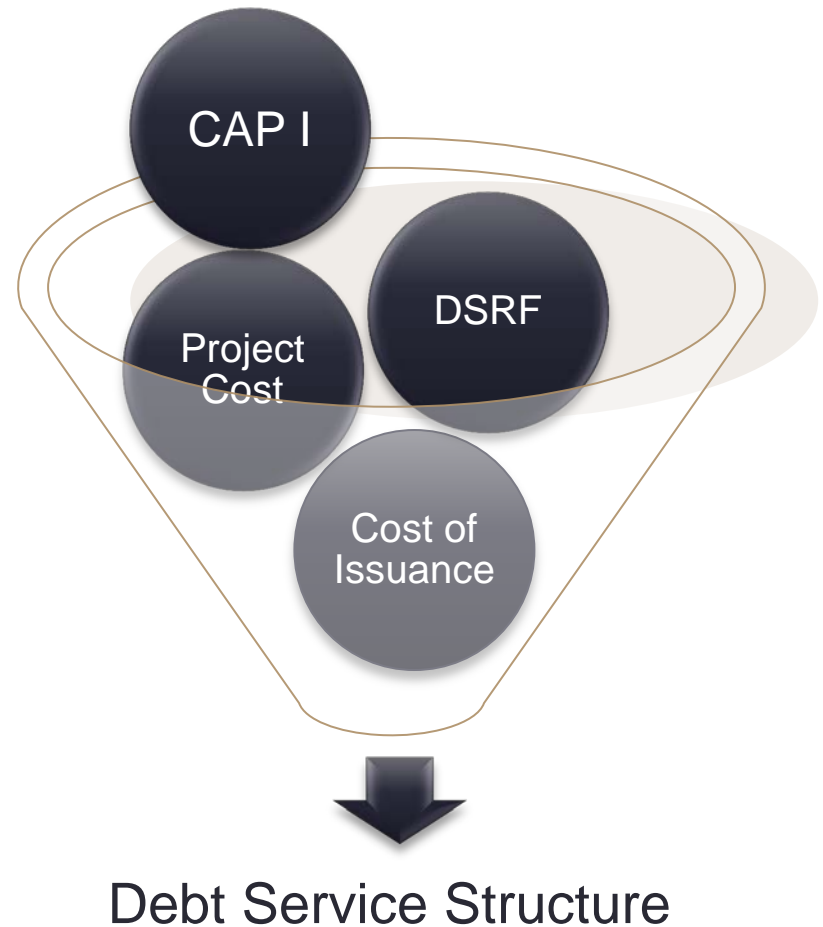
Debt Service Reserve Fund: lesser of three tests:

- i. 10% of proceeds*
- ii. 125% of avg. annual D/S*
- iii. Maximum annual D/S*

Underwriter's Discount: \$5.00/bond

Cost of Issuance: \$200,000

Final Maturity: 30 years



Flow of Funds

Sources and Uses of Funds

Summary of Statistics

Bond Pricing

Debt Service

Net Debt Service

Project Fund

Reserve Funds

- Capitalized Interest
- Debt Service Reserve Fund

Cost of Issuance

Underwriters Discount

Sources and Uses of Funds

2013 New Money

Level Debt Service

Dated Date: 12/1/2013

Delivery Date: 12/1/2013

Sources:

Bond Proceeds:

Par Amount	\$109,545,000.00
Premium	11,814,388.20
	\$121,359,388.20

Uses:

Project Fund Deposits:

Project Fund	100,000,000.00
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Other Fund Deposits:

Debt Service Reserve Fund	7,451,750.00
Capitalized Interest	13,156,228.33
	\$20,607,978.33

Delivery Date Expenses:

Cost of Issuance	200,000.00
Underwriter's Discount	547,725.00
	\$747,725.00

Other Uses of Funds:

Additional Proceeds	3,684.87
	\$121,359,388.20

Bond Summary Statistics

Par Amount	\$109,545,000.00
Bond Proceeds	121,359,388.20
Total Interest	104,824,850.00
Net Interest	93,558,186.80
Total Debt Service	214,369,850.00
Maximum Annual Debt Service	7,451,750.00
Average Annual Debt Service	7,266,774.58
Underwriter's Fees (per \$1000)	
Average Takedown	
Other Fee	5.000000

Total Underwriter's Discount	5.000000
Bid Price	110.284963

Bond Component	Par Value	Price	Avg. Coupon	Avg. Life
Serial Bonds	\$52,025,000.00	113.998	4.851%	12.588
Term Bonds 2038	25,270,000.00	108.327	5.000%	22.598
Term Bonds 2043	32,250,000.00	107.528	5.000%	27.598
	\$109,545,000.00			19.316

Bond Pricing

Bond Component	Maturity Date	Amount	Rate	Yield	Price	Call Date	Call Price	Premium (-Discount)	
Serial Bonds:									
	6/1/2017	\$2,155,000	3.000%	0.960%	107.004			\$150,936.20	
	6/1/2018	2,220,000	3.000%	1.340%	107.225			160,395.00	
	6/1/2019	2,285,000	3.000%	1.650%	107.070			161,549.50	
	6/1/2020	2,355,000	4.000%	1.900%	112.783			301,039.65	
	6/1/2021	2,450,000	5.000%	2.180%	119.414			475,643.00	
	6/1/2022	2,570,000	4.000%	2.370%	112.482			320,787.40	
	6/1/2023	2,675,000	5.000%	2.540%	120.648			552,334.00	
	6/1/2024	2,810,000	5.000%	2.710%	120.805			584,620.50	
	6/1/2025	2,950,000	5.000%	2.860%	119.291	C	6/1/2024	100.000	569,084.50
	6/1/2026	3,095,000	5.000%	3.010%	117.801	C	6/1/2024	100.000	550,940.95
	6/1/2027	3,250,000	5.000%	3.150%	116.430	C	6/1/2024	100.000	533,975.00
	6/1/2028	3,410,000	5.000%	3.280%	115.174	C	6/1/2024	100.000	517,433.40
	6/1/2029	3,585,000	5.000%	3.410%	113.934	C	6/1/2024	100.000	499,533.90
	6/1/2030	3,760,000	5.000%	3.530%	112.804	C	6/1/2024	100.000	481,430.40
	6/1/2031	3,950,000	5.000%	3.610%	112.058	C	6/1/2024	100.000	476,291.00
	6/1/2032	4,150,000	5.000%	3.680%	111.410	C	6/1/2024	100.000	473,515.00
	6/1/2033	4,355,000	5.000%	3.740%	110.858	C	6/1/2024	100.000	472,865.90
		\$52,025,000						\$7,282,375.30	
Term Bonds 2038:									
	6/1/2034	4,575,000	5.000%	4.020%	108.327	C	6/1/2024	100.000	380,960.25
	6/1/2035	4,800,000	5.000%	4.020%	108.327	C	6/1/2024	100.000	399,696.00
	6/1/2036	5,040,000	5.000%	4.020%	108.327	C	6/1/2024	100.000	419,680.80
	6/1/2037	5,295,000	5.000%	4.020%	108.327	C	6/1/2024	100.000	440,914.65
	6/1/2038	5,560,000	5.000%	4.020%	108.327	C	6/1/2024	100.000	462,981.20
		\$25,270,000						\$2,104,232.90	
Term Bonds 2043:									
	6/1/2039	5,835,000	5.000%	4.110%	107.528	C	6/1/2024	100.000	439,258.80
	6/1/2040	6,130,000	5.000%	4.110%	107.528	C	6/1/2024	100.000	461,466.40
	6/1/2041	6,435,000	5.000%	4.110%	107.528	C	6/1/2024	100.000	484,426.80
	6/1/2042	6,755,000	5.000%	4.110%	107.528	C	6/1/2024	100.000	508,516.40
	6/1/2043	7,095,000	5.000%	4.110%	107.528	C	6/1/2024	100.000	534,111.60
		\$32,250,000						\$2,427,780.00	
		109,545,000						11,814,388.20	

Yield Calculations

Yield = The discount rate (applied semi-annually) at which the present value of future debt service equal proceeds of the issue

Dated Date	12/1/2013
Delivery Date	12/1/2013
Last Maturity	6/1/2043
Arbitrage Yield	3.595118%
True Interest Cost (TIC)	4.126602%
Net Interest Cost (NIC)	4.421532%
All-In TIC	4.139982%
Average Coupon	4.953992%
Average Life (years)	19.316
Duration of Issue (years)	12.643

	True Interest Cost TIC	All-In TIC or True Financing Cost	Arbitrage Yield
	-----	-----	-----
Par Value	109,545,000.00	109,545,000.00	109,545,000.00
+ Accrued Interest			
+ Premium (Discount)	11,814,388.20	11,814,388.20	11,814,388.20
- Underwriter's Discount	-547,725.00	-547,725.00	
- Cost of Issuance		-200,000.00	
	-----	-----	-----
Target Value	120,811,663.20	120,611,663.20	121,359,388.20
Target Date	12/1/2013	12/1/2013	12/1/2013
Yield	4.126602%	4.139982%	3.595118%

Debt Service Schedule

Sample Project 2013 New Money

Period Ending	Principal	Coupon	Interest	Debt Service	Period Ending	Principal	Coupon	Interest	Debt Service
6/30/2014			\$2,647,400	\$2,647,400	6/30/2029	\$3,585,000	5.000%	3,866,000	7,451,000
6/30/2015			5,294,800	5,294,800	6/30/2030	3,760,000	5.000%	3,686,750	7,446,750
6/30/2016			5,294,800	5,294,800	6/30/2031	3,950,000	5.000%	3,498,750	7,448,750
6/30/2017	\$2,155,000				6/30/2032	4,150,000	5.000%	3,301,250	7,451,250
6/30/2018	0	3.000%	5,294,800	7,449,800	6/30/2033	4,355,000	5.000%	3,093,750	7,448,750
6/30/2019	2,220,000	3.000%	5,230,150	7,450,150	6/30/2034	4,575,000	5.000%	2,876,000	7,451,000
6/30/2020	2,285,000	3.000%	5,163,550	7,448,550	6/30/2035	4,800,000	5.000%	2,647,250	7,447,250
6/30/2021	2,355,000	4.000%	5,095,000	7,450,000	6/30/2036	5,040,000	5.000%	2,407,250	7,447,250
6/30/2022	2,450,000	5.000%	5,000,800	7,450,800	6/30/2037	5,295,000	5.000%	2,155,250	7,450,250
6/30/2023	2,570,000	4.000%	4,878,300	7,448,300	6/30/2038	5,560,000	5.000%	1,890,500	7,450,500
6/30/2024	2,675,000	5.000%	4,775,500	7,450,500	6/30/2039	5,835,000	5.000%	1,612,500	7,447,500
6/30/2025	2,810,000	5.000%	4,641,750	7,451,750	6/30/2040	6,130,000	5.000%	1,320,750	7,450,750
6/30/2026	2,950,000	5.000%	4,501,250	7,451,250	6/30/2041	6,435,000	5.000%	1,014,250	7,449,250
6/30/2027	3,095,000	5.000%	4,353,750	7,448,750	6/30/2042	6,755,000	5.000%	692,500	7,447,500
6/30/2028	3,250,000	5.000%	4,199,000	7,449,000	6/30/2043	7,095,000	5.000%	354,750	7,449,750
6/30/2028	3,410,000	5.000%	4,036,500	7,446,500					
						\$109,545,000		\$104,824,850	\$214,369,850

Net Debt Service: Gross D/S less CAP I

Date	Gross Debt Service	Debt Service Reserve Fund	Capitalized Interest Fund	Net Debt Service	Annual Net D/S
6/1/2014	\$2,647,400		\$-2,647,400		
6/30/2014					
12/1/2014	2,647,400		-2,647,400		
6/1/2015	2,647,400		-2,647,400		
6/30/2015					
12/1/2015	2,647,400		-2,647,400		
6/1/2016	2,647,400		-2,647,400		
6/30/2016					
12/1/2016	2,647,400	-13,785.74		2,633,614.26	
6/1/2017	4,802,400	-13,785.74		4,788,614.26	
6/30/2017					7,422,228.52
12/1/2017	2,615,075	-13,785.74		2,601,289.26	
-	-	-		-	-
6/1/2040	6,790,375	-13,785.74		6,776,589.26	
6/30/2040					7,423,178.52
12/1/2040	507,125	-13,785.74		493,339.26	
6/1/2041	6,942,125	-13,785.74		6,928,339.26	
6/30/2041					7,421,678.52
12/1/2041	346,250	-13,785.74		332,464.26	
6/1/2042	7,101,250	-13,785.74		7,087,464.26	
6/30/2042					7,419,928.52
12/1/2042	177,375	-13,785.74		163,589.26	
6/1/2043	7,272,375	-7,465,535.74		-193,160.74	
6/30/2043					-29,571.48
	\$214,369,850	\$-8,196,179.96	\$-13,237,000	\$192,936,670.04	\$192,936,670.04

Project Fund: \$100M gross funded; 24 months equal draws

Date	Deposit	Interest @ 0.03%	Principal	Scheduled Draws	Balance
12/1/2013	100,000,000				\$100,000,000
1/1/2014			\$4,166,667	\$4,166,667	95,833,333
2/1/2014			4,166,667	4,166,667	91,666,667
3/1/2014			4,166,667	4,166,667	87,500,000
4/1/2014			4,166,667	4,166,667	83,333,333
5/1/2014			4,166,667	4,166,667	79,166,667
6/1/2014		13,437.50	4,153,229	4,166,667	75,013,437
7/1/2014			4,166,667	4,166,667	70,846,771
8/1/2014			4,166,667	4,166,667	66,680,104
9/1/2014			4,166,667	4,166,667	62,513,437
10/1/2014			4,166,667	4,166,667	58,346,771
11/1/2014			4,166,667	4,166,667	54,180,104
12/1/2014		9,689.52	4,156,977	4,166,667	50,023,127
1/1/2015			4,166,667	4,166,667	45,856,460
2/1/2015			4,166,667	4,166,667	41,689,794
3/1/2015			4,166,667	4,166,667	37,523,127
4/1/2015			4,166,667	4,166,667	33,356,460
5/1/2015			4,166,667	4,166,667	29,189,794
6/1/2015		5,940.97	4,160,726	4,166,667	25,029,068
7/1/2015			4,166,667	4,166,667	20,862,401
8/1/2015			4,166,667	4,166,667	16,695,735
9/1/2015			4,166,667	4,166,667	12,529,068
10/1/2015			4,166,667	4,166,667	8,362,401
11/1/2015			4,166,667	4,166,667	4,195,735
12/1/2015		2,191.86	4,164,475	4,166,667	31,260
	\$100,000,000	\$31,259.85	\$99,968,740	\$100,000,000	

Capitalized Interest: net funded

- 24 month construction period
- 6-month cushion to mitigate potential risk

Date	Deposit	Interest @ 0.06%	Interest Payment	Scheduled Draws	Balance
12/1/201	13,156,228				13,156,228
6/1/2014		3,946.87	13,785.74	2,647,400	10,526,561
12/1/2014		3,157.97	13,785.74	2,647,400	7,896,105
6/1/2015		2,368.83	13,785.74	2,647,400	5,264,859
12/1/2015		1,579.46	13,785.74	2,647,400	2,632,824
6/1/2016		789.85	13,785.74	2,647,400	
	13,156,228	11,842.98	68,928.70	13,237,000	

Debt Service Reserve Fund

Date	Deposit	Interest @ 0.37%	Principal	Capitalized Interest Fund	Debt Service	Balance
12/1/2013	\$7,451,750					\$7,451,750
6/1/2014		13,785.74		-13,785.74		7,451,750
12/1/2014		13,785.74		-13,785.74		7,451,750
6/1/2015		13,785.74		-13,785.74		7,451,750
12/1/2015		13,785.74		-13,785.74		7,451,750
6/1/2016		13,785.74		-13,785.74		7,451,750
12/1/2016		13,785.74			-13,785.74	7,451,750
6/1/2017		13,785.74			-13,785.74	7,451,750
12/1/2017		13,785.74			-13,785.74	7,451,750
-		-		-	-	-
6/1/2040		13,785.74			-13,785.74	7,451,750
12/1/2040		13,785.74			-13,785.74	7,451,750
6/1/2041		13,785.74			-13,785.74	7,451,750
12/1/2041		13,785.74			-13,785.74	7,451,750
6/1/2042		13,785.74			-13,785.74	7,451,750
12/1/2042		13,785.74			-13,785.74	7,451,750
6/1/2043		13,785.74	7,451,750		-7,465,535.74	
	\$7,451,750	\$813,358.66	\$7,451,750	\$-68,928.70	\$-8,196,179.96	

Issuer Costs

Underwriter's Discount Components

Issuer (Administrative) Fee

Takedown: \$/1,000

Rating Agencies

U/W Counsel: I-Bank Requirement

Bond Counsel

DTC: Industry Formula

Disclosure Counsel

CUSIP: Industry Formula

Trustee

Electronic Order Entry Monitoring

Financial Advisor

CDIAC: Industry Formula

Printing & Mailing

Day Loan: I-Bank Formula

Miscellaneous/Contingency

Miscellaneous: Travel & Expenses

Cost of Issuance

Sample Project
2013 New Money

Level Debt Service

<u>Cost of Issuance</u>	<u>\$/1000</u>	<u>Amount</u>
<u>Other Cost of Issuance</u>	1.82573	200,000.00
	1.82573	200,000.00

Underwriter's Discount

Sample Project
2013 New Money

Level Debt Service

Underwriter's Discount	\$/1000	Amount
<u>Other Underwriter's Discount</u>	5.00	547,725.00
	5.00	547,725.00

Questions?

MUNICIPAL DEBT ESSENTIALS: BOND CONCEPTS AND OVERVIEW

OCTOBER 22, 2013

OAKLAND, CA