Bond Concepts

Craig Hill, Managing Principal, NHA Advisors, LLC

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Introduction to Bonds

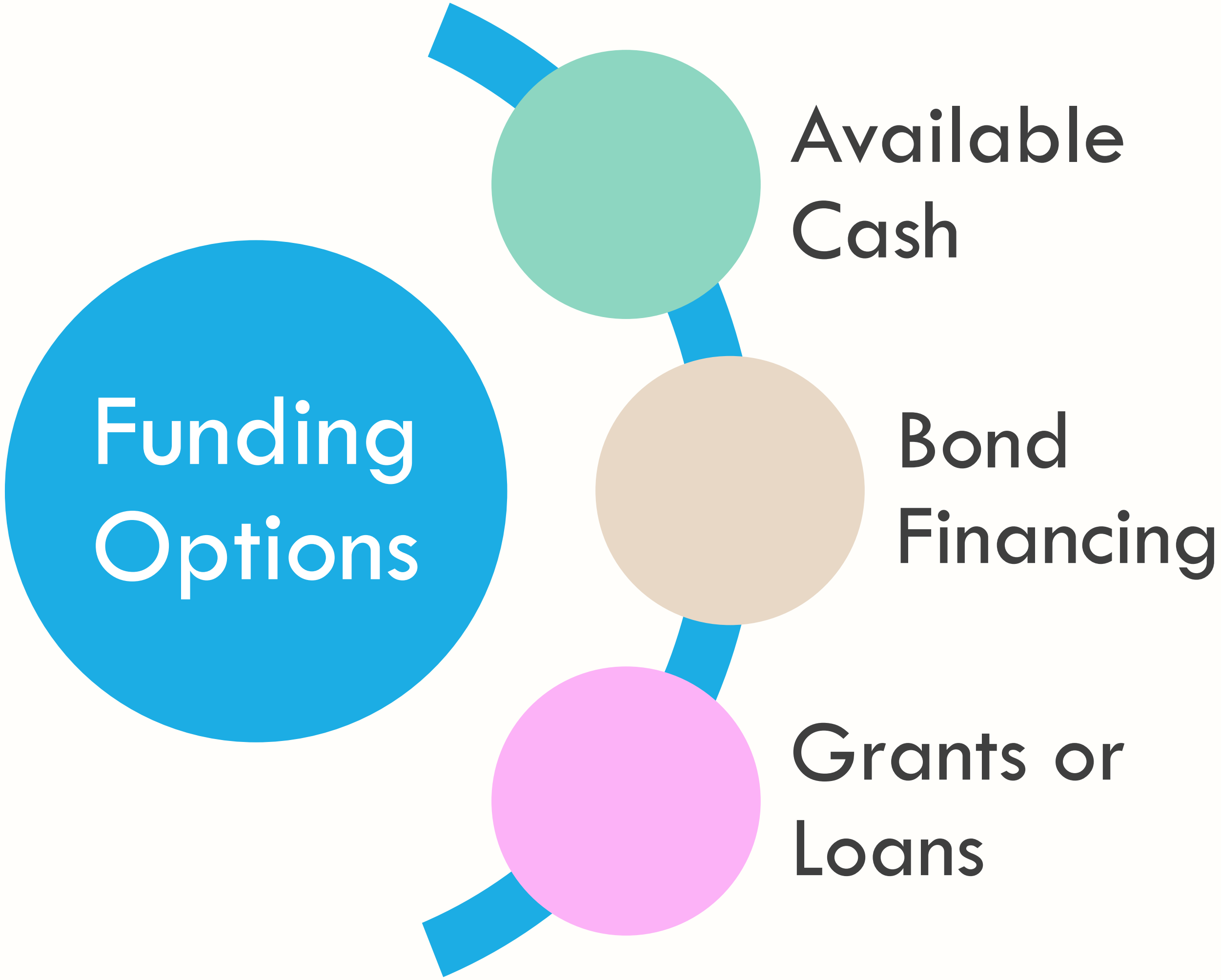
Purpose of Municipal Bonds

Infrastructure

Capital Improvement Projects

- Spread out the cost of constructing the asset over the life of the asset
- Ensures the benefits are paid for by those who enjoy them

Ways to Fund Projects

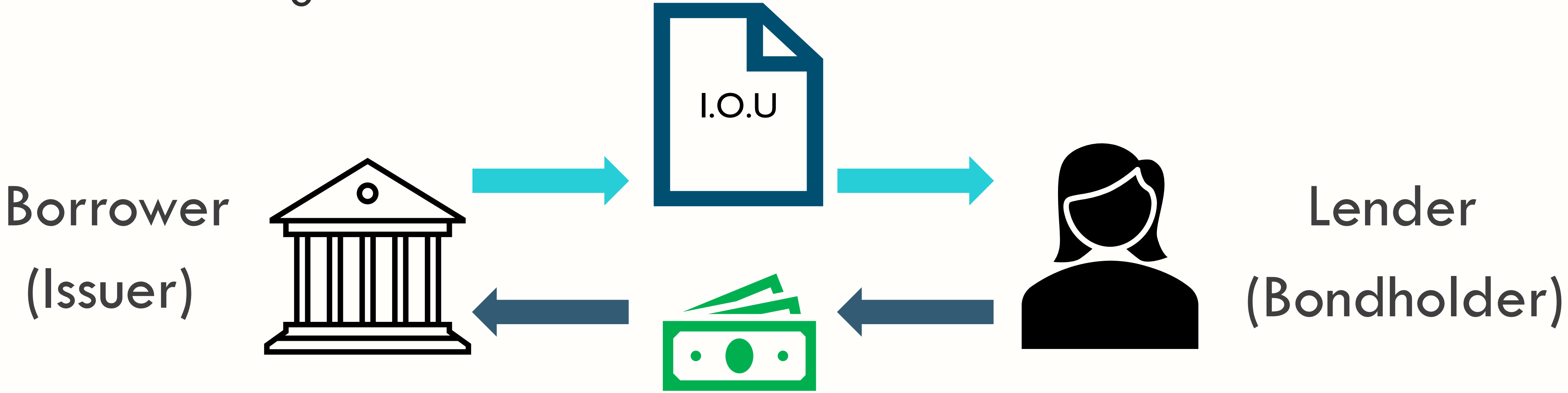


Common Objectives

Project Financing	Refinancing	Cash Flow
• Capital improvement projects • Infrastructure development	• Lower Interest rates • Consolidate debt and facilitate budget predictability	• Tax Revenue Anticipation Notes (TRAN) • Bond Anticipation Notes (BAN)

What Is A Bond?

- Issuer: Entity that issues the bonds
  - Borrows the money
- Bondholder: Owner of the bonds
  - Receives the bonds (lends money)
- Financing mechanism where the borrower receives a payment upfront from a lender in exchange for future repayments made to the lender
  - Simply put: “a loan”
- Can be thought of as an IOU between lender and borrower



Elements Of A Bond

Issuer

Face Value

Coupon

"Clipping the Coupon"

Maturity Schedule

Issuer	Gotham City
Deal	2022 General Obligation Bonds
Par	$4,120,000
Tax Status	Tax-Exempt
Rating	AAA
Par Call Date	12/1/2032
Underwriter	Wayne Enterprises
Municipal Advisor	NHA Advisors

Maturity	PAR AMOUNT	COUPON RATE	YIELD
2023	$175,000	5.00	2.85
2024	$185,000	5.00	2.95
2025	$190,000	5.00	3.10
2026	$200,000	5.00	3.20
2027	$205,000	5.00	3.40
2028	$350,000		
2029	$380,000		
2030	$400,000		
2031	$420,000		
2032	$450,000	4.25	4.50

Serial Bonds

Sinking Fund

Term Bond

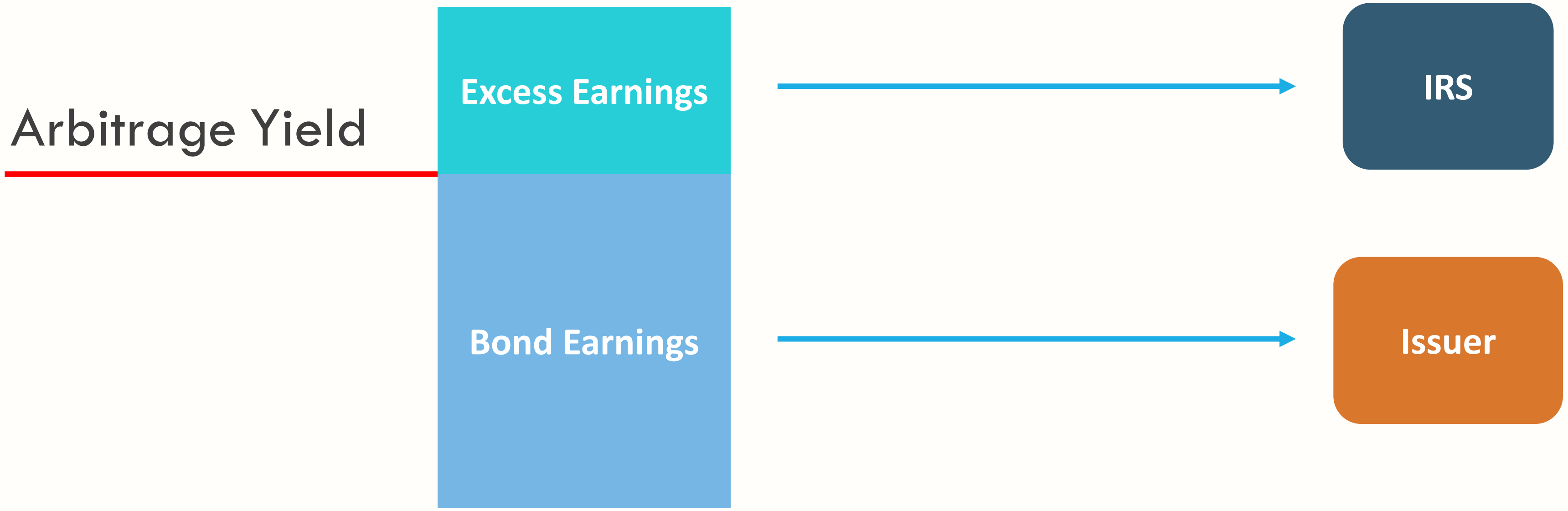
Sources and Uses

Sources Of Funds	
Par Amount of Bonds	$5,000,000
Total Sources	**$5,000,000**

Uses Of Funds	
Costs of Issuance	$200,000
Project Fund	$4,800,000
Total Uses	**$5,000,000**

Tax-Exempt Nature of Municipal Bonds

- Majority of Municipal Bonds are issued for public use projects and so are **Tax-Exempt**
  - IRS requires that bonds issued for private purposes must be issued on a **taxable basis**
- Issuers are not allowed to earn more on the bond proceeds than the calculated yield (“**arbitrage**”)



Bond Structures

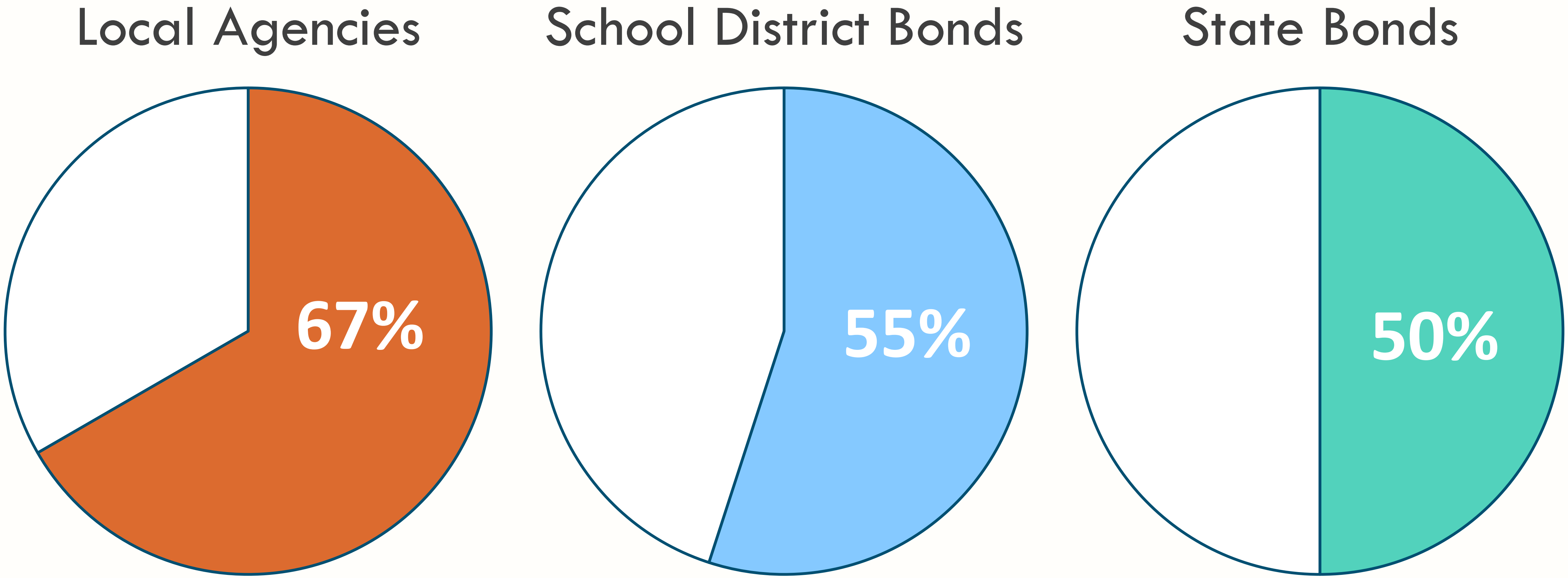
Bond Structures

Repaid w/Taxes
- General Obligation
- Special Tax or Assessment
- Tax Allocation

Repaid from General Fund
- Lease Revenue
- Certificates of Participation
- Pension Obligation

Repaid From Special Revenue
- Utilities
- Parking
- Airport

Voter Approval



Thank YOU Proposition 13…

Voter Approval Exceptions

General Fund Lease Revenue Bonds

Utility Revenue Bonds

Obligations Imposed by Law

Process of Issuing a Bond

Developing the Financing Plan

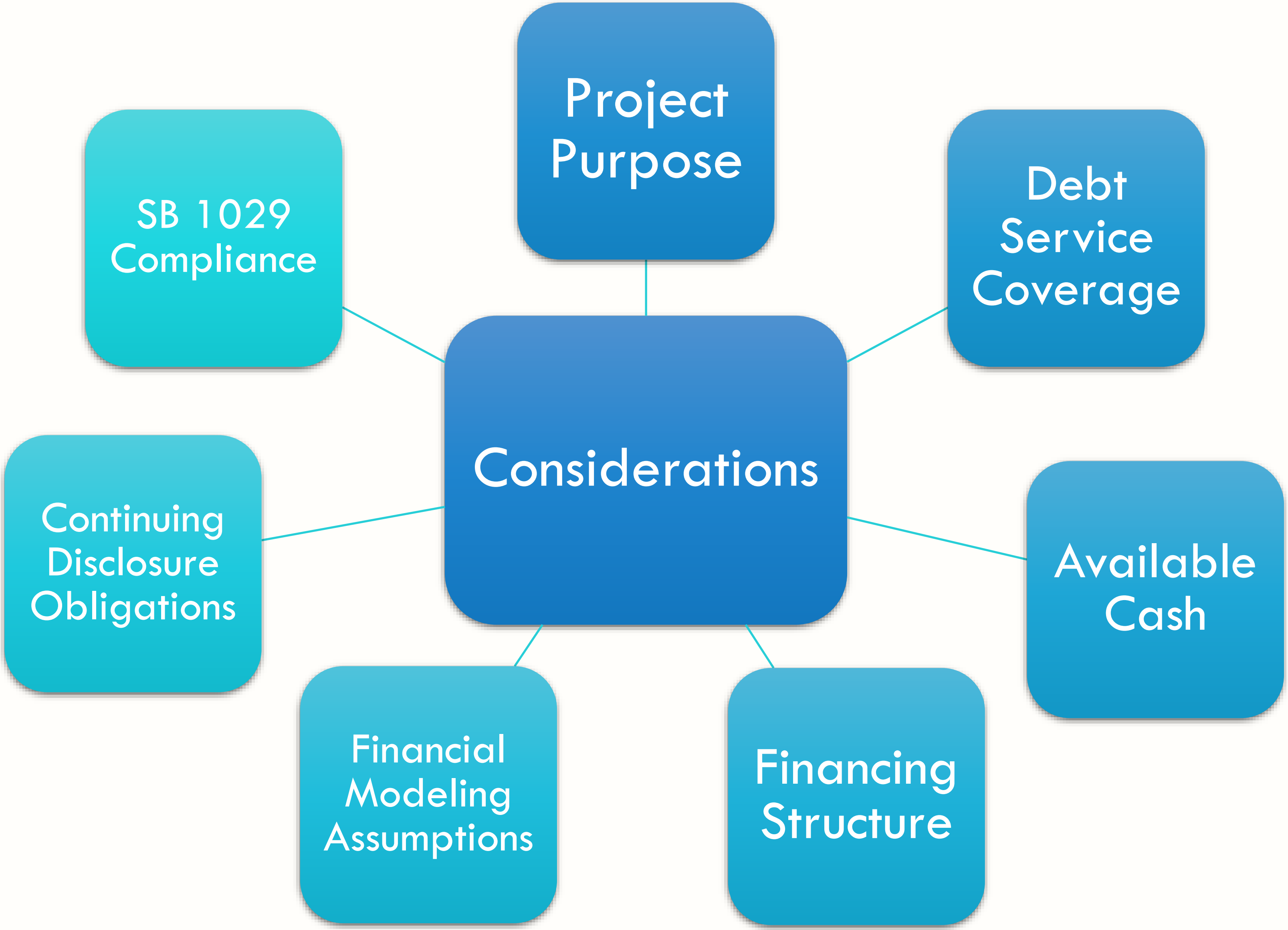
Identify Project Needs

Quantify Available Cash

Repayment Sources

Develop Financial Model

Debt Policy Considerations



Assembling the Financing Team (Public Offering)

Issuer

Municipal Advisor

Bond/Disclosure Counsel

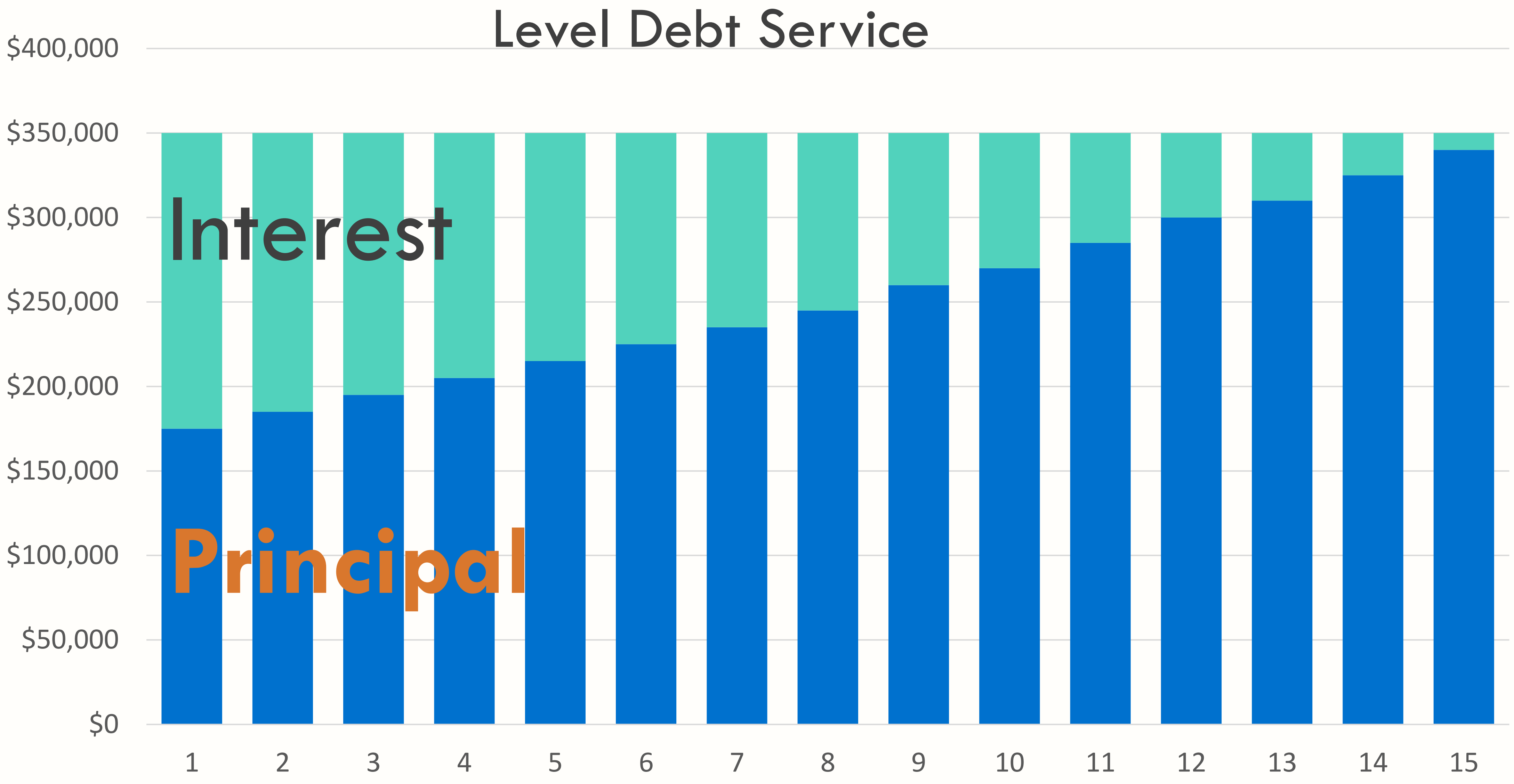
Underwriter

Trustee/Paying Agent

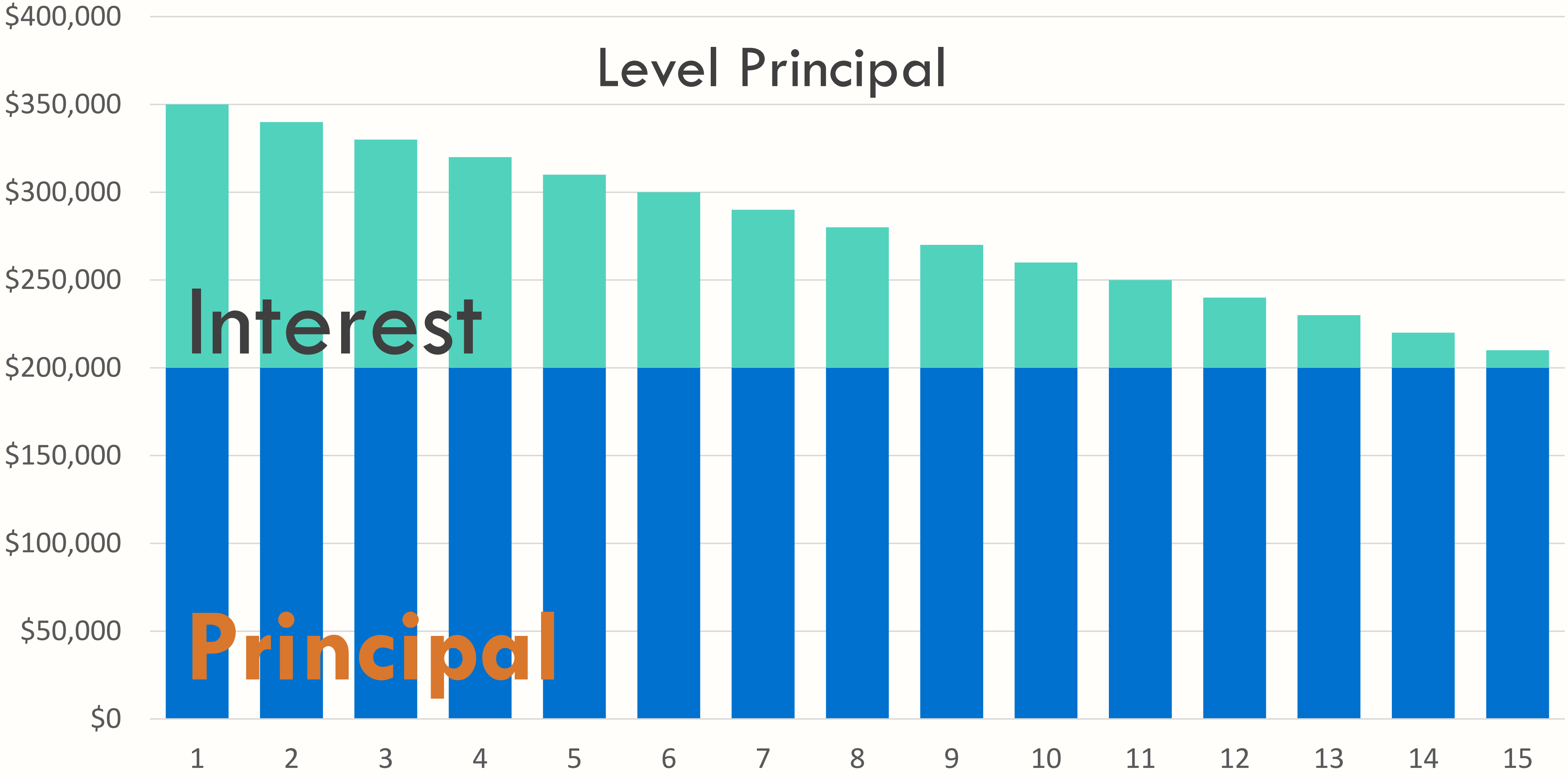
Rating Agency

A+

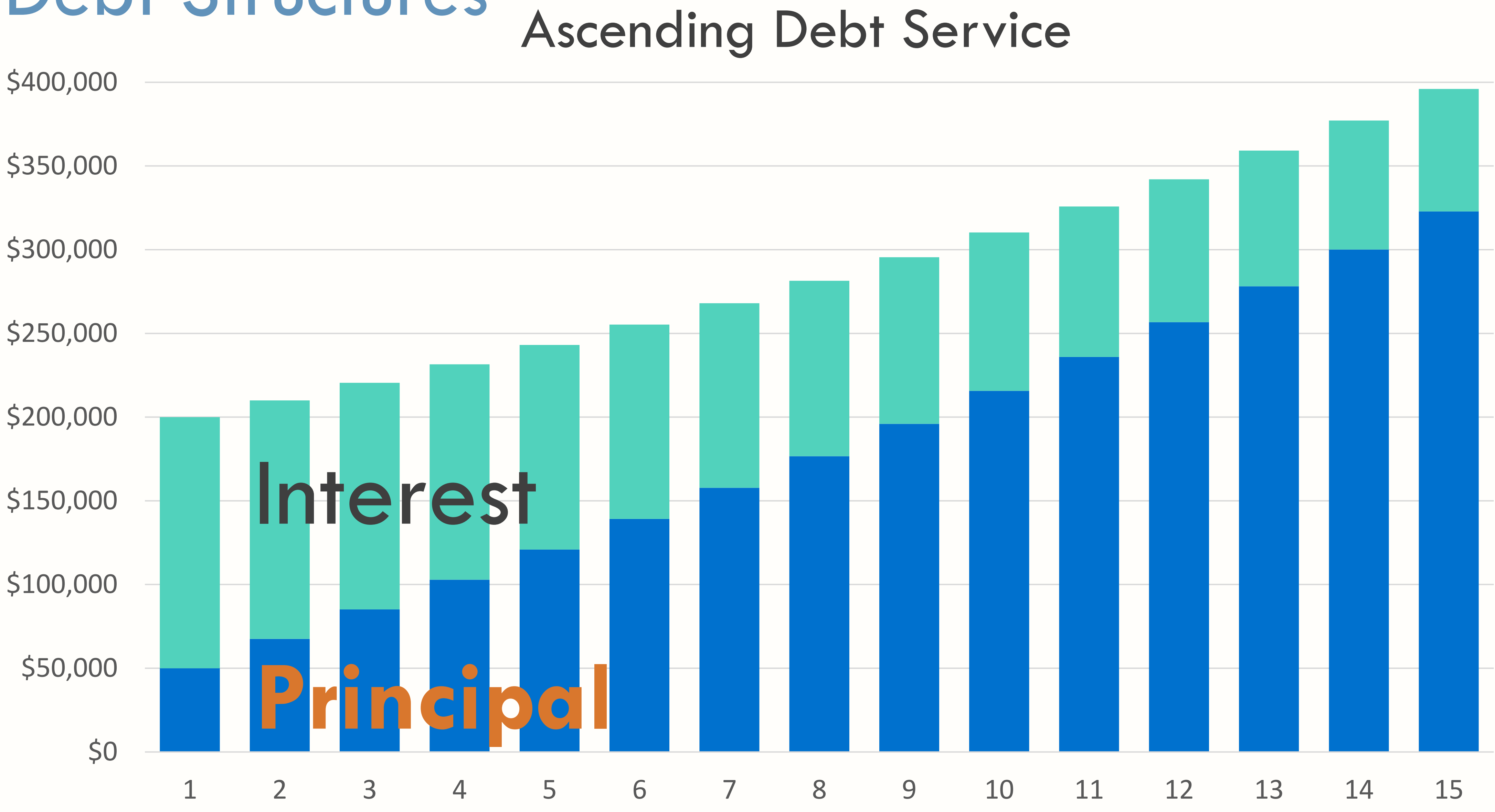
Debt Structures



Debt Structures



Debt Structures



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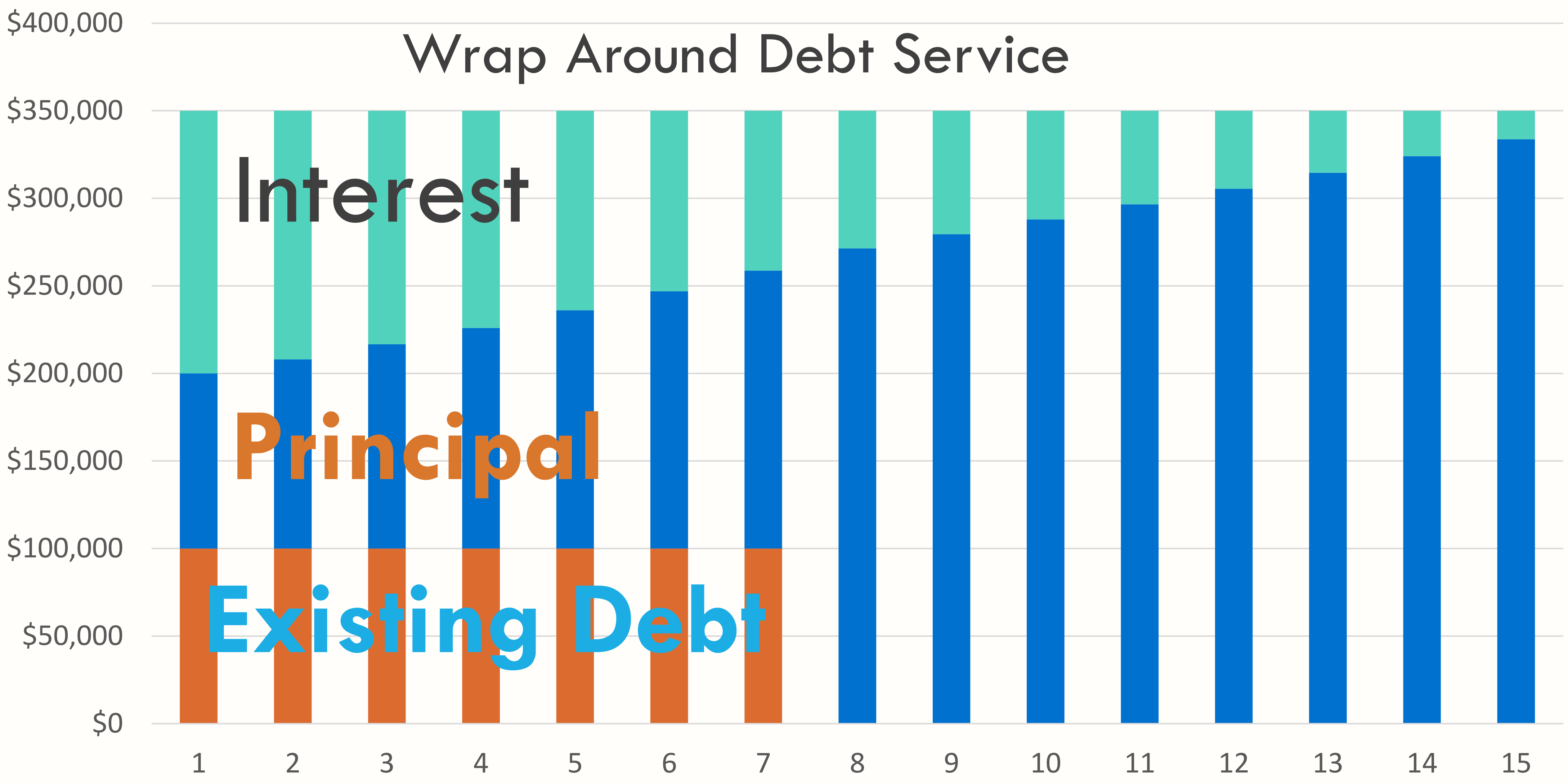
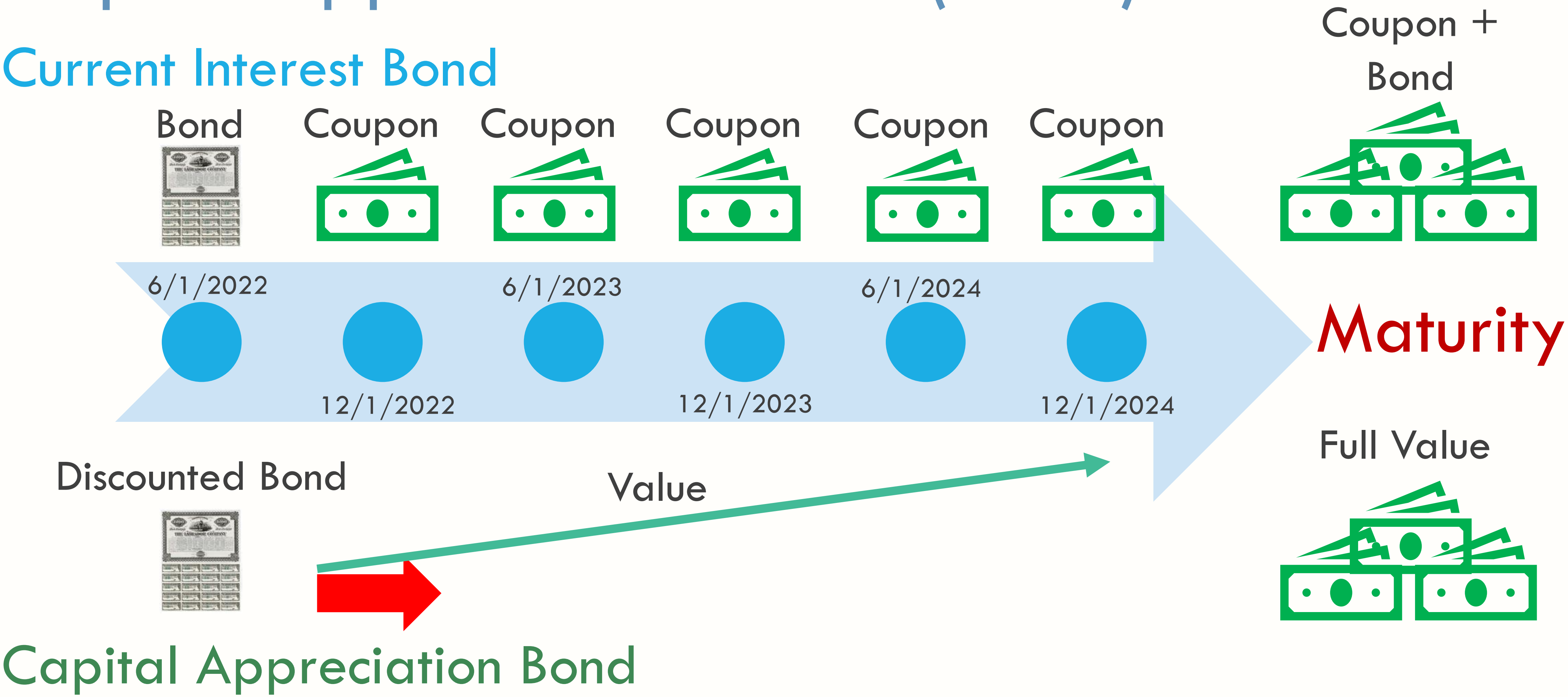


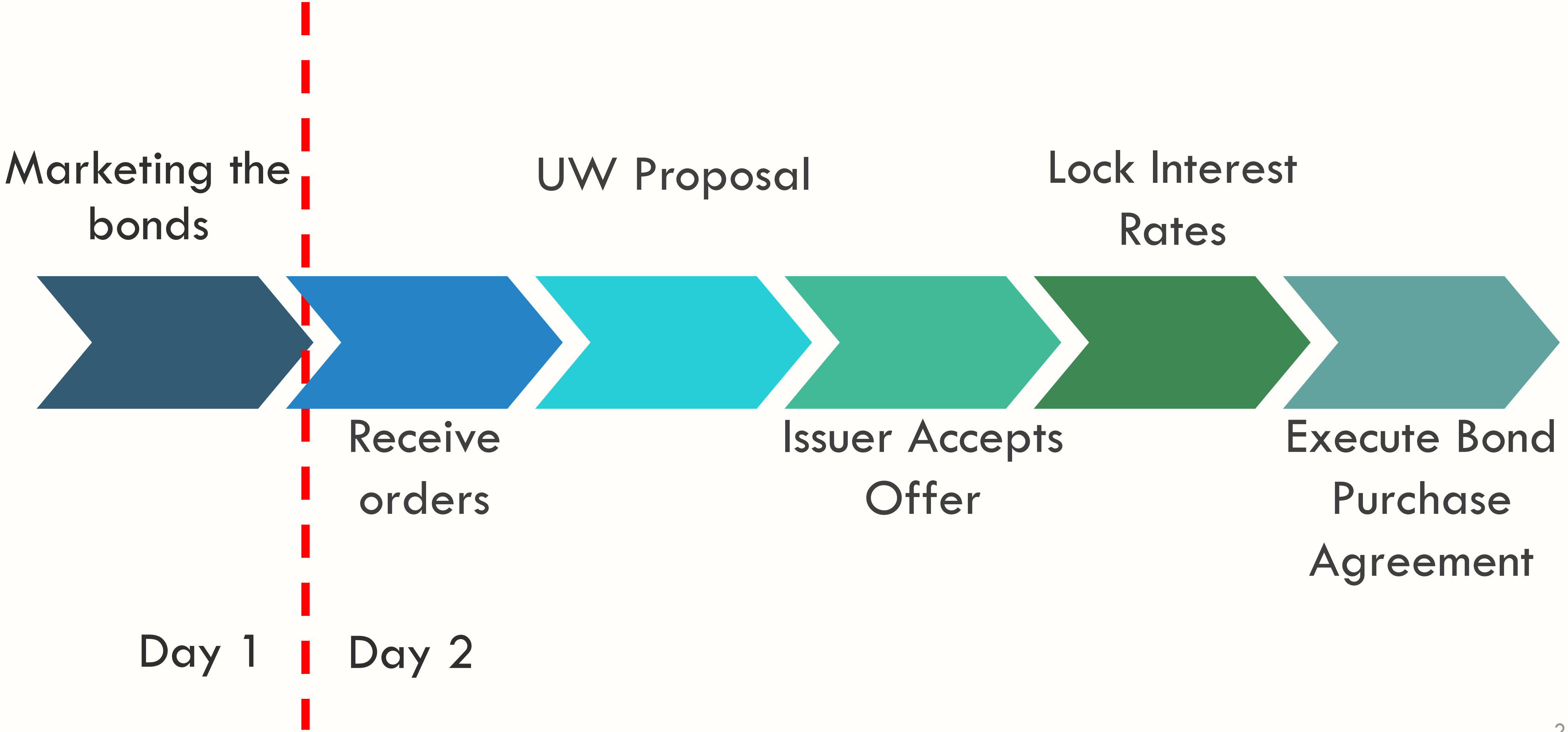
Capital Appreciation Bonds (CABs)



Methods of a Bond Sale

Competitive	Negotiated
• Structured without UW • UW services bid completely • Traditional bonds or high rating	• UW selected by issuer before sale • Structured with UW • Unique Transactions

Underwriting Process



Official Statement

MATURITY SCHEDULE

$30,000,000
CITY OF CAMPBELL
ELECTION OF 2018 GENERAL OBLIGATION BONDS,
SERIES 2022
(Base CUSIP†: 134105)

Maturity Date (September 1)	Principal Amount	Interest Rate	Yield	Price	CUSIP† No.
2022	$2,000,000	5.000%	1.600%	100.644	JF3
2023	1,710,000	5.000	1.900	103.632	JG1
2024	1,010,000	5.000	2.150	106.066	JH9
2025	495,000	5.000	2.310	108.227	JJ5
2026	520,000	5.000	2.380	110.389	JK2
2027	545,000	5.000	2.470	112.253	JL0
2028	575,000	5.000	2.580	113.762	JM8
2029	605,000	5.000	2.710	114.868	JN6
2030	635,000	5.000	2.780	116.159	JP1
2031	665,000	5.000	2.860	115.525 C	JQ9
2032	700,000	5.000	2.910	115.131 C	JR7
2033	730,000	5.000	3.020	114.269 C	JS5
2034	770,000	5.000	3.090	113.725 C	JT3
2035	805,000	5.000	3.180	113.030 C	JU0
2036	850,000	5.000	3.250	112.492 C	JV8
2037	890,000	5.000	3.300	112.110 C	JW6
2038	935,000	5.000	3.350	111.730 C	JX4
2039	980,000	5.000	3.400	111.351 C	JY2
2040	1,030,000	5.000	3.460	110.898 C	JZ9
2041	1,080,000	5.000	3.500	110.597 C	KA2
2042	1,135,000	5.000	3.520	110.448 C	KB0

$6,585,000 – 5.000% Term Bonds maturing September 1, 2047; Yield: 3.550%; Price: 110.223C; CUSIP†: KC8

$4,750,000 – 4.000% Term Bonds maturing September 1, 2050; Yield: 4.050%; Price: 99.159; CUSIP†: KD6

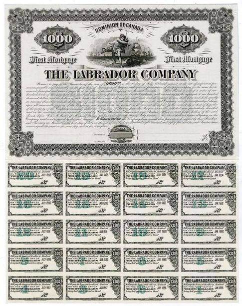
C Priced to the first optional redemption date of September 1, 2030.
† CUSIP® is a registered trademark of the American Bankers Association. CUSIP data herein are provided by CUSIP Global Services ("CGS"), managed on behalf of the American Bankers Association by FactSet Research Systems Inc. © 2022 CUSIP Global Services. All rights reserved. CUSIP® data herein is provided by CUSIP Global Services. This data is not intended to create a database and does not serve in any way as a substitute for the CGS database. CUSIP® numbers are provided for convenience only. Neither of the City nor the Underwriter takes any responsibility for the accuracy of such numbers.

Negotiated Underwriting Flow of Funds

Issuer

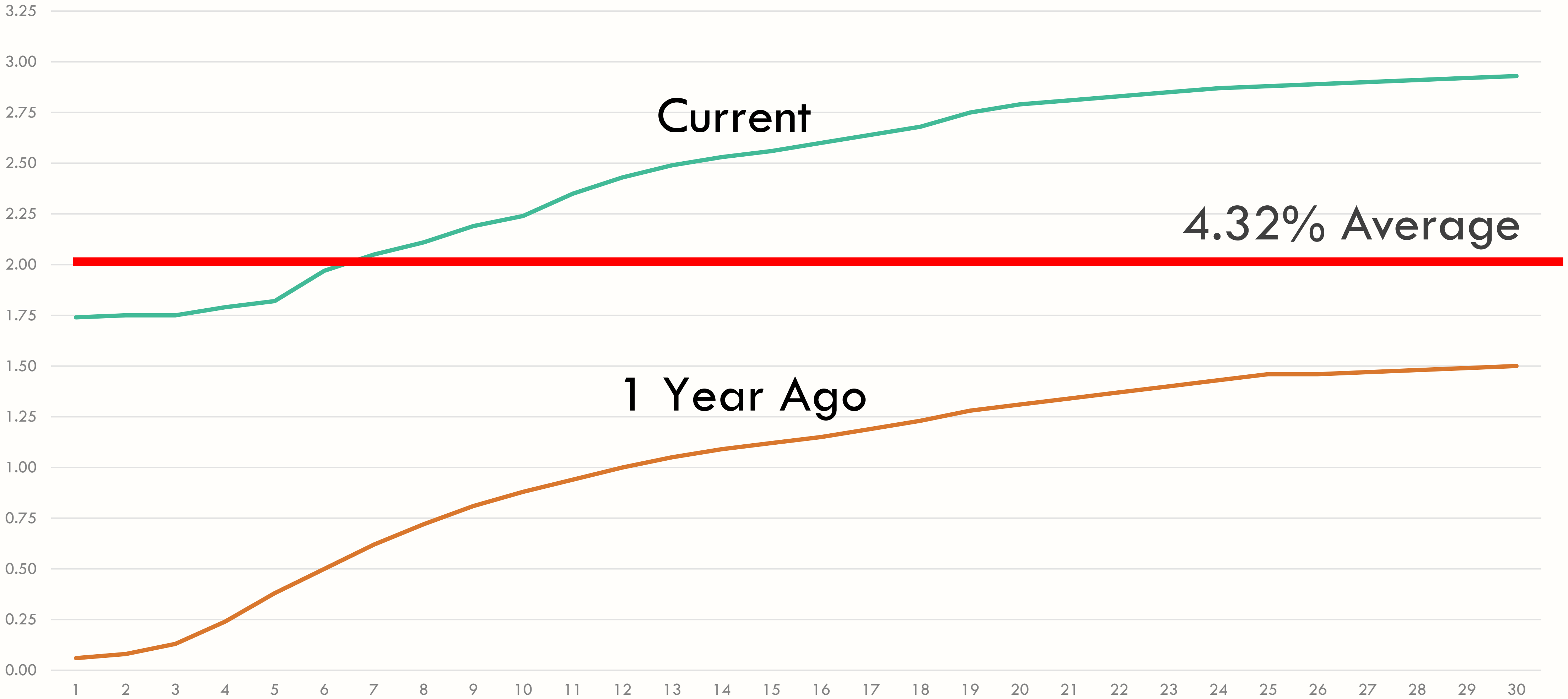
Underwriter

Bondholders



Municipal Market Data (MMD) Yield Curve

- Thomson Reuters Index
- Benchmark for “AAA” rated General Obligation Bonds



Municipal Market Data (MMD) Yield Curve

- Thomson Reuters Index
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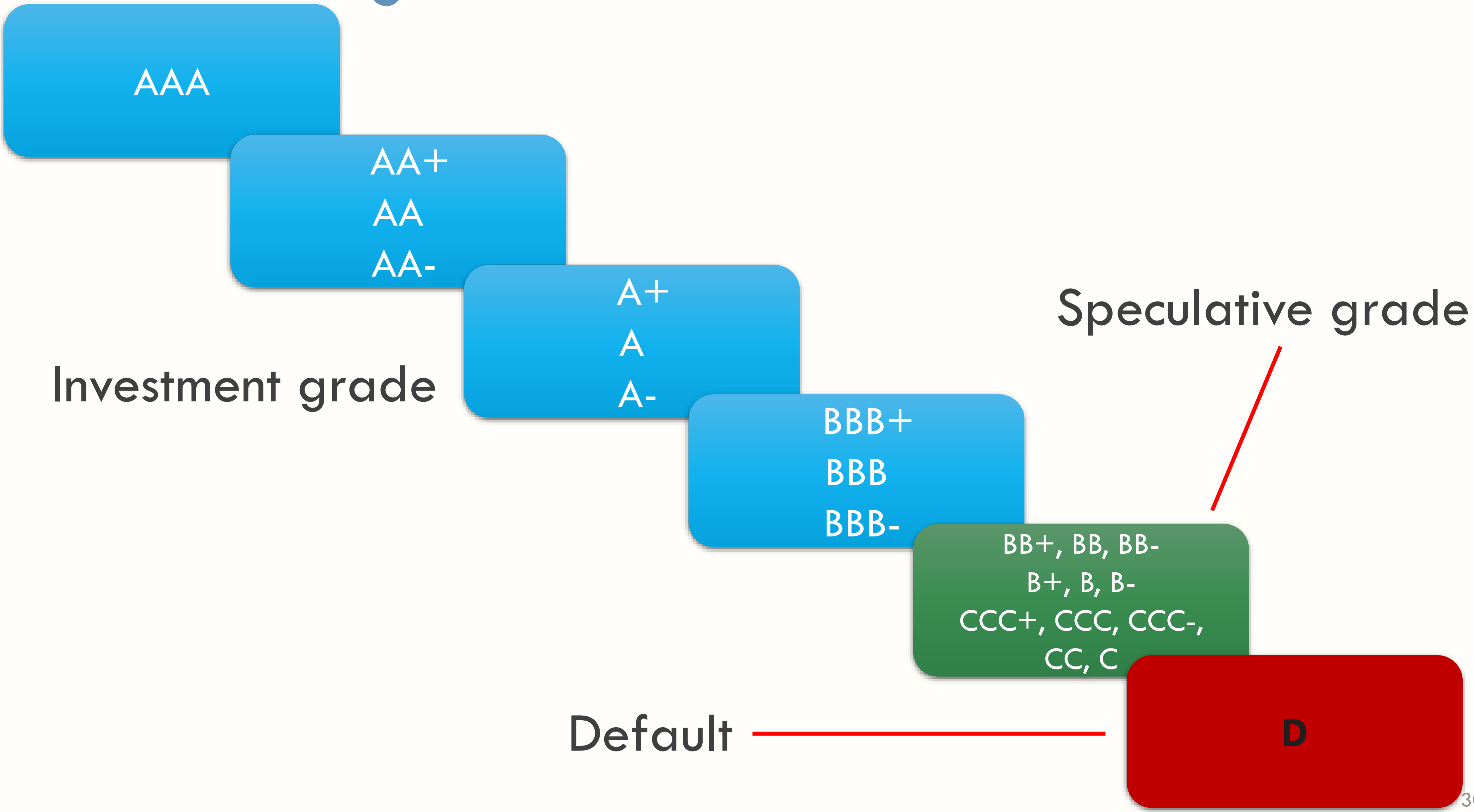
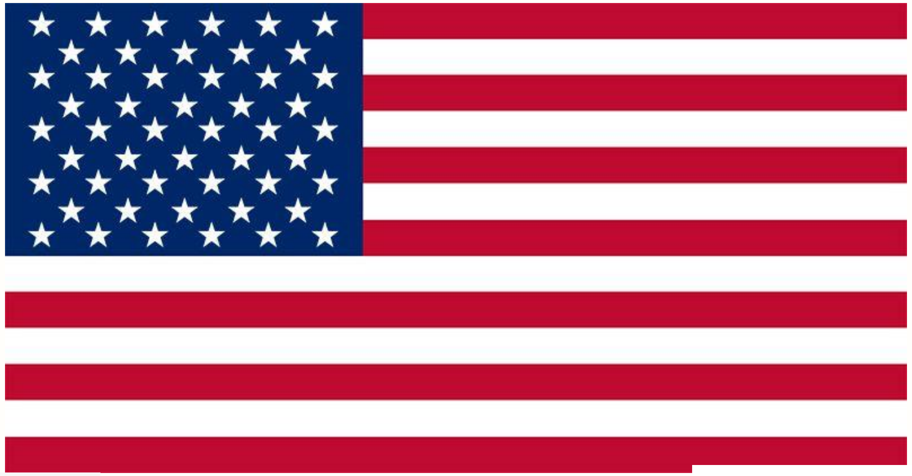
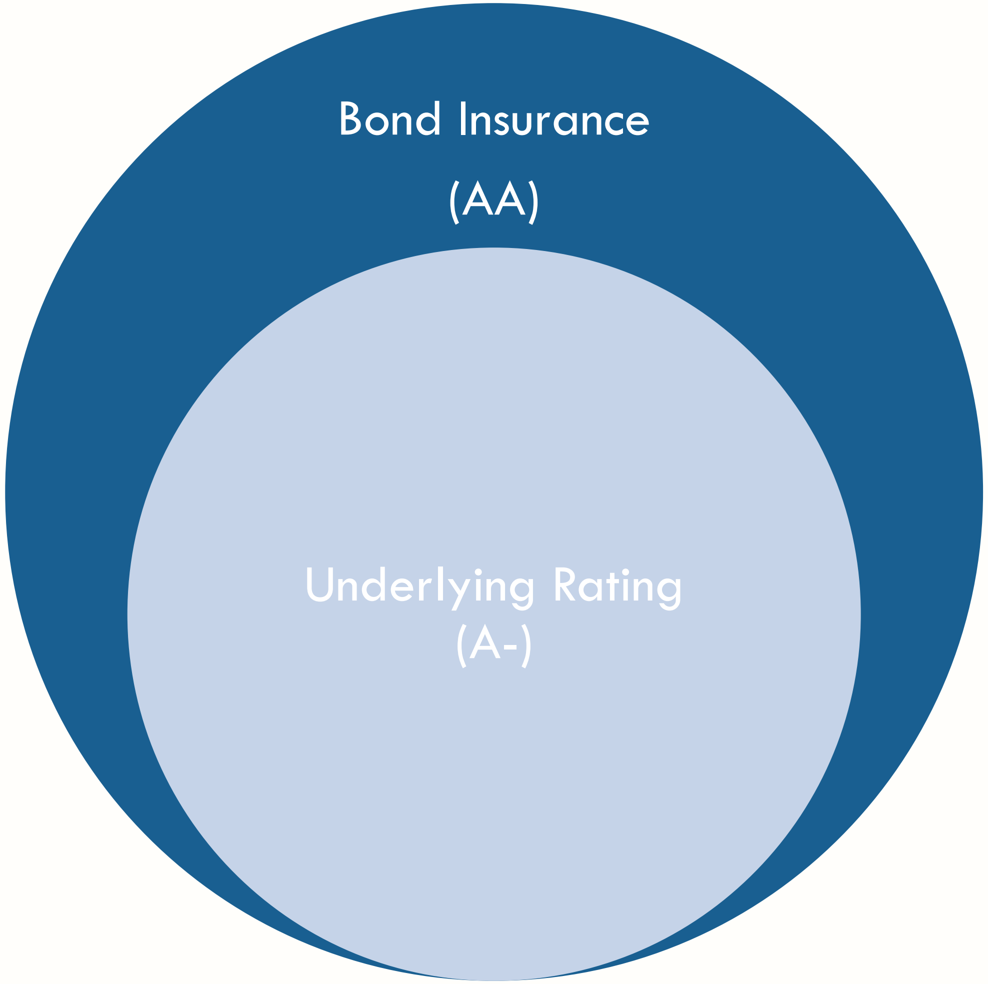
Credit Ratings



What's the Credit Rating?

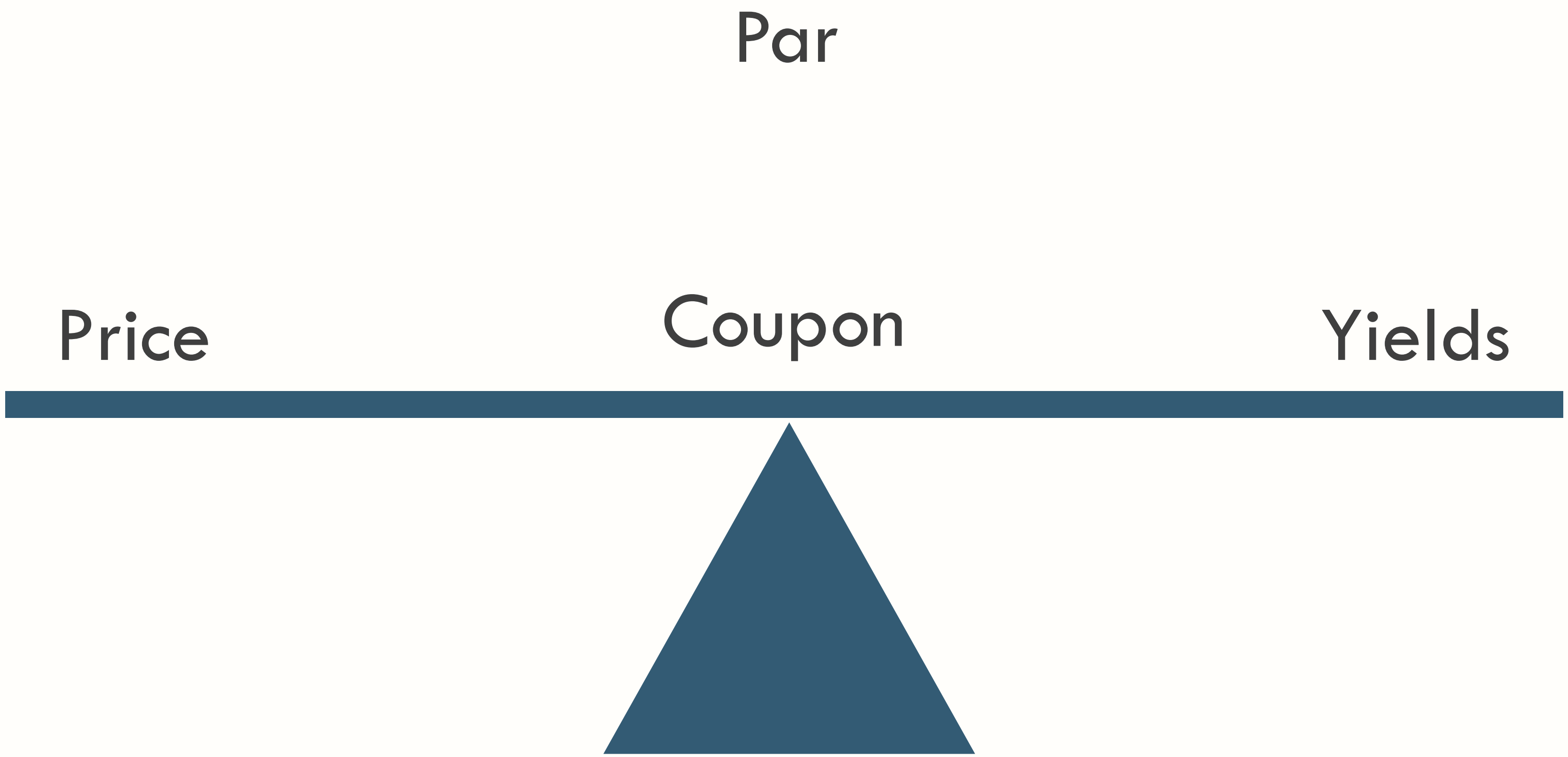


Credit Enhancements



Bond Pricing & Yield

- Prices and yields are inversely correlated



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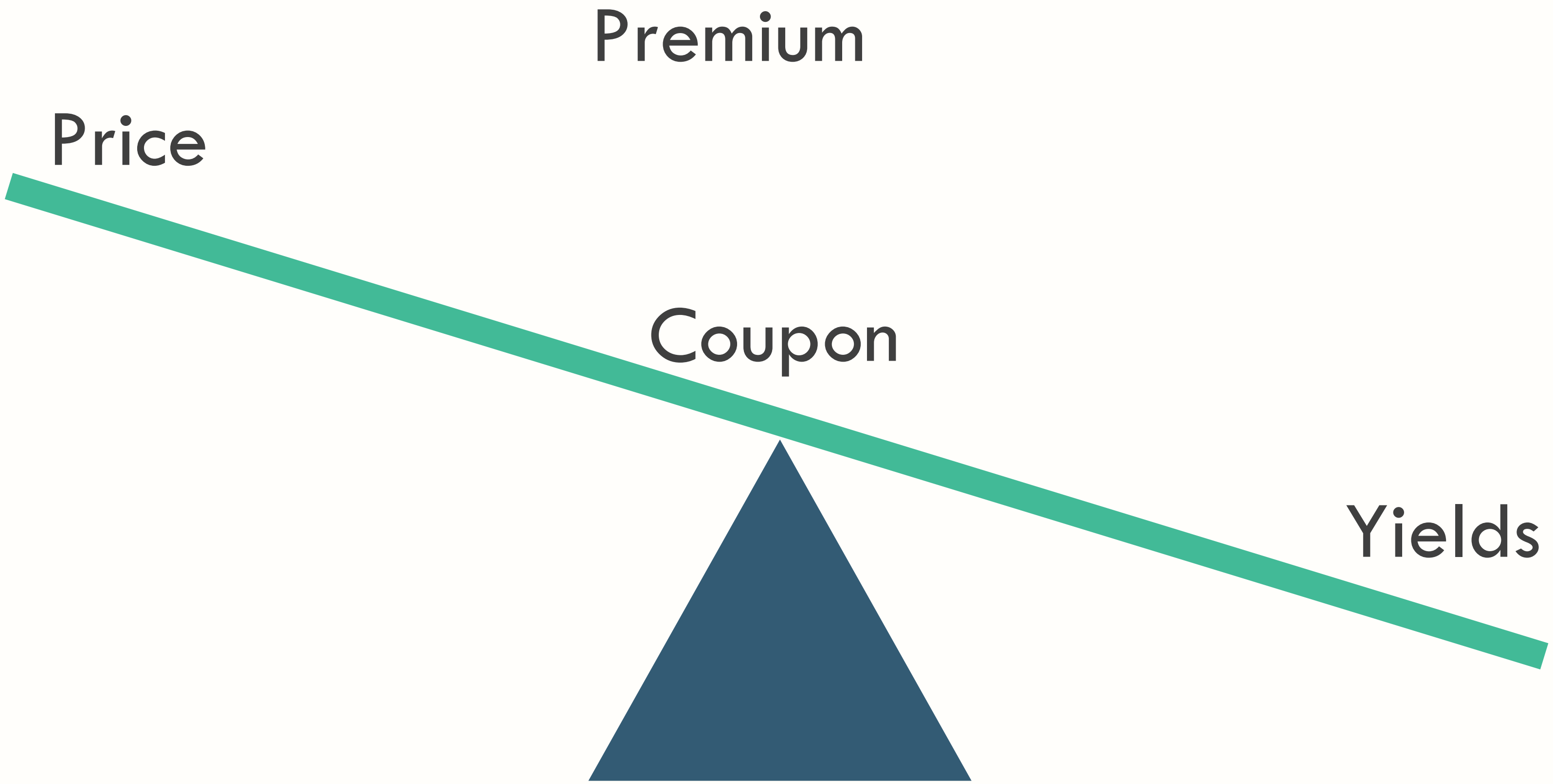

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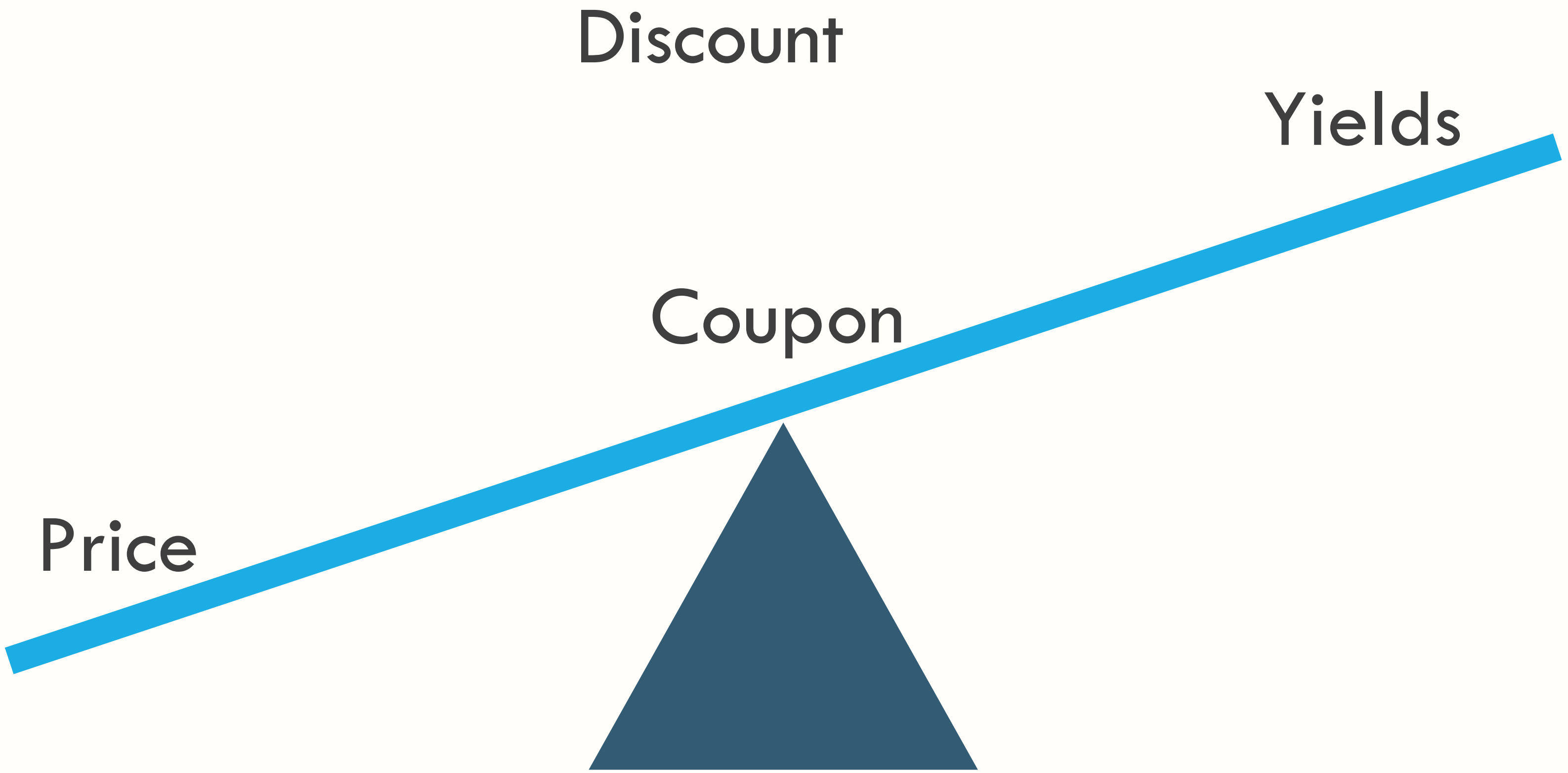
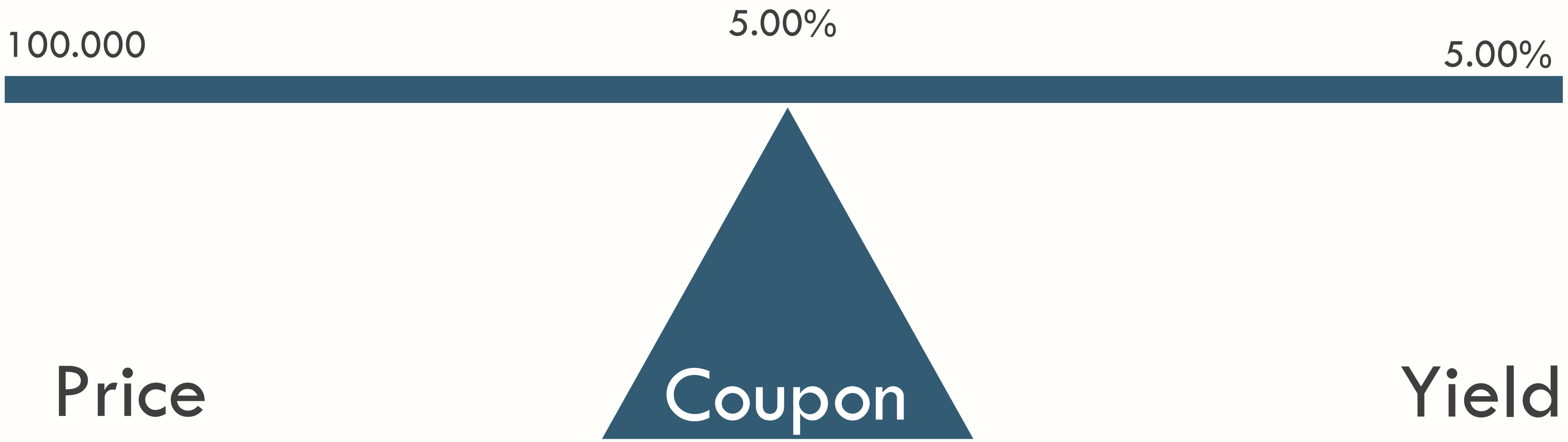


Pricing the Bonds

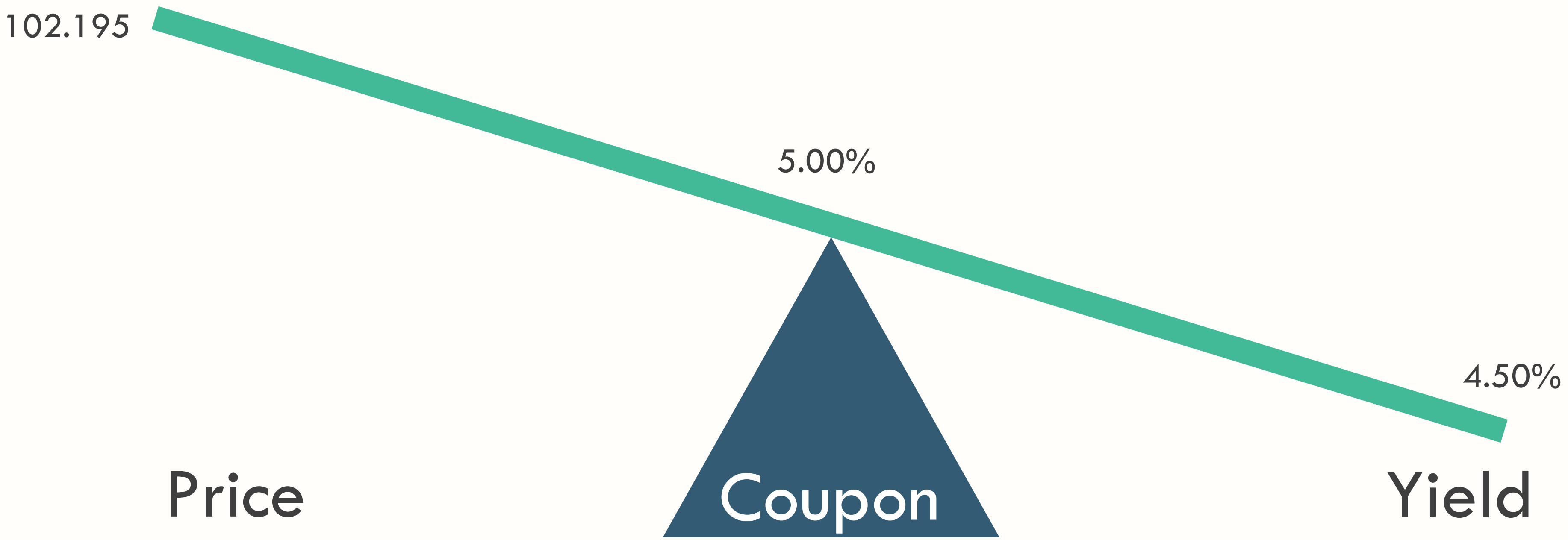
Maturity Date	Coupon	Market Yield	Price
12/1/2023	5.00%	4.50%	102.195
12/1/2024	5.00%	5.00%	100.000
12/1/2025	5.00%	5.50%	97.865

Par



Pricing the Bonds

	Maturity Date	Coupon	Market Yield	Price
Premium	12/1/2023	5.00%	4.50%	102.195
	12/1/2024	5.00%	5.00%	100.000
	12/1/2025	5.00%	5.50%	97.865



Pricing the Bonds

	Maturity Date	Coupon	Market Yield	Price
	12/1/2023	5.00%	4.50%	102.195
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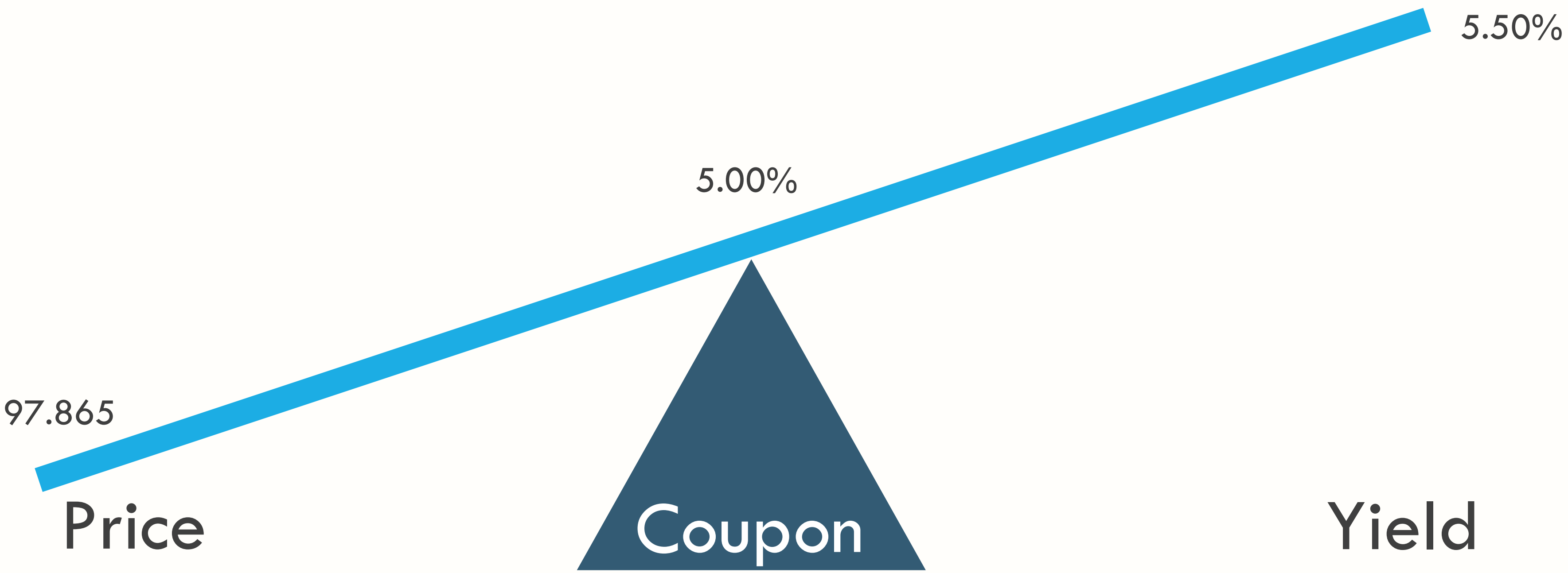
Discount	12/1/2025	5.00%	5.50%	97.865



Investor Preferences

Issuer

Type of Bond

Size of Bond

Credit Rating

Retail

Serial vs Term

Professional Retail/SMA

Premium

vs

Discount

Institutional

Issuer	Gotham City
Deal	2022 General Obligation Bonds
Par	$4,120,000
Tax Status	Tax-Exempt
Rating	AAA
Par Call Date	12/1/2032
Underwriter	Wayne Enterprises
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Maturity	PAR AMOUNT	COUPON RATE	YIELD
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2024	$185,000	5.00	2.95
2025	$190,000	5.00	3.10
2026	$200,000	5.00	3.20
2027	$205,000	5.00	3.40
2028			
2029			
2030			
2031			
2032	$2,000,000	4.25	4.50

Continuing Disclosure

- Issuers have the obligation to repay the bonds AND provide periodic reporting to investors
- Annual reporting and significant events reporting
  - Will be discussed in more detail on Day 3

Basic Bond Math

Bond Price

- **Bond Price**: Price at which the bond is sold to investors
- **Equation**:

$$\text{Bond Price} = \frac{C}{(1+i)} + \frac{C}{(1+i)^2} + \ldots + \frac{C}{(1+i)^n} + \frac{M}{(1+i)^n}$$

  - **C** = Coupon payment
  - **i** = Interest rate (required yield)
  - **M** = Value at maturity
  - **n** = Number of payments

- **Excel 'PRICE' Function**:
  - =PRICE(delivery date, maturity date, coupon, yield, value at maturity, frequency of coupons, day count basis)

Inputs	Values
Delivery Date (settlement)	9/1/2022
Maturity Date	9/1/2032
Coupon (rate)	5.00%
Yield	4.50%
Maturity Value (redemption)	$100
Coupon Payments/Year	2
Day Count Basis	0
PRICE function	**$103.99**

Yield to Maturity

- **Yield to Maturity (YTM)**: Total return anticipated on a bond if held until maturity
- **Equation**:

$$\text{Bond Price} = \frac{\text{Cashflow 1}}{(1+\text{yield})^1} + \frac{\text{Cashflow 2}}{(1+\text{yield})^2} + \ldots + \frac{\text{Last Cashflow}}{(1+\text{yield})^n}$$

  - Back-solves bond price equation to determine yield, given bond price and coupon:

- **Excel 'YIELD' Function**:

=YIELD(delivery date, maturity date, coupon, price, value at maturity, coupon payments per year, day count basis)

Inputs	Values
Delivery Date (settlement)	9/1/2022
Maturity Date	9/1/2032
Coupon (rate)	5.00%
Purchase Price	$110
Maturity Value (redemption)	$100
Coupon Payments/Year	2
Day Count Basis	0
YIELD function	**3.79%**

True Interest Cost

- **True Interest Cost (TIC)**: Rate necessary to discount the amounts payable on the bond to the purchase price received
  - Effective borrowing rate on Bond inclusive of P&I and all costs associated with Bond issuance
  - Proxied by internal rate of return (IRR)

- **Excel 'IRR' function**:

=IRR(values, guess)

  - Values: Series of payments (first cash inflow must have negative value)
  - Guess: Gives Excel a place to start solving

Principal and Interest Payment Date	Annual Debt Service Amount
Issue Bonds	**$(10,000,000)**
12/1/2023	$1,500,000
12/1/2024	$1,500,000
12/1/2025	$1,500,000
12/1/2026	$1,500,000
12/1/2027	$1,500,000
12/1/2028	$1,500,000
12/1/2029	$1,500,000
12/1/2030	$1,500,000
12/1/2031	$1,500,000
12/1/2032	$1,500,000
IRR Function (TIC)	**8.14%**

Debt Service Payments

- If public agency needs to issue Bonds to pay for a police station, knowing the expected cost of the station, how can you approximate the yearly debt service?

- Excel Function

=PMT(Interest rate, Number of Periods, Present Value, Future Value, Payment Due Period)

Inputs	Values
Coupon (rate)	5.00%
Years to Maturity (nper)	30
Present Value (PV)	$30,000,000
Face Value (FV)	$0
Payment Due period	0
PMT Function (Annual DS)	**($1,951,543)**

- "PMT" value returned is negative to show cash payments going out

Case Study

Campbell – Session 2

Fun Stats

California County Ratings

15 AAA Rated Counties in California

20 AA Rated Counties in California

**The state of California has a AA- rating*

Source: S&P Global Ratings as of September 2022

California City Ratings

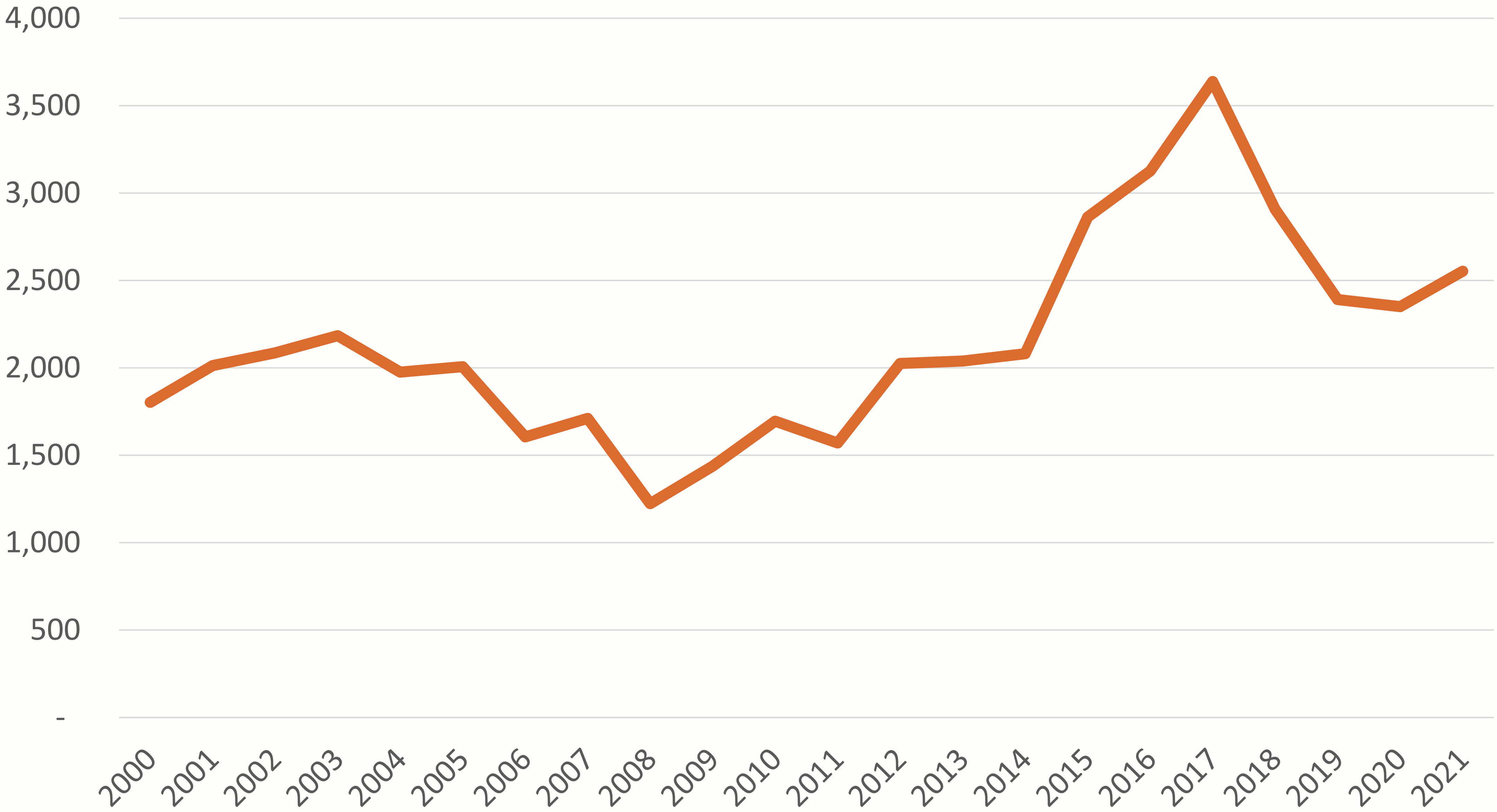
62 AAA Rated Municipalities in California

Roughly 130 AA Rated Municipalities in California

**The state of California has a AA- rating*

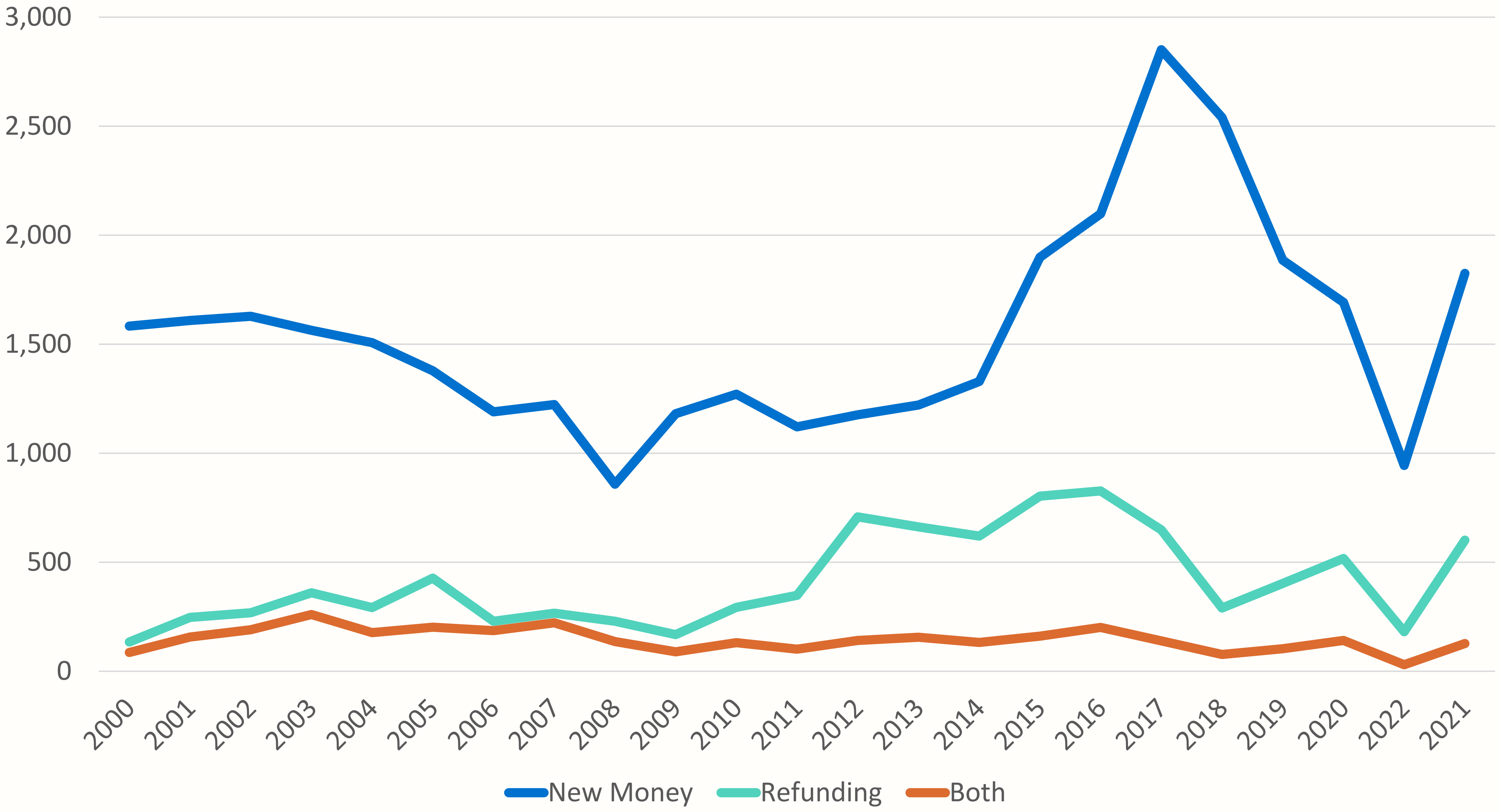
Source: S&P Global Ratings as of September 2022

Bond Transactions Per Year - Since 2000



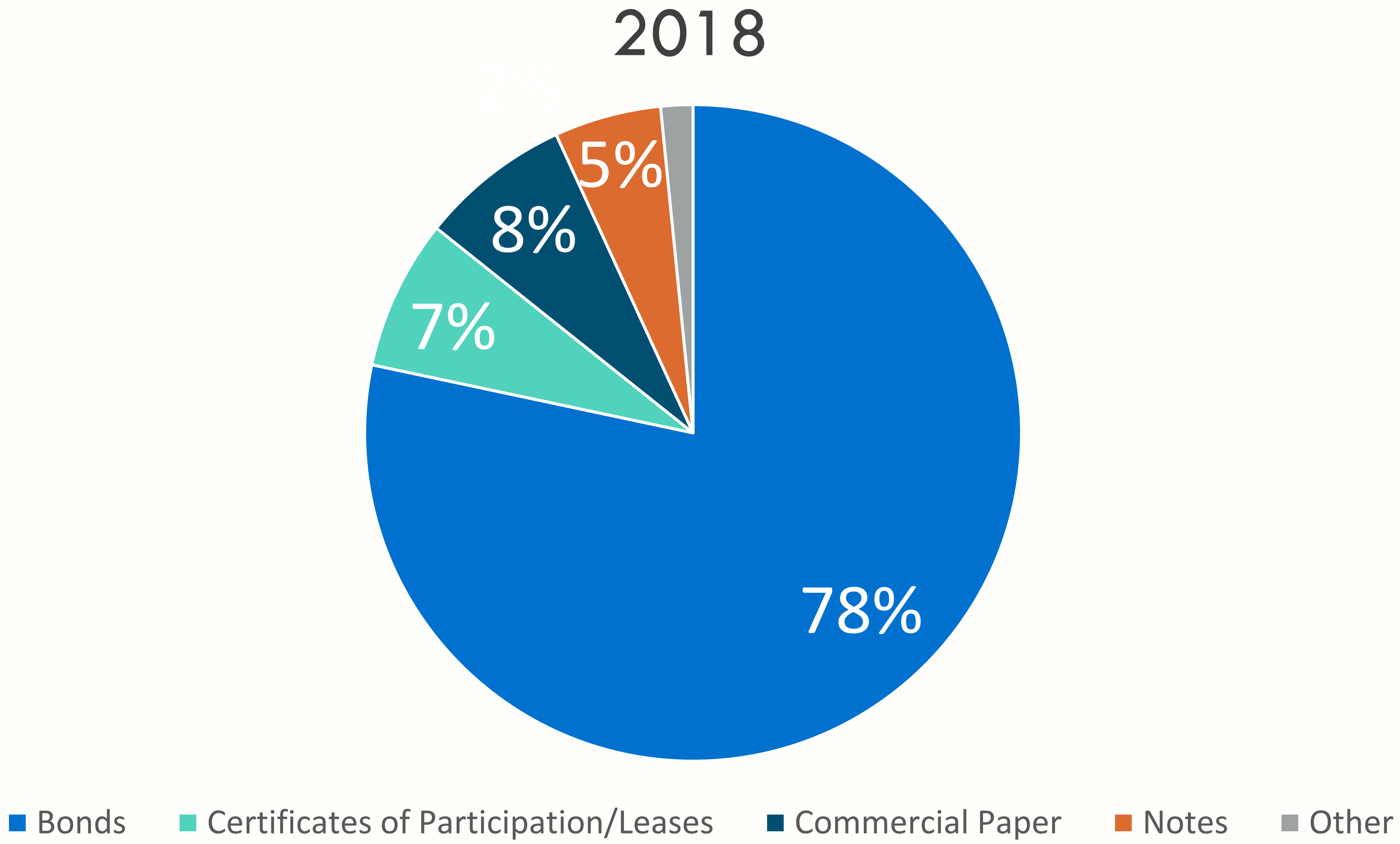
Source: CDIAC data as of August 2022

Transaction Types – Since 2000



Source: CDIAC data as of August 2022

Types of Transactions



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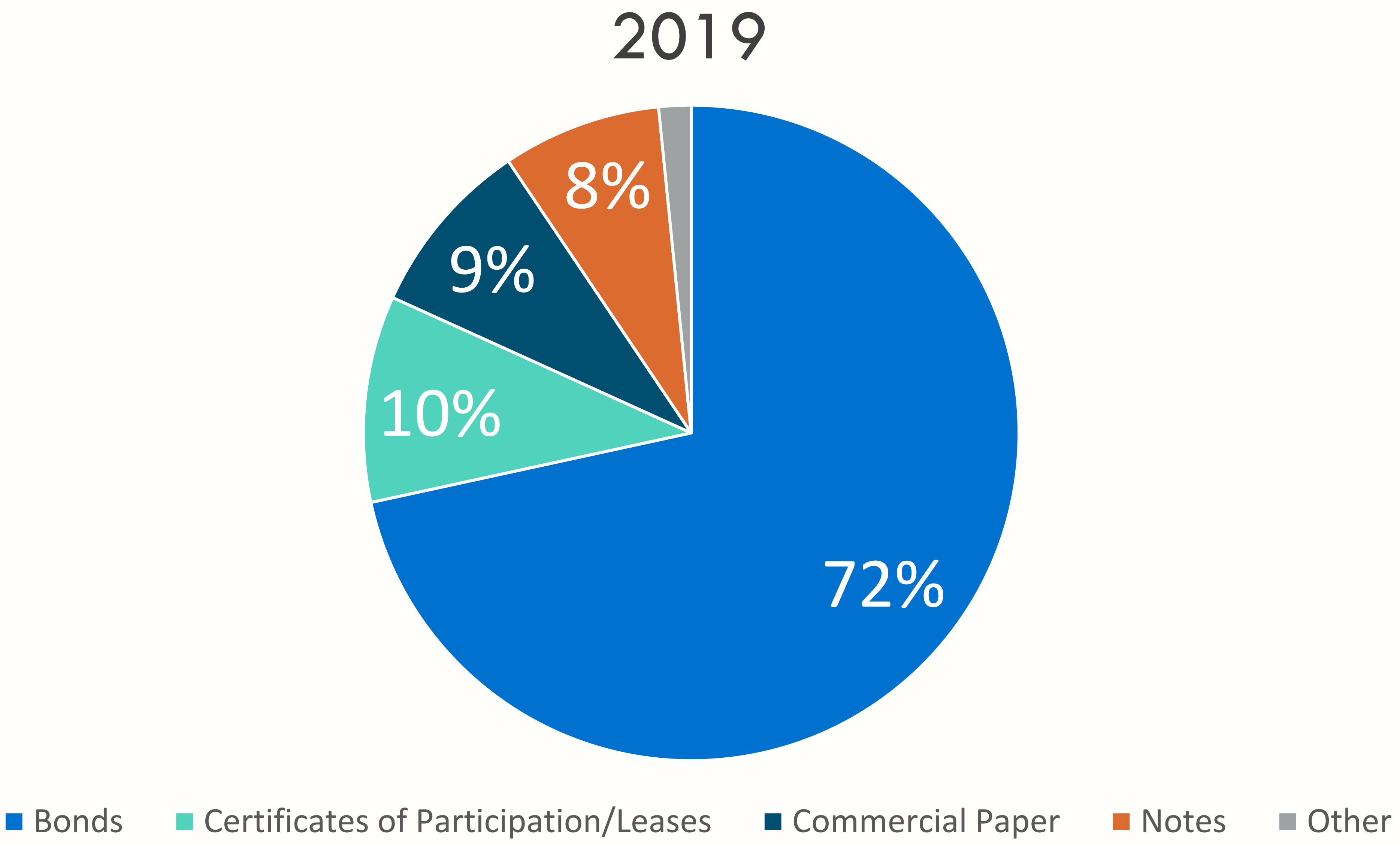
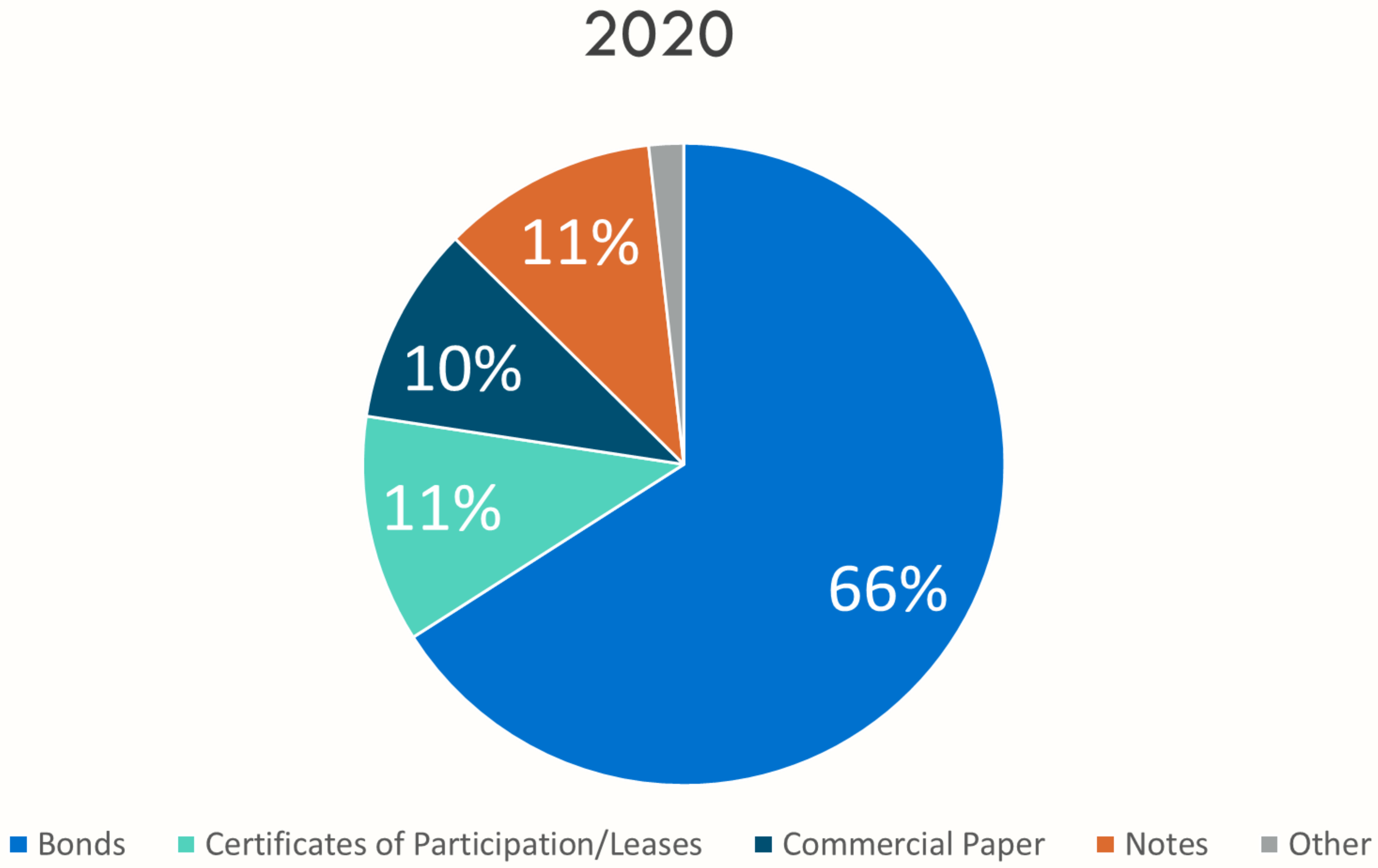


Types of Transactions



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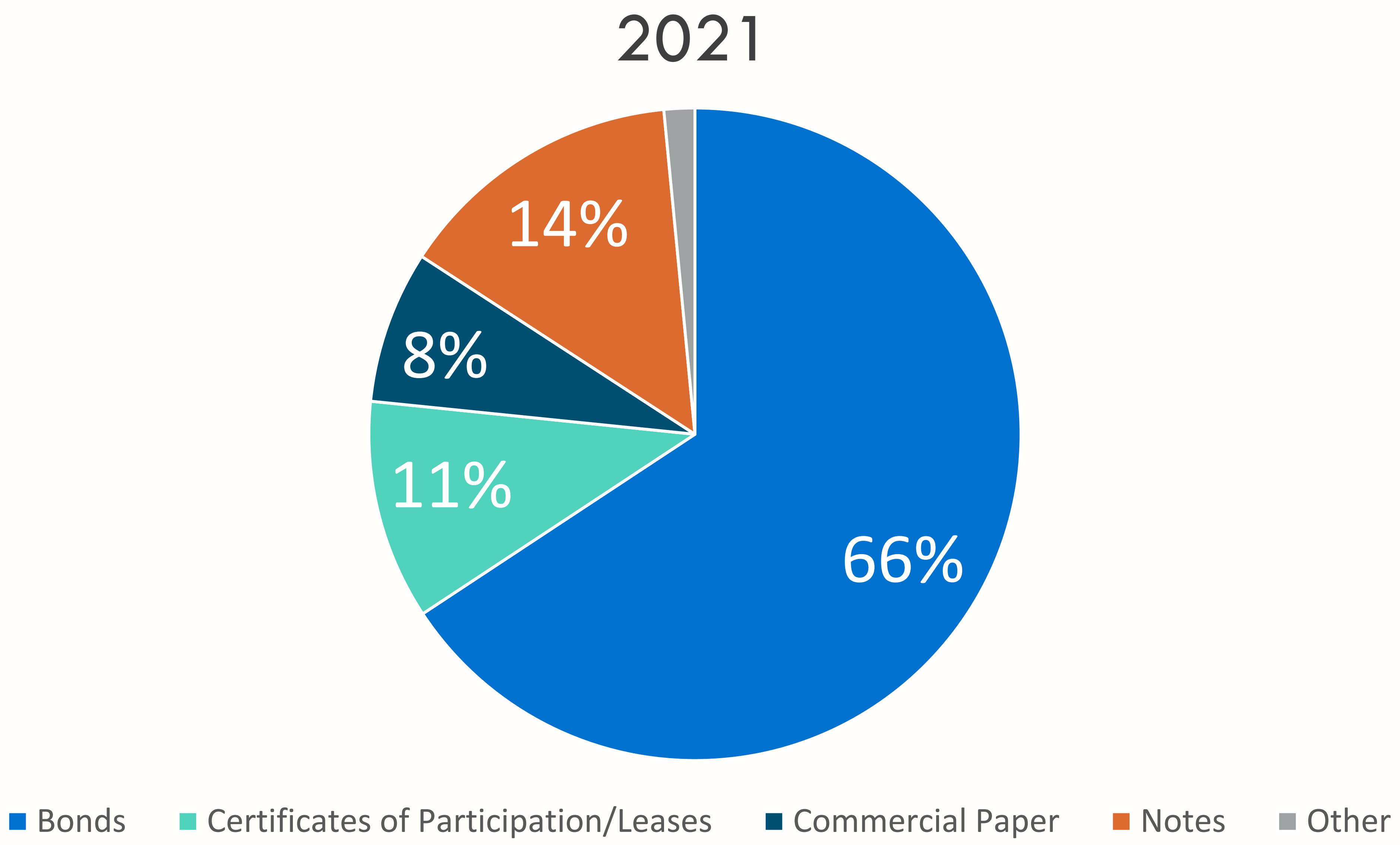
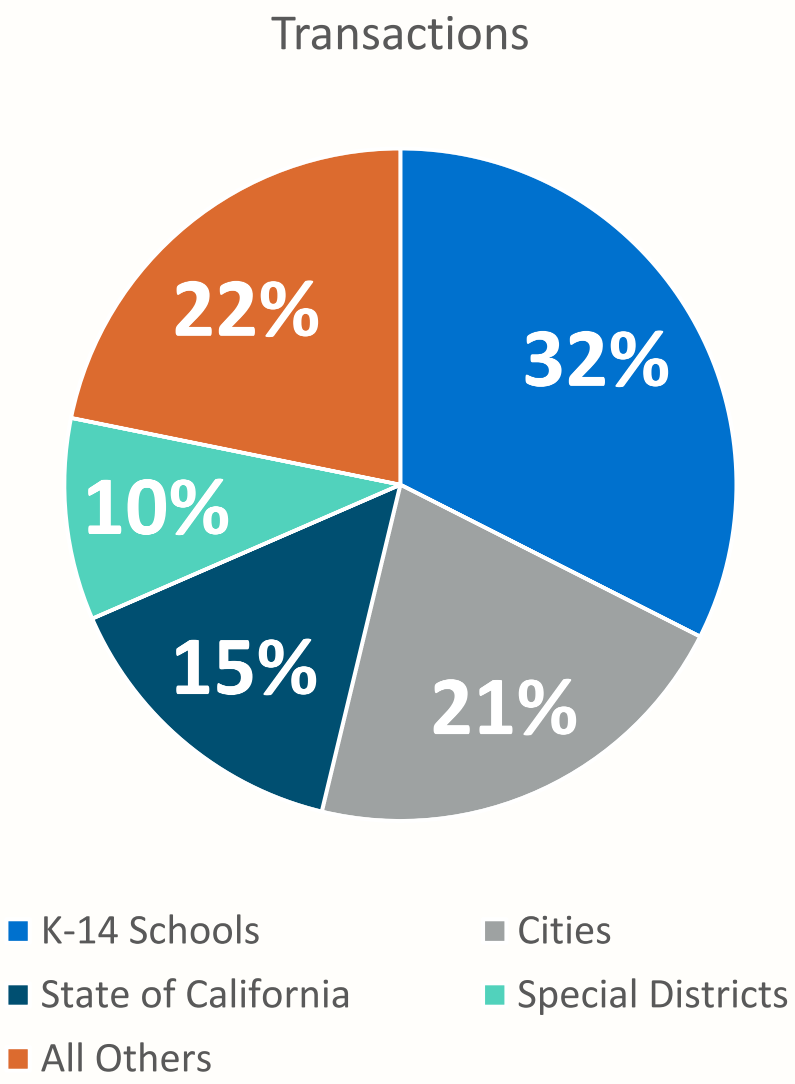
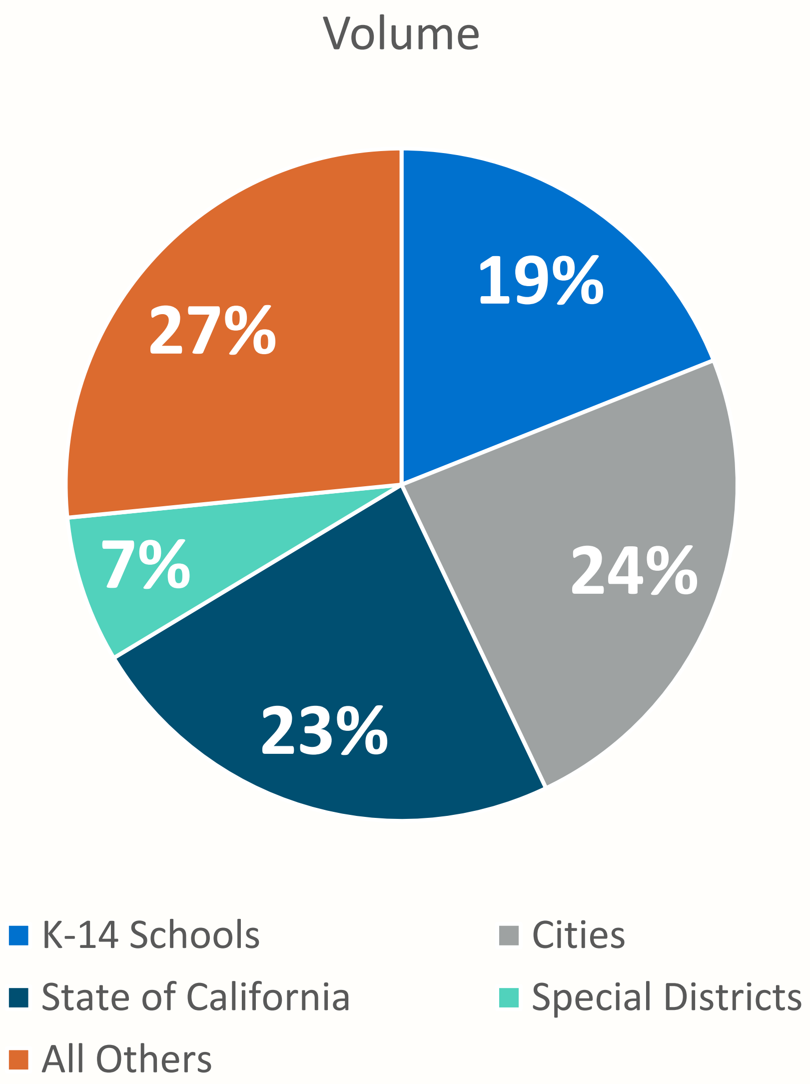


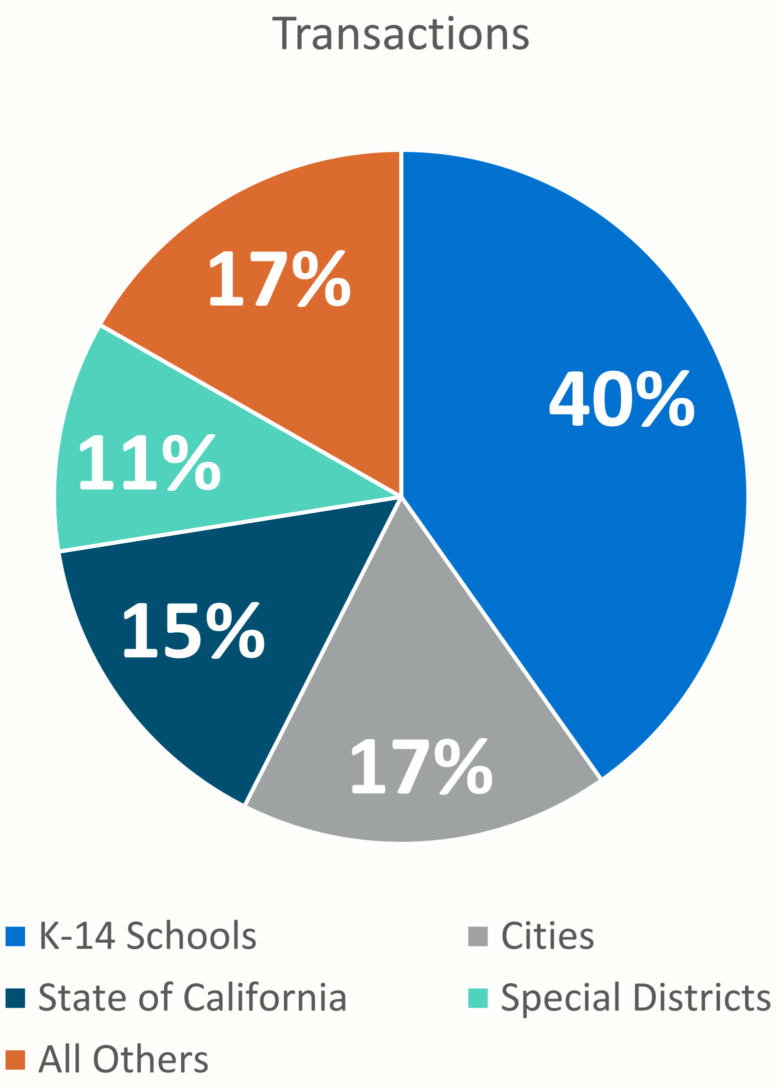
Issuer Type - 2018

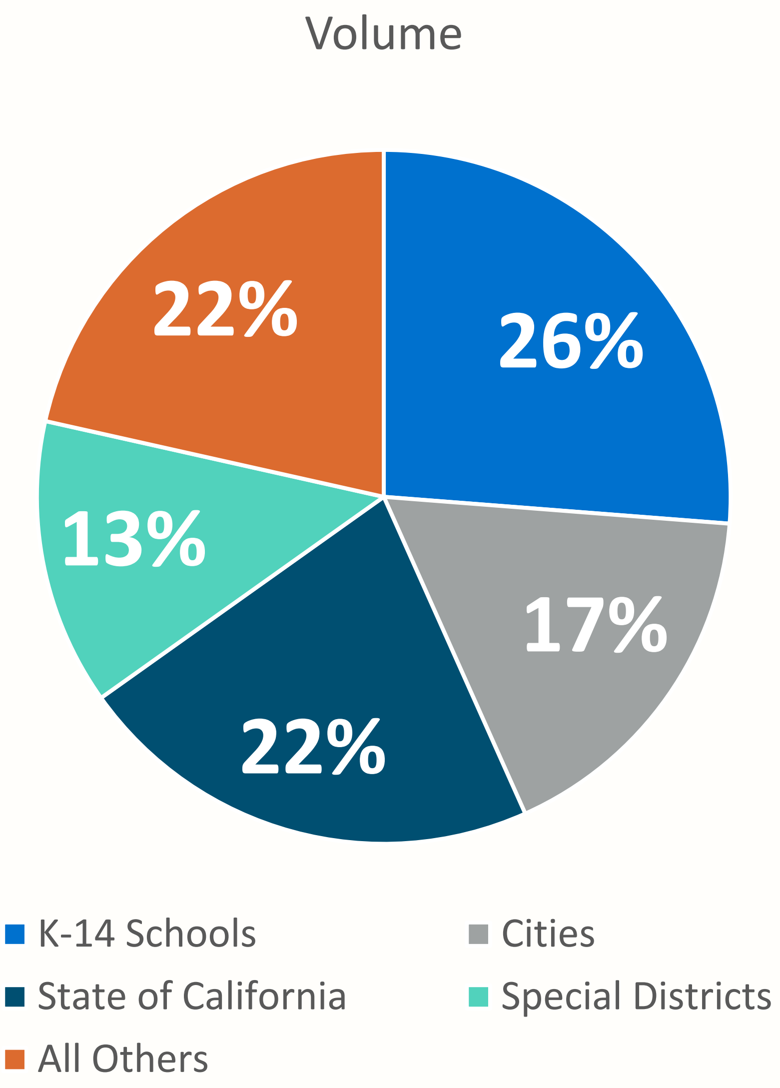




Source: CDIAC data as of August 2022

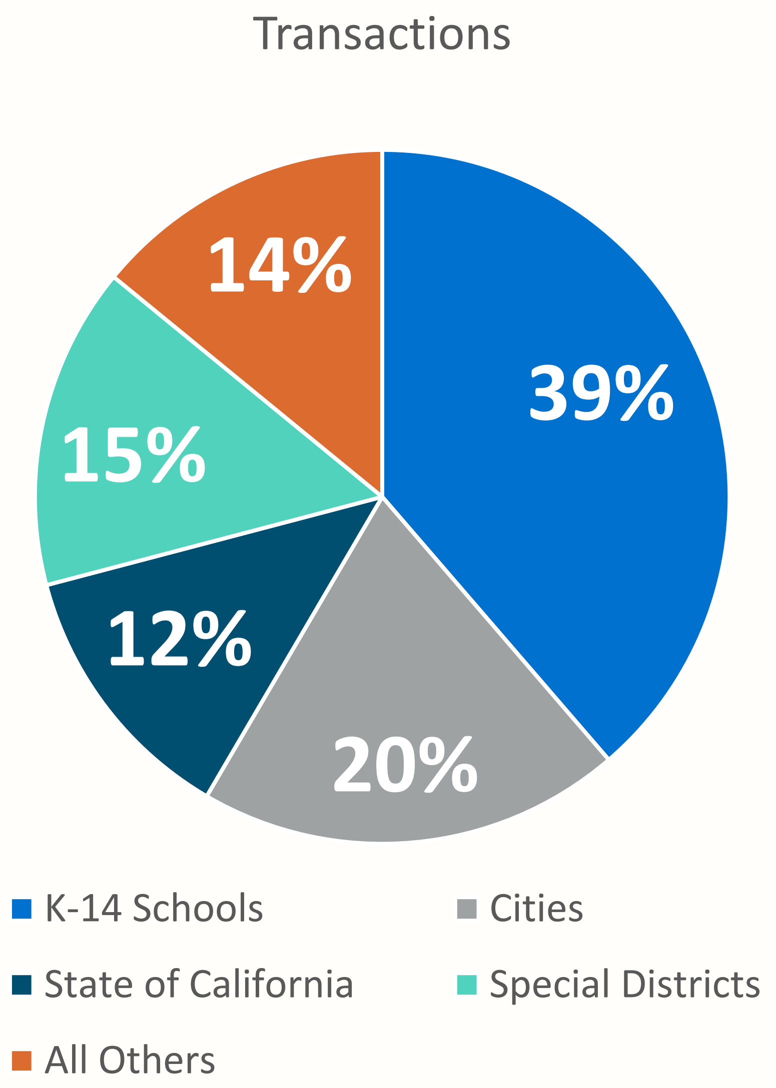
Issuer Type - 2019

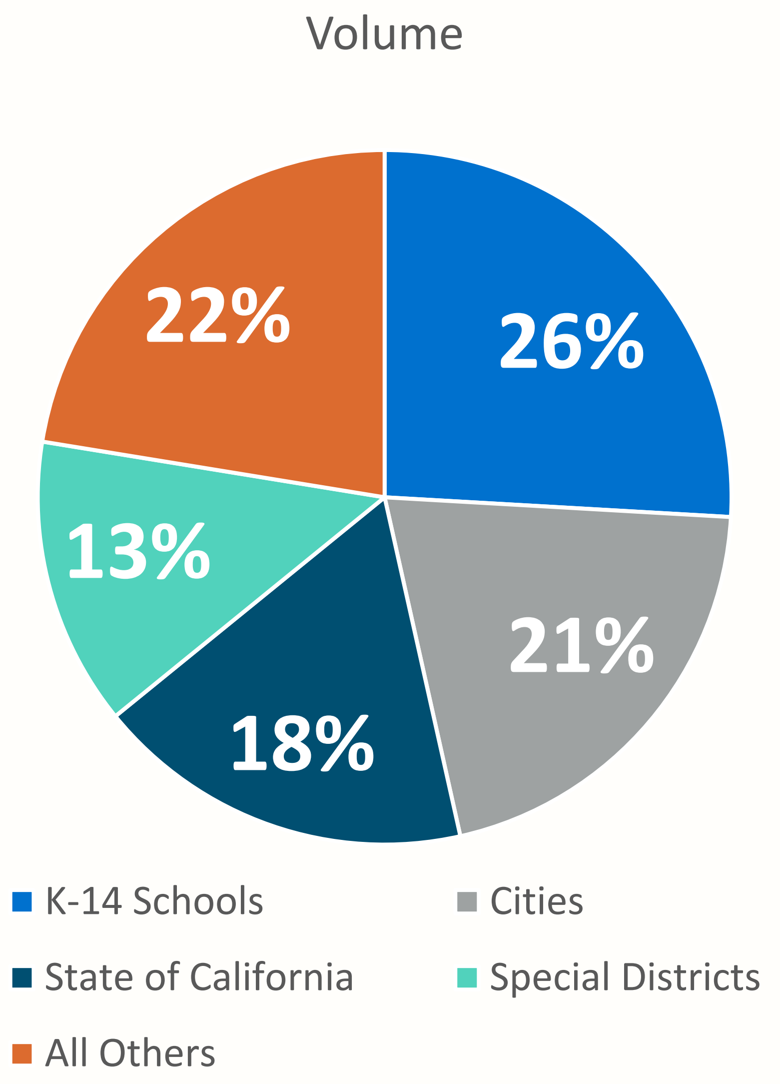




Source: CDIAC data as of August 2022

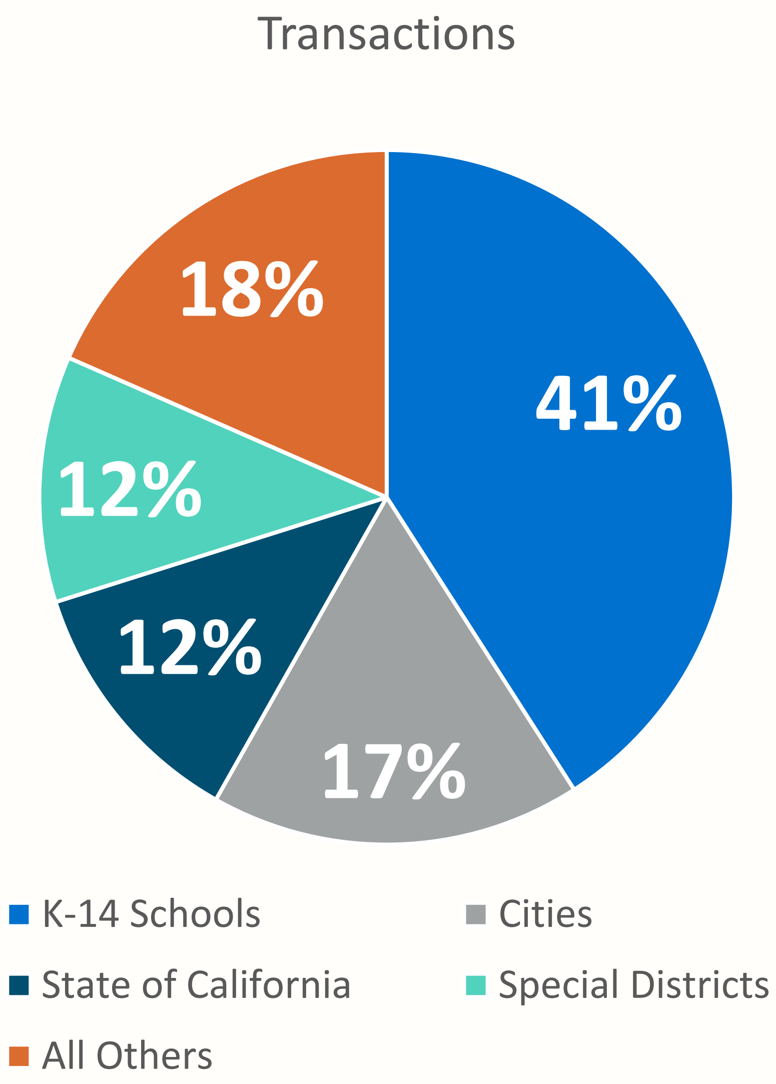
Issuer Type - 2020

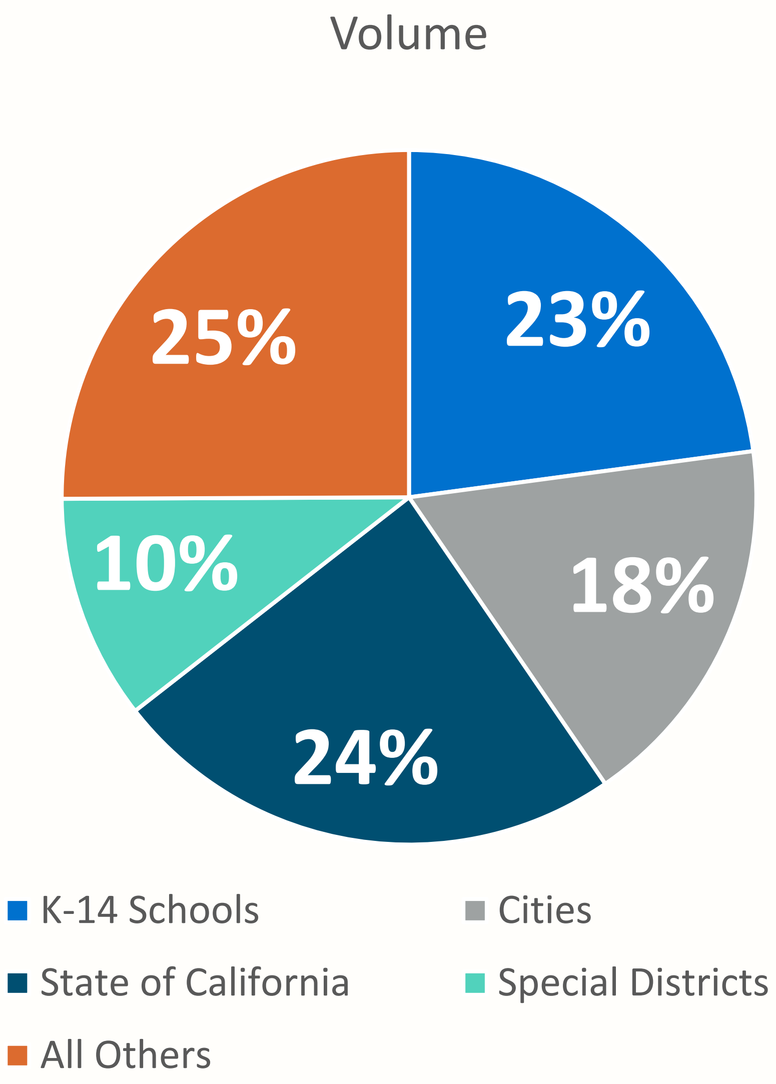




Source: CDIAC data as of August 2022

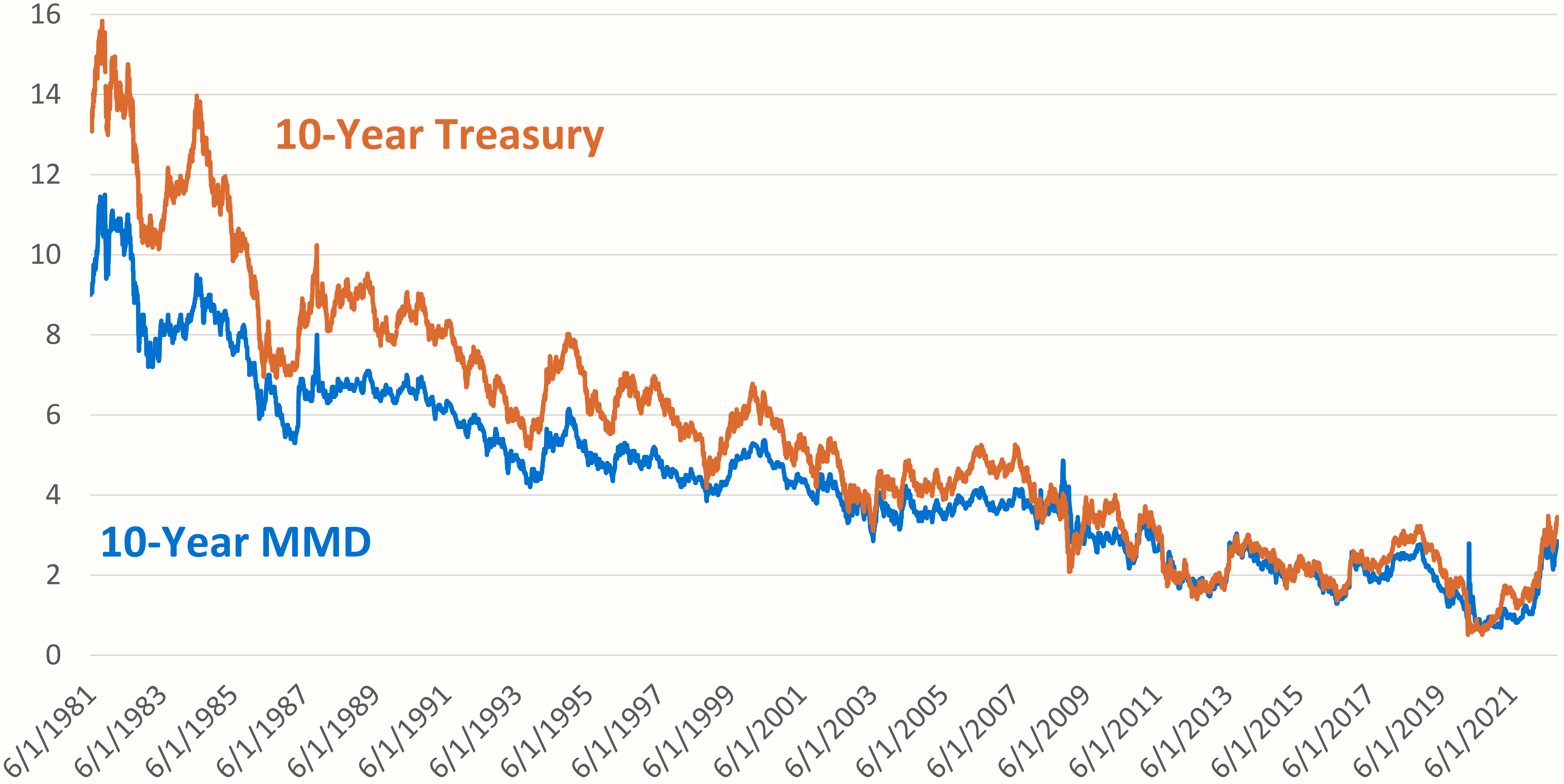
Issuer Type - 2021





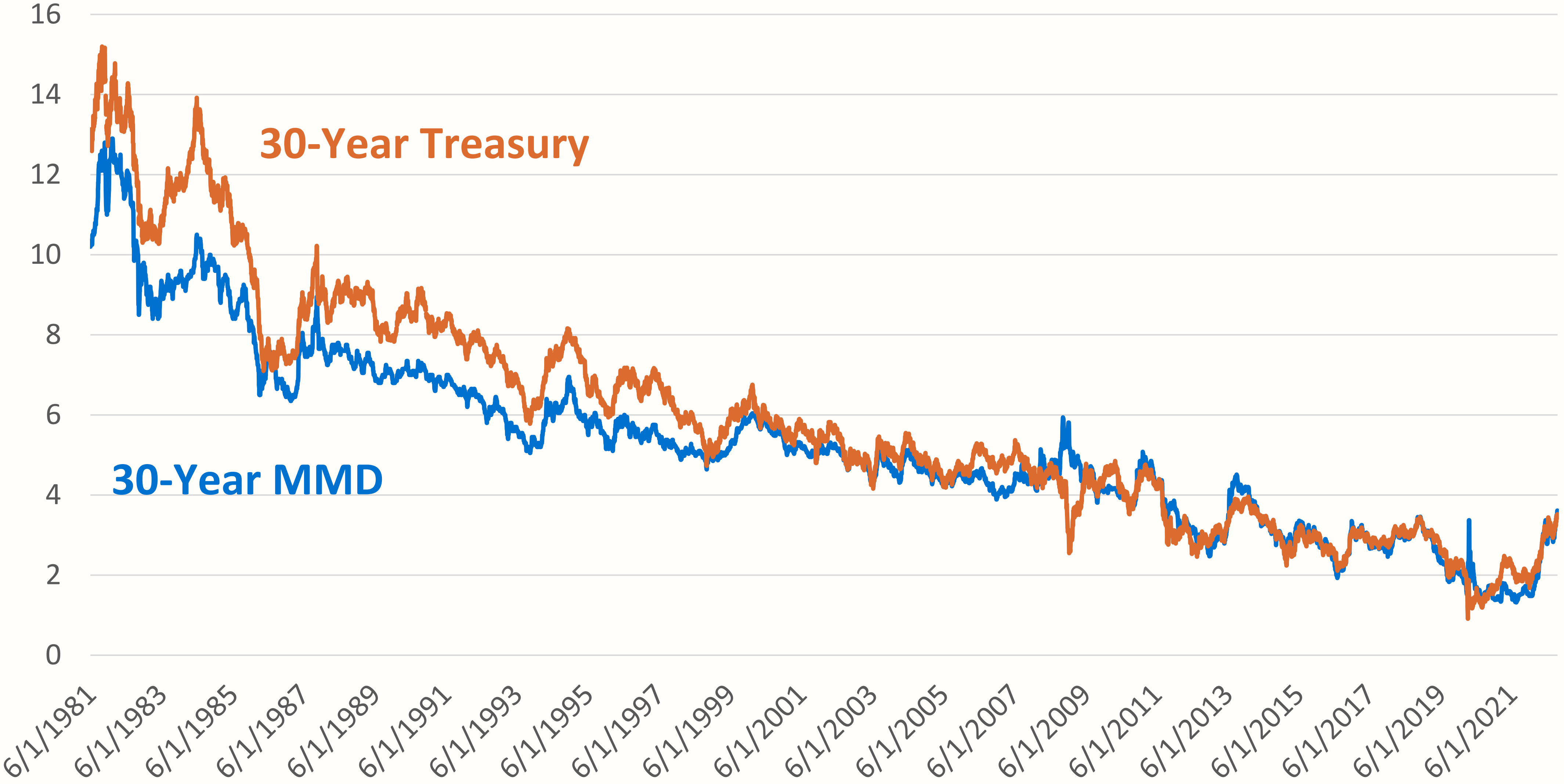
Source: CDIAC data as of August 2022

10-Year MMD & Treasury Rates 1981 – Present



Source: Refinitiv TM3 data as of September 2022

30-Year MMD & Treasury Rates 1981 – Present



Source: Refinitiv TM3 data as of September 2022

Questions?