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2019 SFGFOA Annual Investment Seminar

A primer on fixed income securities

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Presentation agenda

- Bond fundamentals
- Types of bonds
 - Treasury
 - Agency
 - Commercial paper & corporate notes
 - Other short-term investments

Bond fundamentals

Investment risks

Credit Risk

- Risk that the issuer of the security will be downgraded or default

Market Risk

- Sensitivity of the security to interest rate changes

Liquidity Risk

- Ability to sell the security in the secondary market

Where does one invest?

Primary Market

- Market in which securities are originally issued

Secondary Market

- Market where securities trade after they are issued but prior to their maturity

Prices and yield move inversely



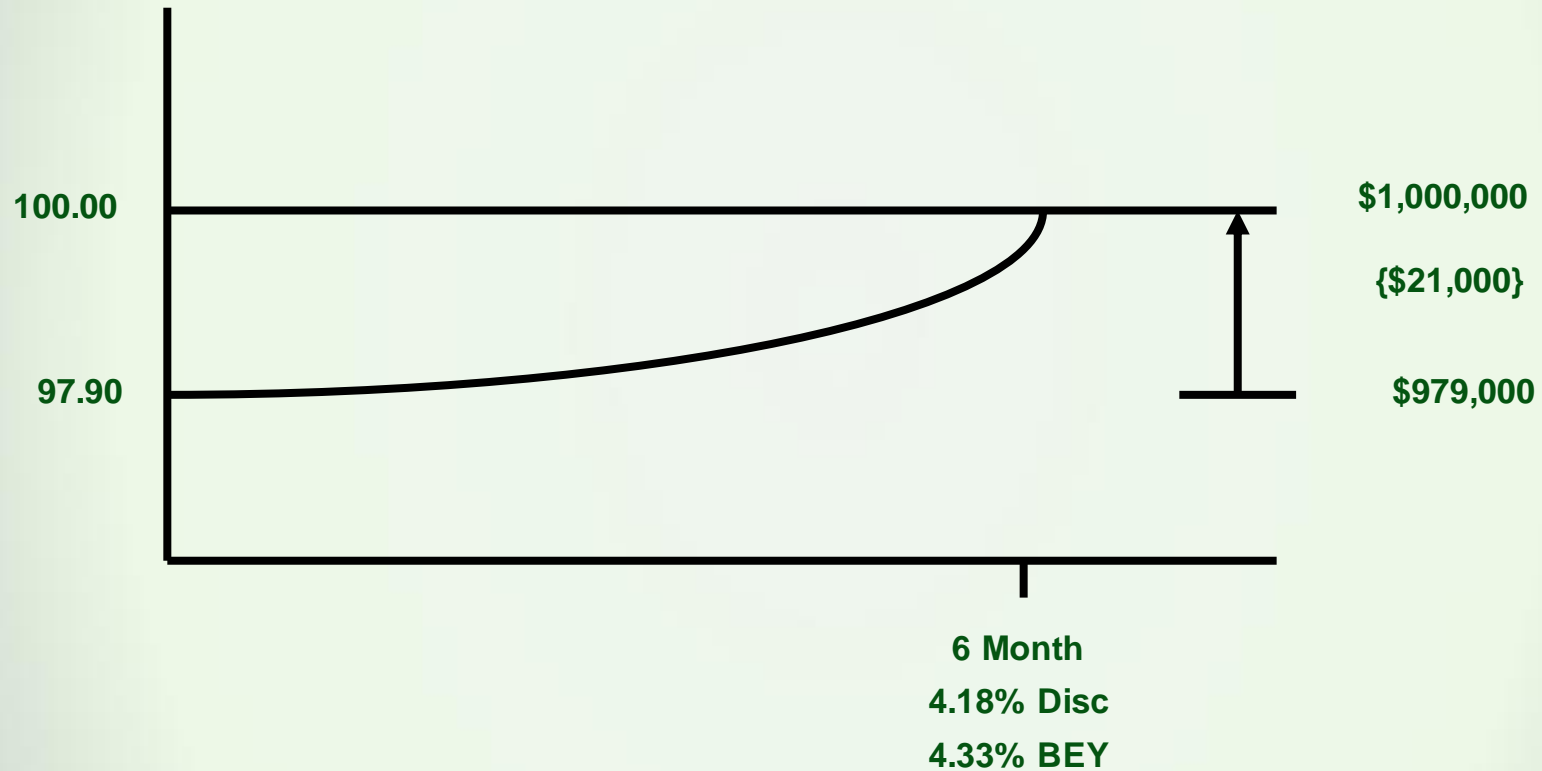
Par: Amount that will be repaid by the issuer at maturity

Premium: If the purchase price is greater than par value (Current Yield < Coupon)

Discount: If the purchase price is less than par value (Current Yield > Coupon)

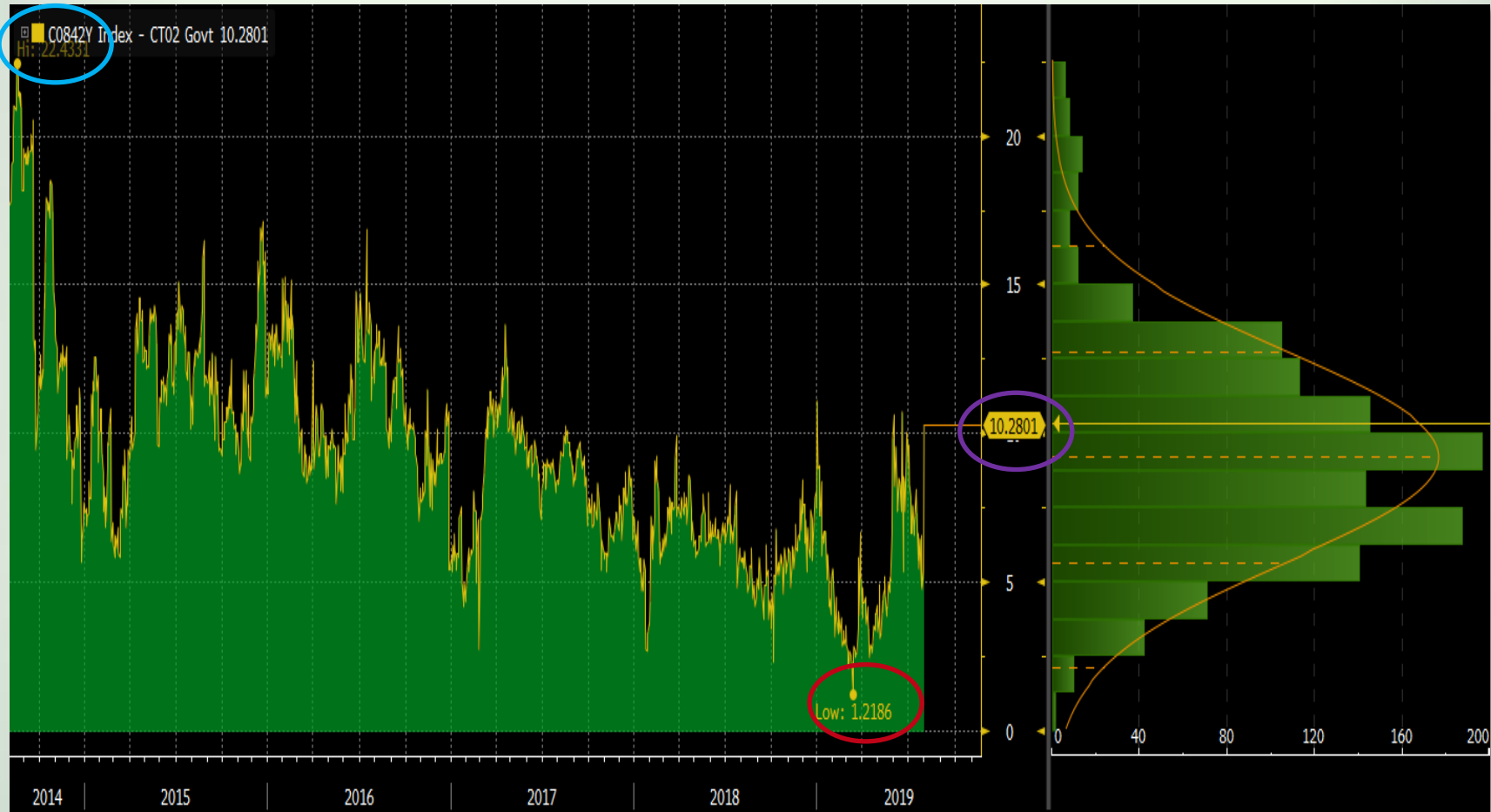
For illustrative purposes only.

Original issue discount



For illustrative purposes only.

Evaluating the pick up versus Treasury securities: “spread”



Source: Bloomberg, as of August 2019. 2-year agency securities versus 2-year Treasury securities.

Types of bonds

Treasury securities

Virtually credit risk free

- Backed by full faith and credit of US government
- Market risk

Potential for excellent liquidity

- Average issue size over \$30bn
- Primary dealers

Standardization

- Coupon and maturity
- Auction schedule

Benchmarks for fixed-income securities

Primary dealer list

www.newyorkfed.org



- Amherst Pierpont Securities, LLC
- Bank of Nova Scotia, New York Agency
- BMO Capital Markets Corp.
- BNP Paribas Securities Corp.
- Barclays Capital Inc.
- BofA Securities, Inc.
- Cantor Fitzgerald & Co.
- Citigroup Global Markets Inc.
- Credit Suisse Securities (USA) LLC
- Daiwa Capital Markets America Inc.
- Deutsche Bank Securities Inc.
- Goldman, Sachs & Co.
- HSBC Securities (USA) Inc.
- Jefferies & Company, Inc.
- J.P. Morgan Securities LLC
- Mizuho Securities USA Inc.
- Morgan Stanley & Co. LLC
- NatWest Markets Securities Inc.
- Nomura Securities International, Inc.
- RBC Capital Markets, LLC
- Societe Generale, New York Branch
- TD Securities (USA) LLC
- UBS Securities LLC.
- Wells Fargo Securities, LLC

Source: www.newyorkfed.org, as of August 2019.

US guaranteed agencies

- Backed by the full faith and credit of the US government
- Most not considered money-market instruments
- Most are not active; therefore, the quotes, except for GNMA's are not widely published
- Examples
 - Government National Mortgage Association (GNMA)
 - Small Business Association (SBA)
 - Housing and Urban Development (HUD)
 - National Credit Union Administration (NCUA)

US sponsored agency securities

- Federal oversight, but not guaranteed
- Differentiated investment offerings
- Most are widely traded
- Examples
 - Federal National Mortgage Association (FNMA)
 - Federal Home Loan Mortgage Corporation (FHLMC)
 - Federal Farm Credit Banks (FFCB)
 - Federal Home Loan Banks (FHLB)
 - Resolution Financing Corporation (REFCO)

Agency characteristics

- Spread over Treasuries
- Liquidity considerations
 - issues size \$10 MM to several billion
- Various structures
 - discount notes, “bullets,” callables, floating rate, step-up callables
- Purchased at the “window”, primary or secondary through dealer

Callable agency securities

- Issuer has right but not the obligation to redeem early
- Investors are paid a higher yield to compensate them for their loss of rights
- One-time (European): Callable one-time only on call date
- Discrete (Bermuda): Callable on certain specified dates (e.g., coupon payment date, monthly, quarterly, annual)
- Continuous (American): Can be called at any time on or after the first call date

Typical schedule

FHLMC 2.45 08/01/24\$ **↑99.995** +.036 66.0 b

At 10:09 Source: BMMK

See What's New in DES for Corporate Bonds

FHLMC 2.45 08/01/24 Cor Settings Actions Page 11/12 Security Description: Bond

Data not provided by Bloomberg 94 Notes 95 Buy 96 Sell

25 Bond Description 26 Issuer Description

Schedules

Call Schedule

Discrete Call minimum 5 business days notice

Last Call Date 05/01/2024

Call Frequency Quarterly

Callable only on date(s) shown

Date	Price
11/01/2019	100.000
02/01/2020	100.000
05/01/2020	100.000
08/01/2020	100.000
11/01/2020	100.000
02/01/2021	100.000
05/01/2021	100.000
08/01/2021	100.000
11/01/2021	100.000
02/01/2022	100.000
05/01/2022	100.000
08/01/2022	100.000

Source: Bloomberg, as of August 1, 2019.

Pricing to maturity may be misleading

FHLMC 2.45 08/01/24 Corp		Settings	Yield and Spread Analysis	
		95 Buy		96 Sell
1) Yield & Spread	2) Yields	3) Graphs	4) Pricing	5) Description
		6) Custom	7) Calls	
FHLMC 2.45 08/01/24 (3134GTP31)		Risk		
Spread	35.98 bp vs 3mB 0 10/31/19	Maturity	OAS	
Price	100.026	4.676	1.094	
Yield	2.444432 Mty	4.678	1.095	
Wkout	08/01/2024 @ 100.00	Convexity	-2.163	
Settle	08/02/19	DV 01 on 1MM	468	
		Benchmark Risk	0.243	
		Risk Hedge	19,219M	
		Proceeds Hedge	1,005M	
Spreads		Invoice		
11) G-Sprd	65.3	Face	1,000 M	
12) I-Sprd	66.8	Principal	1,000,260.00	
Basis	N.A.	Accrued (1 Days)	68.06	
14) Z-Sprd	66.8	Total (USD)	1,000,328.06	
15) ASW	65.8			
16) OAS	-35.0			
17) TED	-64.0			
After Tax (Inc 40.800 % CG 23.800 %)		1.446184		

Source: Bloomberg, as of August 1, 2019.

Valuing to the “worst” provides a better picture

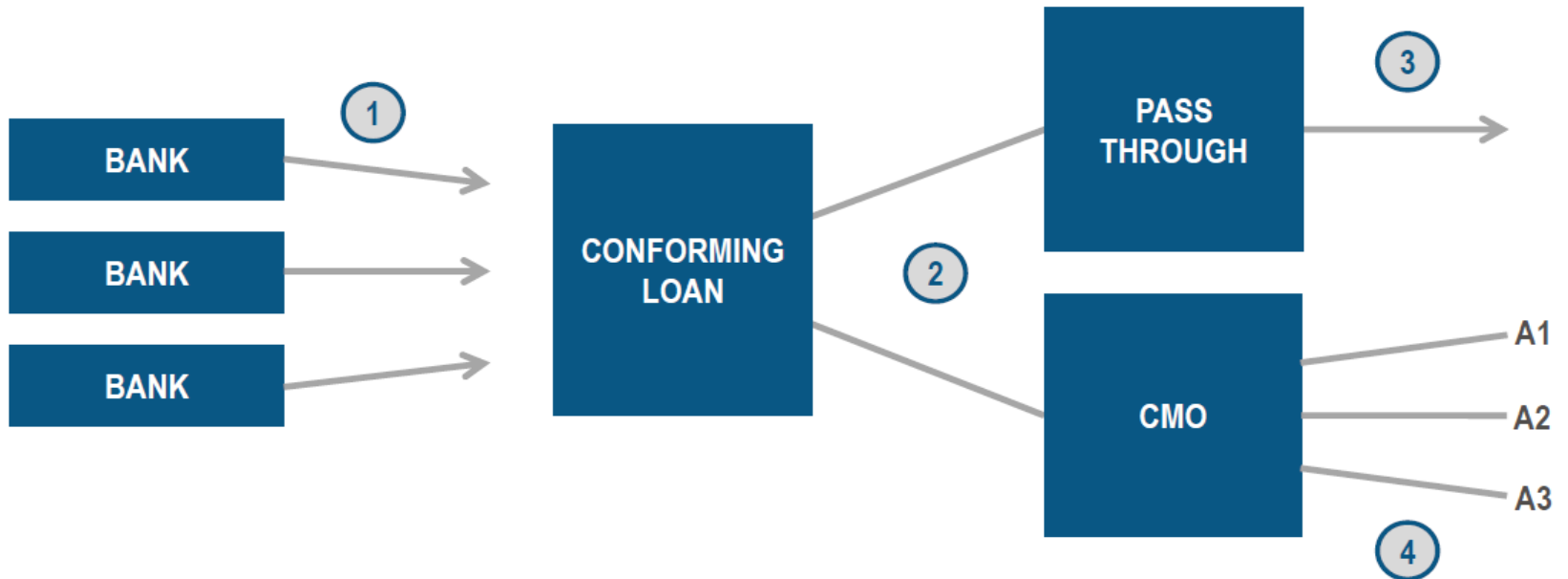
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5) Description		6) Custom	7) Calls	95) Buy
96) Sell				
FHLMC 2.45 08/01/24 (3134GTP31)		Risk		
Spread	25.94 bp	vs	3mB 0 10/31/19	Workout
Price	100.026		2.04 10:25:10	0.246
Yield	2.344062	Wst	2.084632	0.246
Wkout	11/01/2019 @ 100.00	Consensus	Yld 6/6	1.092
Settle	08/02/19			1.092
		Convexity		0.001
		DV 01 on 1MM		24.59
		Benchmark Risk		0.243
		Risk Hedge		1,010 M
		Proceeds Hedge		1,005 M
Invoice				
Face		1,000 M		
Principal		1,000,260.00		
Accrued (1 Days)		68.06		
Total (USD)		1,000,328.06		
Spreads		Yield Calculations		
11) G-Sprd	25.9	Street Convention	2.344062	
12) I-Sprd	9.1	Equiv 1 /Yr	2.364825	
Basis	N.A.	Mmkt (Act/360)	2.292545	
14) Z-Sprd	4.0	True Yield	2.344062	
15) ASW	4.0	Current Yield	2.449	
16) OAS	-34.6			
17) TED	-7.8			
After Tax (Inc 40.800 % CG 23.800 %)		1.369850		

Source: Bloomberg, as of August 1, 2019.

Agency mortgage backed securities

- Introduces prepayment risk, extension risk and liquidity risk
- Pass-through securities
 - Collateralized by 30yr, 15yr or adjustable rate conforming mortgages
 - Payment is determined by the characteristics of the collateral
 - Creditworthiness of the collateral and the agency
- Collateralized mortgage obligations (CMOs)
 - Collateralized by 30yr, 15yr or adjustable rate conforming mortgages
 - Payment is determined by the characteristics of the collateral and the bond indenture
 - Creditworthiness of the collateral and the agency

Visualizing MBS securities



1. Banks issue and sell conforming loans to GSEs
2. GSEs securitize loans in pass-through or collateralized structures
3. Investors receive cash flows as borrowers pay
4. Investors receive cash flows according to a pre-determined schedule

Source: Insight Investment

Commercial paper

- Credit risk
- Unsecured debt
- Highest ratings
 - Moody's: P-1
 - S & P: A-1+
 - Fitch: F-1+
- 270-day maximum maturity
- Discount (most common) or coupon
- Purchased direct or through dealers

Corporate notes

- Credit risk

Average cumulative issuer-weighted global default rates by letter rating, 1983-2018

	1	2	3	4	5	6	7	8	9	10
Aaa	0.00%	0.01%	0.01%	0.04%	0.06%	0.10%	0.13%	0.13%	0.13%	0.13%
Aa	0.02%	0.06%	0.12%	0.20%	0.30%	0.39%	0.48%	0.57%	0.65%	0.74%
A	0.05%	0.17%	0.35%	0.54%	0.77%	1.03%	1.30%	1.58%	1.87%	2.14%
Baa	0.17%	0.44%	0.75%	1.12%	1.50%	1.90%	2.27%	2.64%	3.02%	3.42%
Ba	0.87%	2.47%	4.38%	6.39%	8.17%	9.77%	11.21%	12.57%	13.91%	15.26%
B	3.31%	7.88%	12.57%	16.84%	20.71%	24.19%	27.29%	29.93%	32.26%	34.22%
Caa-C	9.70%	17.32%	23.84%	29.34%	33.93%	37.51%	40.63%	43.53%	46.19%	48.19%

- Coupon securities, can be callable
- Purchased in primary or secondary markets
- DTC eligible

Source: Moody's annual default study, February 2019

Top 20 underwriters of corporate securities

US investment grade corporate bonds – Managers, January 1, 2019-August 1, 2019

Jan 1 2019 - Aug 1 2019					
Rank	Firm	Change	Table Share (%)	Volume (MM USD)	Issues
1	JP Morgan	▲ 1	10.87%	80,342	484
2	Bank of America Merrill Lynch	▼ 1	10.17%	75,170	432
3	Citi	0	9.66%	71,368	401
4	Morgan Stanley	▲ 1	7.39%	54,645	302
5	Goldman Sachs	▼ 1	6.87%	50,748	310
6	Barclays	▲ 1	6.16%	45,546	291
7	Wells Fargo	▼ 1	6.10%	45,112	287
8	Mizuho Financial	▲ 1	3.58%	26,442	221
9	Mitsubishi UFJ Financial Group Inc	▲ 1	3.56%	26,321	195
10	HSBC	▼ 2	3.52%	25,994	144
11	Deutsche Bank	▲ 2	3.33%	24,645	175
12	Credit Suisse	0	3.05%	22,575	151
13	RBC Capital Markets	▼ 2	2.91%	21,505	176
14	BNP Paribas	0	2.86%	21,165	159
15	Sumitomo Mitsui Financial	0	1.98%	14,619	119
16	US Bancorp	0	1.94%	14,342	123
17	TD Securities	0	1.62%	11,943	98
18	Scotiabank	▲ 2	1.27%	9,383	80
19	UBS	▼ 1	1.15%	8,526	40
20	Societe Generale	▲ 1	1.09%	8,071	66
	– Credited	–	100%	739,166	1014

Source: Bloomberg, as of August 2019.

Asset backed securities (ABS)

- Backed with non-mortgage loans
 - auto loans
 - equipment loans
 - credit card loans
- Credit risk
 - non-idiosyncratic risk
 - credit enhancements
 - substitution
 - over collateralization
 - subordination
- Amortizing security with monthly principal and interest payments

Certificates of deposit

Non-negotiable

No secondary market

Redemption penalties

\$250,000 FDIC insurance

Collateralized

Negotiable

Secondary market

\$1 million blocks

May or may not be collateralized

Money market mutual funds

- Commercially operated pooled liquid assets
- Legal structure
 - sponsored by private companies
 - used by variety of institutional investors
 - could include investments not authorized for entity
 - most regulated and registered with SEC
 - Rule 2a-7 governs credit quality, diversification and maturities
 - stable NAV of \$1.00 for government funds
 - floating NAV for any fund with corporate exposure

Local Government Investment Pools (LGIP)

- Combines liquid assets of numerous public entities
- Two general types
 - state-operated pools
 - intergovernmental pools
- Questions to ask
 - Does the pool follow SEC Rule 2a-7?
 - 60 day WAM
 - maturity limit to 1 year on non-floating assets
 - higher credit quality securities
 - Is the pool rated AAAm*? or AAAf*?
 - What are the cut-off times for contributions and withdrawals?
 - Does the pool offer internet access?
 - Does the pool offer ACH transactions?

* m = money market, f = floating.

Evaluating investment options

- Who is the issuer?
- What is the term of the investment?
- What are the sources of income?
- What are the sources of risk?
 - credit risk
 - market risk
 - liquidity risk
- Are there any administrative considerations?
 - calculation of interest
 - issuance schedule
 - monthly P&I – reinvestment risk

Principles and tips if going it alone

- Limit your options to the highest quality, best in class
- Be granular in your allocations to ensure diversification
- Be prepared to hold the issuers during times of stress
- Find your source for credit research
- Only participate in new issues
- Establish a process for monitoring these specific investments
- Document purchase decisions and retain new issue information

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