MTN's and MUNI's

Politics, Policies and Market Updates

CSMFO 2018 Annual Conference

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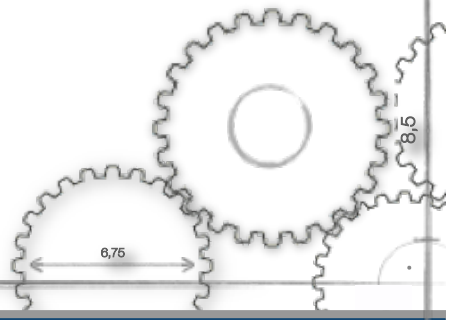
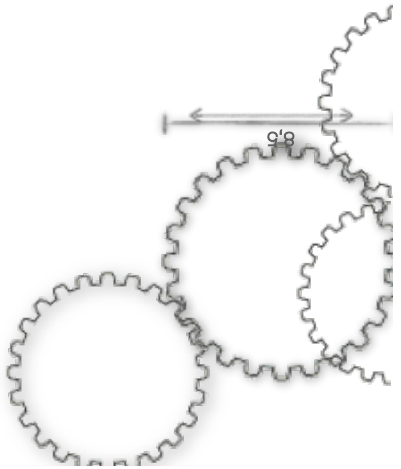


Agenda

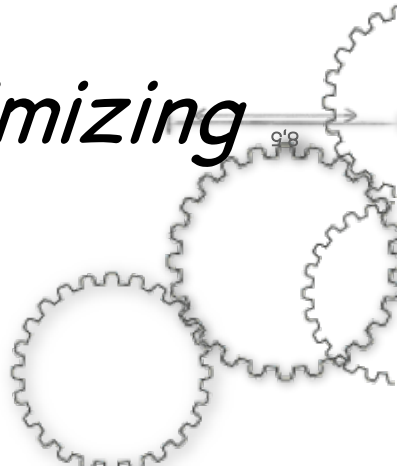
Part 1: Investing in Medium Term Notes
What investors need to know about the politics and policies.

Part 2: Overview of the municipal bond market with a focus on credit trends and themes.



Part 1: Session Objectives

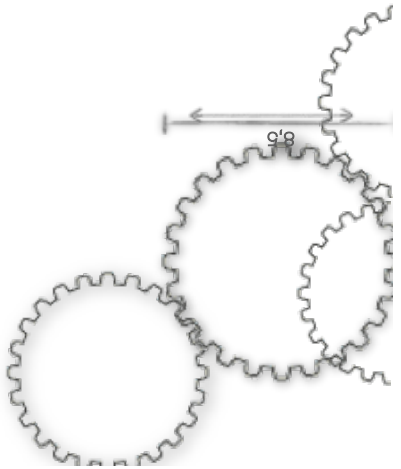
- *Does safety or default risk represent the number 1 threat to principal preservation?*
- *If safety or default risk does not represent the number 1 threat to principal preservation, what does?*
- *What are some strategies for minimizing principal preservation risk?*



Bonds 101

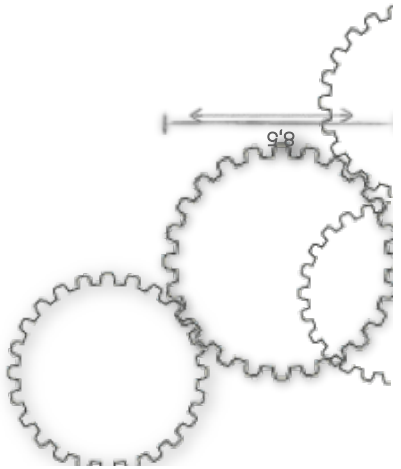
The easy part of public fund investing is buying bonds.

The hard part of public fund investing is explaining why.



Bonds 102

The "Politics" of assuring a public fund's principal is preserved, may require portfolio managers to make investment decisions contrary to traditional Wall Street money management.

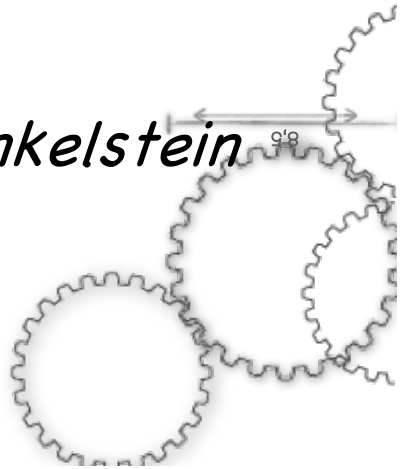


All men are created equal – it's just some men are more equal than others.

Benjamin Disraeli

All bonds are created with risk – it's just some bonds have more political risk than others.

Benjamin Finkelstein



How Policy Can Impact Strategy

Two Types of Risk

Political Risk

Principal Preservation

Priority

#1 Safety

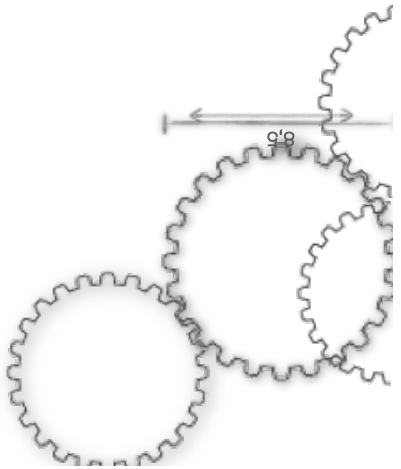
#2 Liquidity

Market Risk

Increase Income

Priority

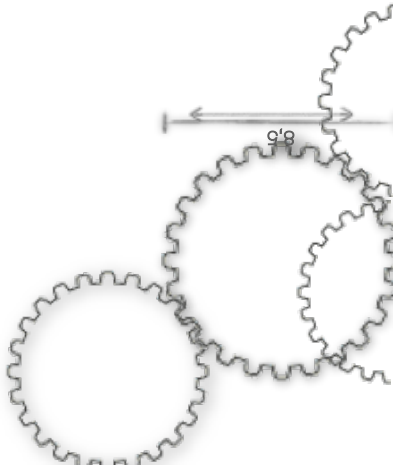
#3 Yield



Types Of Political Risk

1. *Default Risk: A situation where a public fund is forced to sell a security which results in a permanent loss on original investment.*
    - *Orange County Bankruptcy – 1994*
    - *Lehman Brothers Bankruptcy - 2008*

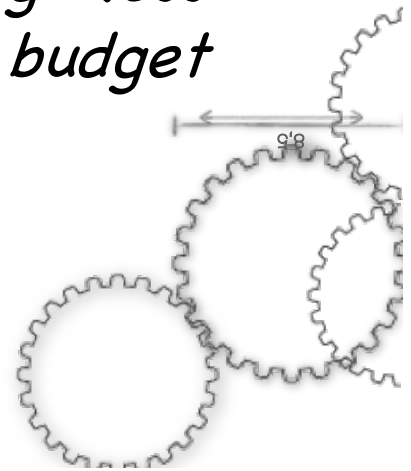
2. *Headline Risk: A situation where a NRSRO like Moody, S&P or Fitch downgrade a issuer out of compliance.*
    - *Bear Stearns Downgraded 2007*
    - *U.S. Debt Downgraded 2011*



Types Of Political Risk

3. *GASB 31 Risk: Financial Reports*
    - *A public fund risk's reporting a loss on CAFR.*
    - *A public fund keeps portfolio under 1yr to avoid reporting a paper loss.*

4. *Budget Risk: Operations*
    - *A public fund haircuts projected income from portfolio to avoid the risk of earning less revenue which could lead to a mid-year budget adjustment downward.*



Credit Risk

➢ Default Risk

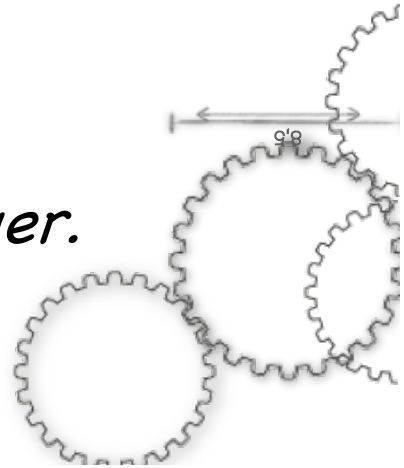
The risk that the issuer will fail to satisfy the terms of the obligation with respect to the timely payment of interest and principal.

➢ Credit Spread Risk

The risk that an issuer's debt obligation will decline due to an increase in the credit spread is called spread risk.

➢ Downgrade Risk

An unanticipated downgrading of an issue or issuer.



Other Market Risk

- **Reinvestment Risk**

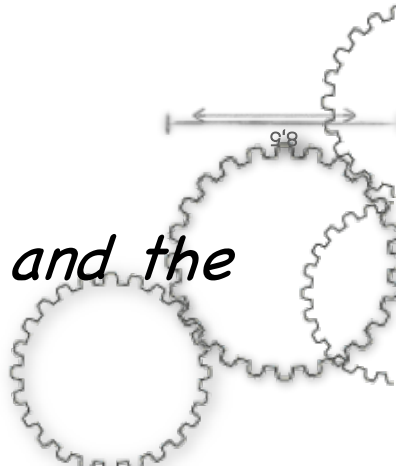
  The risk that the proceeds received from the payment of interest and principal that are available for reinvestment must be reinvested at a lower then the security that generated the proceeds.

- **Interest Rate Risk**

  The risk that an investor faces is that the price of a bond held in a portfolio will decline if market interest rates rise.

- **Liquidity Risk**

  Is the size of the spread between the bid price and the ask price.



MTN State Code

ALLOWABLE INVESTMENT INSTRUMENTS PER STATE GOVERNMENT CODE (AS OF JANUARY 1, 2017)[A] APPLICABLE TO ALL LOCAL AGENCIES[B]

See "Table of Notes for Figure 1" on the next page for footnotes related to this figure.

INVESTMENT TYPE	MAXIMUM MATURITY[C]	MAXIMUM SPECIFIED % OF PORTFOLIO[D]	MINIMUM QUALITY REQUIREMENTS
Medium-Term Notes[N]	5 years	30%	"A" rating category or its equivalent or better

CDIAC State Investment Guidelines 2017

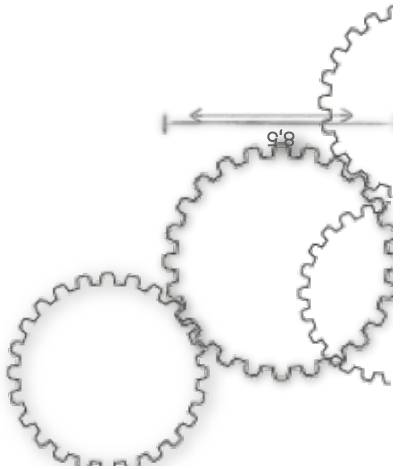
Ratings

Moody's		S&P		Fitch	
Long-term	Short-term	Long-term	Short-term	Long-term	Short-term
Aaa	P-1	AAA	A-1+	AAA	F1+
Aa1		AA+		AA+	
Aa2		AA		AA	
Aa3		AA–		AA–	
A1		A+	A-1	A+	F1
A2		A		A	
A3	P-2	A–	A-2	A–	F2
Baa1		BBB+		BBB+	
Baa2	P-3	BBB	A-3	BBB	F3
Baa3		BBB–		BBB–	

Bond credit rating. (2016, January 15). In Wikipedia, The Free Encyclopedia. Retrieved 07:22, January 21, 2016, from https://en.wikipedia.org/w/index.php?title=Bond_credit_rating&oldid=691840556

"History doesn't repeat itself, but it does rhyme."

Mark Twain



Default Rates

Average Cumulative Default Rates For Corporates By Region (1981 - 2016) (%)

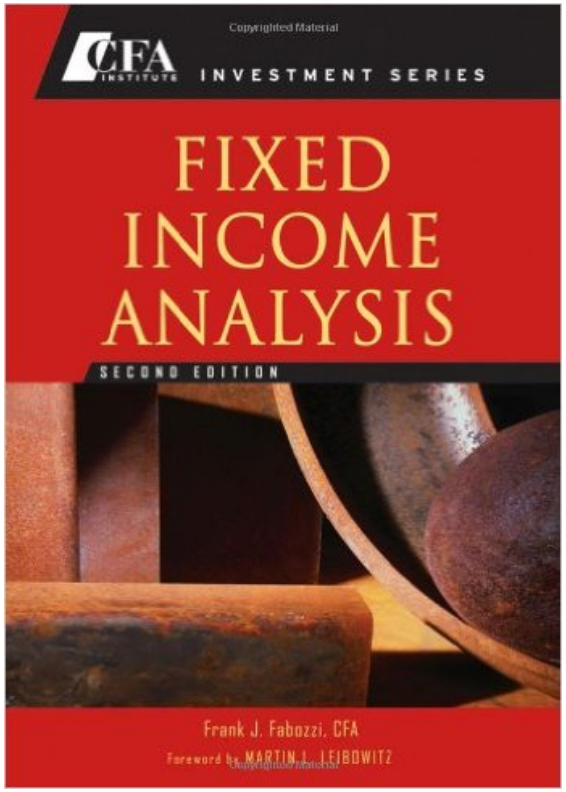
	--Time horizon (years)--														
Rating	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
U.S.															
AAA	0.00	0.04	0.17	0.29	0.42	0.54	0.59	0.67	0.76	0.85	0.90	0.94	0.99	1.09	1.20
AA	0.03	0.08	0.18	0.31	0.45	0.60	0.74	0.86	0.96	1.07	1.17	1.25	1.34	1.42	1.51
A	0.07	0.20	0.36	0.54	0.73	0.95	1.19	1.41	1.65	1.89	2.11	2.32	2.52	2.69	2.89
BBB	0.22	0.58	0.99	1.50	2.05	2.60	3.09	3.58	4.07	4.55	5.02	5.37	5.71	6.06	6.42
BB	0.80	2.52	4.57	6.57	8.38	10.14	11.62	12.98	14.17	15.25	16.13	16.91	17.61	18.22	18.84
B	3.92	9.00	13.43	16.88	19.57	21.76	23.56	24.98	26.24	27.42	28.42	29.20	29.90	30.53	31.16
CCC/C	28.85	39.23	44.94	48.55	51.31	52.53	53.95	55.00	55.96	56.66	57.32	57.93	58.60	59.14	59.14
Investment grade	0.12	0.32	0.56	0.86	1.17	1.49	1.80	2.09	2.38	2.67	2.95	3.17	3.39	3.59	3.81
Speculative grade	4.18	8.25	11.81	14.68	17.00	18.95	20.59	21.95	23.16	24.26	25.18	25.95	26.64	27.24	27.83
All rated	1.80	3.59	5.16	6.48	7.57	8.52	9.32	10.01	10.63	11.21	11.71	12.12	12.49	12.82	13.16

Standard & Poor's "Default, Transition, and Recovery: 2016 Annual Global Default Study and Rating Transitions", Table 25 Page 62

Transition Matrix

What is it?

"A popular tool used by managers to gauge the prospects of an issue being downgraded or upgraded is a rating transition matrix. This is a table constructed by rating agencies that shows the percentage of issues that were downgraded or upgraded in a given time period. So, the table can be used to approximate downgrade risk and default risk."



Frank Fabozzi. Fixed Income Analysis

Transition Matrix

Average Multi-Year Global Corporate Transition Matrices (1981 - 2016) (%)

	--Five-year transition rates (%)--								
From/to	**AAA**	**AA**	**A**	**BBB**	**BB**	**B**	**CCC/C**	**D**	**NR**
AAA	49.58	28.37	4.86	0.81	0.24	0.16	0.08	0.35	15.53
	(11.91)	(13.14)	(2.67)	(1.54)	(0.47)	(0.41)	(0.28)	(0.60)	(6.45)
AA	1.49	50.29	24.87	3.71	0.59	0.39	0.04	0.34	18.26
	(0.93)	(7.74)	(4.69)	(1.65)	(0.63)	(0.59)	(0.10)	(0.38)	(4.55)
A	0.08	5.22	54.95	15.13	2.15	0.71	0.16	0.57	21.04
	(0.10)	(2.31)	(6.65)	(2.21)	(1.11)	(0.88)	(0.18)	(0.42)	(4.05)
BBB	0.03	0.47	10.51	51.02	7.68	2.29	0.40	1.93	25.68
	(0.07)	(0.54)	(3.25)	(7.46)	(1.74)	(1.46)	(0.40)	(1.46)	(4.32)
BB	0.01	0.08	1.06	12.72	30.83	11.08	1.32	7.84	35.06
	(0.06)	(0.18)	(0.99)	(3.26)	(6.80)	(2.19)	(0.91)	(4.84)	(4.51)
B	0.01	0.03	0.28	1.63	10.55	24.83	2.99	19.25	40.42
	(0.11)	(0.09)	(0.58)	(1.22)	(2.73)	(5.50)	(1.02)	(8.87)	(5.51)
CCC/C	0.00	0.00	0.12	0.74	2.98	12.18	2.53	46.96	34.49
	(0.00)	(0.00)	(0.51)	(1.85)	(2.08)	(4.73)	(3.78)	(12.36)	(9.21)

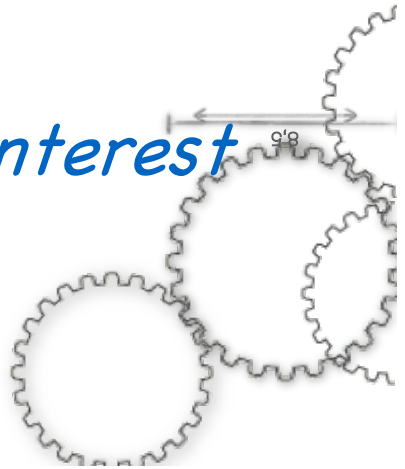
Numbers in parentheses are weighted standard deviations, weighted by the issuer base. Sources: S&P Global Fixed Income Research and S&P CreditPro®.

Policy & Practice

While policy from a Main Street perspective prioritizes safety, history would imply that the greater threat to principal preservation is liquidity!

Therefore, should you share the view that the risk of an unexpected need for cash is a greater probability than an issuer defaulting, what strategies can be employed?

Substitute Credit and Reinvestment Risk for Interest Rate Risk.



Which Bond Is Safest?

USTN Bullet or FHLMC Multi-Step

UST 2.375% 1/31/23
Price: 99.42
YTM: 2.50%
Eff. Duration 4.67

Vs

FHLMC 2.50% 3/8/23
Price: 100.00
YTC: 2.50% YTM: 3.17
Eff. Duration 1.45

1Yr Forward Rates Up 100 bps – Price Change

UST 2.375% Bullet
Price: 96.184
Change: (3.23)
Eff. Duration 3.75

Vs

FHLMC 2.50% Multi
Price: 98.78
Change: (1.22)
Eff. Duration 2.48

Source: Bloomberg OAS1 parallel shift up

Which Bond Is Safest?

FFCB(GSE) or PNC (MTN)

FFCB 2.35% 1/17/23		*PNC 2.45 11/5/20*
Price: 99.00	*Vs*	*Price: 99.50*
YTM: 2.56%		*YTM: 2.64*
Eff. Duration 4.64		*Eff. Duration 2.60*

1Yr Forward Rates Up 100 bps – Price Change

FFCB 2.35% 1/17/23		*PNC 2.45 11/5/20*
Price: 95.89	*Vs*	*Price: 98.36*
Change: (3.11)		*Change: (1.14)*
Eff. Duration 3.72		*Eff. Duration 1.66*

Source: Bloomberg OAS1 parallel shift up

Trade-Offs

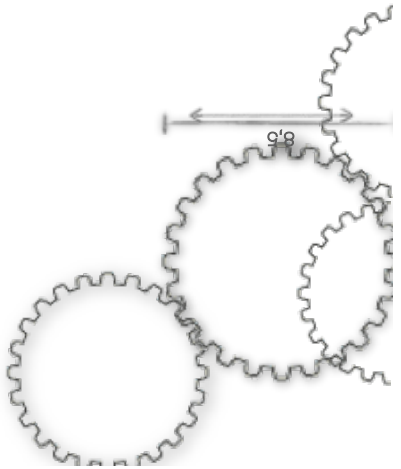
Credit and Reinvestment for Interest Rate

Rewards:

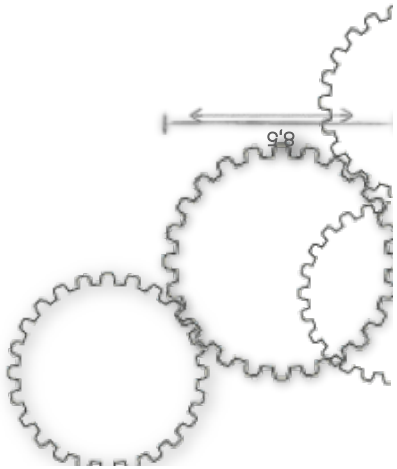
- *Higher or equal income*
- *Lower Interest Rate Risk*

Risks:

- *Default risk*
- *Headline risk*
- *Reinvestment Risk*



What steps can portfolio manager take to help mitigate credit risk?



Lessons From 2008 Great

1. *While not a state statue investment practice would typically limit issuer concentration to 5% of total portfolio. Code allows for 30% in MTNs or 30MM on 100mm portfolio.*

    - *To limit impact of issuer default risk opt for minimum number of issuers. Ex. 30mm/30 issuers limits 1mm per issuer.*

2. *Little focus went into sector concentration resulting in many public funds holding mostly financial MTN's.*

    - *Do not overweight financial sector. Keep ratio to at least 50/50 (no more than half issuers are financial or banks the remaining percentage are industrials.*

Bloomberg DRSK (Merton Model)

What is the 'Merton Model'

The Merton model is an analysis model – named after economist Robert C. Merton – that is used to assess the credit risk of a company's debt. Analysts at brokerage firms and investors utilize the Merton model to understand how capable a company is at meeting financial obligations, servicing its debt and weighing the general possibility that the company will go into credit default. This model was later built out by Fischer Black and Myron Scholes to develop the Black-Scholes pricing model.

Main Driver of Default: Distance-to-Default

The DRSK<GO>framework for modeling default has its origins in the structural model proposed by Robert Merton.1 In this model, arm is viewed as solvent as long as the value of the firm's assets is larger than the value of its liabilities. The issue is that the value of the assets of the firm is not observable and must thus be inferred. The Merton model links the value of the assets to the market cap and debt of a firm, both of which are observable. The key insight of the Merton framework is that the equity of the firm can be viewed as a call option on the total assets of the firm where the strike price is equal to its liabilities. This allows us to infer the value of the assets from the observed equity value using a BlackScholes option pricing approach. …

Source: Investopedia: https://www.investopedia.com/terms/m/mertonmodel.asp and Bloomberg. On the Bloomberg terminal use DRSK <GO>.

Bloomberg DRSK PNC 2.45 11/5/20

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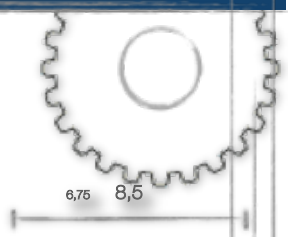

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