

CPIM
CENTER FOR PUBLIC INVESTMENT MANAGEMENT



A PROGRAM BROUGHT TO YOU BY:

JOSH MANDEL
TREASURER OF OHIO

INVESTMENTS 315

Investment Positioning

2015 CPIM Academy

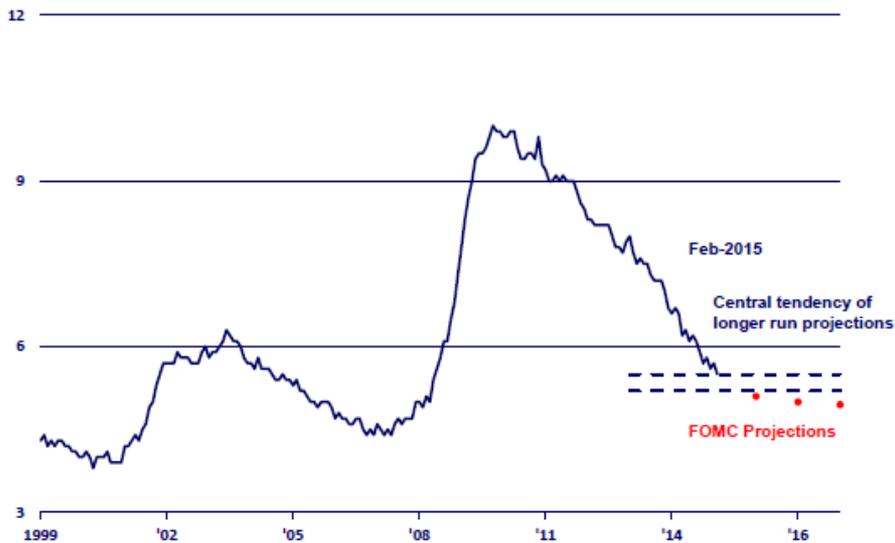
Investment Positioning

- ⦿ This course covers:
 - considerations for investing in today's interest rate environment
 - various investment strategies
 - performance analytics

Federal Reserve's Dual Mandate

- Full Employment
- Price Stability

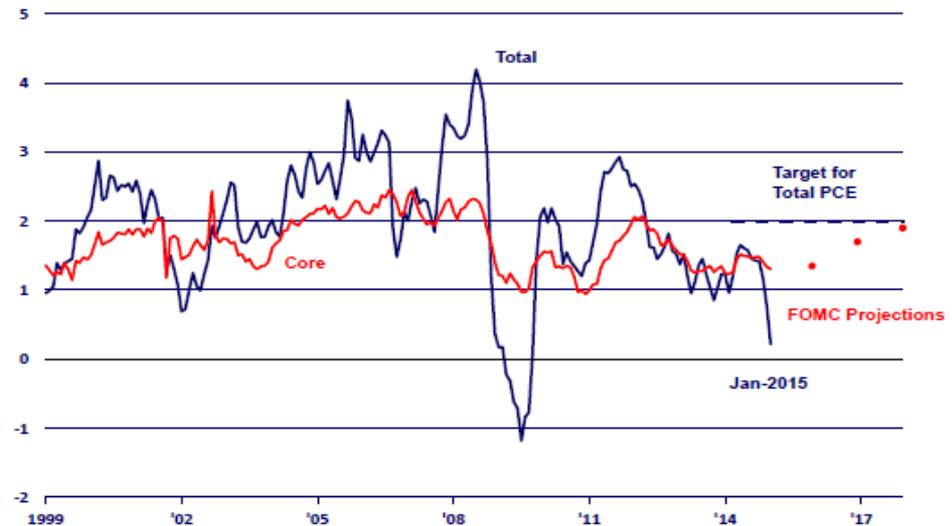
Unemployment Rate
(percent)



FOMC projections are the midpoint of the central tendency of projections from March 2015.
Source: Haver Analytics and Economic Projections of the Federal Reserve Board Members and Bank Presidents.

Consumer Inflation

(12-month percent change in the price index for personal consumption expenditures)



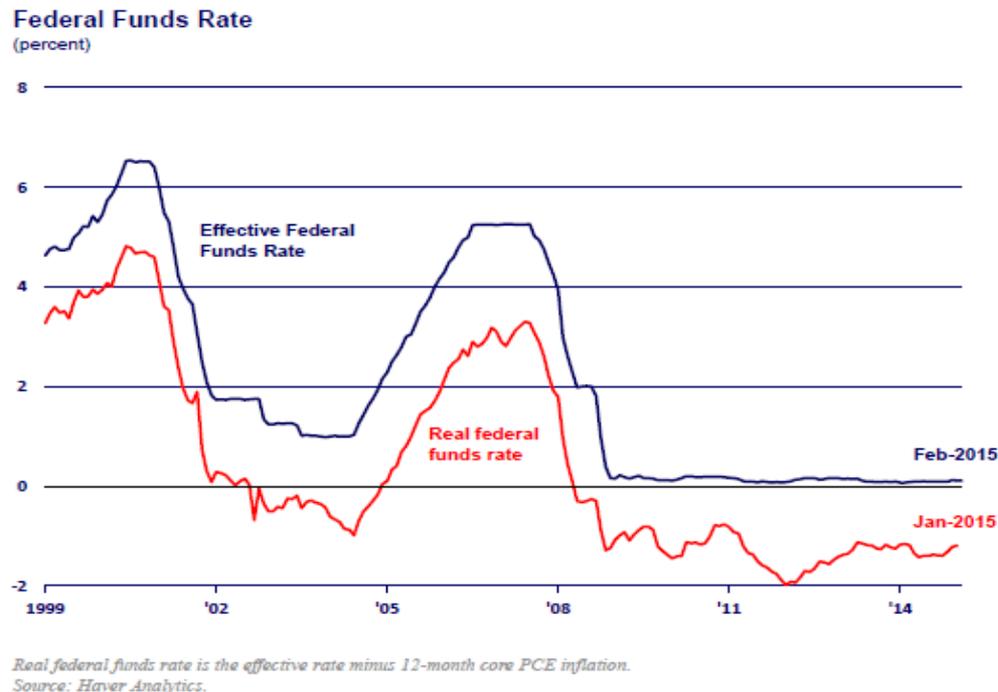
FOMC projections are the midpoint of the central tendency of projections from March 2015.
Source: Haver Analytics and Economic Projections of the Federal Reserve Board Members and Bank Presidents.

Target Fed Funds Rate

- The FOMC's monetary policy decisions are often specified in terms of a “target” for the federal funds rate.
 - The Fed Funds Rate is the interest rate at which depository institutions lend balances held at the Federal Reserve to other institutions overnight.

Federal Funds Rate

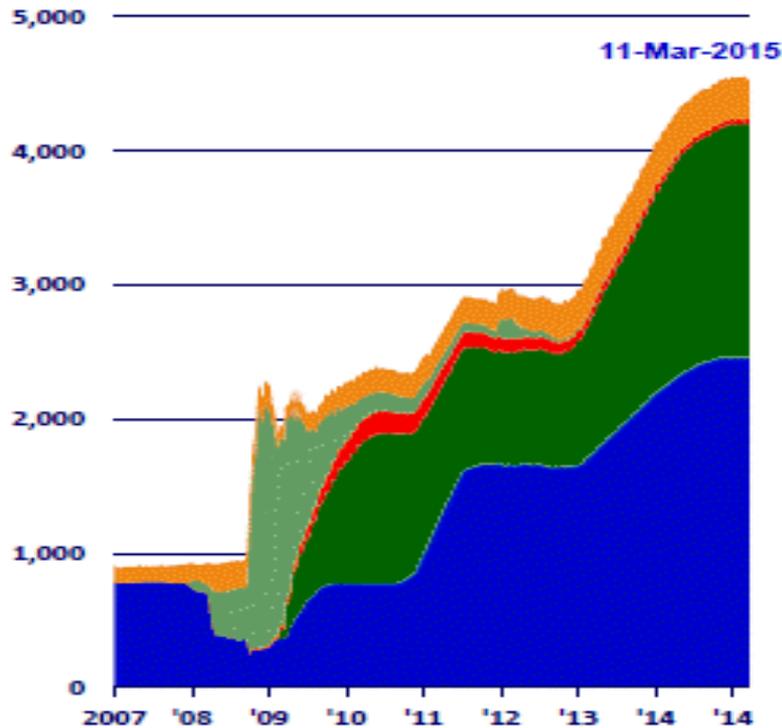
- The Fed Funds Rate has been at historically low levels since December 2008.



Federal Reserve Balance Sheet

Federal Reserve Assets

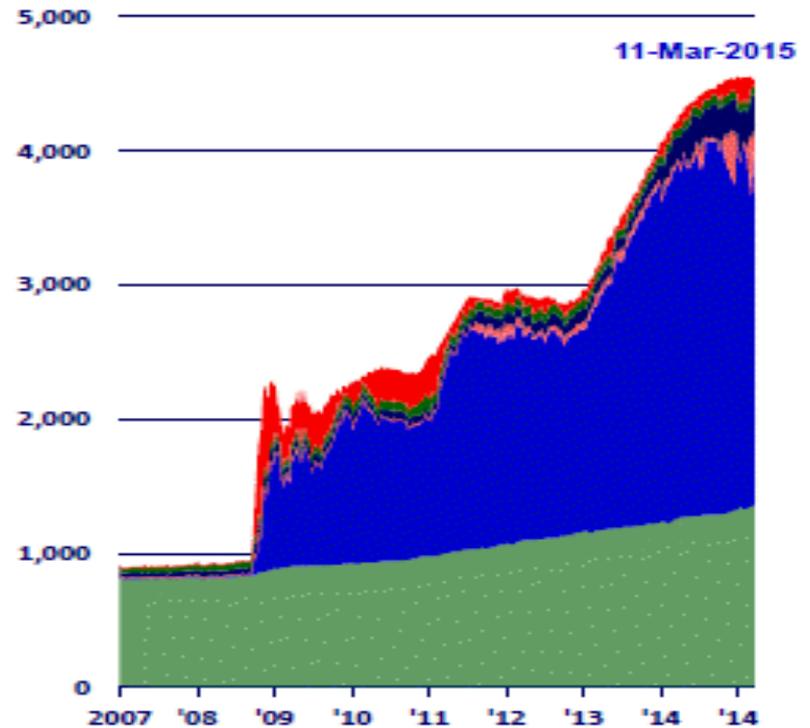
(Bil. \$)



- Treasury Securities
- Agency MBS
- Agency Debt
- Lending and Liquidity Facilities
- All Other Assets

Federal Reserve Liabilities

(Bil. \$)



- Currency
- Bank Reserves
- Deposits
- Repurchase Agreements
- Other Liabilities
- Treasury Accounts

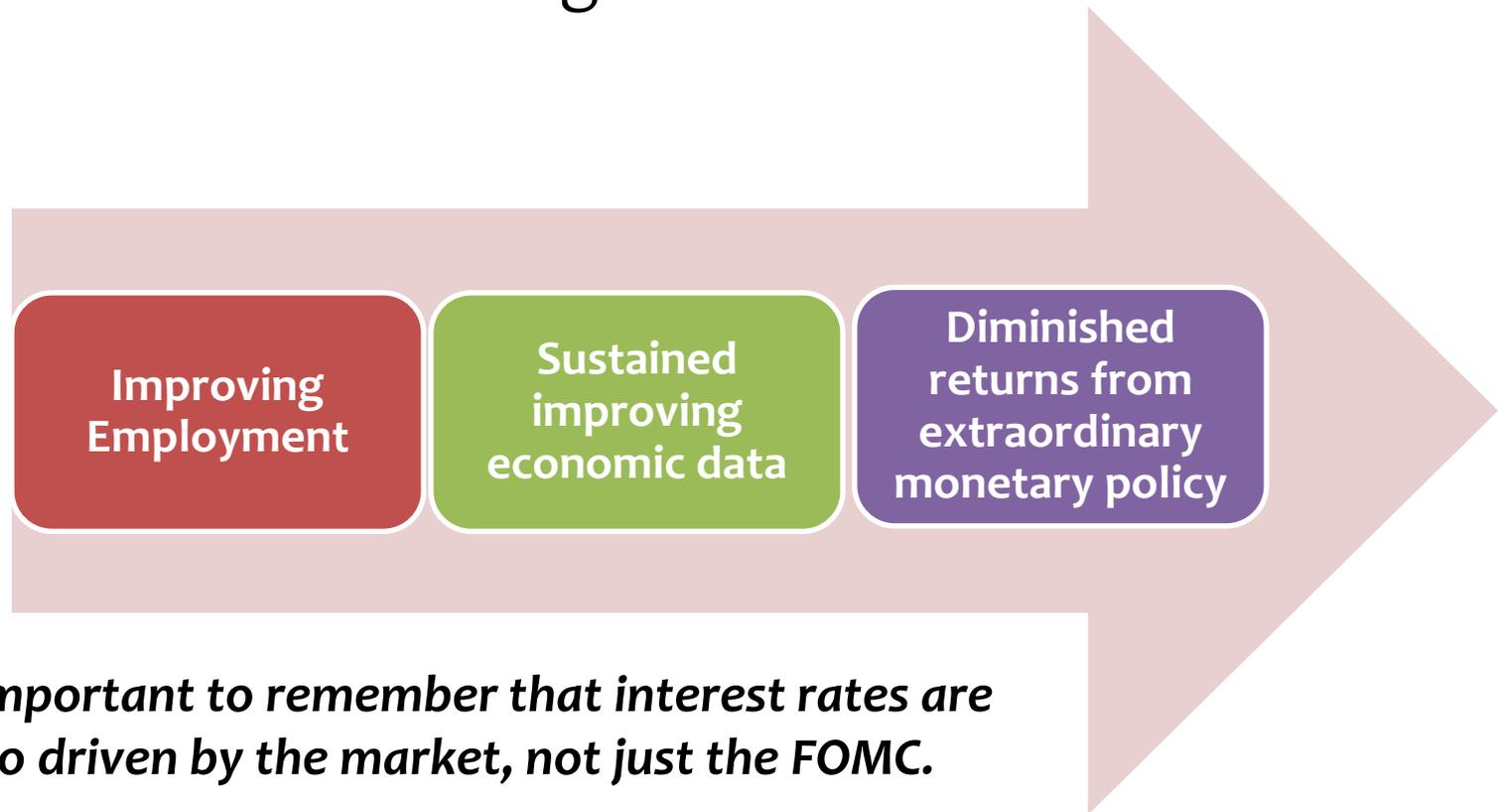
Interest rates are going to rise...



...eventually

What Will Make Interest Rates Rise?

Possible drivers of rising interest rates:



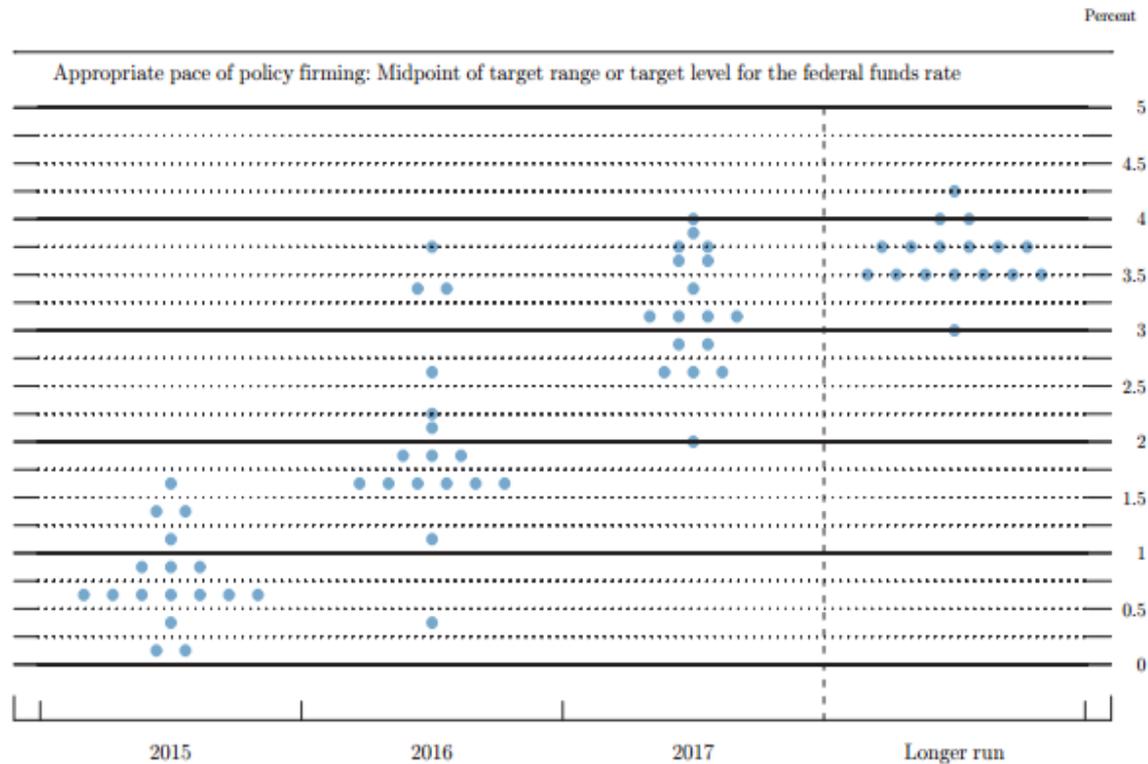
It is important to remember that interest rates are also driven by the market, not just the FOMC.

Fed “Tightening”

- The Fed began its easy, or accommodative, monetary policy in 2008 to spur economic activity and control unemployment.
 - Traditional Fed tightening has taken place to slow the economy and keep inflation in check.
 - This round of tightening is expected to take place simply to end the crisis monetary policy and normalize the yield curve.

The Fed's Dot Plot

- The March 2015 predictions of the fed funds rate by FOMC participants:





**Okay, so how should
we prepare?**

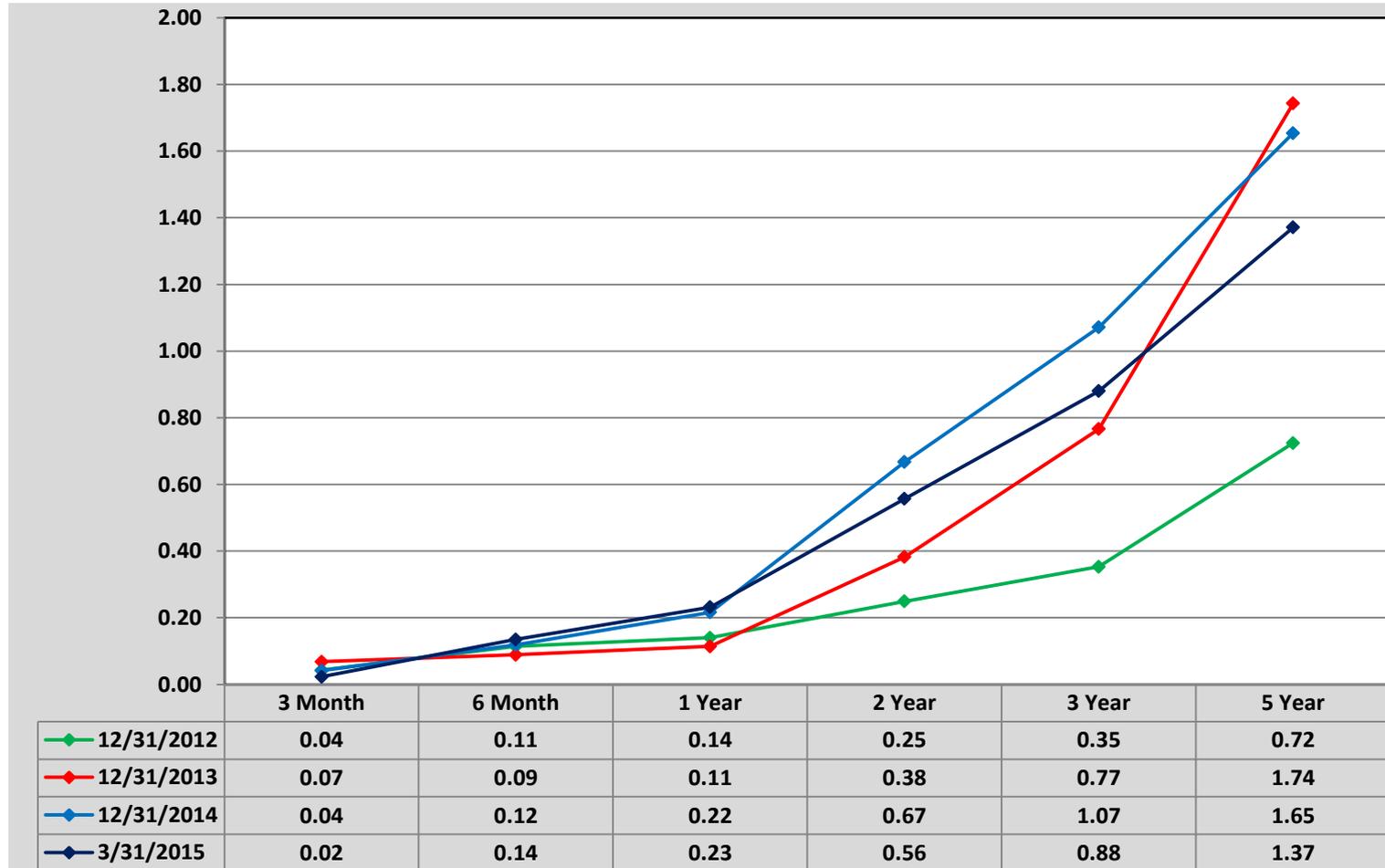
Stay Informed!

◉ “**Headline Risk**”

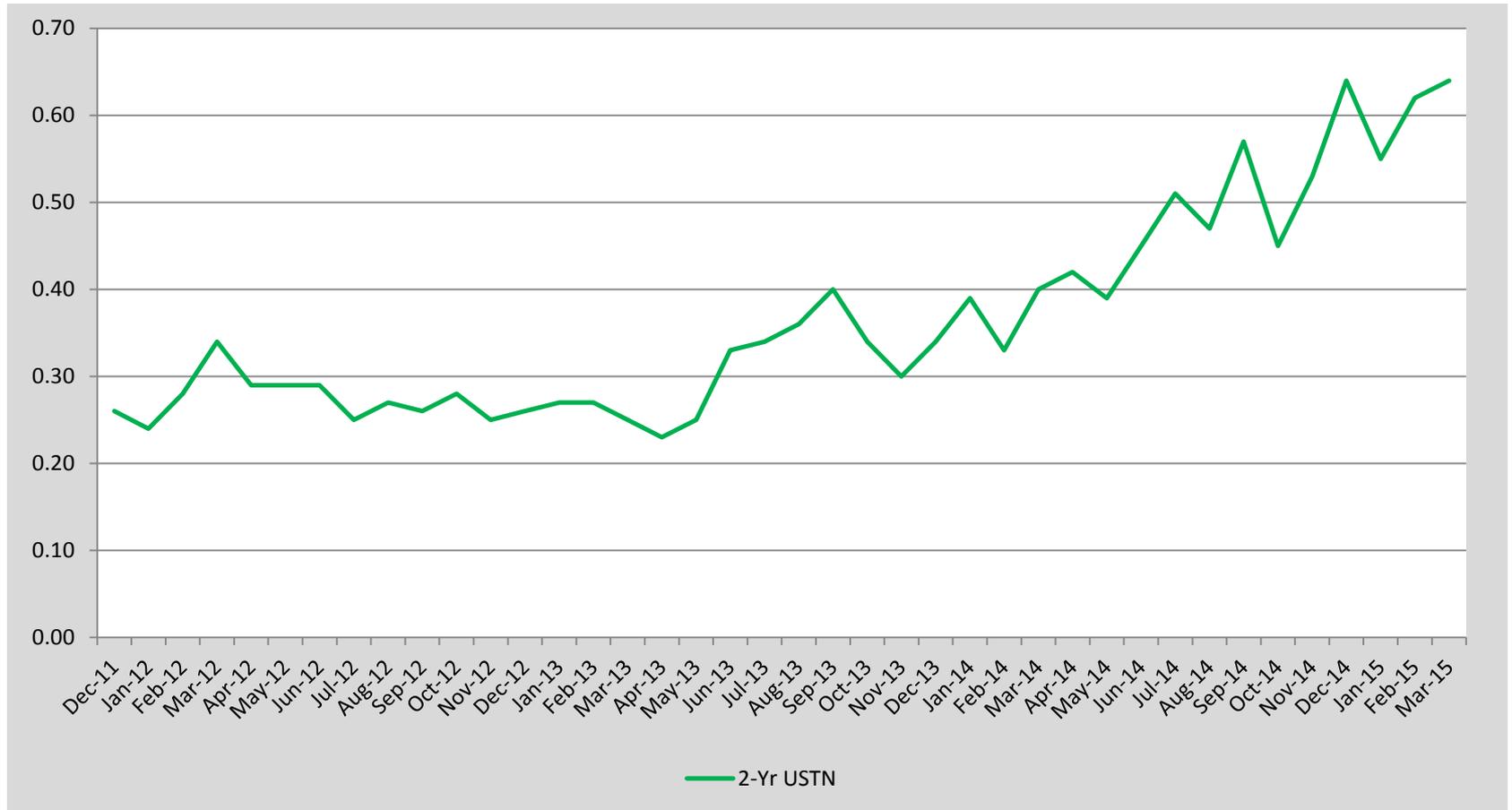
- Headline risk in the investment world refers to the risk that an investor is subjected to from news that affects the value of investments held.
- What is going on across the globe and what affects the market(s) in which you participate?
 - Greece, ISIS, Ukraine, Oil Prices, EU and Japanese QE



US Treasury Yield Curves

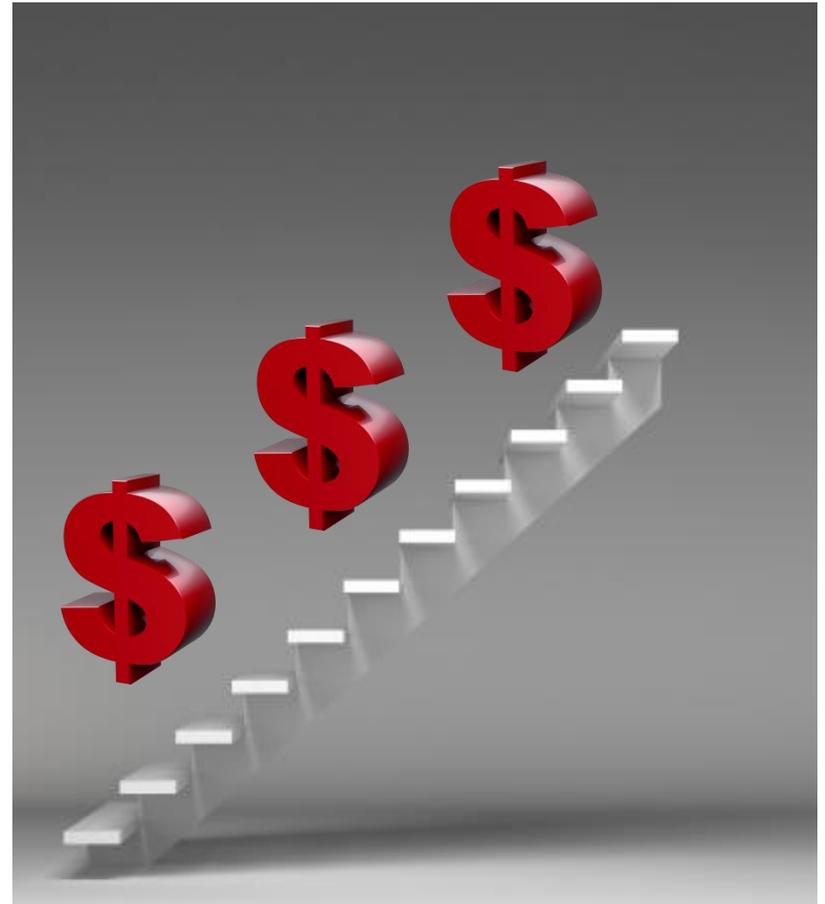


2 - Year UST Trend line



How to Prepare?

- ◉ **Laddered Portfolio**
 - Constant maturities
- ◉ **Short Duration Portfolio**
 - Reduce interest rate risk
- ◉ **Barbell Portfolio**
 - Available liquidity to take advantage of opportunities while taking advantage of higher yielding maturities



Laddering

- In a laddered portfolio, the investor purchases bonds in such a way that it almost mirrors the yield curve.
 - In slight deviation, occasionally, based on one's Macro View and current rates and spreads, they may tend to buy “*cheaper*” bonds at a given point in time.
 - As time moves on and you “*roll*” down the curve, maturities will provide funding for any needed liquidity or additional investments to fill out the ladder.

Short Duration Portfolio

- Keeping the average maturity of the portfolio shorter will prevent the investor from locking into the currently low rates for an extended period.
 - This approach may not yield quite as much in the near-term with the yield curve as it is currently shaped but it will keep interest rate and duration risk to a minimum.
 - This option provides for maximum liquidity.

Barbell Portfolio

- A barbell portfolio is an approach that involves investing primarily in only short-term and long-term securities with very few intermediate maturities.
 - In a barbell portfolio, the investor is looking to obtain the benefit of higher yields found further out the yield curve.
 - Those longer-dated maturities are then coupled with substantially shorter maturities in an effort to maintain liquidity.

Investment Options

- ◉ There are many types and structures of investments available for counties and political subdivisions.
 - US Treasuries – Bills, Notes
 - Agencies – Callable, Non-callable, Step-up, Discount Notes
 - Commercial Paper
 - Municipal Bonds
 - Certificates of Deposit
 - STAR Ohio
- ◉ Be sure to refer to the statute and your approved investment policy.
 - ORC 135.14 – Political Subdivisions
 - ORC 135.35 – Counties

Bond Pricing

- ◉ There is an inverse relationship between bond price and the yield of the bond.
- ◉ Bonds can be bought or sold at 3 different price levels:
 - **Par** – Bonds are commonly issued at Par or 100.00
 - \$1,000,000 of a bond purchased at Par would cost \$1,000,000 at the time of settlement.
 - **Discount** – Bonds can also trade a price below Par or at a discount. The price of a discounted bond would be below 100.00, increasing your YTM.
 - \$1,000,000 of a bond purchased at a discounted price of 99.00 would cost the investor \$990,000 at the time of settlement.
 - **Premium** – Bonds can also be traded at premium price levels, or a price above Par, decreasing your YTM.
 - \$1,000,000 of a bond purchased at a premium price of 101.00 would cost the investor \$1,010,000 at the time of settlement.

US Treasury Active Run

GRAB

United States | 1) Actions | 2) Tools | 3) Settings | Fixed Income Trading

14:14

4) Actives | 5) Bills | 6) Notes | 7) TIPS | 8) Strips | 9) Sprds | 10) Curves | 11) FRN | 12) Bfly | 13) WI

5) Bills				6) Notes				6) Bonds						
31)	04/23/15	0.015 / 0.010	0.010	+0.010	35)	0 ¹ / ₂ 117	99-31 ⁵ / ₈ / 31 ⁷ / ₈	0.502	+ 01+	49)	3 ¹ / ₈ 844	112-02+ / 03+	2.538	+ 05
32)	07/02/15	0.025 / 0.020	0.020	+0.005	36)	0 ¹ / ₂ 217	99-29 ³ / ₄ / 30	0.533	+ 01 ⁵ / ₈	50)	3 N44	109-18+ / 19+	2.537	+ 06
33)	10/01/15	0.135 / 0.130	0.132	-0.003	37)	0 ¹ / ₂ 317 2YR	99-28+ / 28 ³ / ₄	0.551	+ 01 ³ / ₄	51)	2 ¹ / ₂ 245 30YR	99-04+ / 05+	2.540	+ 05+
34)	03/03/16	0.220 / 0.215	0.219	-0.025	38)	0 ⁷ / ₈ 118	100-02+ / 03	0.841	+ 02 ¹ / ₄	7) TIPS				
				39)	1 218	100-12 / 12 ³ / ₄	0.865	+ 02 ¹ / ₄	52)	0 ¹ / ₈ 419	101-31 / 102-01	-0.374	+ 07	
				40)	1 318 3YR	100-10 ³ / ₄ / 11	0.882	+ 02 ¹ / ₄	53)	0 ¹ / ₄ 125	100-28 ³ / ₄ / 101-00	0.147	+ 15 ³ / ₄	
				41)	1 ¹ / ₄ 120	99-14 / 14+	1.367	+ 03+	54)	0 ³ / ₄ 245	102-05+ / 102-13+	0.661	+ 04 ³ / ₄	
				42)	1 ³ / ₈ 220	100-00 / 00+	1.372	+ 04	10) Curve Trades					
				43)	1 ³ / ₈ 320 5yr	99-31 ¹ / ₄ / 31+	1.378	+ 03 ³ / ₄	55)	2yr vs 5yr	82.309 / -82.865	+0.313		
				44)	1 ³ / ₄ 222	100-07+ / 08	1.711	+ 04+	56)	2yr vs 10yr	137.841 / -138.409	+1.354		
				45)	1 ³ / ₄ 322 7YR	100-07 / 07+	1.714	+ 05	57)	5yr vs 10yr	55.369 / -55.619	+1.041		
				46)	2 ³ / ₈ 824	103-29+ / 30	1.914	+ 05	Other Markets					
				47)	2 ¹ / ₄ N24	102-24+ / 25	1.932	+ 04+	58)	US Long(CBT)	14:04 d	164-00	+ 0-17	
				48)	2 225 10YR	100-18+ / 19	1.934	+ 04	59)	10yr Fut (CBT)	14:04 d	128-29	+ 0-10	
								60)	5Yr Fut(CBT)	14:04 d	120-06	+ 0-05 ³ / ₄		
								61)	Dow Jones Ind	14:14	17893.602	- 82.709		
								62)	S&P 500 Ind	13:59 d	2077.890	- 8.330		
								63)	NYM WTI Crd	14:04 d	48.500	- 0.180		
								64)	Gold	14:14	1182.980	- 3.095		

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Agency Non-Callables (Bullets)

- ◉ A Bullet structure eliminates Option Risk by providing the stated coupon payment until the maturity of the bond.
 - Bullets are typically more expensive than Callable bonds due to the fact that the investor has the luxury of locking in the rate with no uncertainty.
- ◉ Another type of Bullet that can be beneficial in certain interest rate environments is a Floating-Rate Bond.
 - Interest rate is tied to a benchmark such as the U.S. Treasury bill, LIBOR, or the fed funds rate.
 - Provide investors protection in a rising rate environment.

Agency Bullet Run

GRAB

Agencies 1) Actions 2) Tools 3) Settings Fixed Income Trading

14:17

4) OTR 5) Shorts 6) 2-30yr 8) Sub 9) MTN 10) Callables 11) Supras

2yr				7yr			
31) T0 ^{1/2}	317	99-28+ / 99-28 ^{3/4}	0.555 - 0.551	46) T1 ^{3/4}	322	100-07 / 100-07+	1.717 - 1.714
32) FHLMC0 ^{7/8}	217	4.50 / 0.25	0.600 - 0.554	47) FHLMC 2 ^{3/8}	122	11.00 / 7.75	1.827 - 1.792
33) FHLMC 1	317	8.25 / 3.50	0.638 - 0.586				
34) FHLB 1	617	17.25 / 14.00	0.728 - 0.691				
35) FHLMC 1	617	16.50 / 13.25	0.720 - 0.684				
3yr				10yr			
36) T1	318	100-10 ^{3/4} / 100-11	0.885 - 0.882	48) T2	225	100-18 ^{3/4} / 100-19	1.934 - 1.934
37) FHLMC 0 ^{3/4}	118	4.00 / -3.50	0.925 - 0.847	49) FNMA 2 ^{5/8}	924	29.25 / 23.00	2.227 - 2.164
38) FNMA 0 ^{7/8}	218	3.25 / -0.25	0.917 - 0.879	50) FNMA 6 ^{1/4}	529	65.75 / 60.50	2.592 - 2.539
39) FHLMC0 ^{7/8}	318	6.75 / 2.75	0.952 - 0.909	51) FHLMC6 ^{3/4}	929	68.25 / 56.00	2.617 - 2.494
40) FHLB 1 ^{1/8}	418	9.25 / 6.75	0.977 - 0.949				
5yr				30yr			
41) T1 ^{3/8}	320	99-31 ^{1/4} / 99-31+	1.380 - 1.378	52) T2 ^{1/2}	245	99-05 / 99-05+	2.540 - 2.540
42) FHLMC1 ^{3/4}	519	-3.50 / -7.00	1.345 - 1.308	53) FNMA 7 ^{1/4}	530	12.50 / 2.75	2.665 - 2.567
43) FNMA 1 ^{3/4}	619	-3.00 / -5.75	1.350 - 1.321	54) FNMA 6 ^{5/8} N30		12.25 / 7.00	2.663 - 2.610
44) FNMA 1 ^{3/4}	919	2.25 / -2.50	1.402 - 1.353	55) FHLMC6 ^{3/4}	331	13.75 / 9.25	2.678 - 2.632
45) FNMA 1 ^{5/8}	120	11.50 / 6.25	1.495 - 1.441	56) FHLMC6 ^{1/4}	732	18.00 / 13.00	2.720 - 2.670

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Dealer Agency Bullet Inventory

GRAB

BULLETS

Page 1 / 2

	Size	Description		Ask Sprd	Benchmark	Cusip	Issue Size	Notes
1)	2531	FHLB	5.625	06/13/16	-7.0	T 0 ½ 03/17	313771AA5	1b sub note
2)	250	FHLB	2.000	09/09/16	-8.0	T 0 ½ 03/17	313370TW8	2.8b
3)	1000	FHLMC	.875	10/14/16	-4.5	T 0 ½ 03/17	3137EADS5	4.5b
4)	5000	FHLB	.625	11/23/16	-1.5	T 0 ½ 03/17	3130A3J70	3bln
5)	4200	FHLB	.700	02/24/17	6.0	T 0 ½ 03/17	3130A4F72	250mm
6)	5050	FHLB	.875	03/10/17	7.5	T 0 ½ 03/17	3133782N0	1.6bln
7)	10257	FNMA	.000	06/01/17	17.0	T 0 ½ 03/17	31359MEL3	4.4b
8)	3150	FHLB	1.000	06/09/17	15.0	T 0 ½ 03/17	313379FW4	1.4b
9)	1250	FFCB	1.100	06/28/17	17.0	T 0 ½ 03/17	3133EDEB4	60mm
10)	4000	FFCB	1.000	07/17/17	19.0	T 0 ½ 03/17	3133EDQM7	130mm
11)	2350	FHLMC	1.000	07/28/17	19.0	T 0 ½ 03/17	3137EADJ5	4.5b
12)	1000	FNMA	.875	08/28/17	22.0	T 0 ½ 03/17	3135G0MZ3	4.5b
13)	1067	FNMA	2.500	09/14/17	29.0	T 0 ½ 03/17	3136FPGL5	50mm
14)	15495	FFCB	1.000	09/25/17	27.5	T 0 ½ 03/17	3133EEQX1	500mm
15)	1000	FFCB	1.160	10/23/17	-5.0	T 1 03/15/18	3133EDDV1	140mm
16)	2000	FHLB	1.000	10/27/17	-5.0	T 1 03/15/18	3130A4B27	45mm
17)	1100	FNMA	2.200	10/27/17	-2.0	T 1 03/15/18	3136FPTQ0	125mm
18)	3900	FFCB	1.125	12/18/17	-2.0	T 1 03/15/18	3133EEFE5	750mm
19)	2300	FNMA	.875	12/20/17	-3.0	T 1 03/15/18	3135GORT2	5.5b
20)	5645	FHLMC	.875	03/07/18	4.0	T 1 03/15/18	3137EADP1	5.5b
21)	2500	FNMA	.875	05/21/18	10.0	T 1 03/15/18	3135G0WJ8	6.5b

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Callables

- ◉ Callable structures are typically cheaper than bullets but the value is all in the eye of the investor and their Macro View.
 - Based on spreads and where the market is trading at the time of issue, Callables can offer a different level of competitiveness at different times.
 - The issuer will call the bond if market rates will allow it to simply retire the debt or re-issue the debt at a lower interest rate.
- ◉ There are different types of Callable structures
 - Straight Callable (e.g. Bermudan, American, European)
 - Step-Rate
 - Canary

Callables

- ◉ A Straight Callable bond will pay a fixed coupon until maturity unless the issuer exercises their option to “Call” the bond in accordance with the predetermined Call schedule.
- ◉ There are three commonly used type of Call schedules:
 - Bermudan – Callable quarterly after a certain date.
 - American – Callable anytime after a certain date.
 - European – Callable only on a certain date.

The type of Call schedule and the “lock-out period,” or the period prior to when a bond is eligible to be called, are both important drivers in determining a bond’s price.

Callables

- ◉ Step-Rate structures are commonly issued structures from the U.S. Agencies in the Fixed Income markets.
- ◉ Step-Rate bonds typically have call features as mentioned on the previous slide.
 - **Step-Rate Bonds**
 - “Steps” offer predetermined increases to the face coupon of the bond.
 - Steps can be strategic investments and the changing coupon is carefully thought through by both buyers and sellers.
 - **Canary Call Structures**
 - Canaries are similar to Steps but are only callable in the period prior to the first step.
 - After the rate steps in a Canary bond, the bond then turns into a bullet where the investor will now receive the higher rate until maturity with no more call risk.

New Issue Agency Bonds

GRAB
4<Go> to set Current Selection as Default

95) Actions ▾ 96) Alerts ▾ 97) Export ▾ 98) Summary 9) Set Homepag New Issue Monitor

Selection U.S. Agencies (NIM 2) 1) Show Filters 2) Clear Filters Issues & News ▾

Date ↑	Issuer/Headline	Coupon	Maturity	Spread	Curr	Outst	Book Mgr	Note
		All ▾	All ▾	All ▾	All ▾	All ▾		
13:15	FED HOME LN BANK	1	10/27/2017		USD	50	WFS-sole	2.5-NC3MBERM
12:45	FED HOME LN BANK	0.9	2/15/2018		USD	25	BB&T-sole	3-NC
12:43	FED HOME LN BANK	STEP	4/29/2020		USD	15	WFS-sole	5-NC1 1X
12:21	FED FARM CREDIT	FRN	7/7/2016		USD	150	BNPPAR-sole	04/07/15
11:51	FED HOME LN BANK	0.53	10/28/2016		USD	30	RAM,RJA	1.5-NC3MOINC
11:40	FREDDIE MAC	STEP	4/24/2020		USD	50	FTN,NOM	5-NC3MO BERM
11:33	FED HOME LN BANK	1.6	4/13/2018		USD	125	FCS-sole	3-NC1 1X
11:32	FREDDIE MAC	1	10/27/2017		USD	85	JOINT LEADS	2.5-NC6MOINC
11:27	FED HOME LN BANK	STEP	4/30/2018		USD	15	HAPSEC-sole	3-NC3MO BERM
11:24	FED FARM CREDIT	FRN	12/7/2015		USD	50	FCS-sole	04/07/15
10:01	FED HOME LN BANK	STEP	4/30/2019		USD	15	VS-sole	4-NC3MO BERM
9:53	FREDDIE MAC	0.85	7/28/2017		USD	25	JOINT LEADS	2.25-NC6MO1X
9:45	FED HOME LN BANK	1	10/30/2017		USD	15	SUN,VS	2.5-NC3MBERM
9:30	FED HOME LN BANK	2	4/29/2019		USD	15	STFL,VS	4-NC1 1X
8:51	FED HOME LN BANK	STEP	4/29/2021		USD	15	MS-sole	6-NC3MO BERM
8:50	FED HOME LN BANK	1.65	4/27/2020		USD	15	BMO,VS	5-NC1 1X
8:45	FED HOME LN BANK	1.25	10/22/2018		USD	15	FTN,RJA,VS	3.5-NC1 1X
5:37	AGENCIES: FNMA Issues Led Trading, Has Supply Slot Tomorrow							
3/30	FED HOME LN BANK	STEP	10/2/2018		USD	15	UBS-sole	3.5-NC3MBERM

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Pricing – Discount Rate

- Bond prices can also be expressed as a discount rate when no stated coupon is associated with the security.
 - Total cost is based on the Net Present Value, which is based on the maturity date and discount rate.

360-Day Discount Note Example

GRAB
Settlement date is on a weekend.

FHDN 0 03/30/16 Govt Yield and Spread Analysis

95 Buy 96 Sell 97 Settings

1) Yields 2) Descriptive

FHDN 0 03/30/16 (313384UY3)

Discount	0.28000	Settle	04/05/15
Price	99.7200000	Issue	03/30/15
360 Days to Maturity		Maturity	03/30/16

Cashflow Analysis

For M Face Amount

Principal (Round)

Redemption 1,000,000.00

Profit 2,800.00

Repo Rate

Overnight Repo Equiv 0.281

Cost of Carry (pts) -4.719

Net P&L -261.44

Yield Calculations Taxed @ %

US Treasury Convention	0.285	0.205
US Govt Bond Equivalent	0.284	0.205
Simple Interest (Act/ <input type="text" value="360"/>)	0.281	0.202
Medium Term CD (Act/ <input type="text" value="360"/>)	0.281	0.202
US Treasury with Leap Year	0.285	0.205

Risk

Duration	0.984
Modified Duration	0.982
Risk	0.979
Convexity	0.014
DV <input type="text" value="01"/> on 1MM	<input type="text" value="97.95"/>
YV <input type="text" value="0.01"/> Dscnt <input type="text" value=""/>	0.01021

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Commercial Paper

- ◉ Commercial Paper is unsecured debt issued by corporations for the purpose of short-term funding of the business.
- ◉ Commercial Paper maturities typically range from 1 day to 270 days.
- ◉ Commercial Paper can be interest bearing, but is typically sold at a discount.

Commercial Paper Issuers

GRAB

Click on column headings to sort by terms

Issuer Lists	Options	Output Results To	DIRECT ISSUER COMMERCIAL PAPER													
Issuer List-ALL ISSUERS														Yellow=Executable, Blue=Executable/Enabled for trading		
Issuer	--1---	--7---	--15--	--30--	--45--	--60--	--90--	--120--	--150--	--180--	--270--	S&P	MDY	FI		
1) Sears Roebuck Accept	NQ	3.700*	4.400	4.500	4.500	4.700	4.700	4.700	4.700	4.700	4.700	C	NP	C		
2) Intesa Funding LLC	0.200	0.250*	0.360*	0.430	0.460*	0.500*	0.580*	0.680*	0.740*	0.810*	NQ	A-3	P-2	F2		
3) Dexia Delaware LLC		0.220*	0.240*	0.300*	0.310	0.350*	0.380*	0.380*	NQ*	NQ*		A-2	P-2	F1		
4) Instit Sec Funding	0.180	0.190*	0.210*	0.270	0.270	0.320	0.340			NQ		A-1	P-1	NR		
5) Societe Generale			NQ			0.200	0.220	0.290	0.340	0.380*	0.540	A-1	P-1	F1		
6) Abbey Natl NA LLC		0.100*	0.110*			0.140	0.260	0.300	0.340*	0.390*	0.520	A-1	P-1	F1		
7) Matixis NY	0.130	0.130*	0.130	0.130	0.130	0.130*	0.170*	0.210*	0.280*	0.320*	0.470	A-1	P-1	F1		
8) Prudential Funding				0.080	0.090	0.110						A-1+	P-1	F1		
9) Toyota Cred Puerto R			0.080*	0.090*	0.100*	0.110*	0.130*	0.150*	0.190*	0.250*	0.350	A-1+	P-1	NR		
10) General Electric Co	NQ	NQ	NQ	0.070	0.070	0.080	0.080					A-1+	P-1	NR		
11) AIG Funding Inc												A-2	P-2	NR		
12) Credit Agric CIB NY	0.120	0.130*	0.130*	0.130	0.140	0.140*	0.200*	0.260*	0.300*	0.390*		A-1	P-1	F1		
13) Toyota Motor Credit		*				0.110*	0.130*	0.150*	0.190*		0.350	A-1+	P-1	NR		
14) GE Capital Corp	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	0.270*	0.370	A-1+	P-1	NR		
15) American Gen Fin Cor	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	NR	NP	NR		

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Investment Performance Analytics

- ◉ According to GIPS (Global Investment Performance Standards) total return is the correct way to measure performance.
- ◉ When measuring performance, total return is the actual rate of return of an investment or a pool of investments over a given evaluation period.

Total Return

- ◉ Total return accounts for two categories of return: income and capital appreciation.
 - Income includes interest paid by fixed-income investments, distributions or dividends.
 - Capital appreciation represents the change in the market price of an asset.

Calculating Total Return

- If \$1 million is invested on 12/31/14 at par in a 3 year bond that has a 1% coupon, a market value of \$1,000,000 on 12/31/14 and a market value of \$990,000 on 1/31/15, the monthly total return would be:
 - Income Earned = $\$1,000,000 * .01 * 30/360 = \833.33
 - Capital Appreciation = Ending Value – Beginning Value = $\$990,000 - \$1,000,000 = (\$10,000)$

Calculating Total Return

- Income Earned + Capital Appreciation (Depreciation) = Net Investment Income
 - $\$833.33 + (\$10,000) = (\$9,166.67)$
- Net Investment Income / Beginning Investment Value = Monthly Total Return
 - $(\$9,166.67) / \$990,000 = \underline{-0.93\%}$

What if the Market Value Reversed?

- Ending Value – Beginning Value = Capital Appreciation (Depreciation)
 - $\$1,000,000 - \$990,000 = \$10,000$
- Net Investment Income =
 - $\$833.33$ (Income Earned) + $\$10,000$ (Capital Appreciation) = $(\$10,833.33)$
- Monthly Total Return =
 - $10,833.33 / \$1,000,000 = \underline{1.08\%}$

But if the Bond is Held to Maturity...

- ◉ Capital Appreciation = Ending Value – Beginning Value
 - $\$1,000,000 - \$1,000,000 = \$0$
- ◉ Income Earned =
 - $\$1,000,000 * .01 * 30/360 * 36 \text{ (months)} = \$30,000 / 3\text{yrs} = \$10,000 \text{ per year, so...}$
- ◉ $\$10,000 + \$0 / \$1,000,000 = 1\% \text{ per year}$ and the total return equals the original YTM.

Performance Benchmarks

- ⦿ Considerations in Benchmark Selection:
 - What are your overall performance goals?
 - What is your tolerance for volatility or risk?
 - What is your need for liquidity?
 - How many different types of securities are you able to invest in?

Performance Benchmarks

- What makes a good benchmark?
 - Unambiguous and transparent
 - Investable
 - Priced daily
 - Availability of historical data
 - Low turnover
 - Specified in advance
 - Published risk characteristics

Benchmark Examples

GRAB
 <Menu> to Return

G1A0 99 Download BofAML Bond Indices: Monthly/Quarterly/Annual Returns

The BofA Merrill Lynch 1-3 Year US Treasury & Agency Index Inception Date 09/30/1982

Currency **LOC** % Hedged **0** Values **Total Return Percentage**

Monthly	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2
Jan	0.502	0.159	0.013	0.131	0.168	0.714	-0.362	1.709	0.234	0.210	-
Feb	-0.208	0.090	0.076	-0.103	-0.079	0.205	0.005	0.918	0.790	0.108	-
Mar		-0.108	0.026	-0.045	-0.032	-0.219	0.520	0.264	0.380	0.150	-
Apr		0.136	0.101	0.200	0.434	0.262	0.011	-0.694	0.368	0.306	0.
May		0.181	-0.141	0.037	0.350	0.418	0.256	-0.330	-0.058	0.151	0.
Jun		-0.048	-0.075	-0.044	0.043	0.449	-0.088	0.295	0.413	0.189	0.
Jul		-0.077	0.160	0.227	0.251	0.262	0.161	0.374	0.865	0.745	-
Aug		0.165	-0.088	0.014	0.341	0.179	0.402	0.401	0.915	0.702	0.
Sep		-0.052	0.224	0.013	-0.128	0.171	0.254	0.593	0.747	0.531	-
Oct		0.269	0.110	-0.048	0.088	0.234	0.215	0.738	0.393	0.426	-
Nov		0.149	0.093	0.087	0.049	-0.192	0.580	1.296	1.558	0.521	0.
Dec		-0.239	-0.133	0.037	0.058	-0.166	-0.720	1.009	0.321	0.031	0.
Quarterly											
Q1		0.141	0.116	-0.016	0.057	0.699	0.161	2.914	1.410	0.469	-
Q2		0.269	-0.116	0.193	0.829	1.133	0.178	-0.730	0.724	0.647	1.
Q3		0.036	0.295	0.255	0.464	0.613	0.819	1.374	2.548	1.991	0.
Q4		0.179	0.070	0.075	0.195	-0.124	0.070	3.074	2.285	0.982	0.
Yearly											
Year		0.626	0.365	0.507	1.552	2.337	1.232	6.749	7.141	4.144	1.

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Benchmark Examples

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G1P0 99 Download BofAML Bond Indices: Monthly/Quarterly/Annual Returns

The BofA Merrill Lynch 1-3 Year US Agency Index Inception Date 03/31/1976

Currency LOC % Hedged 0 Values Total Return Percentage

Monthly	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2
Jan	0.474	0.168	0.027	0.207	0.171	0.614	-0.401	1.644	0.275	0.299	-
Feb	-0.144	0.088	0.030	0.065	-0.052	0.234	0.206	0.713	0.775	0.164	-
Mar		-0.087	0.048	0.008	0.015	-0.158	0.505	0.361	0.370	0.174	-
Apr		0.166	0.097	0.148	0.426	0.244	0.302	-0.500	0.395	0.291	0.
May		0.157	-0.127	0.018	0.328	0.313	0.432	-0.257	-0.023	0.150	0.
Jun		-0.079	-0.109	0.026	0.066	0.500	0.037	0.310	0.401	0.199	0.
Jul		-0.071	0.163	0.166	0.157	0.267	0.222	0.321	0.768	0.771	-
Aug		0.151	-0.063	0.046	0.278	0.143	0.401	0.244	0.667	0.704	0.
Sep		-0.014	0.204	0.037	-0.061	0.190	0.278	0.240	0.831	0.552	-
Oct		0.219	0.169	-0.006	0.076	0.284	0.219	0.385	0.447	0.515	-
Nov		0.194	0.089	0.074	0.046	-0.227	0.514	1.547	1.176	0.551	0.
Dec		-0.195	-0.104	0.055	0.072	-0.100	-0.563	1.857	0.459	0.058	0.
Quarterly											
Q1		0.170	0.105	0.280	0.134	0.689	0.308	2.738	1.426	0.638	-
Q2		0.244	-0.140	0.192	0.822	1.060	0.772	-0.449	0.774	0.641	1.
Q3		0.065	0.304	0.249	0.375	0.601	0.903	0.807	2.283	2.040	0.
Q4		0.217	0.154	0.124	0.193	-0.044	0.167	3.831	2.096	1.127	0.
Yearly											
Year		0.697	0.424	0.847	1.532	2.324	2.166	7.053	6.735	4.515	1.

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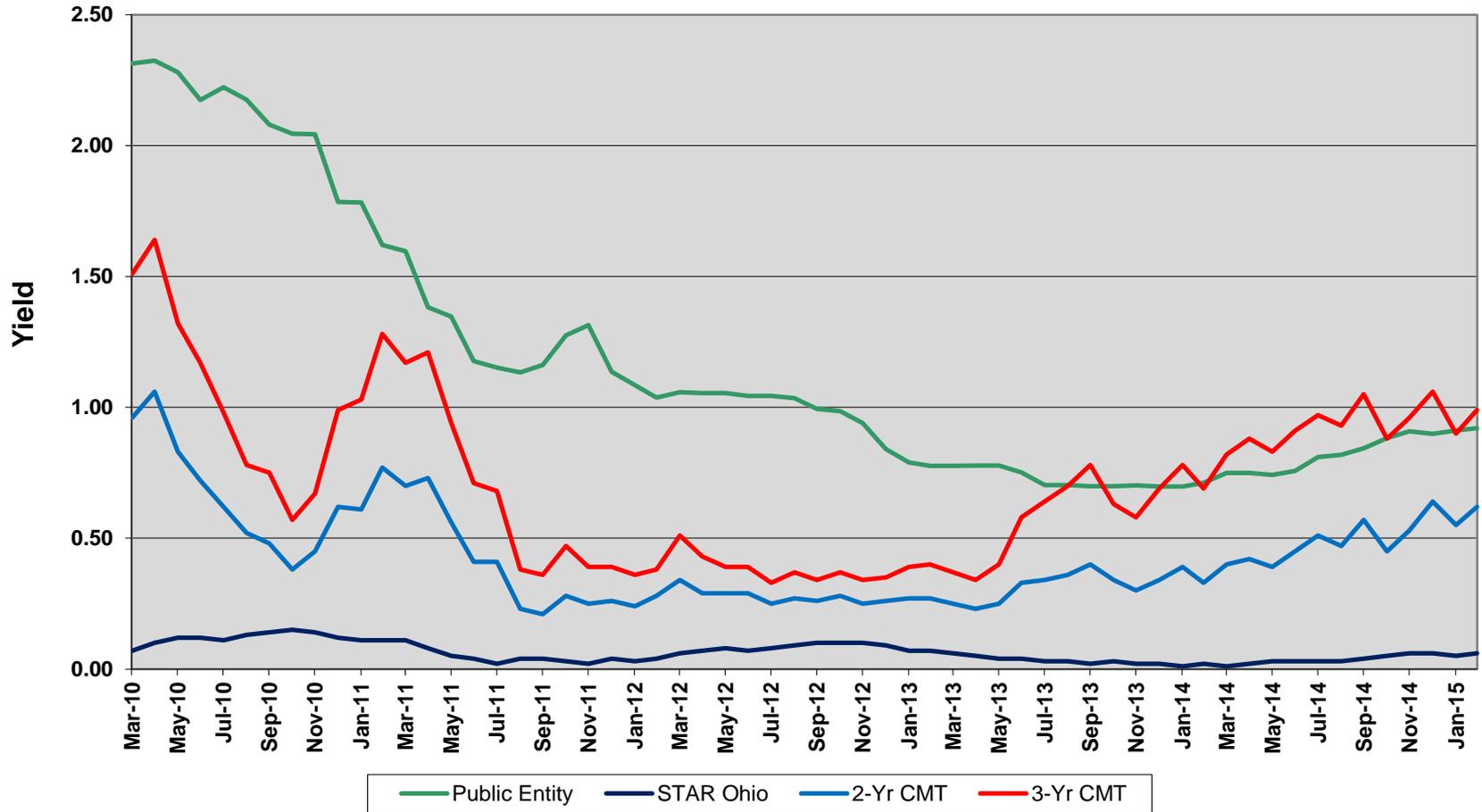
Other “Performance” Analytics

- ◉ Since public entities typically hold bonds to maturity, the holding period total return of each investment will likely end up being the YTM.
 - In addition, public entities do not want to be forced to rebalance their portfolios (possibly while incurring a loss) in order to match an index.
- ◉ What other methods can we use to assess our portfolios?
 - Compare YTM of investment portfolio over time to other relevant market indicators.

Market Indicator Examples

- STAR Ohio
 - Daily/Monthly Yields available on TOS website.
- Constant Maturity Treasury (CMT)
 - Calculated by the Federal Reserve Bank of NY
 - Available on the treasury.gov website.
- USD Government Agency Index
 - Calculated using the “BVAL” curve on Bloomberg.
 - Available on Bloomberg.

Example Yield Spread Graph



Conclusion

- ◉ Stay informed on Fed policy and market sentiments in order to develop an opinion on the direction of interest rates.
- ◉ Develop an investment strategy consistent with your views on the market that also incorporates your liquidity needs and risk tolerance.
- ◉ Measure investment performance against a benchmark or market reference point that is appropriate for your portfolio.

Thank You!

**If you have any questions or comments,
please feel free to contact us.**

