CPIM

CENTER FOR PUBLIC INVESTMENT MANAGEMENT

A PROGRAM BROUGHT TO YOU BY:

JOSH MANDEL

TREASURER OF OHIO

INVESTMENTS 315

Investment Positioning

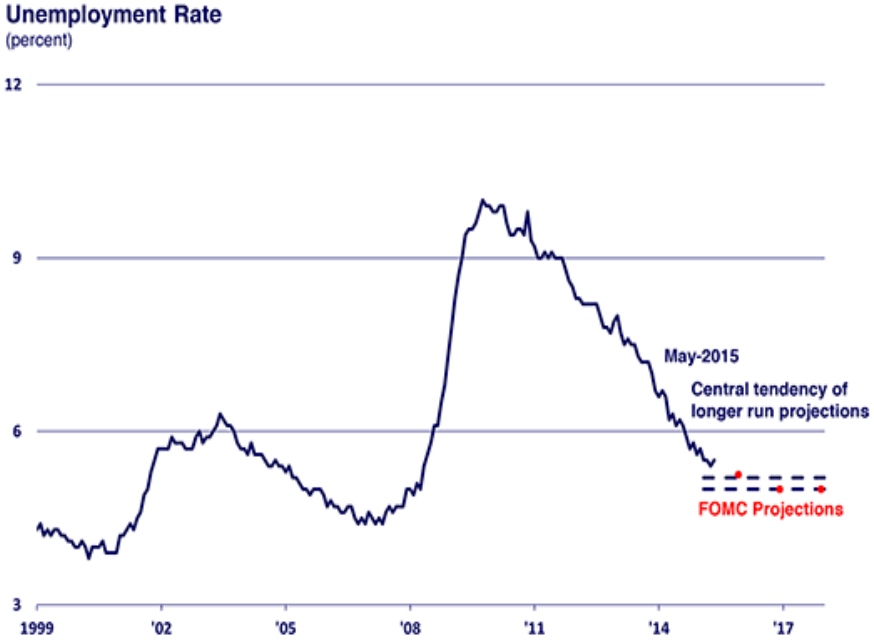
2015 CPIM Academy

Investment Positioning

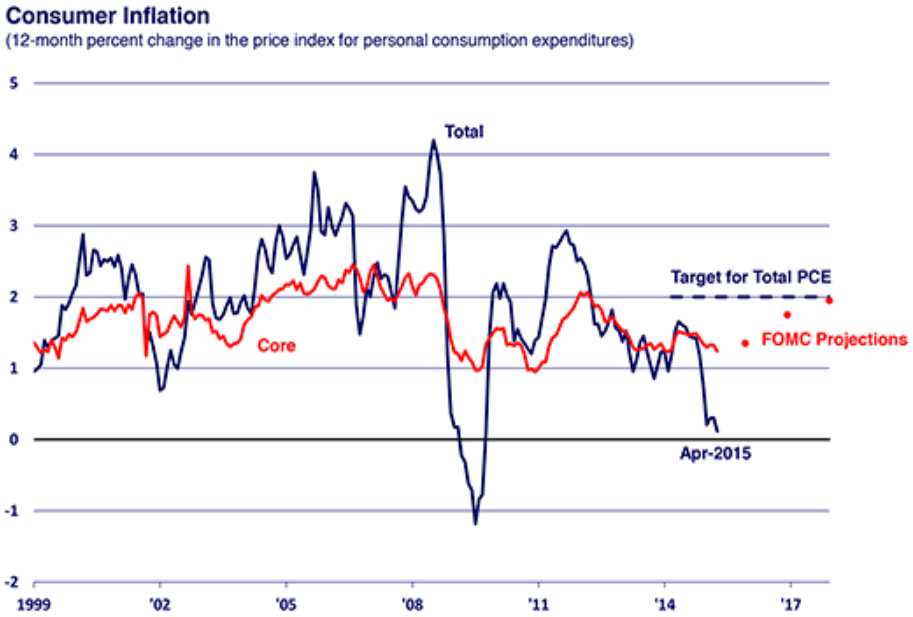
- This course covers:
  - considerations for investing in today's interest rate environment
  - various investment strategies
  - performance analytics

Federal Reserve's Dual Mandate

- Full Employment
- Price Stability



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



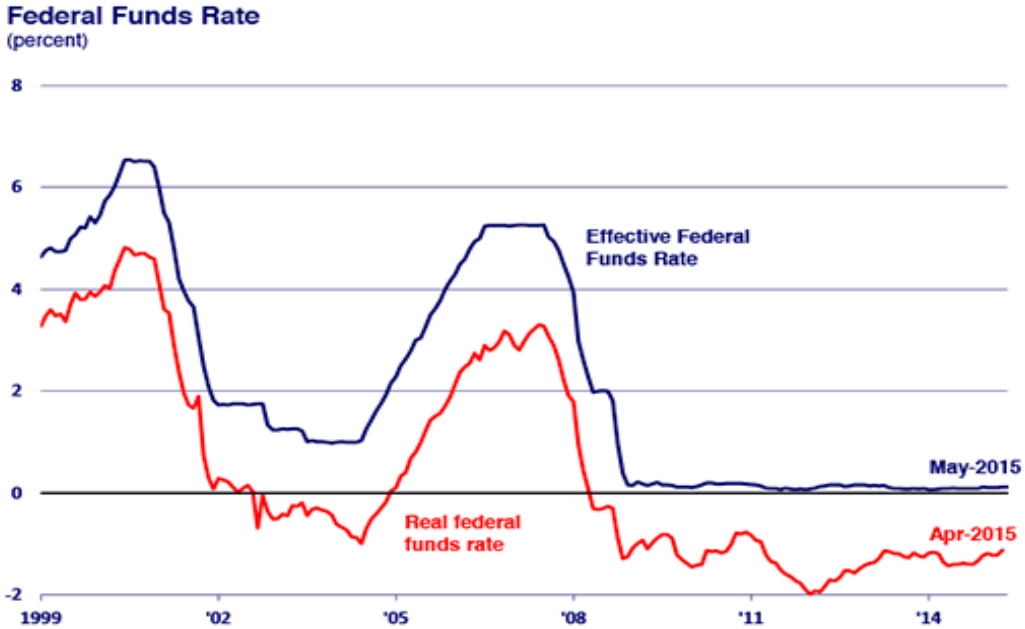
FOMC projections are the midpoint of the central tendency of projections from June 2015.
Source: Haver Analytics and Economic Projections of the Federal Reserve Board Members and Bank Presidents.

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.

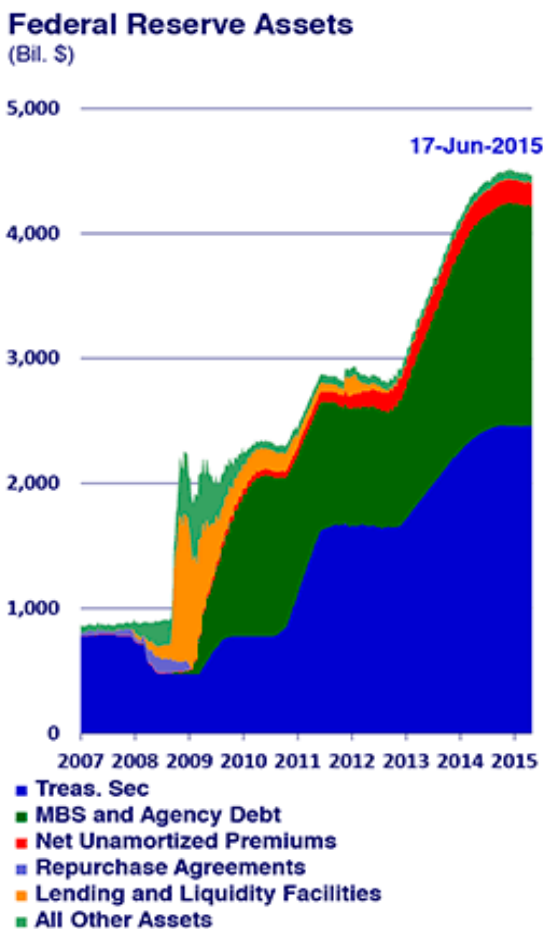
Federal Funds Rate

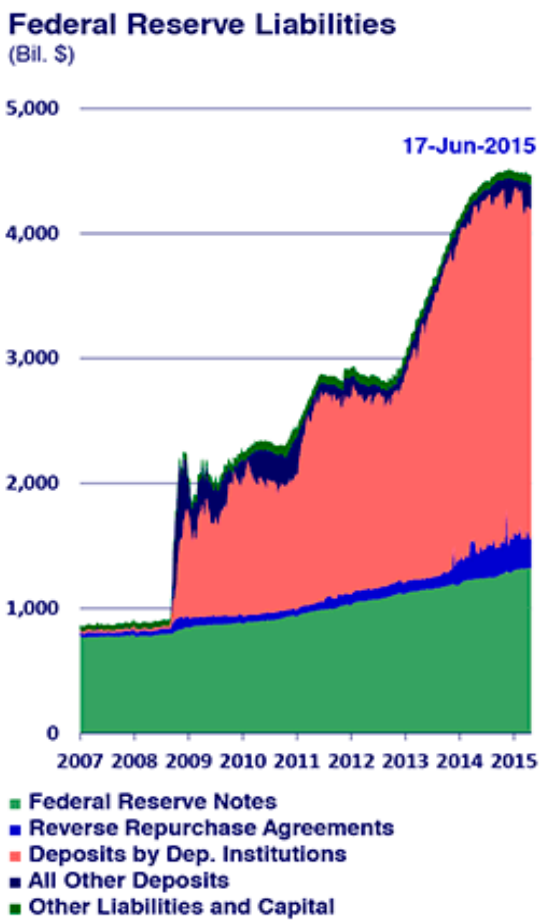
- The Fed Funds Rate has been at historically low levels since December 2008.



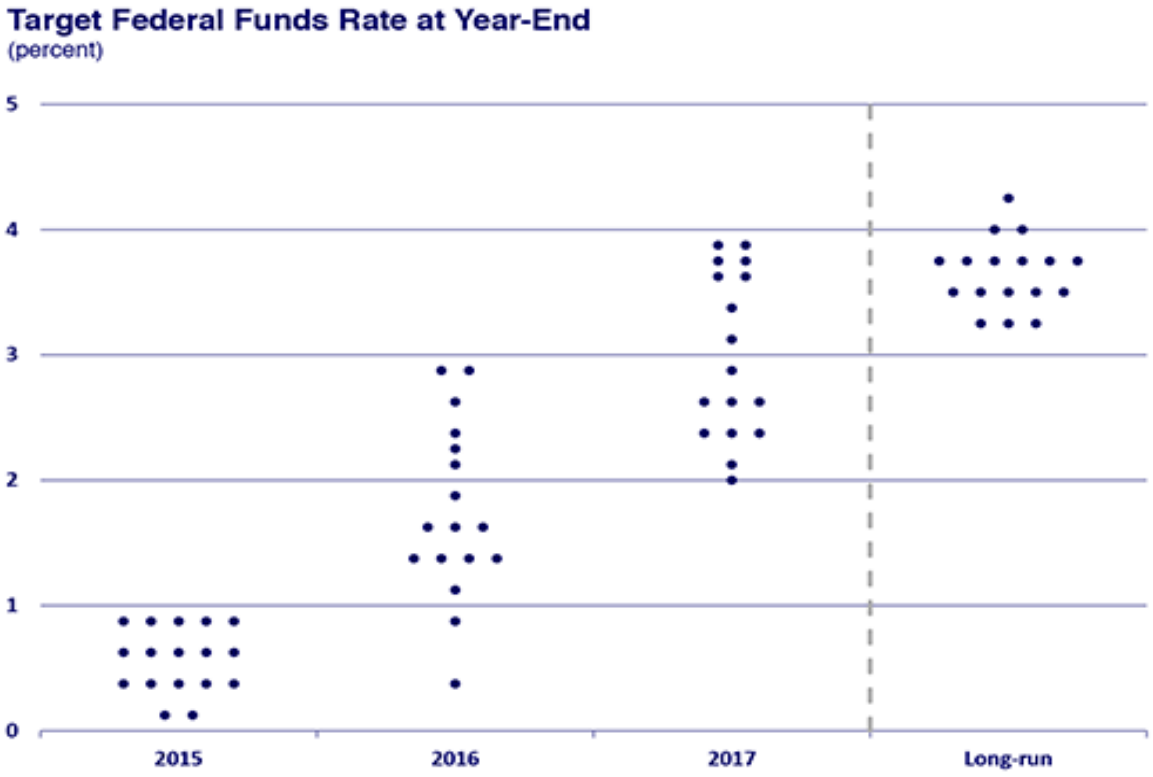
Real federal funds rate is the effective rate minus 12-month core PCE inflation.
Source: Haver Analytics.

Federal Reserve Balance Sheet





The Fed's Dot Plot

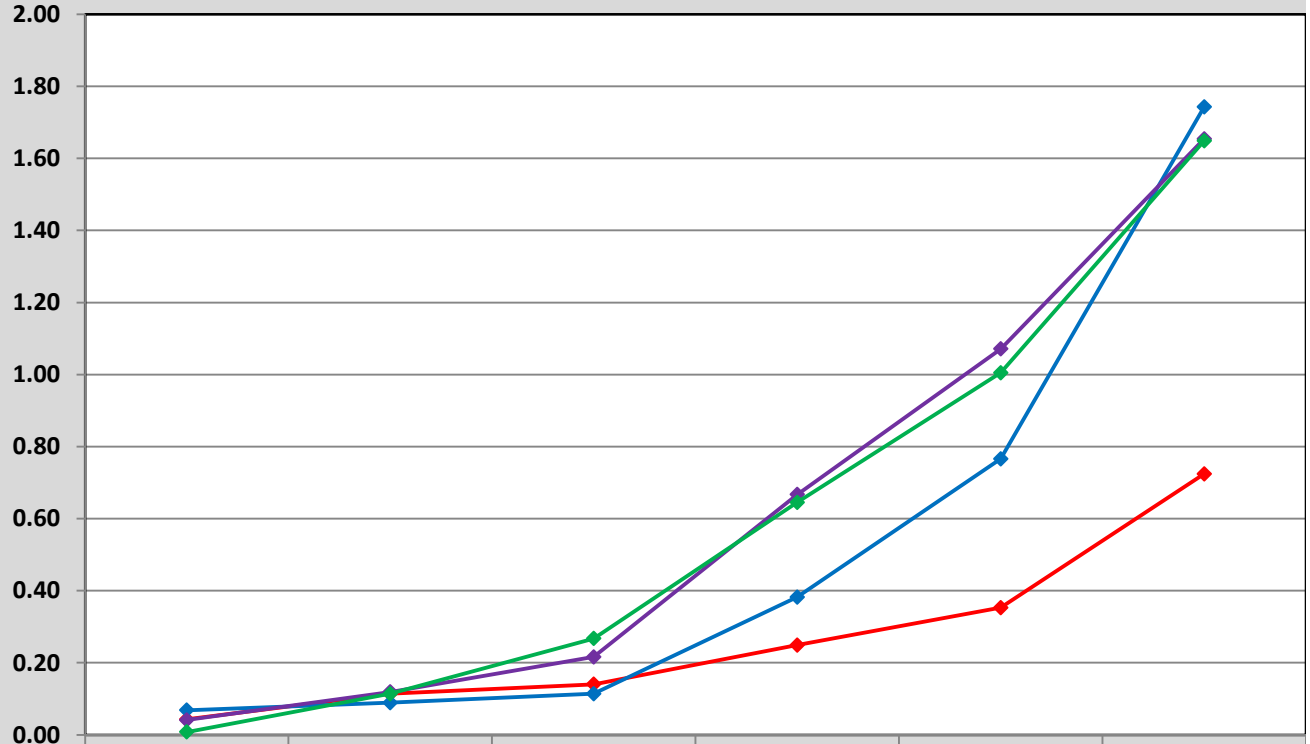


Source: June 2015 Summary of Economic Projections. Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the appropriate level of the target federal funds rate at the end of the specified calendar year or over the longer run.

Fed "Tightening"

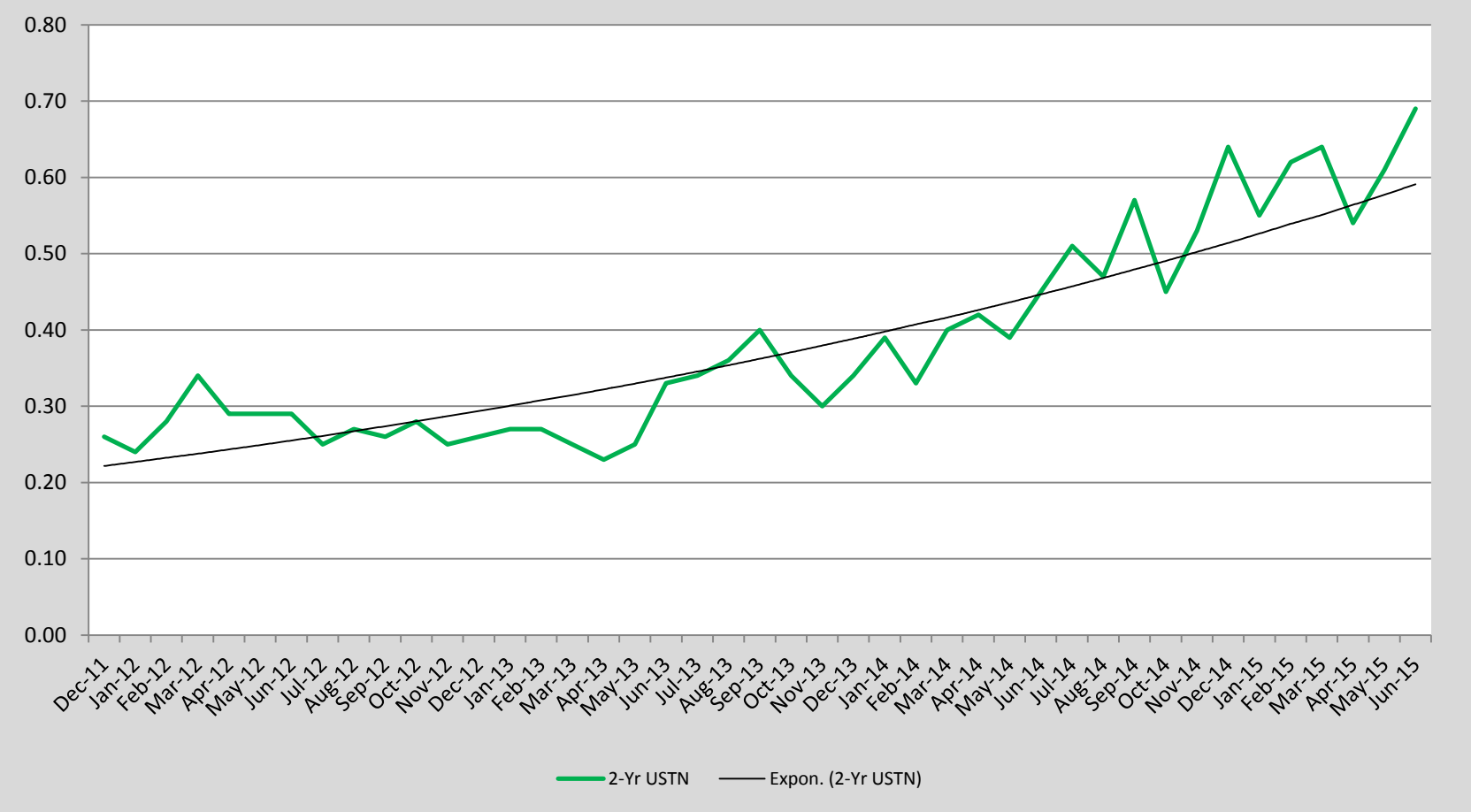
- The Fed began its easy, or accommodative, monetary policy in 2008 to spur economic activity and control unemployment.
  - Traditional Fed tightening has taken place to slow the economy and keep inflation in check.
  - This round of tightening is expected to take place simply to end the crisis monetary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

US Treasury Yield Curves



	3 Month	6 Month	1 Year	2 Year	3 Year	5 Year
12/31/2012	0.04	0.11	0.14	0.25	0.35	0.72
12/31/2013	0.07	0.09	0.11	0.38	0.77	1.74
12/31/2014	0.04	0.12	0.22	0.67	1.07	1.65
6/30/2015	0.01	0.11	0.27	0.65	1.01	1.65

2 - Year UST Trend



How to Prepare?

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

Image courtesy of tigger11th/FreeDigitalPhotos.net

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, but it will keep interest rate and duration risk to a minimum.
  - This option provides for maximum liquidity.

Laddering

- In a laddered portfolio, the investor purchases bonds in such a way that it almost mirrors the yield curve.
  - Based on 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.

Barbell Portfolio

- A barbell portfolio invests primarily in only short-term and long-term securities with very few intermediate maturities.
  - Maximize yield with longer-term securities.
  - Maximize liquidity with short-term securities.

Investment Options

- Be sure to refer to the statute and your approved investment policy.
  - ORC 135.14 – Political Subdivisions
  - ORC 135.35 – Counties
    - US Treasuries – Bills, Notes
    - Agencies – Callable, Non-callable, Step-up, Discount Notes
    - Commercial Paper
    - Municipal Bonds
    - Certificates of Deposit
    - STAR Ohio

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

10:02

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

5) Bills

31) 07/16/15	0.000/-0.005	-0.005	+0.005
32) 09/17/15	0.005/0.000	0.000	--
33) 12/17/15	0.065/0.060	0.061	-0.005
34) 05/26/16	0.215/0.210	0.214	-0.005

6) Notes

35) 0½ 417	99-26⅜ /26¾	0.589	+ 01⅛
36) 0⅝ 517 2YR	100-00¼ /00+	0.617	+ 01
37) WI 2YR	0.655/0.650		-0.015
38) 0¾ 418	99-15+ /16	0.930	+ 02¾
39) 1 518	100-03+ /03¾	0.959	+ 02+
40) 1⅛ 618 3YR	100-13 /13¼	0.984	+ 02¾
41) 1⅜ 420	99-01+ /02	1.576	+ 06+
42) 1½ 520 5YR	99-19¼ /19+	1.582	+ 06+
43) WI 5YR	1.605/1.600		-0.045
44) 1⅞ 522 7yr	99-04+ /05	2.006	+ 11
45) WI 7YR	2.020/2.015		-0.055
46) 2¼ N24	99-27 /27+	2.267	+ 15
47) 2 225	97-19 /19+	2.277	+ 15
48) 2⅛ 525 10YR	98-20 /20+	2.279	+ 15+

6) Bonds

49) 3 N44	98-12 /13	3.083	+1-04
50) 2½ 245	88-18+/19	3.090	+1-00+
51) 3 545 30YR	98-19+/20	3.071	+1-04

7) TIPS

52) 0⅛ 420	101-01¾ /101-04¼	-0.110	+ 02¼
53) 0¼ 125	98-21+ /98-25	0.380	+ 11+
54) 0¾ 245	91-22 /91-29¼	1.069	+1-00¾

10) Curve Trades

55) 2yr vs 5yr	96.152/-96.723	-2.667
56) 2yr vs 10yr	165.817/-166.401	-3.919
57) 5yr vs 10yr	69.499/-69.843	-1.251

Other Markets

58) US Long(CBT)	09:52 d	151-19	+1-28
59) 10yr Fut (CBT)	09:52 d	126-15+	+0-20
60) 5Yr Fut(CBT)	09:52 d	119-11	+0-10+
61) Dow Jones Ind	10:02	18093.191	-22.648
62) S&P 500 Ind	09:47 d	2116.950	-4.290
63) NYM WTI Crd	09:52 d	59.620	-0.830
64) Gold	10:02	1203.650	+1.730

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
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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 Benchmark Bullets

GRAB

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

10:02

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

2yr				**7yr**			
31) T0 5/8	517	100-00 1/4 / 100-00+	0.621 - 0.617	47) 1 7/8	522	99-05 / 99-05+	2.006 - 2.003
32) FHLMC 1	317	2.00 / -2.25	0.641 - 0.594	48) FHLMC 2 3/8	122	12.75 / 9.00	2.133 - 2.093
33) FHLB 0 5/8	517	8.00 / 5.25	0.701 - 0.669				
34) FHLB 1	617	10.25 / 5.75	0.723 - 0.674				
35) FHLMC 0 3/4	717	15.00 / 11.75	0.771 - 0.734				
3yr				**10yr**			
36) T1 1/8	618	100-12 3/4 / 100-13	0.989 - 0.986	49) T2 1/8	525	98-20 / 98-20+	2.281 - 2.279
37) FHLMC 0 3/4	118	-3.25 / -7.75	0.957 - 0.909	50) FNMA 2 5/8	924	29.25 / 25.00	2.573 - 2.529
38) FHLMC0 7/8	318	1.75 / -2.25	1.007 - 0.964	51) FNMA 6 1/4	529	71.75 / 65.50	2.998 - 2.934
39) FHLB 1 1/8	418	4.00 / 0.50	1.029 - 0.991	52) FHLMC6 3/4	929	71.25 / 60.50	2.993 - 2.884
40) FNMA1 1/8	718	14.25 / 11.75	1.132 - 1.104				
5yr				**30yr**			
41) T1 1/2	520	99-19 1/4 / 99-19+	1.584 - 1.582	53) T3	545	98-19+ / 98-20	3.071 - 3.071
42) FNMA 1 3/4	919	-4.50 / -9.25	1.539 - 1.490	54) FNMA 6 5/8	N30	7.00 / 2.00	3.141 - 3.091
43) FHLMC 1 1/4	019	-2.25 / -6.00	1.562 - 1.522	55) FHLMC6 3/4	331	9.75 / 5.50	3.169 - 3.126
44) FNMA 1 5/8	120	5.75 / 0.75	1.642 - 1.590	56) FHLMC6 1/4	732	13.50 / 7.25	3.206 - 3.143
45) FHLMC1 3/8	520	8.25 / 1.00	1.667 - 1.592				
46) FNMA 1 1/2	620	14.50 / 11.75	1.729 - 1.700				

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Dealer Agency Bullet Inventory

GRAB

BULLETS

Page 1 / 2

	Size	Ticker	Cpn	Maturity	Spread	Ref	Yield	Price	Cusip
1)	15905	FHLB	.850	08/28/17	17.50	2YR	.792	100.126	3130A5ML0
2)	10000	FHLMC	1.000	09/27/17	20.00	2YR	.817	100.410	3134G3M31
3)	37970	FHLB	.900	09/28/17	21.00	2YR	.827	100.164	3130A5KH1
4)	1000	FHLB	1.500	10/10/17	25.00	2YR	.867	101.438	3130A04F4
5)	24000	FHLB	.900	10/27/17	24.50	2YR	.862	100.089	3130A5L56
6)	1680	FHLB	.800	10/30/17	25.50	2YR	.872	99.833	3130A5HU6
7)	4555	FHLB	.950	11/28/17	28.50	2YR	.902	100.116	3130A5KF5
8)	645	FHLB	1.125	12/08/17	30.00	2YR	.917	100.505	3130A3HF4
9)	1140	FHLB	.750	12/08/17	29.50	2YR	.912	99.607	313381B20
10)	2940	FHLB	.900	01/30/18	-5.00	3YR	.936	99.907	3130A5J75
11)	6460	FHLB	1.125	02/28/18	2.00	3YR	1.006	100.313	3130A4NM0
12)	13695	FNMA	1.130	02/28/18	-2.50	3YR	.961	100.445	3135G0VC4
13)	49000	FHLB	1.125	03/29/18		3YR	.986	100.378	3130A5PE3
14)	1790	TVA	4.500	04/01/18	7.00	3YR	1.056	109.392	880591EC2
15)	33800	FHLB	1.125	04/25/18	2.50	3YR	1.011	100.318	3130A5M63
16)	5000	FFCB	2.580	06/08/18	8.00	3YR	1.066	104.400	31331KNA4
17)	8360	FHLB	1.250	06/08/18	10.00	3YR	1.086	100.475	313379DT3
18)	42750	FHLB	1.150	06/22/18	10.00	3YR	1.086	100.187	3130A5QA0
19)	33350	FHLB	1.200	06/27/18	10.00	3YR	1.086	100.336	3130A5M55
20)	4900	FHLB	1.125	06/29/18	10.00	3YR	1.086	100.114	3130A5JT7
21)	940	FHLB	1.150	08/27/18	15.00	3YR	1.136	100.043	3130A5H36
22)	38500	FHLB	1.250	08/28/18	13.50	3YR	1.121	100.402	3130A5PX1

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Callables

- Callable structures are typically cheaper than bullets.
  - 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.
- Types of Callable structures:
  - Fixed-Rate Callable (e.g. Bermudan, American, European)
  - Step-Rate

Callables

- A Fixed-Rate 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 Callable Bonds
  - "Steps offer predetermined increases (or decreases) to the coupon of the bond.
- Canary Callable Bonds
  - Canaries are similar to Steps but are only callable in the period prior to the first step.

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		
10:02	FREDDIE MAC	STEP	6/25/2018		USD	25	FTN-sole	3-NC3MO BERM
8:48	FED HOME LN BANK	STEP	7/15/2020		USD	15	BMO-sole	5-NC3MO BERM
8:37	FED HOME LN BANK	1.17	6/29/2018		USD	15	FTN,RJA,VS	3-NC1 1X
6:47	AGENCIES: Dealer Positions in Coupons See Small Rise; MBS Higher							
6:22	AGENCIES: Lowest Thurs. Volume Since July 2014; FNMA Passed							
6/18	FED HOME LN BANK	0.375	6/20/2016		USD	105	DAIWA-sole	1-NC
6/18	Washington to Bond Traders: We're Worried About Liquidity Too							
6/18	FREDDIE MAC	1.3	6/25/2018		USD	75	BNYM,MS,WFS	3-NC3MO INC
6/18	FED HOME LN BANK	VAR	7/16/2025		USD	25	BCLY-sole	10C 1MBERM
6/18	FED FARM CREDIT	3.75	6/25/2035		USD	15	STFL-sole	20-NC
6/18	FED FARM CREDIT	3.04	6/17/2024		USD	88	JOINT LEADS	9-NC1 CONINC
6/18	FREDDIE MAC	STEP	7/9/2019		USD	40	JOINT LEADS	4-NC3MO BERM
6/18	FED HOME LN BANK	2.875	6/13/2025		USD	15	ML-sole	10-NC
6/18	FED HOME LN BANK	1.625	6/14/2019		USD	1.63B	FTN,ML,MS	INCREASE
6/18	FED HOME LN BANK	0.375	6/22/2016		USD	26.7	RJA-sole	1-NC
6/18	FREDDIE MAC	0.95	9/22/2017		USD	35	JEFF-sole	2.25-NC3MBER
6/18	FED FARM CREDIT	3.17	6/30/2025		USD	82	JOINT LEADS	10-NC1 CONT
6/18	FED FARM CREDIT	3.84	6/25/2035		USD	15	JOINT LEADS	20-NC3 CONT
6/18	FREDDIE MAC	0.8	6/23/2017		USD	25	BNYM,MS,WFS	2-NC3MO BERM

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Dealer Agency Callable Inventory

GRAB
200<Go> to view in Launchpad, Click prices to execute a trade

97) Settings 98) Output Page 1/1 INTL FCStone Partners L.P.

1 - 2 | 2 - 4 | 4 - 8 | 8+ | Step Coupons | 1MM+

INTL FCStone

66) MSG Contributor 10:03:53
Zoom 100%

INTL FCStone Partners L.P. -> INTL FCStone Partners L.P. -> US Agencies -> Callables -> 2 - 4 (GDCO 3577 3)

Callables 2-4 Years				Size	Price	YTC	YTM		
Ticker	Cpn	Maturity	Call Dtd	(M)	Ask	Ask	Ask	Cusip	Comment
1) FHLB	1.250	06/23/17	03/23/16	210	100.563	0.500	0.966	3130A4FZ0	Onetime
2) FHLB	0.850	07/24/17	06/26/15	1000	99.950	5.334	0.874	313380WR4	Anytime
3) FHLMC	1.000	08/28/17	08/28/15	180	100.000	0.997	1.000	3134G3E55	Quarterly
4) FHLB	0.950	11/01/17	06/26/15	1000	99.900	9.947	0.993	3133814N2	Anytime
5) FFCB	0.940	11/13/17	06/26/15	35	99.700	27.995	1.067	3133EC2M5	Anytime
6) FHLMC	1.000	11/22/17	08/22/15	575	99.850	1.897	1.063	3134G3A34	Quarterly
7) FFCB	0.980	11/27/17	08/27/15	22050	99.935	1.340	1.007	3133EEP53	Anytime
8) FHLB	1.000	03/20/18	06/26/15	300	99.450	50.649	1.204	313382FP3	Anytime
9) FHLB	1.300	03/29/18	09/29/15	52300	100.100	0.899	1.263	3130A5PD5	Quarterly
10) FHLMC	1.200	04/20/18	10/20/15	10	99.700	2.117	1.308	3134G6NT6	Onetime
11) FHLMC	1.300	06/18/18	03/18/16	355	100.050	1.232	1.283	3134G64T7	Quarterly
12) FFCB	1.125	07/09/18	06/26/15	80	99.350	59.709	1.343	3133EA3M8	Anytime
13) FHLMC	1.650	06/10/19	12/10/15	250	99.900	1.865	1.676	3134G62J1	Quarterly

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Bond Description Page

GRAB
FREDDIE MAC FHLMC 0 ¾ 06/18 N O T P R I C E D

FHLMC 0 ¾ 06/25/18 Corp | Page 1/11 | Description: Structured Note

Data not provided by Bloomberg | 94) Notes | 95) Buy | 96) Sell | 97) Settings

21) Bond Description | 22) Issuer Description

Pages
1) Bond Info
2) Addtl Info
3) Covenants
4) Guarantors
5) Bond Ratings
6) Identifiers
7) Exchanges
8) Inv Parties
9) Fees, Restrict
10) Schedules
11) Coupons

Quick Links
32) ALLQ Pricing
33) QRD Quote Reca
34) TDH Trade Hist
35) CAC Corp Action
36) CF Prospectus
37) CN Sec News
38) HDS Holders
39) VPR Underly Info

66) Send Bond

Issuer Information

Issuer	FREDDIE MAC
Industry	Government Agencies

Security Information

Mkt Iss	Domestic MTN		
Country	US	Currency	USD
Rank	Unsecured	Series	
Coupon	0.75	Type	Step-Up...
Cpn Freq	S/A		
Day Cnt	30/360	Iss Price	100.00000
Maturity	06/25/2018		
CALL 09/25/15@100.00			
Iss Sprd			
Calc Type	(1311)MULTI-STEP CPN BND		
Announcement Date			06/19/2015
Interest Accrual Date			06/30/2015
1st Settle Date			06/30/2015
1st Coupon Date			12/25/2015

Security created by firm FTN FINANCIAL

Identifiers

ID Number	EK9911679
CUSIP	3134G7EA5
ISIN	US3134G7EA52

Bond Ratings

Moody's	NA
S&P	NA
Fitch	NA
DBRS	NA

Issuance & Trading

Amt Issued/Outstanding
USD 25,000.00 (M) /
USD 25,000.00 (M)

Min Piece/Increment
1,000.00 / 1,000.00

Par Amount	1,000.00
Book Runner	FTN-sole
Exchange	NOT LISTED

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Call Schedule

GRAB
FREDDIE MAC FHLMC 0 ¾ 06/18 N O T P R I C E D
FHLMC 0 ¾ 06/25/18 Corp Page 10/11 Description: Structured Note
Data not provided by Bloomberg 94) Notes 95) Buy 96) Sell 97) Settings
21) Bond Description 22) Issuer Description

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2) Addtl Info
3) Covenants
4) Guarantors
5) Bond Ratings
6) Identifiers
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34) TDH Trade Hist
35) CAC Corp Action
36) CF Prospectus
37) CN Sec News
38) HDS Holders
39) VPR Underly Info

66) Send Bond

Schedules
51) Call

Discrete Call minimum 5 business days notice
Last Call Date 03/25/2018

Call Frequency Quarterly
Callable only on date(s) shown

Date	Price
09/25/2015	100.000
12/25/2015	100.000
03/25/2016	100.000
06/25/2016	100.000
09/25/2016	100.000
12/25/2016	100.000
03/25/2017	100.000
06/25/2017	100.000
09/25/2017	100.000
12/25/2017	100.000
03/25/2018	100.000

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Coupon Schedule

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FREDDIE MAC FHLMC 0 ¾ 06/18 N O T P R I C E D
FHLMC 0 ¾ 06/25/18 Corp Page 11/11 Description: Structured Note
Data not provided by Bloomberg 94) Notes 95) Buy 96) Sell 97) Settings
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35) CAC Corp Action
36) CF Prospectus
37) CN Sec News
38) HDS Holders
39) VPR Underly Info

66) Send Bond

Coupons
51) Coupons

Issue Date	06/30/2015	First Coupon	Short First
1st Coupon Date	12/25/2015	Last Coupon	Normal
Observation Index	N/A	Paying Index	N/A

Coupon	End Date
0.750	06/25/2016
1.000	12/25/2016
1.250	06/25/2017
2.000	12/25/2017
3.000	06/25/2018

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Yield to Maturity/Call

GRAB
66<GO> to message data

FHLMC 0 ¾ 06/25/18 Corp — Page 1/2 — Yield and Spread Analysis

95) Buy | 96) Sell | 97) Settings

1) Yield & Spread | 2) Graphs | 3) Pricing | 4) Custom | 5) Descriptive | 6) Calls

Settlement Date 06/30/15 | Price 100 | Blend | Full Screen

YTC (3134G7EA5)	Date	Price	Yield
Yield to Maturity	06/25/2018	100.00	1.452
Yield to Custom	06/25/2016	100.00	0.750
Yield to Next Call	09/25/2015	100.00	0.750
Yield to Worst Call	09/25/2015	100.00	0.750

May be called quarterly starting 09/25/2015

Date	Price	Yield	Treas Crv	Sprd	Adj Dur	Risk
09/25/15	100.0000	0.7500	0.005	0.745	0.236	0.236
12/25/15	100.0000	0.7500	0.069	0.681	0.484	0.484
03/25/16	100.0000	0.7503	0.155	0.595	0.732	0.732
*06/25/16	100.0000	0.7500	0.246	0.505	0.981	0.981
09/25/16	100.0000	0.8006	0.343	0.458	1.228	1.228
*12/25/16	100.0000	0.8338	0.439	0.395	1.474	1.474
03/25/17	100.0000	0.8935	0.534	0.360	1.720	1.720
*06/25/17	100.0000	0.9378	0.629	0.309	1.965	1.965
09/25/17	100.0000	1.0555	0.717	0.338	2.208	2.208
*12/25/17	100.0000	1.1488	0.805	0.344	2.451	2.451

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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

Yield Calculations

		Taxed @ 28.00 %
US Treasury Convention	0.285	0.205
US Govt Bond Equivalent	0.284	0.205
Simple Interest (Act/ 360)	0.281	0.202
Medium Term CD (Act/ 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 01 on 1MM	97.95
YV 0.01 Dscnt	0.01021

Cashflow Analysis

For 1,000 M Face Amount	
Principal (Round) N	997,200.00
Redemption	1,000,000.00
Profit	2,800.00
Repo Rate	5
Overnight Repo Equiv	0.281
Cost of Carry (pts)	-4.719
Net P&L	-261.44

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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*	0.350*	0.450*	0.490	0.490*	0.660*	0.710*	0.780*	0.890*	NQ	A-3	P-2	F2
3) Dexia Delaware LLC		0.220*	0.240*	0.310*	0.320	0.350*	0.400*	0.400*	NQ*	NQ*		A-2	P-2	F2
4) Instit Sec Funding	0.160	0.180*	0.180	0.240	0.240	0.310	0.320			NQ		A-1	P-1	NR
5) Natixis NY	0.130	0.130*				0.240*	0.240	0.240*	0.360*	0.410*	0.600	A-1	P-1	F1
6) Abbey Natl NA LLC							0.220	0.280	0.340*	0.410*	0.530	A-1	P-1	F1
7) AIG Funding Inc												A-2	P-2	NR
8) Credit Agric CIB NY	0.120	0.130*	0.090*	NQ*		0.120*	NQ*	NQ*	0.340*	0.440*	0.600	A-1	P-1	F1
9) General Electric Co	NQ	0.060*										A-1+	P-1	NR
10) Toyota Motor Credit				0.120*		0.160*	0.200*	0.250*		0.330*	0.420	A-1+	P-1	NR
11) GE Capital Corp	NQ	NQ	NQ	NQ	NQ	NQ*	0.180	NQ	0.260*	0.310*	NQ	A-1+	P-1	NR
12) Societe Generale			NQ	NQ		0.200	0.240	0.260	0.360	0.460*	0.620	A-1	P-1	F1
13) American Gen Fin Cor	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	NR	NP	NR
14) American Gen Fin Inc	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	C	NR	NR
15) American Express Crd	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	A-2	P-1	F1

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Investment Performance Analytics

- According to GIPS (Global Investment Performance Standards) total return is the correct way to measure performance.
  - Total return is the actual rate of return of an investment or a pool of investments over a given evaluation period.
  - 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 = <u>-0.93%</u>

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 = <u>1.08%</u>

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 (months) = $30,000/ 3yrs = $10,000 per year, so…
- $10,000 + $0 / $1,000,000 = 1% 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?

Example Benchmark Returns

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	0.230	-0.108	0.026	-0.045	-0.032	-0.219	0.520	0.264	0.380	0.150	-
Apr	0.047	0.136	0.101	0.200	0.434	0.262	0.011	-0.694	0.368	0.306	0.
May	0.073	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	0.523	0.141	0.116	-0.016	0.057	0.699	0.161	2.914	1.410	0.469	-
Q2	0.121	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	0.644	0.626	0.365	0.507	1.552	2.337	1.232	6.749	7.141	4.144	1.

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Example Benchmark Characteristics

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Enter <Go> to Load, <Menu> to Return

G1A0 | 99) Download | BofAML Bond Indices: Index Characteristics

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

06/18/2015 | Currency USD | Calculation Conventional

		Jun Market Change			5/31 Rebalancing	
		Jun Index 6/18/2015	Jun Index 5/31/2015	MTD Chg 6/18/2015	May Index 5/31/2015	Rebal Chg 5/31/2015
Valuations (Scale MM)						
# of Issues		457	457	0	450	7
Face Value		3,200,166	3,200,166	0	3,237,754	-37,588
Accrued Interest		13,078	11,262	1,816	11,361	-99
Cash		909	0	909	7,926	-7,926
Full Market Value		3,275,178	3,277,108	-1,930	3,320,491	-43,383
% of	G0A0	34.53	34.14	0.39	34.26	-0.11
Yield						
Effective Yield		0.65	0.61	0.04	0.57	0.04
Yield to Worst		0.65	0.60	0.04	0.57	0.04
Yield to Maturity		0.65	0.61	0.04	0.57	0.04
Spread (in Semi-Annual Terms)						
To Worst (vs Govt)		0	0	0	0	0
OAS (vs Govt)		0	-1	1	-1	0
Libor OAS		-21	-21	0	-21	0
Asset Swap		-20	-20	0	-20	0
Duration						
Effective Duration		1.82	1.86	-0.05	1.76	0.11
Spread Duration		1.81	1.86	-0.05	1.75	0.10
Mod Dur to Worst		1.81	1.86	-0.05	1.75	0.11
Mod Dur to Maturity		1.83	1.88	-0.05	1.77	0.11

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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.

2-Year CMT History

GRAB

H15T2Y Index | Export to Excel | Page 1/7 | Historical Price Table

US Treasury Yield Curve Rate T Note Constant Maturity 2 Year

Range 06/30/1995 - 05/31/2015 Period Monthly

Market Last Price Mid Line Currency USD

View Price Table

High	6.81	on	05/31/00
Low	.21	on	09/30/11
Average	3.04		3.04
Net Chg	-5.11		-89.35%

Date	Last Price	Mid Line	Date	Last Price	Mid Line	Date	Last Price	Mid Line
12/31/15			12/31/14	.64	.64	12/31/13	.34	.34
11/30/15			11/30/14	.53	.53	11/30/13	.30	.30
10/31/15			10/31/14	.45	.45	10/31/13	.34	.34
09/30/15			09/30/14	.57	.57	09/30/13	.40	.40
08/31/15			08/31/14	.47	.47	08/31/13	.36	.36
07/31/15			07/31/14	.51	.51	07/31/13	.34	.34
06/30/15			06/30/14	.45	.45	06/30/13	.33	.33
05/31/15	.61	.61	05/31/14	.39	.39	05/31/13	.25	.25
04/30/15	.54	.54	04/30/14	.42	.42	04/30/13	.23	.23
03/31/15	.64	.64	03/31/14	.40	.40	03/31/13	.26	.26
02/28/15	.62	.62	02/28/14	.33	.33	02/28/13	.27	.27
01/31/15	.55	.55	01/31/14	.39	.39	01/31/13	.27	.27

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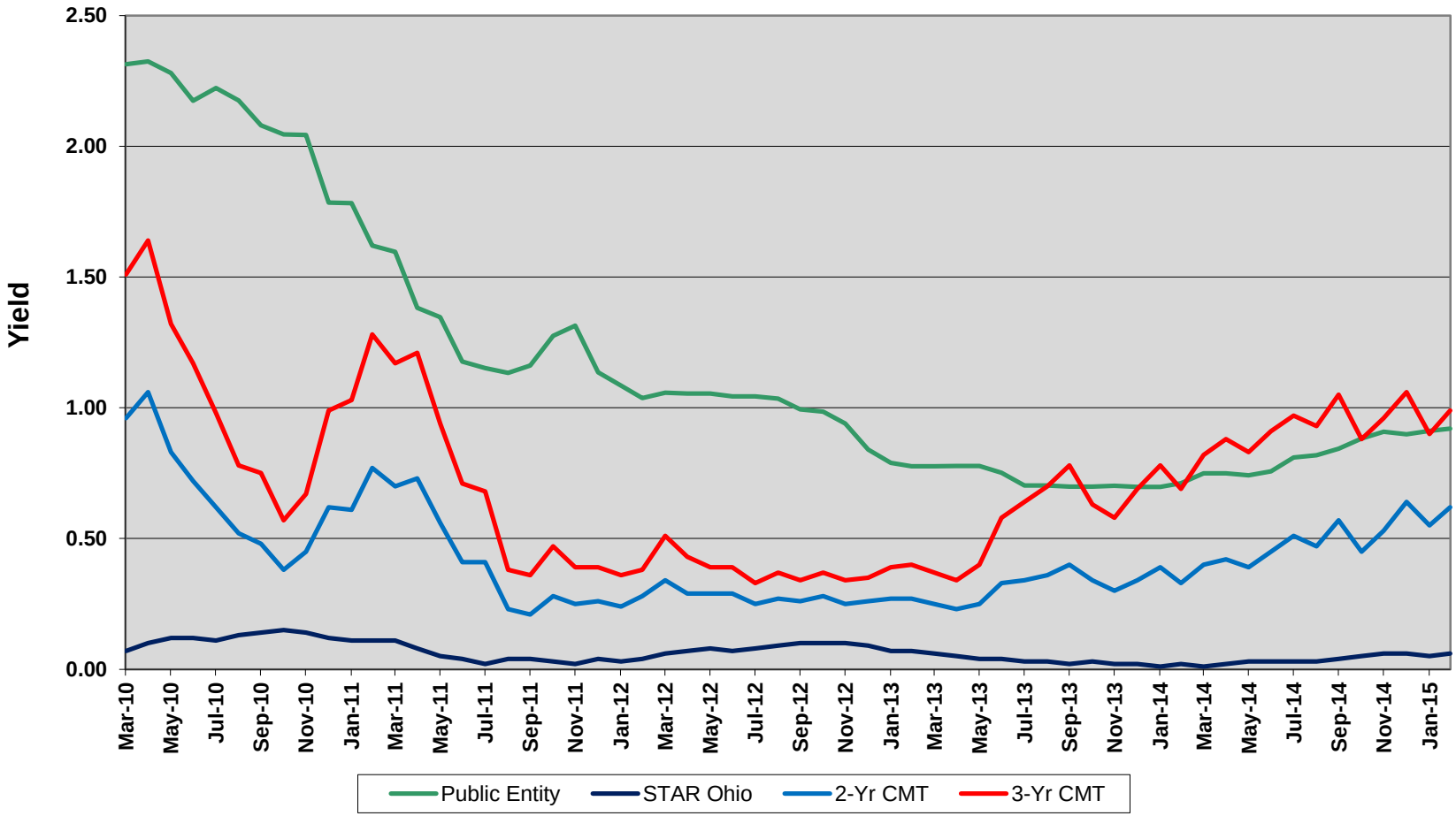
Example Yield Spread Graph



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.