

CDIAC

CALIFORNIA  
DEBT AND  
INVESTMENT  
ADVISORY  
COMMISSION

# THE PUBLIC INVESTMENT PORTFOLIO: DEMYSTIFYING THE WORLD OF U.S. FEDERAL AGENCIES AND SUPRANATIONALS

HANK STERN, CITY TREASURER, CITY OF ANAHEIM

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June 17, 2015

10:00 AM – 11:45 AM

# Disclaimer

The information presented in this webinar series is intended to assist public investment professionals. The content presented is informational and does not constitute investment advice or the recommendation to invest in any or all of the investment instruments discussed. When choosing an investment instrument for a public portfolio, the whole portfolio, investment policy, suitability, financial needs of the public agency and any associated risks should be considered. In addition, the information in each webinar is set to reflect the period in time in which it is presented and any changes that may affect any of the instruments discussed, such as legislation, reform or market conditions, or that may alter the relevancy of any of these webinars, will not be reflective in the post archival recordings. In such instances, viewers should be advised to use the information only as a reference as no updates to the recordings will be made. Please consult the California Debt and Investment Advisory Commission's publication *Local Agency Investment Guidelines* for any interpretive updates.

# California State Code

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- California Government Code
  - ▣ Section 53601, (f), “Federal agency or United States government-sponsored enterprise obligations, participations, or other instruments, including those issued by or fully guaranteed as to principal and interest by federal agencies or United States government-sponsored enterprises.”

Note: there is no reference in section (f) to credit rating of the Federal Agencies by any of the NRSRO

# California State Code

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- California Government Code
  - ▣ Section 53601, (q), “United States dollar denominated senior unsecured unsubordinated obligations issued or unconditionally guaranteed by the
    - International Bank for Reconstruction and Development
    - International Finance Corporation
    - Inter-American Development Bank

With a maximum remaining maturity of five years or less, and eligible for purchase and sale within the United States. Investments under this subdivision shall be rated “AA” or better by an NRSRO and shall not exceed 30 percent of the agency’s moneys that may be invested pursuant to this section.”

- ▣ Section 53601 (q) became effective January 1, 2015.

# Investment Policy Considerations

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## Defining the investment options of Federal Agency debt

1. Have you clearly defined and listed the Federal Agency issues as ‘authorized’ by your Investment Policy?
2. Have you set a maximum limit to invest in Federal Agencies by:
  - a. Total Federal Agency investments?
  - b. Total % per issuer?
  - c. Total % per issue?

# Investment Policy Considerations

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Why consider percentage limitations?

Diversification – to avoid overweighting and potential portfolio risk to loss or liquidity.

Note: Your Investment Policy should be tailored to your agency's investment risk tolerance – it can be more restrictive than the California Government Code

# U.S. Fixed Income Market



# The “Big Four” Federal Agencies

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<http://www.fanniemae.com/portal/funding-the-market/debt/index.html>



<http://www.freddiemac.com/debt/index.html>



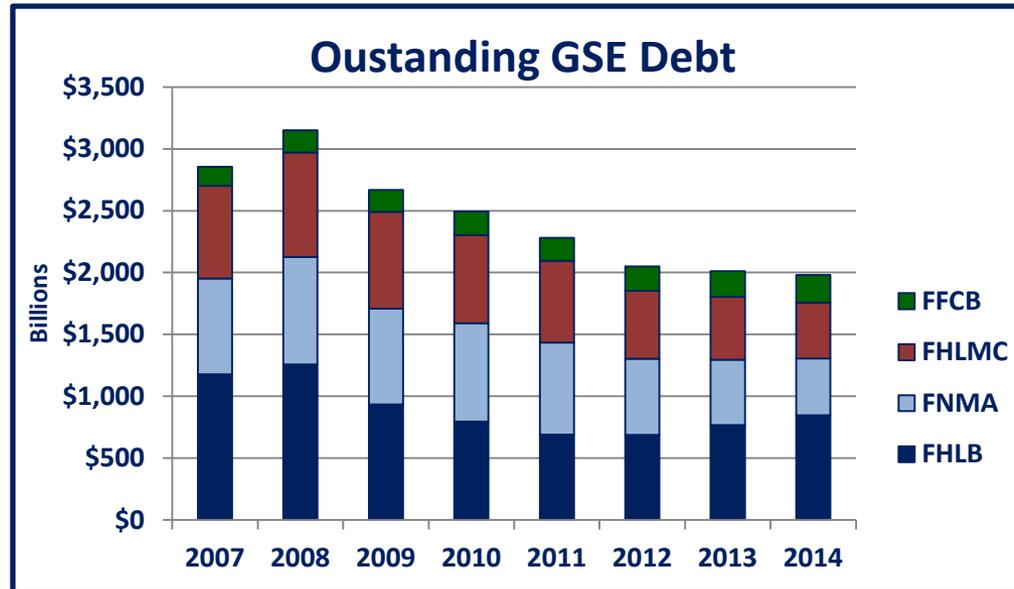
[http://www.fhlf-of.com/ofweb\\_userWeb/pageBuilder/debt-securities-21](http://www.fhlf-of.com/ofweb_userWeb/pageBuilder/debt-securities-21)



[http://www.farmcreditfunding.com/ffcb\\_live/debtSecurities.html](http://www.farmcreditfunding.com/ffcb_live/debtSecurities.html)

# “Big Four” Agency Debt Outstanding

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**Total Debt Outstanding (\$Billions)**

Agency	2007	2008	2009	2010	2011	2012	2013	2014
FHLB	1,179	1,258	935	797	692	688	767	847
FNMA	774	870	775	794	742	616	529	460
FHLMC	748	843	781	714	661	548	507	450
FFCB	154	178	177	189	185	198	208	225
<b>Total</b>	<b>2,854</b>	<b>3,149</b>	<b>2,668</b>	<b>2,494</b>	<b>2,280</b>	<b>2,050</b>	<b>2,011</b>	<b>1,982</b>

As of Year-End

# Supervision

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“Our mission is to ensure that Fannie Mae, Freddie Mac, and the Federal Home Loan Bank System are operating in a safe and sound manner so that they can serve as a reliable source of liquidity and funding for housing finance and community investment.” (FHFA website)

# Supervision

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## FARM CREDIT ADMINISTRATION



“FCA’s mission is to ensure a safe, sound, and dependable source of credit and related services for agriculture and rural America. Our agency was created by a 1933 Executive order of President Franklin D. Roosevelt. Today the Agency derives its authority from the Farm Credit Act of 1971, as amended.” (FCA website)

# The “Lesser Known” Agencies

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**Tennessee Valley Authority**

(Obligations of TVA – No U.S. Govt Guarantee)



**Overseas Private Investment Corporation**

(Full Faith and Credit Guaranty of the United States of America)



**Private Export Funding Corporation**

(Full Faith and Credit Guaranty of the United States of America)



*U.S. Small Business Administration*

**Small Business Administration**

(U.S. Government Guarantee Through SBA)

# Additional Agency Information

## Contents

LEHMAN BROTHERS

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*Guide to*  
**Agency &  
Government-Related  
Securities**

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<http://www.investinginbonds.com/assets/files/LehmanAgencies.pdf>

# Organizational Information

Agency	Creation	Purpose	Use of Funds	Guarantee	Owner(s)
<b>FHLB</b>	1932	Restore confidence in the thrift industry	Advances (loans) to member banks	None; joint and several obligations of the FHLBs (12)	Member banks: 7,300 (approx)
<b>FNMA</b>	1938	Provide liquidity to the U.S. mortgage market	Purchase mortgage loans	"Essentially Guaranteed" U.S. Treasury	Conservatorship to the U.S. Treasury; public stock still trades
<b>FHLMC</b>	1970	Increase liquidity to the U.S. mortgage market	Purchase mortgage loans	"Essentially Guaranteed" U.S. Treasury	Conservatorship to the U.S. Treasury; public stock still trades
<b>FFCB</b>	1971 (1916)	Act as financial intermediary to provide credit to farmers	Provide short and long term loans to farms and affiliated businesses	None; joint and several obligations of the FFCBs (4)	Cooperative of borrowers

# Ratings Information



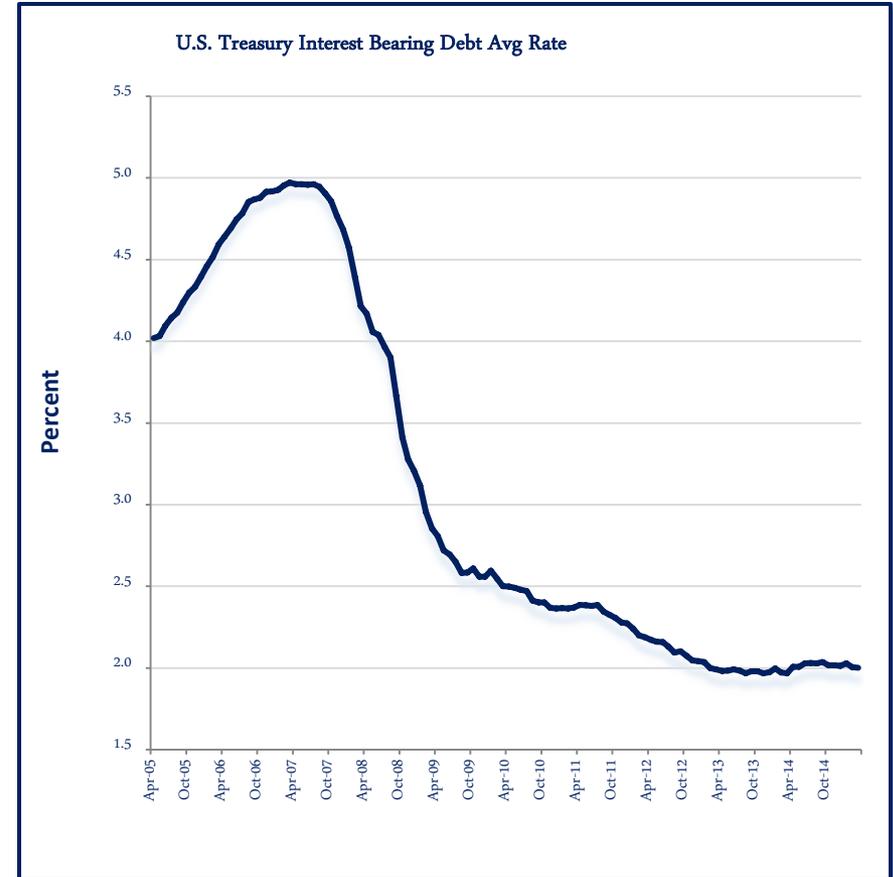
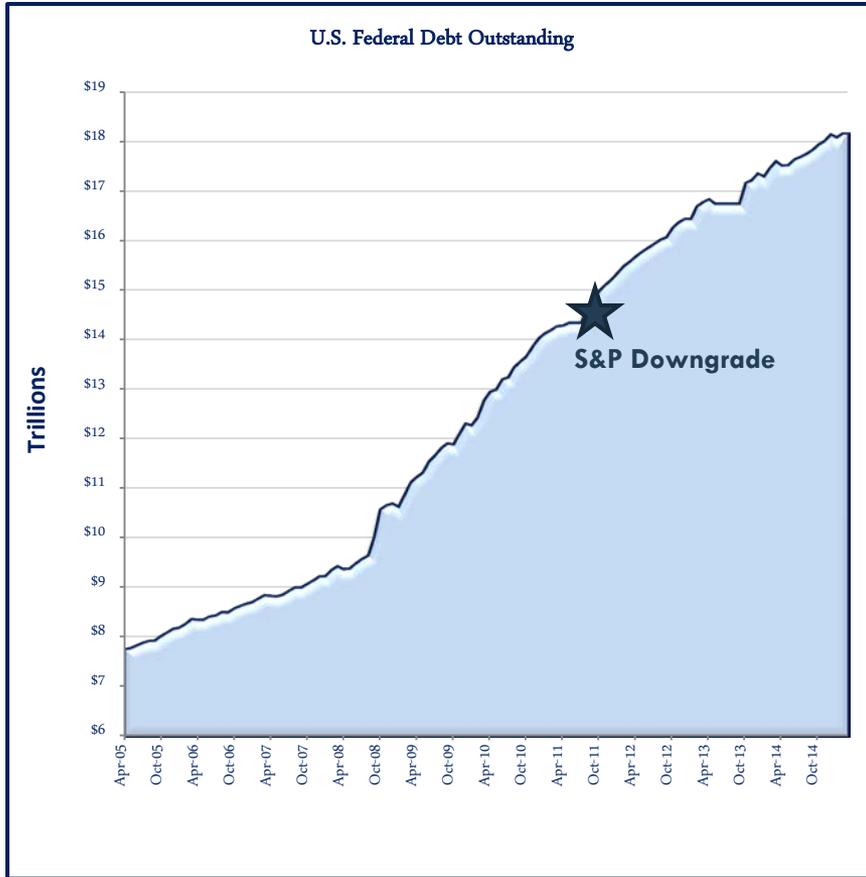
Agency	S&P LT	Moody's LT	Fitch LT	S&P ST	Moody's ST	Fitch ST
FHLB	AA+	Aaa	AAA	A-1+	P-1	F-1
FNMA	AA+	Aaa	AAA	A-1+	P-1	F-1
FHLMC	AA+	Aaa	AAA	A-1+	P-1	F-1
FFCB	AA+	Aaa	AAA	A-1+	P-1	F-1



*“On August 5, 2011, Standard & Poor’s (S&P) lowered the credit rating of long-term U.S. government debt from AAA (the highest possible rating) to AA+. The downgrade reflects S&P’s judgment that (1) the recent Budget Control Act (P.L. 112-25) falls short of what is needed to stabilize the government’s fiscal situation and (2) the capacity of Congress and the Administration to deal with the debt has become less stable, effective, and predictable.”*

<http://www.fas.org/sgp/crs/misc/R41955.pdf>

# U.S. Federal Debt Information



# FNMA/FHLMC Conservatorship

## FNMA / FHLMC Timeline

- Jul 2008: Federal Housing Finance Agency (FHFA) Created
- Jul 2008: U.S. Treasury Granted Emergency Authority to Assist GSEs
- Sep 2008: FNMA/FHLMC Placed into Conservatorship
- Sep 2008: Senior Preferred Stock Purchase Agreement (SPSPA) by the Treasury (\$100Bil Each)
- Feb 2009: U.S. Treasury Raises SPSPA to \$200Bil Each FNMA/FHLMC
- Mar 2009: Fed Announces Program to Buy \$200Bil GSE Debt and \$1.25Tril MBS
- Dec 2009: U.S. Treasury Extends/Amends SPSPA – Dec 2012
- Feb 2011: U.S. Treasury Issues “White Paper” Outlining Three Options for GSE Reform
- May 2011: Campbell (R-CA)/Peters (D-MI) Bill Introduced in the House of Representatives
- Aug 2011: S&P Downgrades GSE Senior Debt from AAA to AA+

### Campbell/Peters Bill Highlights

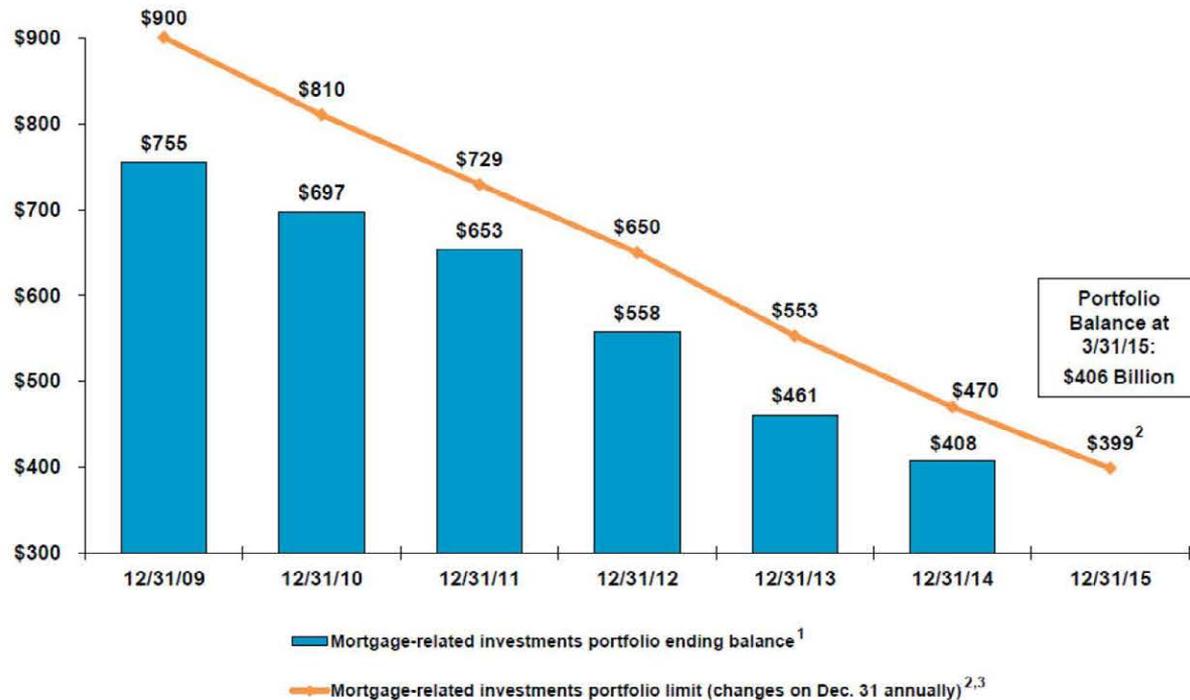
- Encourages Private Sector Investment in the Secondary Mortgage Market
- Limited Charter for FNMA and FHLMC
- Limits Taxpayer Liability
- Accurately Prices Risk
- Winds down FNMA and FHLMC

# FHLMC (and FNMA) Caps

## Mortgage-related investments portfolio



UPB  
\$ Billions



<sup>1</sup> Represents the unpaid principal balance (UPB) of the company's mortgage-related investments portfolio. The mortgage-related investments portfolio is determined without giving effect to the January 1, 2010 change in accounting standards related to the transfer of financial assets and consolidation of variable interest entities (VIEs).

<sup>2</sup> The mortgage-related investments portfolio limit as of December 31, 2015 under the Purchase Agreement, as amended on August 17, 2012.

<sup>3</sup> Under FHFA regulation and the Purchase Agreement with Treasury, as amended on August 17, 2012, the company's mortgage-related investments portfolio is subject to a cap beginning in 2013 that decreases by 15% each year until the cap reaches \$250 billion. Prior to the August 17, 2012 amendment, the portfolio was subject to a cap that decreased by 10% each year.

# FNMA/FHLMC Conservatorship

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# U.S. Treasury Support for FNMA/FHLMC

*“These agreements support market stability by providing additional **security and clarity to GSE debt holders – senior and subordinated** – and support mortgage availability by providing additional confidence to investors in GSE mortgage backed securities. This commitment will eliminate any mandatory triggering of receivership and will ensure that the conserved entities have the ability to fulfill their financial obligations.”*

*“Fannie Mae and Freddie Mac are so large and so interwoven in our financial system that a failure of either of them would cause great turmoil in our financial markets here at home and around the globe.”*

U.S. Treasury statement: [www.treas.gov/press/releases/hp1129.htm](http://www.treas.gov/press/releases/hp1129.htm)

*“... we [the U.S. Treasury] have **essentially guaranteed** Fannie Mae and Freddie Mac securities ”*

U.S. Treasury statement: [www.treas.gov/press/releases/hp1301.htm](http://www.treas.gov/press/releases/hp1301.htm)



# Tax Payers Paid Back by FNMA/FHLMC



## Fannie and Freddie

The total amount invested in Fannie and Freddie so far is **\$187B.**

The Treasury has been earning a return on its investments, which has resulted in a profit. So far the companies have paid \$228B in dividends to the Treasury.

### The State of the Bailout

**OUTFLOWS: \$615 billion** This includes money that has actually been spent, invested, or loaned.



**INFLOWS: \$670 billion** Money returned and paid to Treasury as interest, dividends, fees or to repurchase their stock warrants.



# FNMA/FHLMC Possible Reform Scenarios

## Nationalization

- Fold the GSEs into the federal government, like the FHA, VA, and GNMA.

## Privatization

- Reconstitute the GSEs as private companies with no government support or replace the GSEs with alternative approaches to mortgage finance.

## Hybrid Model

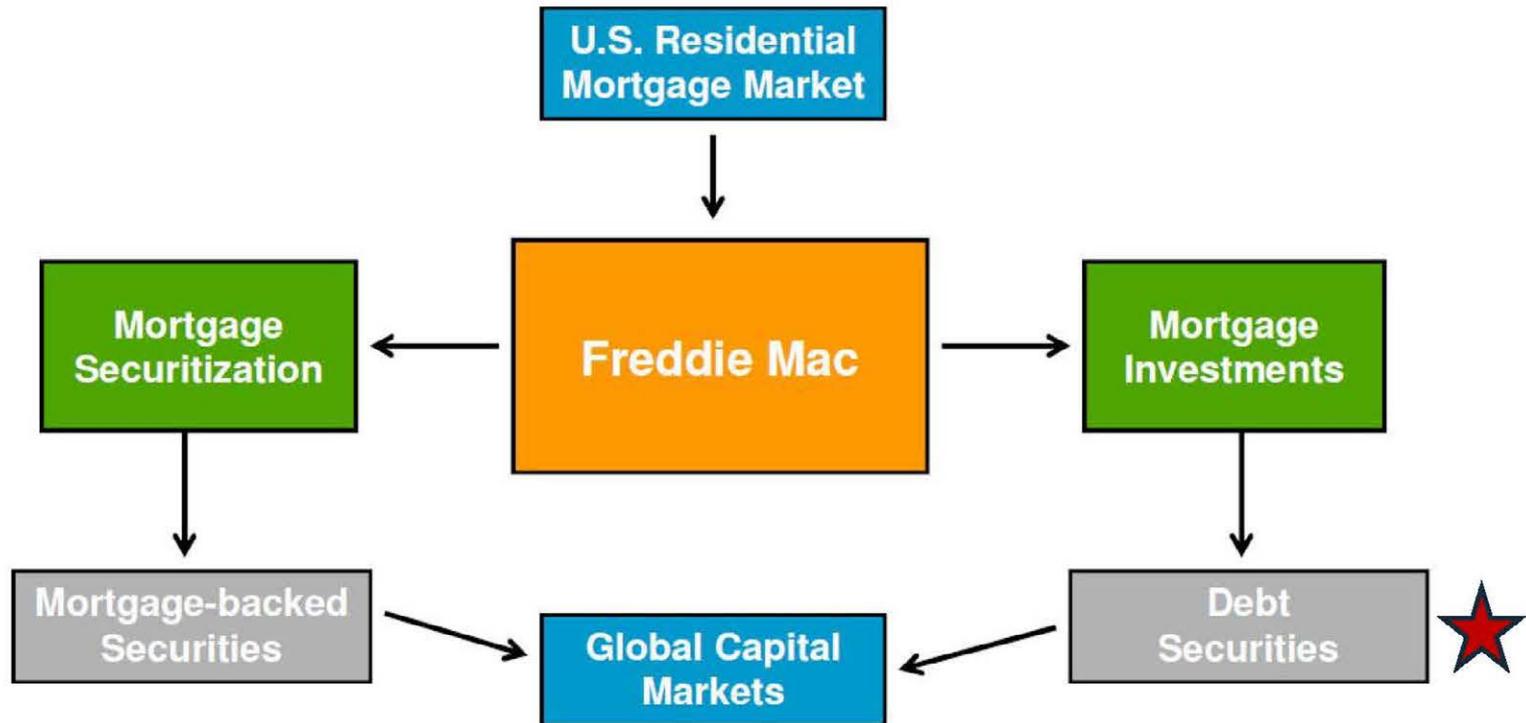
- Combine private capital with some level of government support or backing.

April 18 (Bloomberg) -- U.S. Treasury officials are leaning toward recommending that Fannie Mae and Freddie Mac be replaced with a government safety net for the mortgage finance system and continued federal backing for loans to lower-income homebuyers, according to three people briefed on the discussions.

Treasury Secretary Timothy F. Geithner has said in recent public appearances that an agency recommendation for winding down the two taxpayer-owned mortgage companies could be released in coming weeks. It hasn't yet been determined whether the plan, likely to be a broad outline rather than a detailed prescription for legislation, will be released that soon, the people said.

# How FHLMC (and FNMA) Work

Congress created Freddie Mac to provide stability, liquidity, and affordability to the U.S. residential mortgage market

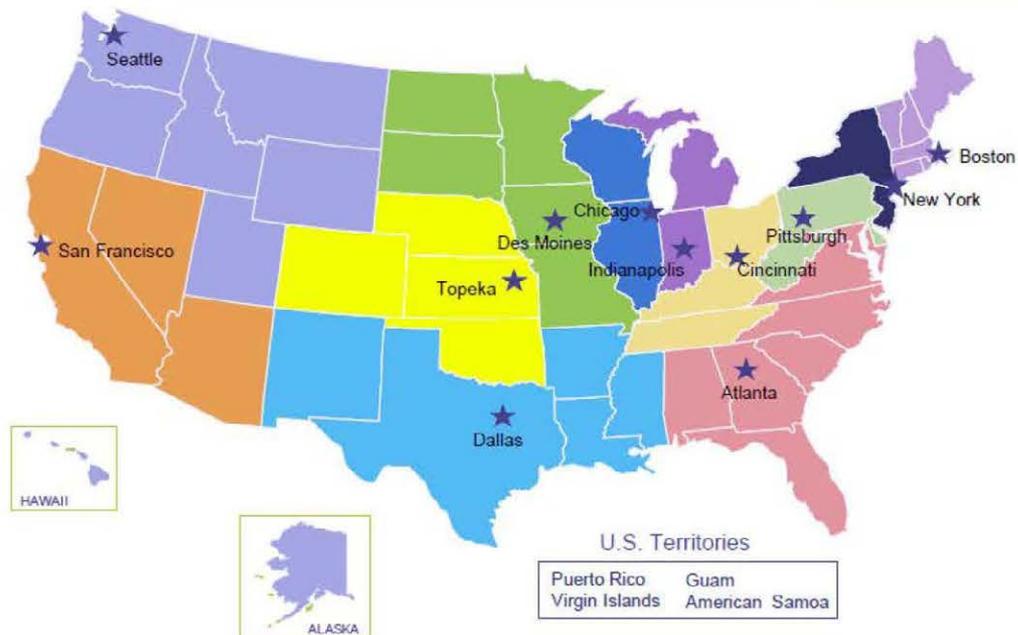


# FHLB System Overview

The 12 FHLBanks are government-sponsored enterprises (GSEs) organized under an act of Congress (Federal Home Loan Bank Act of 1932)

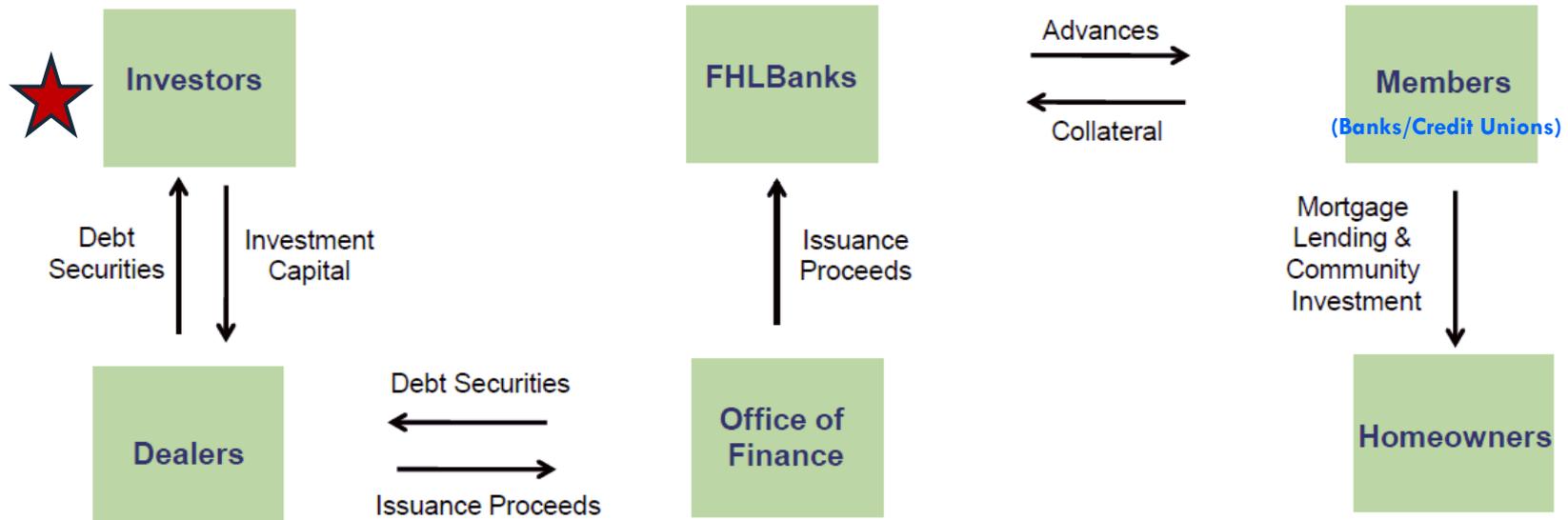
FHLBanks serve the general public by providing readily available, low-cost funding to approximately 7,300 members, thereby increasing the availability of credit for residential mortgage lending and investment in housing and community development

FHLBanks fund their operations principally through the sale of debt securities through the Office of Finance



# How the FHLB System Works

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The twelve regional FHLBanks are linked by:

- ❑ A common mission to support housing
- ❑ A shared safety and soundness regulator (FHFA)
- ❑ A shared responsibility to fully repay all senior unsecured debt obligations

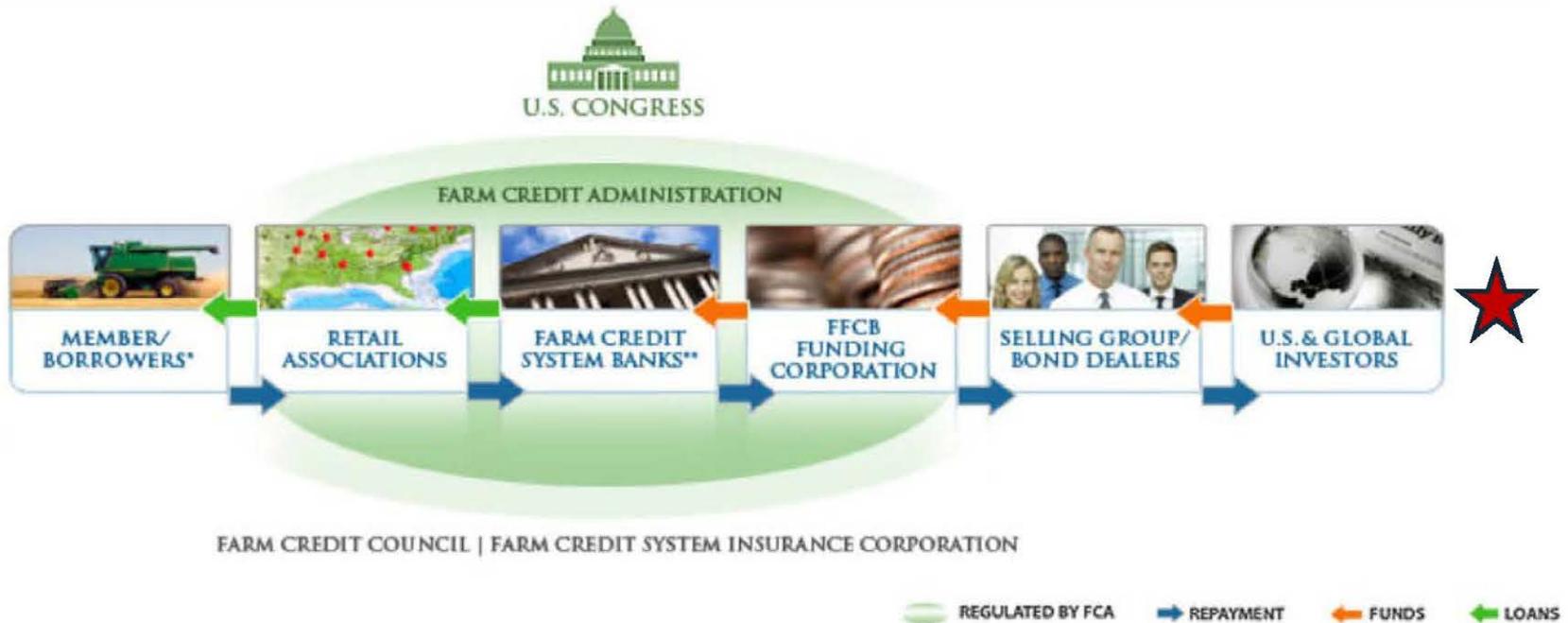
All senior unsecured debt securities issued through the Office of Finance ("Consolidated Obligations") are the **joint and several** obligations of the entire FHLBank System.

Current ratings:

- ❑ S&P: AA+ / A-1+ / stable outlook
- ❑ Moody's: Aaa / P-1 / stable outlook

# How the FFCB System Works

## FARM CREDIT SYSTEM FLOW OF FUNDS



# Types of Securities Issued

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- Discount Notes
- Bullets (non-callable)
- Floating Rate Notes (FRN)
- Fixed to Floating Rate Notes
- Callables
- Mortgage-Backed Securities (FNMA and FHLMC)
- Subordinated Notes

# Discount Note Offerings – ADN Page

97) Settings ▾ Page 1/2 Agency Discount Notes

Federal Home Loan Bank Fannie Mae Freddie Mac Federal Farm Credit Bank Farmer Mac World Bank ▾

US Govt-Discount Notes-Window Rates  
Federal Home Loan Bank Zoom 100%

Days	Rate	Target	Amount	Days	Rate	Target	Amount	19:03 GMT
0/N 6/11	0.00	8650.00		0/01-16	0.065	50.50		10-Jun-15
7/10	0.015	0.00		0/19-N/30	0.07	0.00		
7/13-17	0.02	124.97		3/07	0.24	12.00		
7/21-24	0.035	50.00		3/10-6/03	0.23	0.00		
7/27-30	0.045	51.50		6/09	0.33	0.00		
7/31	0.045	14.63		6/10	0.345	355.00		
8/04-07	0.055	58.76		TOTAL		9475.420	MM	
8/10	0.055	31.40						
8/14	0.055	51.37						
8/17-21	0.055	25.00						
8/24-31	0.055	0.00						
9/01-04	0.06	0.00						
9/11-16	0.06	0.30						

THIS SCREEN DOES NOT CONSTITUTE  
AN OFFER TO SELL OR A SOLICITATION  
OF AN OFFER TO BUY ANY SECURITIES.

# Discount Note Offerings – BOOM Page

Discount Notes		91) Searches	92) Settings	97) Trading Access	Money Market Offerings					
93) Refine Search		DEFAULT	Prim & Sec	Group by None	88) Sellback		89) Chart			
86) Table		87) RateRun								
AskSz (M)	Issuer	Maturity	SD	Dsc/Cpn	AskYld	Dlr	Pgm	Ticker	DTM	Time
1,000,000	FNMA DISCOUNT	02/01 - 02/12	1	0.170	0.170	GS	AGD	FNDN	257 - 268	11:00
750,000	FNMA DISCOUNT	02/01 - 02/12	1	0.170	0.170	RBSM	AGD	FNDN	257 - 268	11:00
888,888	FNMA DISCOUNT	02/01 - 02/12	1	0.170	0.170	NOMR	AGD	FNDN	257 - 268	11:00
999,999	FNMA DISCOUNT	02/01		0.170	0.170	CITI	AGD	FNDN	257	09:05
500,000	FNMA DISCOUNT	02/01 - 02/12	1	0.170	0.170	MS	AGD	FNDN	257 - 268	11:09
30,000	FHLB DISC CORP	02/02		0.190	0.190	BAML	AGD	FHDN	258	08:24
999,999	FNMA DISCOUNT	02/02		0.170	0.170	CITI	AGD	FNDN	258	09:05
1,000,000	FREDDIE DISCOUNT	02/02 - 02/17		0.175	0.175	UBS	AGD	FMCDN	258 - 273	07:20
50,000	FHLB DISC CORP	02/03		0.205	0.205	RBSM	AGD	FHDN	259	03:10
56,000	FHLB DISC CORP	02/03		0.200	0.200	MS	AGD	FHDN	259	03:25
999,999	FNMA DISCOUNT	02/03		0.170	0.170	CITI	AGD	FNDN	259	09:05
999,999	FNMA DISCOUNT	02/04		0.170	0.170	CITI	AGD	FNDN	260	09:05
999,999	FNMA DISCOUNT	02/05		0.170	0.170	CITI	AGD	FNDN	261	09:05
999,999	FNMA DISCOUNT	02/08		0.170	0.170	CITI	AGD	FNDN	264	09:05
999,999	FNMA DISCOUNT	02/09		0.170	0.170	CITI	AGD	FNDN	265	09:05
999,999	FNMA DISCOUNT	02/10		0.170	0.170	CITI	AGD	FNDN	266	09:05
999,999	FNMA DISCOUNT	02/11		0.170	0.170	CITI	AGD	FNDN	267	09:05
50,000	FNMA DISCOUNT	02/12		0.185	0.185	DB	AGD	FNDN	268	04:24
999,999	FNMA DISCOUNT	02/12		0.170	0.170	CITI	AGD	FNDN	268	09:05
100,000	FNMA DISCOUNT	02/16 - 02/19	1	0.180	0.180	WFS	AGD	FNDN	272 - 275	11:00
750,000	FNMA DISCOUNT	02/16 - 02/19	1	0.180	0.180	BAML	AGD	FNDN	272 - 275	11:00
500,000	FNMA DISCOUNT	02/16 - 02/19	1	0.180	0.180	MTBK	AGD	FNDN	272 - 275	11:00
250,000	FNMA DISCOUNT	02/16 - 02/19	1	0.180	0.180	MZUH	AGD	FNDN	272 - 275	11:00

# Discount Note Details

31

FHDN 0 10/26/15 Govt		Page 1/11 Description: Bond	
		95 Buy	96 Sell
21) Bond Description		22) Issuer Description	
<b>Pages</b>	<b>Issuer Information</b>	<b>Identifiers</b>	
1) Bond Info	<b>Name</b> FHLB DISC CORP	<b>ID Number</b> 313384NL9	
2) Addtl Info	<b>Industry</b> US GOVT AGENCY	<b>CUSIP</b> 313384NL9	
3) Covenants	<b>Security Information</b>		
4) Guarantors	<b>Issue Date</b> 10/27/14		
5) Bond Ratings	<b>Interest Accrues</b>		
6) Identifiers	<b>1st Coupon Date</b>	<b>Issuance &amp; Trading</b>	
7) Exchanges	<b>Maturity Date</b> 10/26/15	<b>Disc @ Issue</b>	
8) Inv Parties	<b>Floater Formula</b> N.A.	<b>Risk Factor</b> .435	
9) Fees, Restrict	<b>Workout Date</b>	<b>Amount Issued</b> 232 (MM)	
10) Schedules	<b>Coupon</b>	<b>Amount Outstanding</b> 232 (MM)	
11) Coupons	<b>Cpn Frequency</b>	<b>Minimum Piece</b> 100000	
<b>Quick Links</b>	<b>Security Type</b> AGD	<b>Minimum Increment</b> 1000	
32) ALLQ Pricing	<b>Type</b> NONE		
33) QRD Quote Recap	<b>Mty/Refund Type</b> NORMAL		
34) CACS Corp Action	<b>Series</b>		
35) CN Sec News	<b>Calc Type</b> DISCOUNT		
36) HDS Holders	<b>Day Count</b> ACT/360		
	<b>Market Sector</b> US GOVT		
	<b>Country</b> US	<b>Currency</b> USD	

# Discount Note Trade Ticket

Buy/Sell	Sell	Cusip	313384NA3	Status	Accepted
Issue	FHDN 0 10/16/15	Broker		Benchmark	
Audit Trail				Broker Name	
Quantity	1,000,000	Disc Rate	0.1000	Principal	\$ 999,658.33
Price	99.9658	Yield	0.1014	Acc Int	0.00
Settle Date	06/15/2015	Spread		Net	999,658.33
B/Price	0.000000 (0-00)	B/Yield		B/Discount	
Entry/Exec Time	10:23:15 / 10:23:18	Seq No	51121		
Trade Date	06/15/2015	TS Tick No	0		

# Bullets, Callables, FRN Offerings – NIM Page

95) Actions ▾		96) Alerts ▾		97) Export ▾		98) Summary		99) Set Homepage		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 ▾					
13:48	FREDDIE MAC	1.6	5/28/2019		USD	125	BNYM,MS,WFS	4-NC3MO		INC	
13:41	FED HOME LN BANK	STEP	5/27/2020		USD	55	AP,MTBK	5-NC6MO		INC	
13:30	FREDDIE MAC	1	11/27/2017		USD	155	JOINT LEADS	2.5-NC6MO		INC	
13:26	FREDDIE MAC	0.85	8/25/2017		USD	25	JOINT LEADS	2.25-NC1		1X	
13:24	FED HOME LN BANK	STEP	5/28/2020		USD	35	INCAP,MSRW	5-NC3MO		INC	
13:00	FED HOME LN BANK	STEP	5/25/2018		USD	40	FTN-sole	3-NC3MO		INC	
12:56	FREDDIE MAC	1.7	6/25/2019		USD	25	JOINT LEADS	4-NC3MO		BERM	
12:51	FREDDIE MAC	0.77	5/26/2017		USD	25	STFL-sole	2-NC3MO		1X	
12:50	FREDDIE MAC	STEP	6/17/2020		USD	25	FTN,RJA,VS	5-NC1		BERM	
12:15	FREDDIE MAC	STEP	6/29/2020		USD	15	MTBK-sole	5-NC3MO		BERM	
11:56	FED HOME LN BANK	1.04	2/26/2018		USD	25	FTN,RJA,VS	2.75-NC9M		INC	
11:41	FED FARM CREDIT	2.93	6/3/2024		USD	42	GS,NOM	9-NC1		CONT	
11:40	FED FARM CREDIT	2.98	5/28/2024		USD	85	GS,NOM	9-NC3MO		CONT	
11:39	FED FARM CREDIT	3.25	11/27/2026		USD	50	JOINT LEADS	11.5-NC3M		CON	
11:38	FED FARM CREDIT	0.77	6/1/2017		USD	20	MS-sole	2-NC3MO		CONT	
11:36	FED FARM CREDIT	FRN	6/1/2018		USD	100	DAIWA-sole	06/01/15			
11:18	FREDDIE MAC	0.95	8/28/2017		USD	35	JEFF-sole	2.25-NC3M		BERM	
11:00	FREDDIE MAC	0.91	8/25/2017		USD	25	DB-sole	2.25-NC6M		BERM	
10:48	FREDDIE MAC	1.25	5/25/2018		USD	500	JOINT LEADS	3-NC3MO		BERM	

# Bullet Details

FNMA 0 <sup>7</sup> / <sub>8</sub> 02/08/18 Corp		Page 1/11 Description: Bond	
		94) Notes	95) Buy
		96) Sell	97) Settings
21) Bond Description	22) Issuer Description		
<b>Pages</b>	<b>Issuer Information</b>		<b>Identifiers</b>
1) Bond Info	<b>Name</b> FANNIE MAE	<b>ID Number</b> EJ4992099	
2) Addtl Info	<b>Industry</b> Government Agencies	<b>CUSIP</b> 3135G0TG8	
3) Covenants	<b>Security Information</b>		<b>ISIN</b> US3135G0TG87
4) Guarantors	<b>Mkt Iss</b> Global	<b>Bond Ratings</b>	
5) Bond Ratings	<b>Country</b> US	<b>Currency</b> USD	<b>Moody's</b> Aaa
6) Identifiers	<b>Rank</b> Unsecured	<b>Series</b>	<b>S&amp;P</b> AA+
7) Exchanges	<b>Coupon</b> 0.875	<b>Type</b> Fixed	<b>Fitch</b> AAA
8) Inv Parties	<b>Cpn Freq</b> S/A	<b>Iss Price</b> 99.72300	<b>Composite</b> AA+
9) Fees, Restrict	<b>Day Cnt</b> 30/360	<b>Issuance &amp; Trading</b>	
10) Schedules	<b>Maturity</b> 02/08/2018	<b>Amt Issued/Outstanding</b>	
11) Coupons	<b>BULLET</b>	USD	5,000,000.00 (M) /
<b>Quick Links</b>	<b>Iss Sprd</b> 17.00bp vs T 0 <sup>3</sup> / <sub>4</sub> 12/31/17	USD	5,000,000.00 (M)
32) ALLQ Pricing	<b>Calc Type</b> (1)STREET CONVENTION	<b>Min Piece/Increment</b>	
33) QRD Quote Recap	<b>Announcement Date</b> 01/03/2013	2,000.00 / 1,000.00	
34) TDH Trade Hist	<b>Interest Accrual Date</b> 01/07/2013	<b>Par Amount</b>	1,000.00
35) CACS Corp Action	<b>1st Settle Date</b> 01/07/2013	<b>Book Runner</b>	BCLY,DB,JPM
36) CF Prospectus	<b>1st Coupon Date</b> 02/08/2013	<b>Reporting</b>	TRACE
37) CN Sec News			
38) HDS Holders			
39) VPRD Underly Info			

# Bullet Trade Ticket

Buy/Sell	Sell	Cusip	3135G0TG8	Status	Accepted
Issue	FNMA 0 <sub>z</sub> 02/08/18	Broker	FTNF	Benchmark	
Audit Trail				Broker Name	FTN FINANCIAL
Quantity	1,000,000	Disc Rate		Principal	\$ 995,500.00
Price	99.550000	Yield	1.0479	Acc Int	3,111.11
Settle Date	06/16/2015	Spread		Net	998,611.11
B/Price	0.000000 (0-00)	B/Yield		B/Discount	
Entry/Exec Time	10:28:46 / 10:28:48	Seq No	61334		
Trade Date	06/15/2015	TS Tick No	0		

# Floating Rate Note (FRN) Details

FHLB Float 05/26/17 Corp		Page 1/11 Description: Bond	
94 Notes		95 Buy	
96 Sell		97 Settings	
21) Bond Description	22) Issuer Description		
<b>Pages</b>	<b>Issuer Information</b>		<b>Identifiers</b>
1) Bond Info	<b>Name</b> FEDERAL HOME LOAN BANK	<b>ID Number</b> EK9210064	
2) Addtl Info	<b>Industry</b> Government Agencies	<b>CUSIP</b> 3130A5F46	
3) Covenants	<b>Security Information</b>		<b>ISIN</b> US3130A5F467
4) Guarantors	<b>Mkt Iss</b> US Domestic	<b>Bond Ratings</b>	
5) Bond Ratings	<b>Country</b> US	<b>Currency</b> USD	<b>Moody's</b> Aaa
6) Identifiers	<b>Rank</b> Sr Unsecured	<b>Series</b>	<b>S&amp;P</b> AA+
7) Exchanges	<b>Coupon</b>	<b>Type</b> Floating	<b>Composite</b> AA+
8) Inv Parties	<b>Formula</b> MONTHLY US LIBOR +8.0000		
9) Fees, Restrict	<b>Day Cnt</b> 30/360	<b>Iss Price</b> 100.00000	
10) Schedules	<b>Maturity</b> 05/26/2017		<b>Issuance &amp; Trading</b>
11) Coupons	<b>BULLET</b>		<b>Amt Issued/Outstanding</b>
<b>Quick Links</b>	<b>Iss Sprd</b>		USD 500,000.00 (M) /
32) ALLQ Pricing	<b>Calc Type</b> (21)FLOAT RATE NOTE		USD 500,000.00 (M)
33) QRD Quote Recap	<b>Announcement Date</b> 05/15/2015		<b>Min Piece/Increment</b>
34) TDH Trade Hist	<b>Interest Accrual Date</b> 05/26/2015		100,000.00 / 5,000.00
35) CACS Corp Action	<b>1st Settle Date</b> 05/26/2015		<b>Par Amount</b> 5,000.00
36) CF Prospectus	<b>1st Coupon Date</b> 06/26/2015		<b>Book Runner</b> JEFF-sole
37) CN Sec News			<b>Reporting</b> TRACE
38) HDS Holders			
39) VPRD Underly Info			

# Floating Rate Indices

## T-bill

Issuer Information			
Name	FEDERAL FARM CREDIT BANK		
Industry	Government Agencies		
Security Information			
Mkt of Issue	US Domestic		
Country	US	Currency	USD
Rank	Unsecured	Series	
Coupon		Type	Floating
Formula	<u>WEEKLY T-BILL +6.0000</u>		
Day Cnt	30/360	Iss Price	100.00000
Maturity	03/18/2014		

## Quarterly LIBOR

Issuer Information			
Name	FEDERAL HOME LOAN BANK		
Industry	Government Agencies		
Security Information			
Mkt of Issue	US Domestic		
Country	US	Currency	USD
Rank	Unsecured	Series	
Coupon		Type	Floating
Formula	<u>QUARTLY US LIBOR -11.0000</u>		
Day Cnt	ACT/360	Iss Price	100.00000
Maturity	03/06/2015		

## Monthly LIBOR

Issuer Information			
Name	FEDERAL FARM CREDIT BANK		
Industry	Government Agencies		
Security Information			
Mkt of Issue	US Domestic		
Country	US	Currency	USD
Rank	Unsecured	Series	1
Coupon		Type	Floating
Formula	<u>MONTHLY US LIBOR -4.0000</u>		
Day Cnt	ACT/360	Iss Price	100.00000
Maturity	09/15/2014		

## Prime Rate

Issuer Information			
Name	FEDERAL FARM CREDIT BANK		
Industry	Government Agencies		
Security Information			
Mkt of Issue	US Domestic		
Country	US	Currency	USD
Rank	Unsecured	Series	-
Coupon	0.22	Type	Floating
Formula	<u>DAILY FCPR -303.0000</u>		
Day Cnt	ACT/360	Iss Price	100.00000
Maturity	03/04/2015		

# Floating Rate Indices History

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Prime Rate 3.25



# California Code – “Zero Interest”

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## 53601.6.(b)

A local agency shall not invest any funds pursuant to this article or pursuant to Article 2 (commencing with Section 53630) in any security that could result in zero interest accrual if held to maturity. However, a local agency may hold prohibited instruments until their maturity dates. The limitation in this subdivision shall not apply to local agency investments in shares of beneficial interest issued by diversified management companies registered under the Investment Company Act of 1940 (15 U.S.C. Sec. 80a-1 et seq.) that are authorized for investment pursuant to subdivision (l) of Section 53601.

*FEDERAL FARM CREDIT BANKS  
CONSOLIDATED SYSTEMWIDE BONDS, RETAIL BONDS AND DISCOUNT NOTES*



“The applicable Term Sheet will also indicate any Spread. In addition, Floating-Rate Bonds and Floating-Rate Retail Bonds may have a maximum and/or minimum rate of interest which may accrue and be payable for the relevant Interest Period(s). Floating-Rate Bonds and Floating-Rate Retail Bonds will not accrue interest at a negative rate. **Accordingly, all such Floating-Rate Bonds and Floating – Rate Retail Bonds have a minimum interest rate limitation of 0%.**” FFCB Offering Circular Dec 8, 2014

# Callable Bond Details

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- When you purchase a callable, you are selling a call option to the issuer
- You should be paid for selling that option by means of receiving a higher coupon than a bullet
- The issuer has the right to call the bond
- The purchaser has the obligation to relinquish the bond
- Refinancing: The issuer will most likely call the bonds if the interest rate has dropped

# Callables – What's Up With the Names



# Callables – American

FFCB 1.09 02/26/18 Corp		Page 1/11		Description: Bond	
Data not provided by Bloomberg		94 Notes	95 Buy	96 Sell	97 Settings
21) Bond Description		22) Issuer Description			
<b>Pages</b>	<b>Issuer Information</b>	<b>Identifiers</b>			
1) Bond Info	<b>Name</b> FEDERAL FARM CREDIT BANK	<b>ID Number</b>	EK9231722		
2) Addtl Info	<b>Industry</b> Government Agencies	<b>CUSIP</b>	3133EEP46		
3) Covenants	<b>Security Information</b>		<b>ISIN</b>	US3133EEP466	
4) Guarantors	<b>Mkt Iss</b> US Domestic	<b>Bond Ratings</b>			
5) Bond Ratings	<b>Country</b> US	<b>Currency</b> USD	<b>Moody's</b>	Aaa	
6) Identifiers	<b>Rank</b> Unsecured	<b>Series</b>	<b>S&amp;P</b>	NA	
7) Exchanges	<b>Coupon</b> 1.09	<b>Type</b> Fixed	<b>Composite</b>	NR	
8) Inv Parties	<b>Cpn Freq</b> S/A	<b>Issuance &amp; Trading</b>			
9) Fees, Restrict	<b>Day Cnt</b> 30/360	<b>Iss Price</b> 100.00000	<b>Amt Issued/Outstanding</b>		
10) Schedules	<b>Maturity</b> 02/26/2018	USD 50,000.00 (M) /			
11) Coupons	<b>CALL</b> 08/26/15@100.00	USD 50,000.00 (M)			
<b>Quick Links</b>	<b>Iss Sprd</b>	<b>Min Piece/Increment</b>			
32) ALLQ Pricing	<b>Calc Type</b> (1)STREET CONVENTION	1,000.00 / 1,000.00			
33) QRD Quote Recap	<b>Announcement Date</b> 05/18/2015	<b>Par Amount</b> 1,000.00			
34) TDH Trade Hist	<b>Interest Accrual Date</b> 05/26/2015	<b>Book Runner</b> JOINT LEADS			
35) CACS Corp Action	<b>1st Settle Date</b> 05/26/2015	<b>Reporting</b> TRACE			
36) CF Prospectus	<b>1st Coupon Date</b> 08/26/2015				
37) CN Sec News					
38) HDS Holders					
39) VPRD Underly Info					

Schedules	
51) Call	
Call with minimum 5 business days notice May be called in full or part	
Callable on and anytime after date(s) shown	
Date	Price
08/26/2015	100.000



# Callables – Bermudan

FHLMC 2 06/29/20 Corp		Page 1/11	Description: Bond
Data not provided by Bloomberg		94 Notes	95 Buy
		96 Sell	97 Settings
21) Bond Description	22) Issuer Description		
<b>Pages</b>	<b>Issuer Information</b>	<b>Identifiers</b>	
1) Bond Info	Name FREDDIE MAC	ID Number	EK9258683
2) Addtl Info	Industry Government Agencies	CUSTIP	3134G6V42
3) Covenants	<b>Security Information</b>		ISIN US3134G6V421
4) Guarantors	Mkt Iss Domestic MTN	<b>Bond Ratings</b>	
5) Bond Ratings	Country US	Currency	USD
6) Identifiers	Rank Unsecured	Series	
7) Exchanges	Coupon 2	Type	Fixed
8) Inv Parties	Cpn Freq S/A	<b>Issuance &amp; Trading</b>	
9) Fees, Restrict	Day Cnt 30/360	Iss Price	100.00000
10) Schedules	Maturity 06/29/2020	<b>Amt Issued/Outstanding</b>	
11) Coupons	CALL 12/29/15@100.00	USD	100,000.00 (M) /
<b>Quick Links</b>	Iss Sprd	USD	100,000.00 (M)
32) ALLQ Pricing	Calc Type (1)STREET CONVENTION	<b>Min Piece/Increment</b>	
33) QRD Quote Reca	Announcement Date	1,000.00 / 1,000.00	
34) TDH Trade Hist	Interest Accrual Date	Par Amount	1,000.00
35) CACS Corp Action	1st Settle Date	Book Runner	JOINT LEADS
36) CF Prospectus	1st Coupon Date	Reporting	TRACE
37) CN Sec News			
38) HDS Holders			
39) VPRD Underly Info			

Schedules	
5) Call	
Discrete Call minimum 5 business days notice	
Last Call Date 03/29/2020	
Call Frequency Quarterly	
Callable only on date(s) shown	
Date	Price
12/29/2015	100.000
03/29/2016	100.000
06/29/2016	100.000
09/29/2016	100.000
12/29/2016	100.000
03/29/2017	100.000
06/29/2017	100.000
09/29/2017	100.000
12/29/2017	100.000
03/29/2018	100.000
06/29/2018	100.000
09/29/2018	100.000

# Bullets vs. Callables

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Structure	Coupons			
	2Yr	3Yr	4yr	5yr
T-Note	0.73	1.09	1.46	1.71
Bullet	0.79	1.18	1.57	1.85

European One-Time Calls				
NC 3mon	0.90	1.31	1.65	1.91
NC 6mon	0.90	1.31	1.68	1.91
NC 1Yr	0.87	1.29	1.64	1.90
NC 2Y		1.24	1.60	1.85

Bermudan Discrete Calls				
NC 3mon	0.92	1.37	1.76	2.04
NC 6mon	0.92	1.36	1.75	2.02
NC 1Yr	0.87	1.30	1.67	1.95
NC 2Y		1.24	1.61	1.89

American Continuous Calls				
NC 3mon	0.94	1.39	1.81	2.09
NC 6mon	0.93	1.38	1.80	2.07
NC 1Yr	0.88	1.32	1.71	1.99
NC 2Y		1.25	1.65	1.93

Number of Callable Days			
2Yr	3Yr	4yr	5yr
0	0	0	0
0	0	0	0

1	1	1	1
1	1	1	1
1	1	1	1
	1	1	1

7	11	15	19
6	10	14	18
4	8	12	16
	4	8	12

635	1,000	1,365	1,730
545	910	1,275	1,640
360	725	1,090	1,455
	360	725	1,090

Data as of 6/15/15, assumes 2-3 weeks forward settlements and standard fees on callables, agency bullets are MTNs

# Callables – Canary

FHLMC 1 3/4 06/08/18 Corp		Page 1/11		Description: Bond	
Data not provided by Bloomberg		94 Notes	95 Buy	96 Sell	97 Settings
21) Bond Description		22) Issuer Description			
Pages		Issuer Information		Identifiers	
1) Bond Info	Name	FREDDIE MAC		ID Number	EK9091878
2) Addtl Info	Industry	Government Agencies		CUSIP	3134G6N66
3) Covenants	Security Information		ISIN		
4) Guarantors	Mkt Iss	Domestic MTN		Bond Ratings	
5) Bond Ratings	Country	US	Currency	USD	Moody's
6) Identifiers	Rank	Unsecured	Series		S&P
7) Exchanges	Coupon	1.25	Type	Fixed	Fitch
8) Inv Parties	Cpn Freq	S/A	Composite		
9) Fees, Restrict	Day Cnt	30/360	Iss Price	100.00000	AAA
10) Schedules	Maturity	06/08/2018	Issuance & Trading		
11) Coupons	CALL	09/08/15@100.00	Amt Issued/Outstanding		
Quick Links	Iss Sprd		USD		
32) ALLQ Pricing	Calc Type	(1)STREET CONVENTION	25,000.00 (M) /		
33) QRD Quote Recap	Announcement Date	05/11/2015	USD		
34) TDH Trade Hist	Interest Accrual Date	06/08/2015	25,000.00 (M)		
35) CACS Corp Action	1st Settle Date	06/08/2015	Min Piece/Increment		
36) CF Prospectus	1st Coupon Date	12/08/2015	1,000.00 / 1,000.00		
37) CN Sec News			Par Amount		
38) HDS Holders			1,000.00		
39) VPRD Underly Info			Book Runner		
			VS-sole		
			Reporting		
			TRACE		

Schedules	
5) Call	
Discrete Call minimum 5 business days notice	
Last Call Date 06/08/2016	
Call Frequency Quarterly	
Callable only on date(s) shown	
Date	Price
09/08/2015	100.000
12/08/2015	100.000
03/08/2016	100.000
06/08/2016	100.000

# Callables – Step-Up

FHLB 1 3/4 05/27/20 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	
<b>Pages</b>	<b>Issuer Information</b>	<b>Identifiers</b>	
1) Bond Info	Issuer FEDERAL HOME LOAN BANK	ID Number	EK8914054
2) Addtl Info	Industry Government Agencies	CUSIP	3130A5BQ1
3) Covenants	<b>Security Information</b>		
4) Guarantors	Mkt Iss US Domestic	ISIN	US3130A5BQ19
5) Bond Ratings	Country US	Currency	USD
6) Identifiers	Rank Unsecured	Series	0000
7) Exchanges	Coupon 1.25	Type	Step-Up...
8) Inv Parties	Cpn Freq S/A	<b>Bond Ratings</b>	
9) Fees, Restrict	Day Cnt 30/360	Iss Price	100.00000
10) Schedules	Maturity 05/27/2020	<b>Issuance &amp; Trading</b>	
11) Coupons	CALL 11/27/15@100.00	Amt Issued/Outstanding	
<b>Quick Links</b>	Iss Sprd	USD	55,000.00 (M) /
32) ALLQ Pricing	Calc Type (1311)MULTI-STEP CPN BND	USD	55,000.00 (M)
33) QRD Quote Recap	Announcement Date 04/30/2015	Min Piece/Increment	
34) TDH Trade Hist	Interest Accrual Date 05/27/2015	100,000.00 / 5,000.00	
35) CACS Corp Action	1st Settle Date 05/27/2015	Par Amount	5,000.00
36) CF Prospectus	1st Coupon Date 11/27/2015	Book Runner	AP,MTBK
37) CN Sec News		Reporting	TRACE
38) HDS Holders			
39) VPRD Underly Info			

Coupons			
51) Coupons			
Issue Date	05/27/2015	First Coupon	Normal
1st Coupon Date	11/27/2015	Last Coupon	Normal
Observation Index	N/A	Paying Index	N/A
	Coupon		End Date
	1.250		11/27/2017
	1.500		05/27/2018
	2.000		11/27/2018
	3.000		05/27/2019
	4.000		11/27/2019
	5.000		05/27/2020

Average Coupon = 2.175

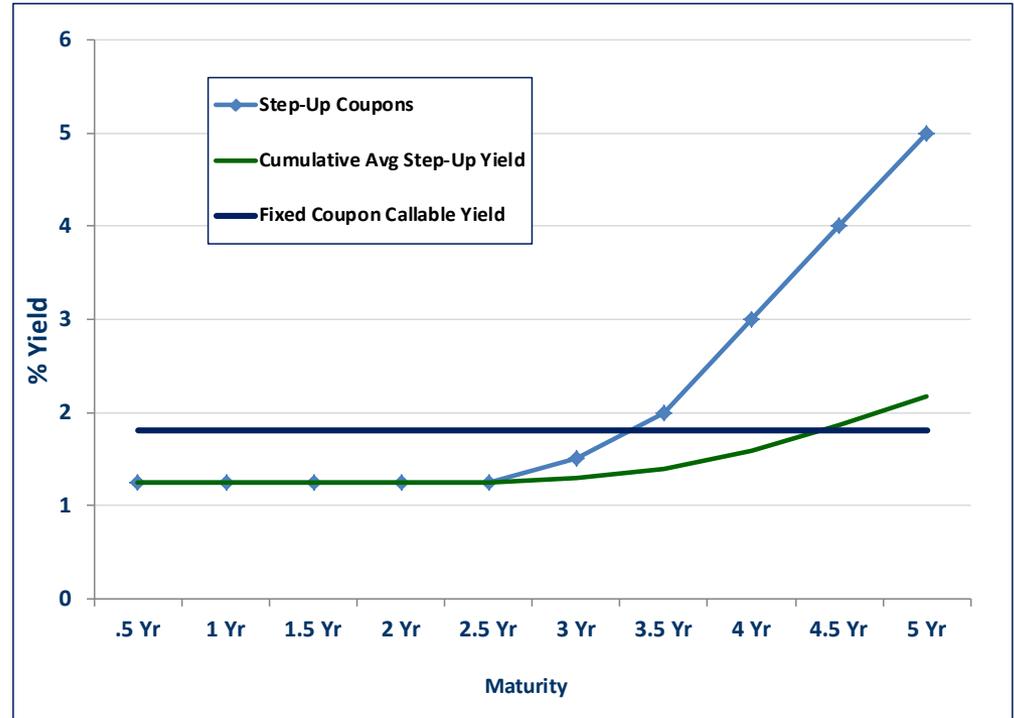
Some Investment Accounting Systems average the coupons for YTM

Schedules		
50) Call		
Discrete Call minimum 5 business days notice		
May be called in full or part		
Last Call Date 02/27/2020		
Call Frequency Quarterly		
Callable only on date(s) shown		
	Date	Price
	11/27/2015	100.000
	02/27/2016	100.000
	05/27/2016	100.000
	08/27/2016	100.000
	11/27/2016	100.000
	02/27/2017	100.000
	05/27/2017	100.000
	08/27/2017	100.000
	11/27/2017	100.000
	02/27/2018	100.000
	05/27/2018	100.000

# Step-Up vs. Fixed Coupon

Step Up Analysis - 5yr				
Coupon End Date	Step-Up Coupons	Cumulative Avg Step Yield	Fixed Coupon Callable Yield	Var
.5 Yr	1.250	1.250	1.800	(0.550)
1 Yr	1.250	1.250	1.800	(0.550)
1.5 Yr	1.250	1.250	1.800	(0.550)
2 Yr	1.250	1.250	1.800	(0.550)
2.5 Yr	1.250	1.250	1.800	(0.550)
3 Yr	1.500	1.292	1.800	(0.508)
3.5 Yr	2.000	1.393	1.800	(0.407)
4 Yr	3.000	1.594	1.800	(0.206)
4.5 Yr	4.000	1.861	1.800	0.061
5 Yr	5.000	2.175	1.800	0.375

Step-up and fixed coupon callable yields as of 4/30/15



# Callables – Verde

FHLB 1 06/11/20 Corp		Page 1/11		Description: Structured Note	
Data not provided by Bloomberg		94 Notes		95 Buy	
21) Bond Description		22) Issuer Description		96 Sell	
97 Settings					
Pages		Issuer Information		Identifiers	
1) Bond Info	Issuer	FEDERAL HOME LOAN BANK		ID Number	EK9151821
2) Addtl Info	Industry	Government Agencies		CUSIP	3130A5EQ8
3) Covenants	Security Information				
4) Guarantors	Mkt Iss	US Domestic		ISIN	US3130A5EQ81
5) Bond Ratings	Country	US	Currency	USD	Bond Ratings
6) Identifiers	Rank	Unsecured	Series	0000	Moody's
7) Exchanges	Coupon	1	Type	Step-Up...	S&P
8) Inv Parties	Cpn Freq	Quarterly			
9) Fees, Restrict	Day Cnt	30/360	Iss Price	100.00000	Composite
10) Schedules	Maturity	06/11/2020			
11) Coupons	CALL	09/11/15@100.00			
Quick Links	Iss Spnd				
32) ALLQ Pricing	Calc Type	(1311)MULTI-STEP CPN BND			
33) QRD Quote Recap	Announcement Date	05/13/2015		Issuance & Trading	
34) TDH Trade Hist	Interest Accrual Date	06/11/2015		Amt Issued/Outstanding	
35) CACS Corp Action	1st Settle Date	06/11/2015		USD 15,000.00 (M) /	
36) CF Prospectus	1st Coupon Date	09/11/2015		USD 15,000.00 (M)	
37) CN Sec News					Min Piece/Increment
38) HDS Holders					100,000.00 / 5,000.00
39) VPRD Underly Info					Par Amount
					5,000.00
					Book Runner
					HAPSEC-sole
					Reporting
					TRACE

Schedules	
51) Call	
Discrete Call minimum 5 business days notice	
May be called in full or part	
Last Call Date 06/11/2019	
Call Frequency Quarterly	
Callable only on date(s) shown	
Date	Price
09/11/2015	100.000
12/11/2015	100.000
03/11/2016	100.000
06/11/2016	100.000
06/11/2019	100.000

Coupons			
51) Coupons			
Issue Date	06/11/2015	First Coupon	Normal
1st Coupon Date	09/11/2015	Last Coupon	Normal
Observation Index	N/A	Paying Index	N/A
	Coupon		End Date
	1.000		09/11/2015
	1.250		12/11/2015
	1.500		03/11/2016
	1.750		06/11/2016
	2.000		06/11/2019
	3.000		06/11/2020

# Callables – Step-Down

FHLB 7 3/4 03/18/20 Corp		Page 1/11	Description: Structured Note			
Data not provided by Bloomberg						
21) Bond Description		22) Issuer Description				
Pages		Issuer Information		Identifiers		
1) Bond Info	Issuer	FEDERAL HOME LOAN BANK		ID Number	EK7655120	
2) Addtl Info	Industry	Government Agencies		CUSIP	3130A4EVO	
3) Covenants	Security Information		ISIN		US3130A4EV02	
4) Guarantors	Mkt Iss	US Domestic		Bond Ratings		
5) Bond Ratings	Country	US	Currency	USD	Moody's	Aaa
6) Identifiers	Rank	Unsecured	Series		S&P	AA+
7) Exchanges	Coupon	7.75	Type	Step-Dow...	Composite	AA+
8) Inv Parties	Cpn Freq	Quarterly	Issuance & Trading			
9) Fees, Restrict	Day Cnt	30/360	Iss Price	100.00000	Amt Issued/Outstanding	
10) Schedules	Maturity	03/18/2020	USD			25,000.00 (M) /
11) Coupons	CALL	09/18/15@100.00	USD			25,000.00 (M)
Quick Links	Iss Cnd		Min Piece/Increment			
32) ALLQ Pricing	Calc Type	(1311)MULTI-STEP CPN BND				
33) QRD Quote Recap	Announcement Date		02/19/2015	100,000.00 / 5,000.00		
34) TDH Trade Hist	Interest Accrual Date		03/18/2015	Par Amount	5,000.00	
35) CACS Corp Action	1st Settle Date		03/18/2015	Book Runner	MS-sole	
36) CF Prospectus	1st Coupon Date		06/18/2015	Reporting	TRACE	
37) CN Sec News						
38) HDS Holders						
39) VPRD Underly Info						

Schedules	
59 Call	
Discrete Call minimum 5 business days notice	
May be called in full or part	
Last Call Date 12/18/2019	
Call Frequency Quarterly	
Callable only on date(s) shown	
Date	Price
09/18/2015	100.000
12/18/2015	100.000
03/18/2016	100.000
06/18/2016	100.000
09/18/2016	100.000
12/18/2016	100.000
03/18/2017	100.000
06/18/2017	100.000
09/18/2017	100.000
12/18/2017	100.000
03/18/2018	100.000

Coupons			
51 Coupons			
Issue Date	03/18/2015	First Coupon	Normal
1st Coupon Date	06/18/2015	Last Coupon	Normal
Observation Index	N/A	Paying Index	N/A
	Coupon		End Date
	7.750		06/18/2015
	2.000		03/18/2016
	1.250		03/18/2020

Average Coupon = 1.69

5Yr Bullet = 1.61 as of 2/19/15

# Fixed to Floating Rate Details

FHLB 1 05/07/20 Corp		Page 1/11	Description: Structured Note		
		90 Notes	95 Buy	96 Sell	97 Settings
21) Bond Description		22) Issuer Description			
<b>Pages</b>	<b>Issuer Information</b>	<b>Identifiers</b>			
1) Bond Info	Issuer FEDERAL HOME LOAN BANK	ID Number	EK8688484		
2) Addtl Info	Industry Government Agencies	CUSIP	3130A53P2		
3) Covenants	<b>Security Information</b>	ISIN	US3130A53P20		
4) Guarantors	Mkt Iss US Domestic	<b>Bond Ratings</b>			
5) Bond Ratings	Country US	Currency	USD		
6) Identifiers	Rank Unsecured	Series	Moody's Aaa		
7) Exchanges	Coupon 1	Type	Fixed to...		
8) Inv Parties	Cpn Freq Quarterly	S&P AA+			
9) Fees, Restrict	Day Cnt 30/360	Iss Price	100.0000		
10) Schedules	Maturity 05/07/2020	<b>Issuance &amp; Trading</b>			
11) Coupons	CALL 08/07/15@100.00	Amt Issued/Outstanding			
<b>Quick Links</b>	Iss Sprd	USD 10,000.00 (M) /			
32) ALLQ Pricing	Cate Type (1010)FIX-TO-FLOAT BONDS	USD 10,000.00 (M)			
33) QRD Quote Recap	Announcement Date 04/17/2015	Min Piece/Increment			
34) TDH Trade Hist	Interest Accrual Date 05/07/2015	100,000.00 / 5,000.00			
35) CACS Corp Action	1st Settle Date 05/07/2015	Par Amount 5,000.00			
36) CF Prospectus	1st Coupon Date 08/07/2015	Book Runner RBCCM-sole			
37) CN Sec News		Reporting TRACE			
38) HDS Holders					
39) VPR Underly Info					

Schedules	
50 Call	
Discrete Call minimum 5 days notice	
May be called in full or part	
Last Call Date 02/07/2020	
Call Frequency	Quarterly
Callable only on date(s) shown	
Date	Price
08/07/2015	100.000
11/07/2015	100.000
02/07/2016	100.000
05/07/2016	100.000
08/07/2016	100.000
11/07/2016	100.000
02/07/2017	100.000
05/07/2017	100.000
08/07/2017	100.000
11/07/2017	100.000
02/07/2018	100.000

Coupons					
51) Coupons					
Paying Index	Interbank Rate	Bench Freq	Quarterly		
Observation Index	N/A	Last Reset	00/00/0000		
Convention	Foll-Unadj eff 05/07/2015				
Coupon Calendar	US				
First Irreg Cpn	Normal				
Last Irreg Cpn	Normal				
FRN Coupon Formula					
Date	Formula	Day Count	Freq	Cap	Floor
05/07/2015	1.000% Fixed	30/360	QTL		
05/07/2017	US0003M +1.000%	30/360	QTL	3.000	0.000

# Callables – Notices of Calls

52

## FEDERAL RESERVE BANK SERVICES

Search:

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■ Check
■ FedACH®
■ FedCash®
■ Fedwire®
■ National Settlement
■ Treasury
■ Central Bank

### Fedwire Call Notices

A call notice is an announcement, or notification, from an issuer of Fedwire-eligible securities that a security will be retired, or called, either in part or in full prior to its maturity date. The notice includes the date the security will be called, CUSIP number and the principal and interest factors.

Highlight and select a Call Date from the drop down menu. The link to the Call Notice details is the date and time the file was processed.

You may [sign up](#) to receive e-mail notifications of Call Notice updates. If you currently subscribe and wish to cancel the service, use the [Unsubscribe Page](#).

Please call **800-390-2788** if you have any questions.

Call Date	May 19, 2015	Go
Fannie Mae	<a href="#">05/08/2015-08:45 AM ET</a> (XLS)	
Farm Credit	<a href="#">05/13/2015-12:21 PM ET</a> (XLS)	
Farmer Mac		
FHLBanks	<a href="#">05/12/2015-09:17 AM ET</a> (XLS)	
Freddie Mac	<a href="#">05/12/2015-11:13 AM ET</a> (XLS)	
IFC		
Sallie Mae		
Treasury		
TVA		
World Bank		

<https://www.frbervices.org/app/callnotices/CallNotices.action>

# Callables – Partial Call

FHLB 1.12 08/25/17 Corp		Page 1/11		Description: Bond	
Data not provided by Bloomberg					
21) Bond Description		22) Issuer Description		97) Settings	
<b>Pages</b>					
<b>Issuer Information</b>					
1) Bond Info	Name	FEDERAL HOME LOAN BANK		<b>Identifiers</b>	
2) Addtl Info	Industry	Government Agencies		ID Number	EK4319910
3) Covenants	<b>Security Information</b>		CUSIP	3130A2UB0	
4) Guarantors	Mkt Iss	US Domestic		ISIN	US3130A2UB08
5) Bond Ratings	Country	US	Currency	USD	
6) Identifiers	Rank	Unsecured		Moody's	Aaa
7) Exchanges	Coupon	1.12	Type	Fixed	
8) Inv Parties	Cpn Freq	S/A		S&P	AA+
9) Fees, Restrict	Day Cnt	30/360	Iss Price	100.0000	
10) Schedules	Maturity	08/25/2017		<b>Issuance &amp; Trading</b>	
11) Coupons	CALL	06/01/15@100.00		Amt Issued/Outstanding	
<b>Quick Links</b>	Iss Sprd			USD	50,000.00 (M) /
32) ALLQ Pricing	Calc Type	(1) STREET CONVENTION		USD	25,000.00 (M)
33) QRD Quote Recap	Announcement Date	08/08/2014		Min Piece/Increment	
34) TDH Trade Hist	1st Coupon Date	02/25/2015		10,000.00 / 5,000.00	
35) CACS Corp Action	Call Announcement Date	04/20/2015		Par Amount	5,000.00
36) CF Prospectus	Call Effective Date	04/27/2015		Book Runner	DB,GS,NOM
37) CN Sec News				Reporting	TRACE
38) HDS Holders					
39) VPRE Underly Info					

Schedules	
51) Call	56) Factor Hist
Call with minimum 5 business days notice	
May be called in full or part	
Call Announcement Date 04/20/2015	
Callable on and anytime after date(s) shown	
	Date
	02/25/2015

Schedules		
51) Call	56) Factor Hist	
Principal Factor History		
	Date	Factor
	08/25/2014	1.00000000
	04/27/2015	0.50000000

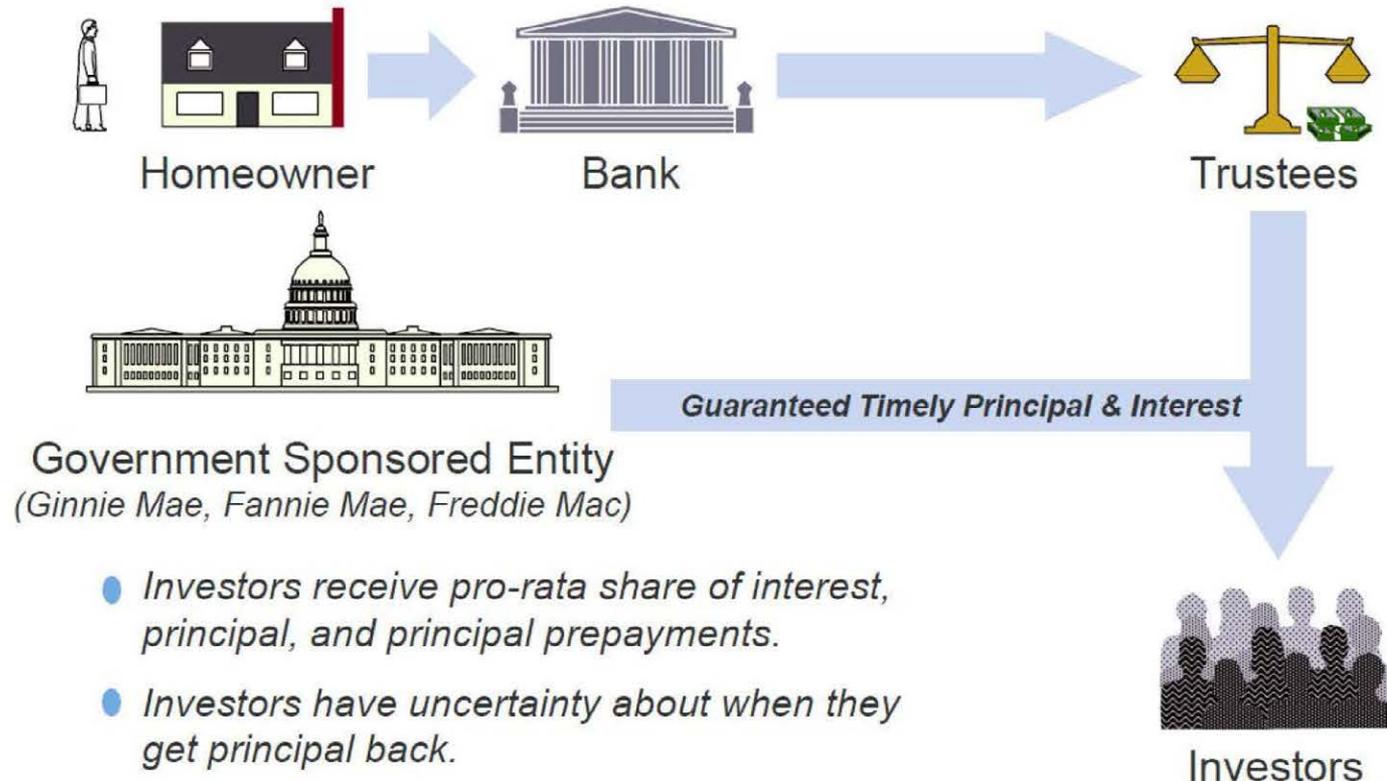
	Date	Action Type	Summary
1)	04/20/15	Debt Redem-Call	Partial, USD 25.000 M at 100.000%, Effective 4/27/15
2)	08/13/14	Debt Off-Incr	25.000 M; 1.12 08/17
3)	08/08/14	Debt Off-New	USD 1.12 08/17; 25000.000 M @100.000 %



# Agency MBS Pass-Through Details

## Mortgage-Backed Securities

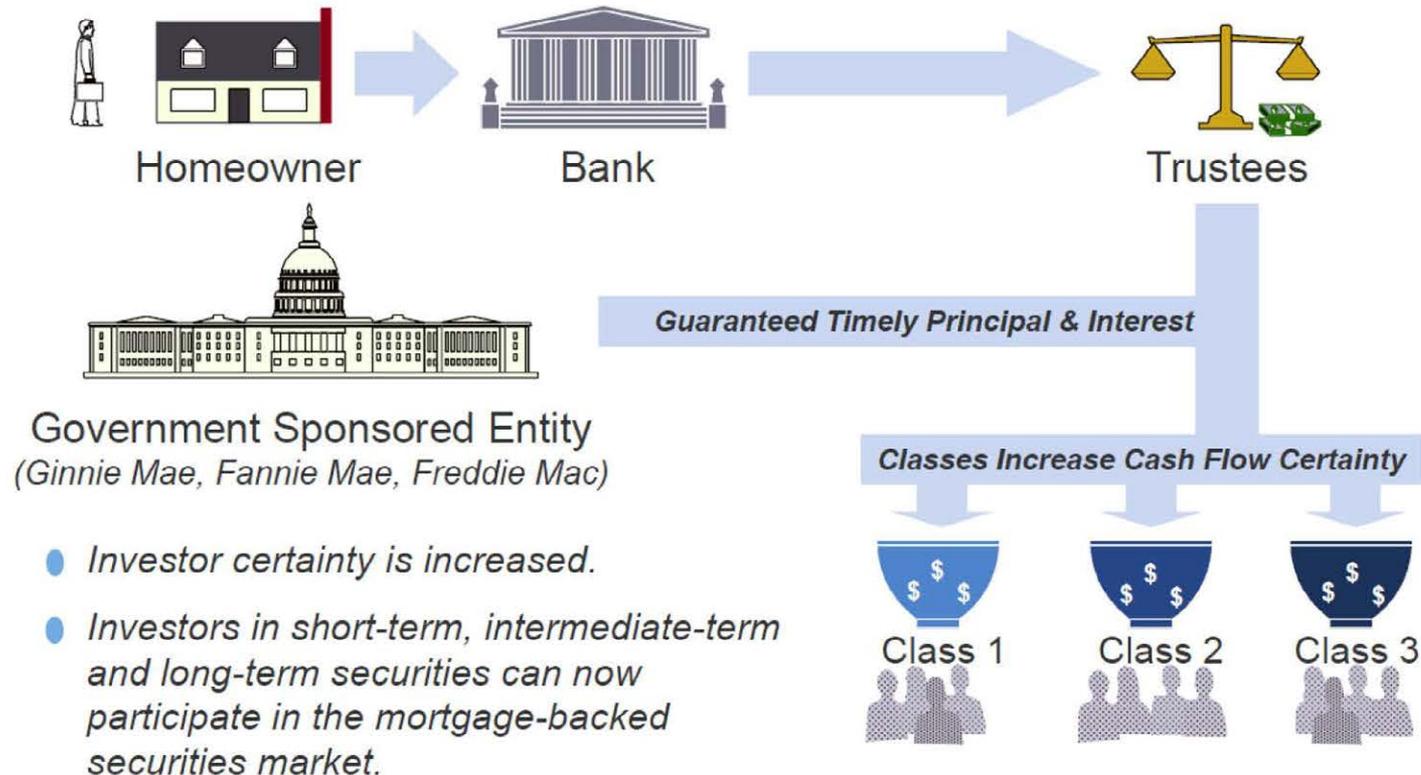
The Traditional Mortgage Pass-Through



# Agency MBS CMO Details

## Mortgage-Backed Securities

Collateralized Mortgage Obligations (CMOs) & Cash Flow Profile

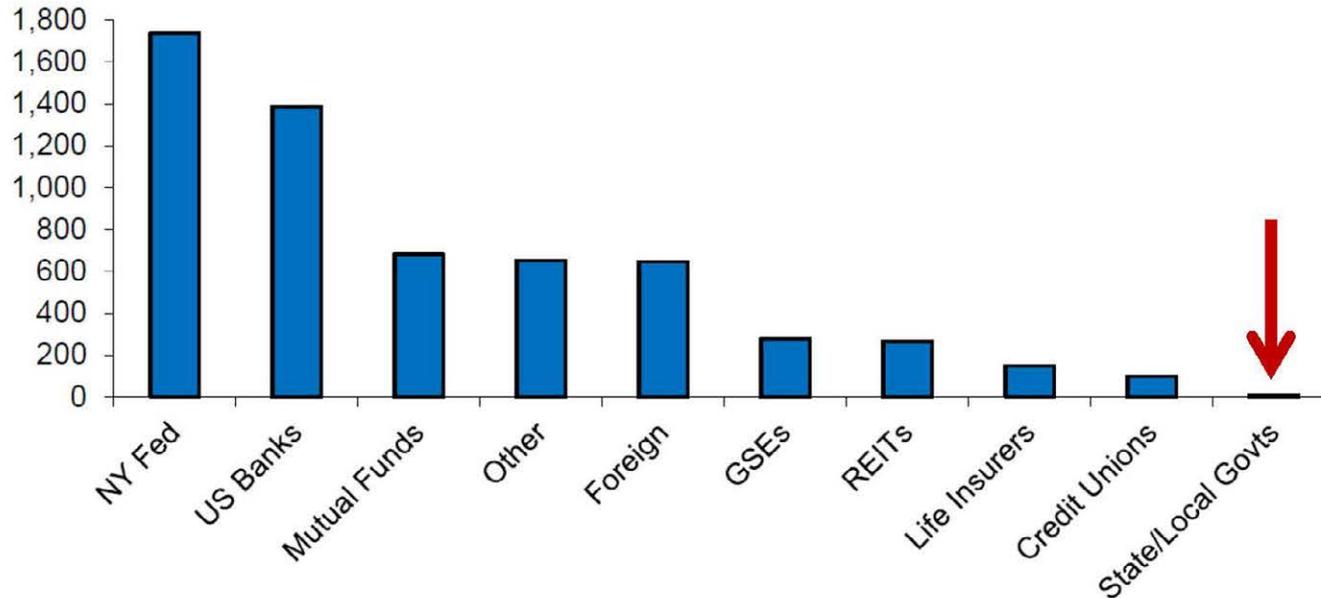


# MBS Investors

## Estimated institutional holdings of Agency MBS



\$ Billions



Note: Agency MBS includes Freddie Mac, Fannie Mae and Ginnie Mae securities. Other investors include hedge funds, structured investment vehicles, pension funds, saving institutions, nonprofits and individuals.

Source: Freddie Mac, Fannie Mae, Federal Reserve, Inside MBS & ABS, National Credit Union Administration, and the U.S. Treasury Department.

Data as December 31, 2014.

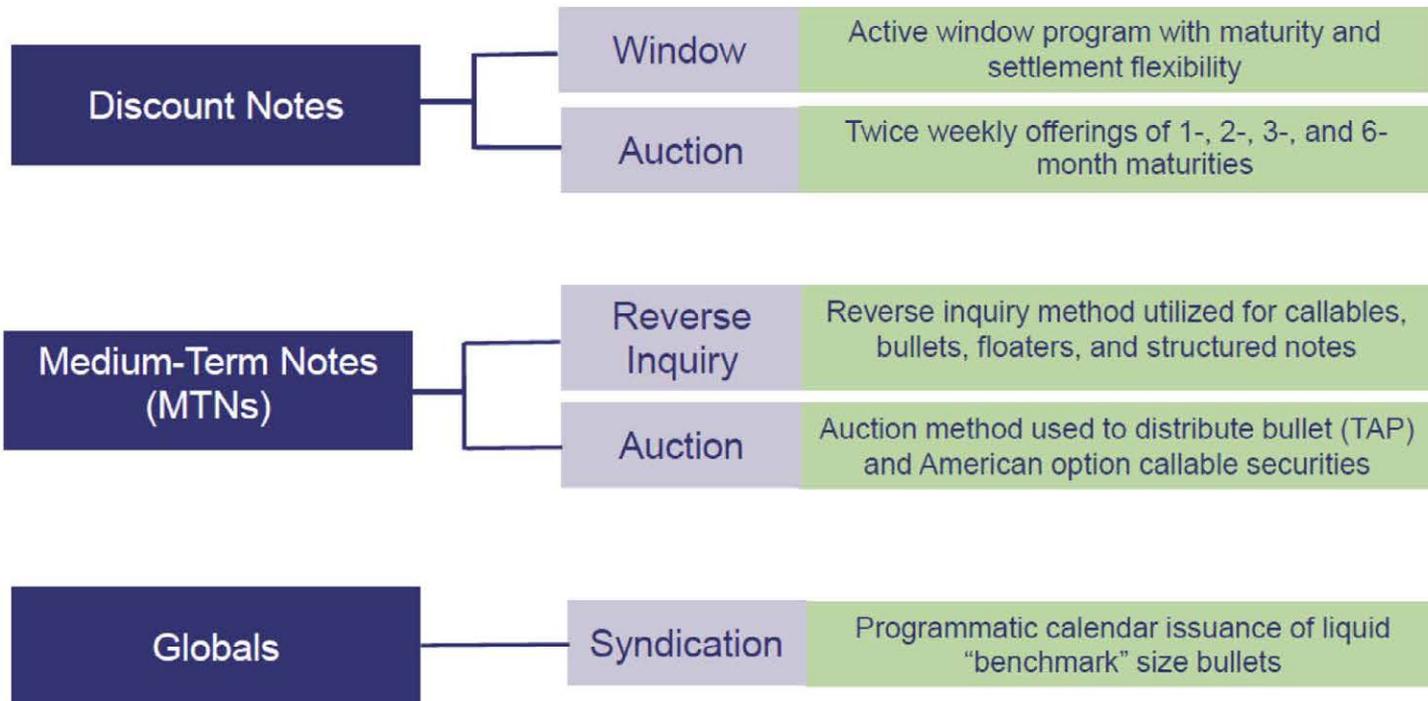
# Agency Subordinated Debt Details

FHLMC 0 11/29/19 Corp		Page 1/11 Description: Bond	
		94 Notes	95 Buy
		96 Sell	97 Settings
21) Bond Description	22) Issuer Description		
<b>Pages</b>	<b>Issuer Information</b>		<b>Identifiers</b>
1) Bond Info	<b>Name</b> FREDDIE MAC	<b>CUSIP/ID#</b> 313400BV4	
2) Addtl Info	<b>Industry</b> Government Agencies	<b>CUSIP</b> 313400BV4	
3) Covenants	<b>Security Information</b>		<b>ISIN</b> US313400BV47
4) Guarantors	<b>Mkt Iss</b> Domestic MTN	<b>Bond Ratings</b>	
5) Bond Ratings	<b>Country</b> US	<b>Currency</b> USD	<b>S&amp;P</b> AA-
6) Identifiers	<b>Rank</b> <b>Subordinated</b>	<b>Series</b>	<b>Fitch</b> AA-
7) Exchanges	<b>Coupon</b> 0	<b>Type</b> Zero Co...	<b>Composite</b> AA-
8) Inv Parties	<b>Cpn Freq</b>	<b>Iss Price</b>	<b>Issuance &amp; Trading</b>
9) Fees, Restrict	<b>Day Cnt</b> 30/360		<b>Amt Issued/Outstanding</b>
10) Schedules	<b>Maturity</b> 11/29/2019		USD 7,000,000.00 (M) /
11) Coupons	<b>BULLET</b>		USD 331,609.00 (M)
<b>Quick Links</b>	<b>Iss Sprd</b>		<b>Min Piece/Increment</b>
32) ALLQ Pricing	<b>Calc Type</b> (1)STREET CONVENTION		1,000.00 / 1,000.00
33) QRD Quote Recap	<b>Announcement Date</b>		<b>Par Amount</b> 1,000.00
34) TDH Trade Hist	<b>Interest Accrual Date</b>		<b>Book Runner</b>
35) CACS Corp Action	<b>1st Settle Date</b> 11/29/1984		<b>Reporting</b> TRACE
36) CF Prospectus	<b>1st Coupon Date</b>		
37) CN Sec News			
38) HDS Holders			
39) VPRD Underly Info			

# Agency Issuance – FHLB

## A Full Range of Debt Products

FHLBanks Use Multiple Debt Programs and Issuance Methods



# Agency Issuance – FHLB

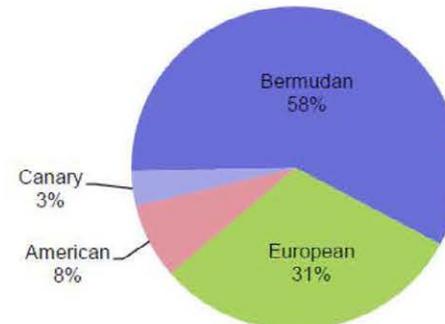
## Callable Bond Program

- ▣ Essential component of FHLBank core funding, supporting both advances and investment portfolios
- ▣ Callables offer enhanced yield over comparable bullets and allow investors to express views on volatility and/or the yield curve without sacrificing credit quality or utilizing derivatives
- ▣ Flexible reverse inquiry process delivers a high degree of customization
- ▣ Approximately 36% of fixed rate callable issuance in 2014 was SEC Rule 2a-7 eligible; 25% YTD '15

Callable Issuance by Lockout



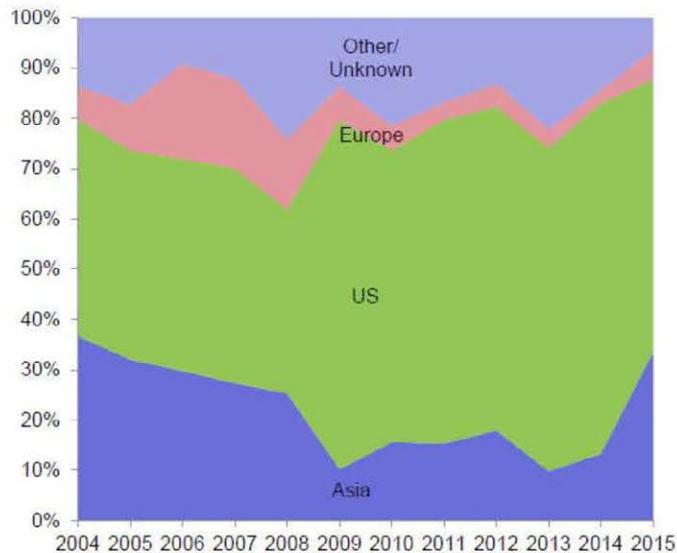
Callable Issuance by Option Type



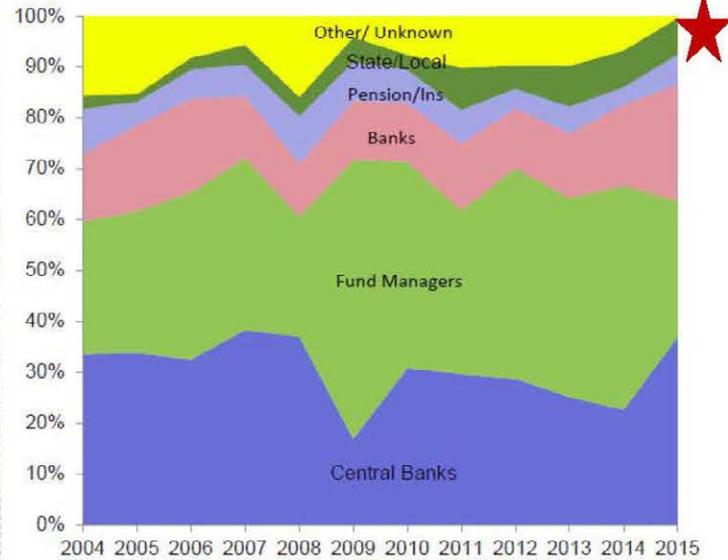
# Agency Issuance – FHLB

## Global Bond Investor Distribution

By Geographic Region



By Investor Type



# Supranationals



# Supranationals

## Washington Supras



- Over half of the funding program in each of the “Washington Supras” is in USD.
- All three have maintained their triple-A credit ratings.

	World Bank (IBRD)	International Finance Corporation (IFC)	Inter-American Development Bank (IADB)
<b>Development purpose</b>	Global source of funding to member governments	Global source of finance for private enterprise in developing countries.	Regional source of development finance for Latin America and the Caribbean.
<b>Membership</b>	Global – 188 members	Global – 184 members	48 members, of which 26 are Latin American/Caribbean countries
<b>Year established</b>	1944	1956	1959
<b>Largest shareholder</b>	United States – 16%	United States – 24%	United States – 30%
<b>Balance Sheet</b>	USD 359 billion	USD 84.1 billion	USD 97 billion
<b>Annual Funding Program</b>	USD 40-50 billion	USD 18 billion	USD 21 billion
<b>SEC Exemption*</b>	Yes	Yes	Yes, but still required to file certain information with SEC under SEC Regulation IA
<b>Act of Congress Authorizing US Membership</b>	Bretton Woods Act 22 USC 286 et. Seq.	International Finance Corporation Act 22 USC 282 et. Seq.	Inter-American Development Bank Act 22 USC 283 et. Seq.
<b>Type of Lending</b>	Preferred Creditor Status (PCS) Lending to Sovereigns or Sovereign guaranteed only	Lending to or equity investment in Emerging Market private sector entities	PCS Lending to Sovereign or Sovereign guaranteed (approximately 92%) plus Lending to private sector

\* Exemptions refer to the Securities Act of 1933 and Securities Exchange Act of 1934.

# Supranationals

## Supranational Instrumentality of the United States



- ↳ These institutions were established by international treaties known as its Articles of Agreement (“the Articles”).
- ↳ The Articles was incorporated into US federal law by Congressional Act – federal statutes that
  - authorized the United States’ membership and participation in the institution
  - recognizes its immunities and privileges
- ↳ IADB, IFC and IBRD securities are exempted securities within the meaning of Section 3(a)(2) of the U.S. Securities Act of 1933, as amended, and Section 3(a)(12) of the U.S. Securities Exchange Act of 1934, as amended.
- ↳ The US Secretary of the Treasury sits on the Board of Governors of each of these institutions

# Supranationals

## Supranational Financial Strength

A supranational's Aaa/AAA rating is based on a solid financial structure, conservative financial policies and consistent performance, as well as support and capital backing from its shareholders.

### Strong Credit Quality

Quality Loan Portfolio

Prudent Risk Management

Substantial Liquidity

Diversified Shareholder Base

IADB, IBRD, and IFC's main headquarters are in Washington, D.C.



# Supranationals – Issuance

## 1 Benchmark Bonds, Global Bonds

- Broad sponsorship from underwriters with solid primary placement
- Diversified investor base
- Strong dealer commitment to secondary market support
- Characteristics:
  1. Issue size is typically USD1-4 billion
  2. Maturities generally range between 2-10 years
- IADB/IFC/World Bank bonds are represented in the following major indices:
  - Barclays Capital Global Aggregate Index
  - Bank of America Merrill Lynch Global Broad Market Quasi-Govt. Index
  - Citigroup World Broad Investment-Grade (WorldBIG) Bond Index

# Supranationals – Issuance

## 2 Other Plain Vanilla Notes

- ↳ Smaller MTN transactions customized to meet specific investor needs
- ↳ Various formats, including fixed and floating rate notes (FRNs)

## 3 Structured Notes

- ↳ Capital Protection and AAA/Aaa rating
- ↳ Tailor Made Solutions
- ↳ Buyback Alternative to enhance liquidity
- ↳ Confidentiality
- ↳ Standardized documentation
- ↳ Pricing comparable to GSEs

# Supranationals – Issuance

## 4 Discount Notes

	Inter-American Development Bank (IADB)	International Finance Corporation (IFC)	World Bank (IBRD)
<b>Ratings</b>	A-1+ by S&P and P-1 by Moody's		
<b>Maturities</b>	360 days or less		
<b>Documentation</b>	Governed by Discount Note Offering Circular		
<b>Clearing</b>	Book entry form through the Federal Reserve Bank of NY		
<b>Bloomberg Page</b>	IADN<GO>	IFC<GO>	WBDN<GO>
<b>Outstanding Amount</b> (as of March 6, 2015)	USD 635 million	USD 1.3 billion	USD 5.6 billion
<b>Dealers</b>	Bank of America Securities Barclays Capital Credit Suisse Securities Goldman Sachs HSBC Securities Morgan Stanley	Barclays Capital Goldman Sachs HSBC Jefferies JP Morgan Securities Merrill Lynch Nomura UBS	Barclays Capital CastleOak Securities FTN Financial Goldman Sachs Jefferies JP Morgan Securities Mizuho Securities UBS Securities

# Supranationals – Contact Information

## For More Information, Contact Us

### **Inter-American Development Bank (IADB)**

**Laura Fan**, Head of Funding

[lauraf@iadb.org](mailto:lauraf@iadb.org)

Phone: 202-623-3772

<http://www.iadb.org/en/idb-finance/investors/investors,1977.html>

### **International Finance Corporation (IFC)**

**Ben Powell**, Head of Funding

[bpowell@ifc.org](mailto:bpowell@ifc.org)

Phone: 202-473-1642

**Flora Chao**, Senior Funding Officer

[fchao@ifc.org](mailto:fchao@ifc.org)

Phone: 202-473-7355

[www.ifc.org/investors](http://www.ifc.org/investors)

### **The World Bank (IBRD)**

**George Richardson**, Head of Capital Markets

[grichardson@worldbank.org](mailto:grichardson@worldbank.org)

Phone: 202-473-0368

**Urvi Mehta**, Investor Relations

[umehta@worldbank.org](mailto:umehta@worldbank.org)

Phone: 202-477-2860

<http://treasury.worldbank.org/capitalmarkets>

# Suitable Agency/Supra Allocations

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## Agencies:

- Sector Limits: Most policies do not have a sector limit
- Issuer Limits: Some policies have 40%-50% issuer limits, many have no issuer limits
- Type Limits: Some policies have a not greater than 50% callable limit
  - Few policies have a floating rate note limit

## Supras:

- Sector Limit: Not greater than 30% in total (Code)
- Issuer Limits: Some policies have 5%-10%, some have no issuer limits

# TRACE Trading Information



## FINRA TRACE Bond Market Activity

View: Corporate | Agency | Structured Products |

	All Issues	Fannie Mae	FHLB	Freddie Mac
Total Issues Traded	696	155	199	130
Advances	218	56	56	24
Declines	332	77	95	53
Unchanged	10	3	4	1
52 Week High	41	9	10	6
52 Week Low	39	3	17	1
Dollar Volume*	4428	1010	1269	1366

[More FINRA TRACE Bond Market Information](#)

\*Par value in millions

## Quick Search

Debt / Asset Class

- Treasury/Agency
- Corporate
- 144A
- Municipal
- Securitized Products

Show Results As

- Bonds
- Trades

Issuer Name

Symbol / CUSIP

SEARCH

<http://finra-markets.morningstar.com/MarketData/Default.jsp>

# TRACE Trading Information

## FEDERAL HOME LN BKS

[+ ADD TO WATCHLIST](#)

Coupon Rate  
**1.125%**

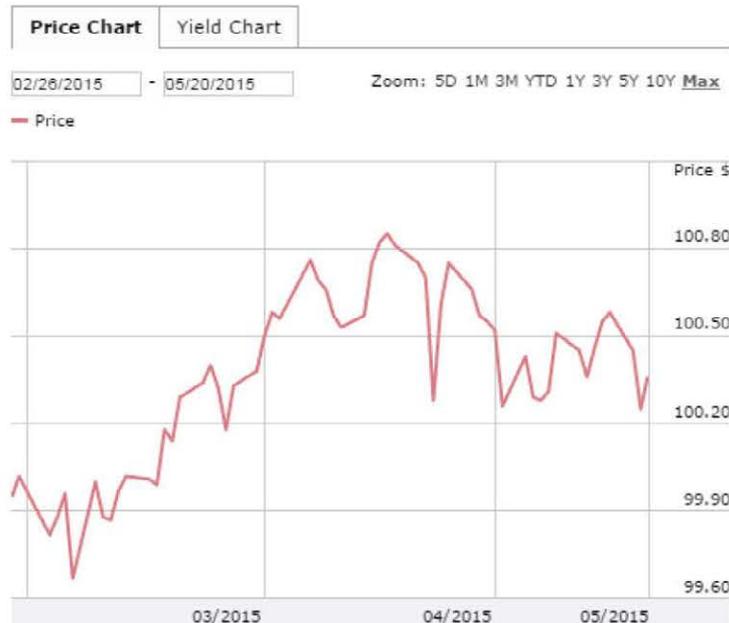
Maturity Date  
**04/25/2018**

Symbol	CUSIP	Next Call Date	Callable
FHLN4217666	3130A4GJ5	—	—

Last Trade Price	Last Trade Yield	Last Trade Date	US Treasury Yield
\$100.36	1.000%	05/20/2015	—

[Trade History](#)

### Price/Yield Chart



### Classification Elements

Bond Type	US Agency Debenture
Debt Type	—
Industry Group	Government
Industry Sub Group	U.S. Agencies
Sub-Product Asset	AGCY
Sub-Product Asset Type	Agency Debt Bond
State	—
Use of Proceeds	—
Security Code	—

### Special Characteristics

Medium Term Note	No
------------------	----

### Issue Elements

Offering Date	02/26/2015
Dated Date	02/27/2015

# TRACE Trading Information

## Bond Trade Activity Search Results

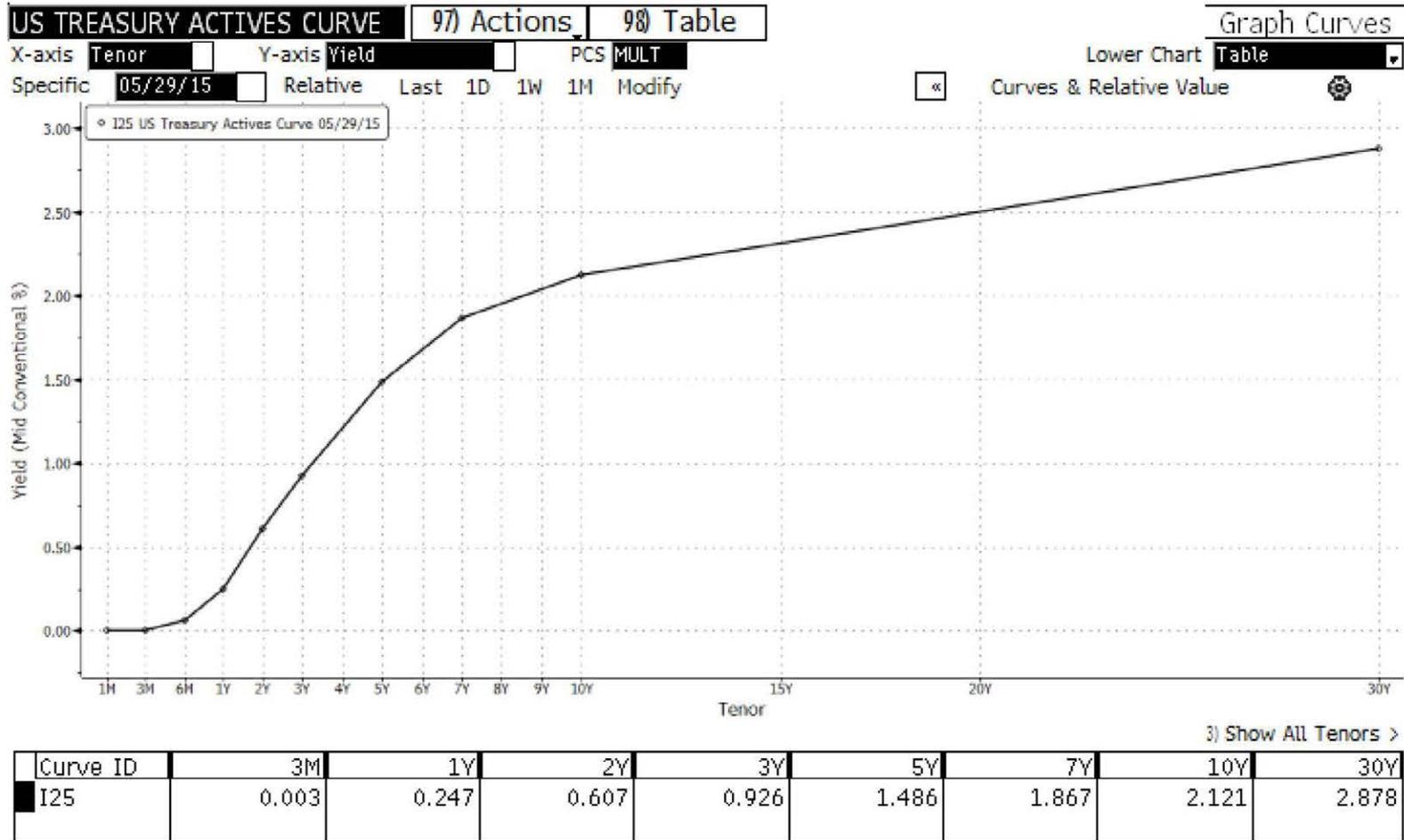
### Glossary

From  to

Execution													
Date	Time	Settlement	Status	Quantity	Price	Yield	Commission	Modifier	2nd Modifier	Special	As-Of	Reporting Party	Side
5/20/2015	15:50:48	5/21/2015	T	50000	100.360	1	N	-	-	-	-		S
5/20/2015	14:15:05	5/21/2015	T	1250000	100.382	0.992	N	-	-	-	-		S
5/20/2015	12:31:37	5/21/2015	T	5000000	100.343	1.006	N	-	-	-	-		D
5/20/2015	12:31:04	5/21/2015	T	5000000	100.359	1	N	-	-	-	-		S
5/20/2015	10:46:29	5/21/2015	T	3000000	100.320	1.014	N	-	-	-	-		D
5/20/2015	10:29:28	5/21/2015	T	50000	100.325	1.012	N	-	-	-	-		S
5/19/2015	16:23:11	5/20/2015	T	5MM+	100.249	1.038	N	-	-	-	-		B
5/19/2015	14:26:42	5/20/2015	T	20000	100.287	1.025	N	-	-	-	-		B
5/19/2015	14:06:31	5/20/2015	T	450000	100.317	1.015	N	-	-	-	-		S
5/19/2015	11:26:04	5/20/2015	T	120000	100.329	1.011	N	-	-	-	-		S
5/19/2015	10:57:51	5/19/2015	T	55000	100.345	1.005	N	-	-	-	-		S
5/19/2015	10:57:51	5/19/2015	Correction	55000	100.345	1.005	N	-	-	-	-		S
5/19/2015	10:56:23	5/20/2015	T	55000	100.391	0.989	N	-	-	-	-		S
5/18/2015	13:46:18	5/19/2015	T	1000000	100.448	0.97	N	-	-	-	-		S
5/15/2015	13:57:49	5/26/2015	T	3000000	100.576	0.924	N	-	-	-	-		B
5/15/2015	13:40:19	5/18/2015	T	390000	100.645	0.902	N	-	-	-	-		S
5/15/2015	12:43:39	5/18/2015	T	5000000	100.591	0.921	N	-	-	-	-		D
5/15/2015	10:51:37	5/18/2015	T	5MM+	100.578	0.925	N	-	-	-	-		B
5/15/2015	10:41:42	5/18/2015	T	5MM+	100.605	0.916	N	-	-	-	-		D
5/15/2015	10:40:06	5/18/2015	T	5MM+	100.613	0.913	N	-	-	-	-		D

S= Dealer selling to investor  
B= Dealer buying from investor  
D= Dealer to dealer transaction

# The Treasury Yield Curve Framework



# Primary Risks Associated with Bonds

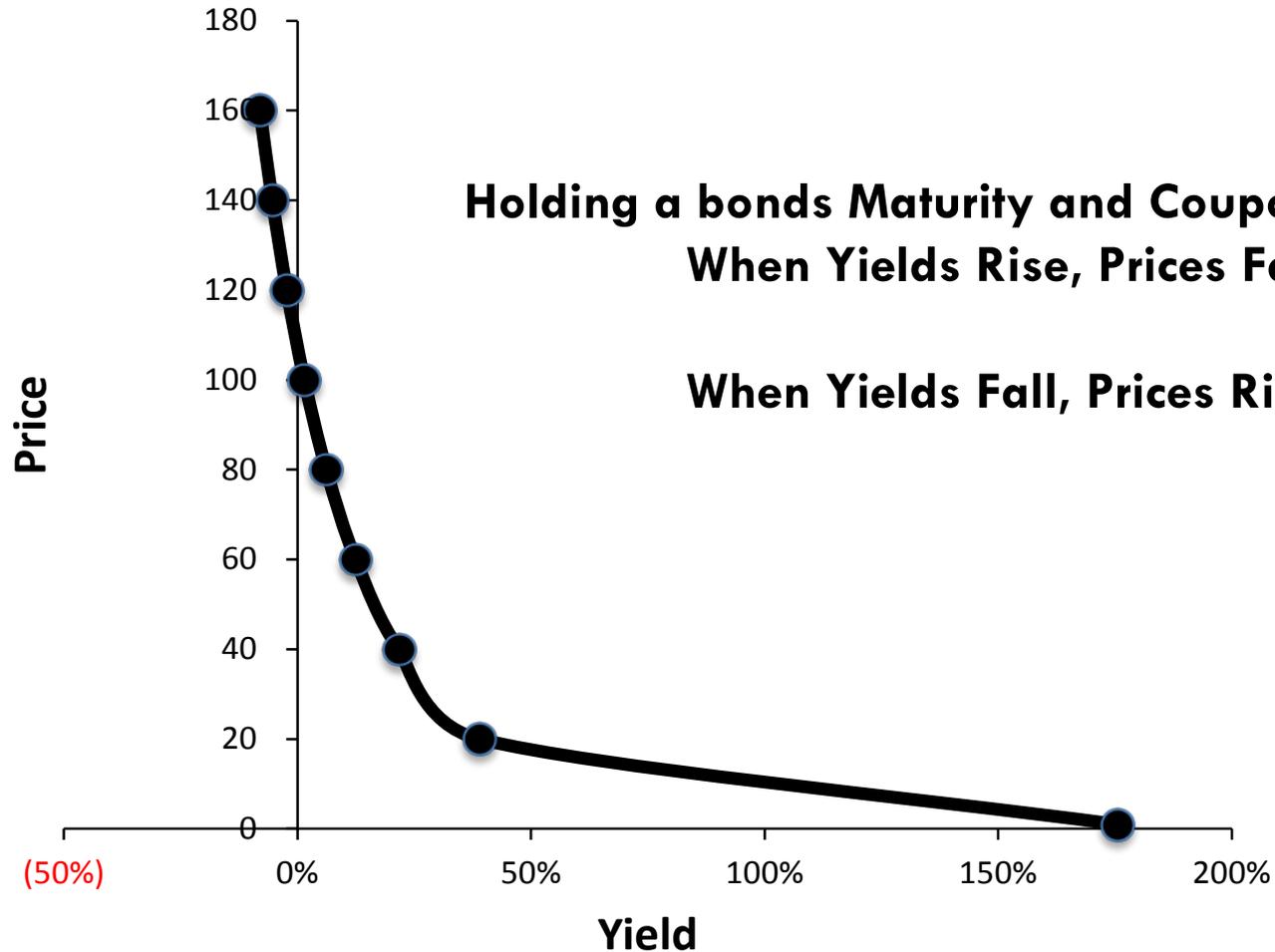
74

- **Interest Rate Risk:** The risk that bond prices will fall as interest rates rise.
- **Reinvestment Risk:** The risk that proceeds from the bond will be reinvested at a rate lower than the yield when purchased.
- **Call Risk:** The risk that a bond with a call provision will be called (redeemed before the stated maturity date) by the issuer.
- **Default/Credit Risk:** The risk that the bond issuer will be unable to pay the interest and principal as promised.

# Price & Yield Relationship

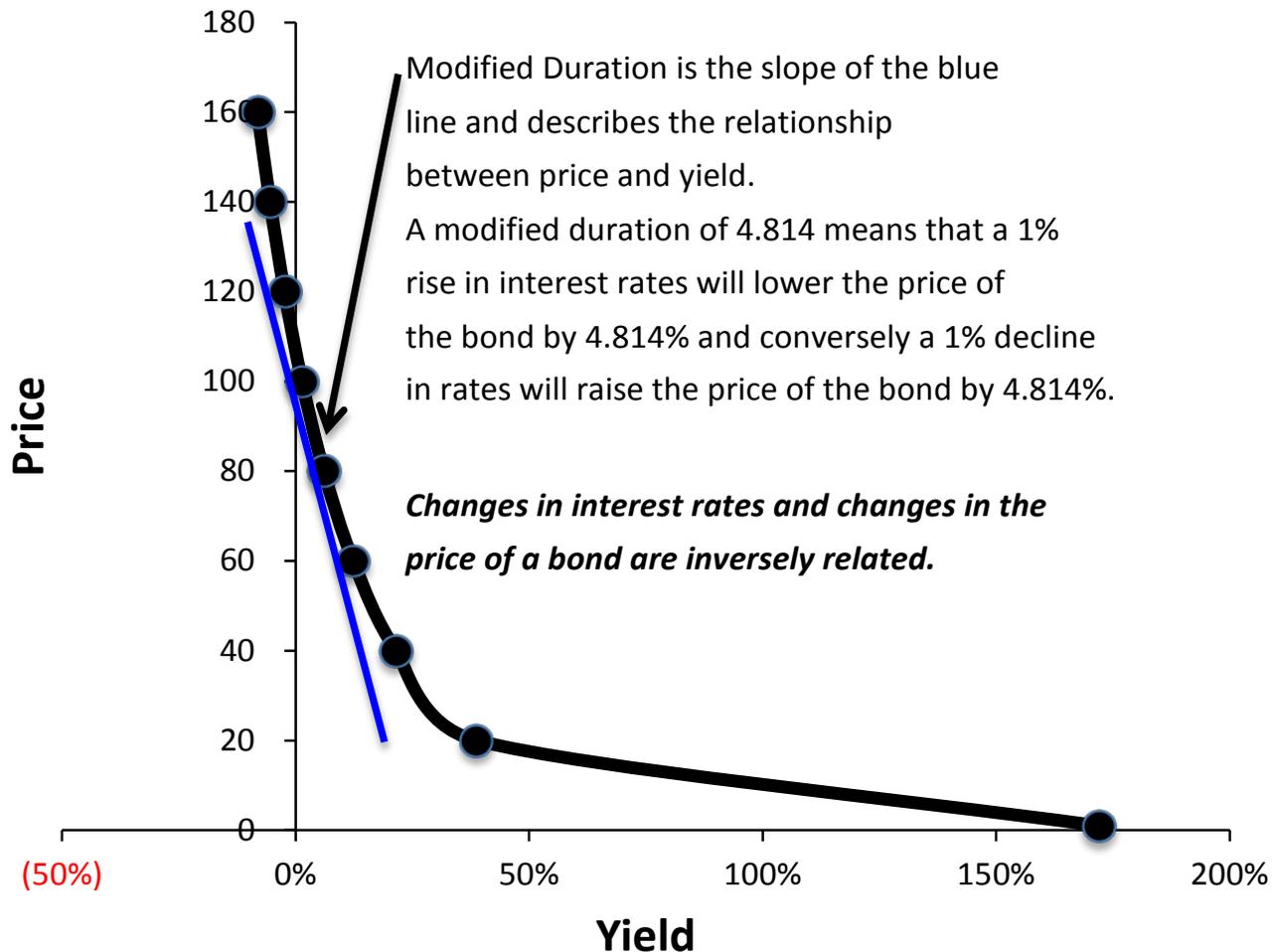
75

## Price / Yield Relationship



# The Price-Yield-Duration Connection

## Price / Yield Relationship



# Yield Spread

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“Given that Treasury securities do not expose investors to credit risk, market participants look at the yield offered on an on-the-run Treasury security as the minimum interest rate required on a non-Treasury security with the same maturity. ... it is commonplace to refer to the additional yield over the benchmark Treasury issue of the same maturity as the yield spread.

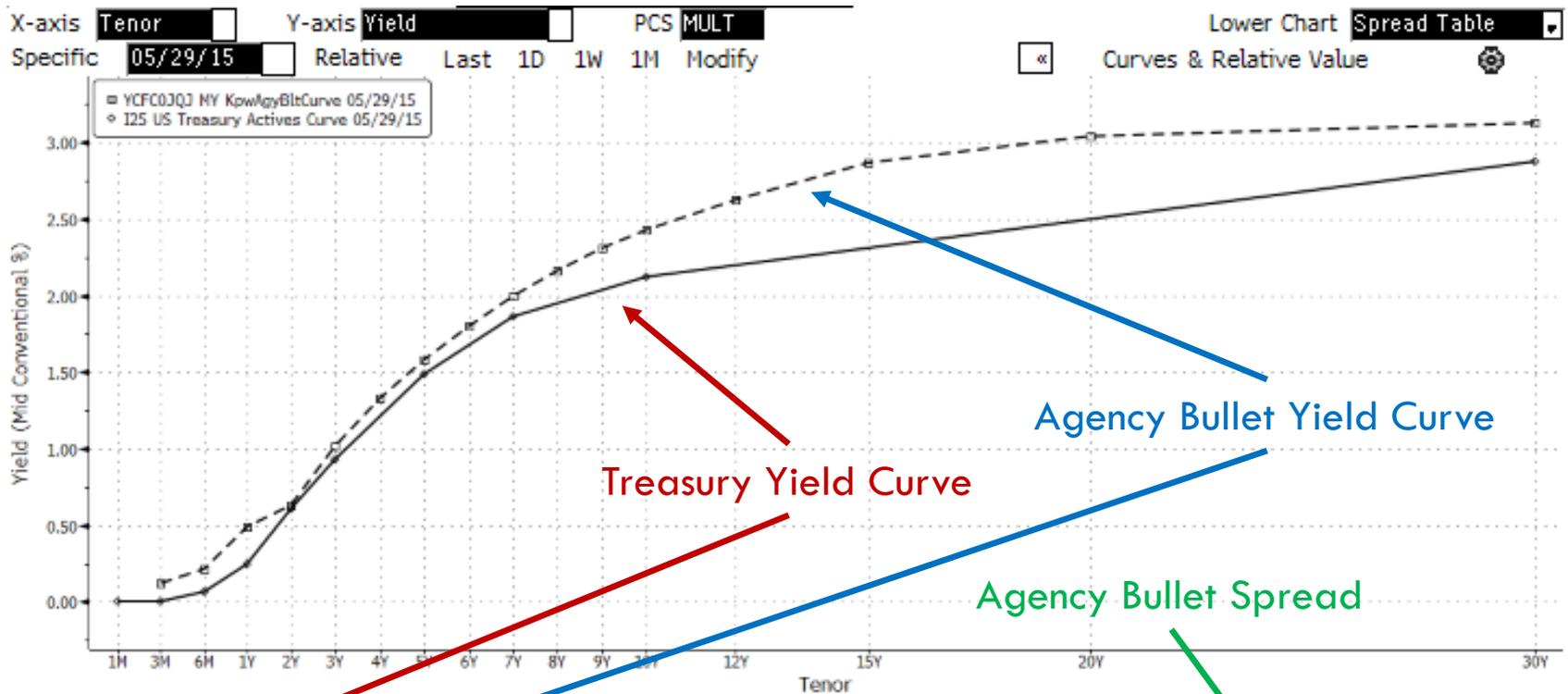
$$\text{yield spread} = \text{yield on bond X} - \text{yield on bond Y}$$

where bond Y is considered the reference bond (or benchmark) against which bond X is measured. When a yield spread is computed in this manner it is referred to as an absolute yield spread and it is measured in basis points.”

[Fabozzi CFA, Frank J. (2010-05-13). Fixed Income Analysis (CFA Institute Investment Series) (Kindle Locations 1590-1591, 1673, 1676-1678). Wiley. Kindle Edition]

# Yield Curve/Spread Analysis: Agency Bullet Bonds

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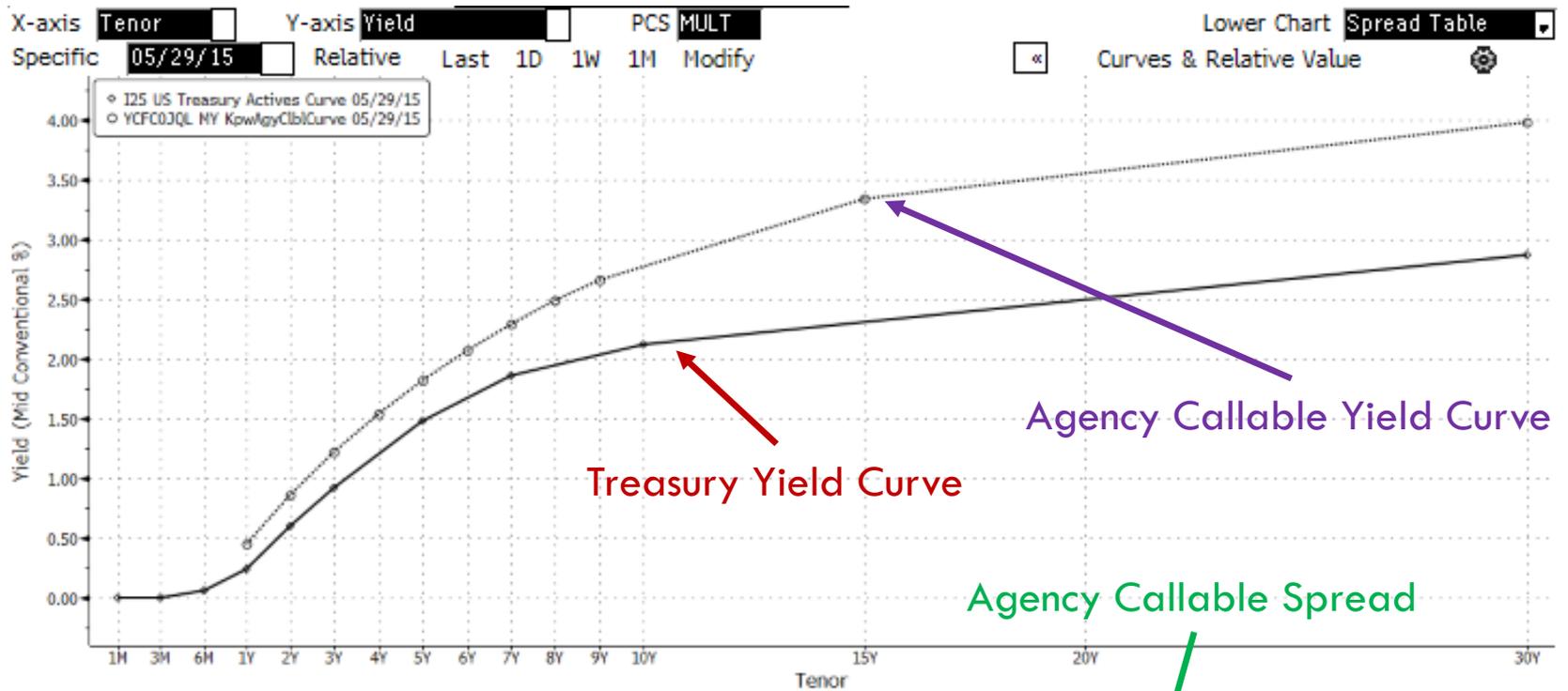


3) Show All Tenors >

Curve ID	3M	1Y	2Y	3Y	5Y	7Y	10Y	15Y	30Y
YCFC0JQJ	0.120	0.493	0.630	1.015	1.584	1.995	2.430	2.868	3.127
I25	0.003	0.247	0.607	0.926	1.486	1.867	2.121		2.878
YCFC0JQJ -	11.8	24.6	2.2	8.9	9.8	12.9	30.9		24.9

# Yield Curve/Spread Analysis: Agency Callable Bonds

79

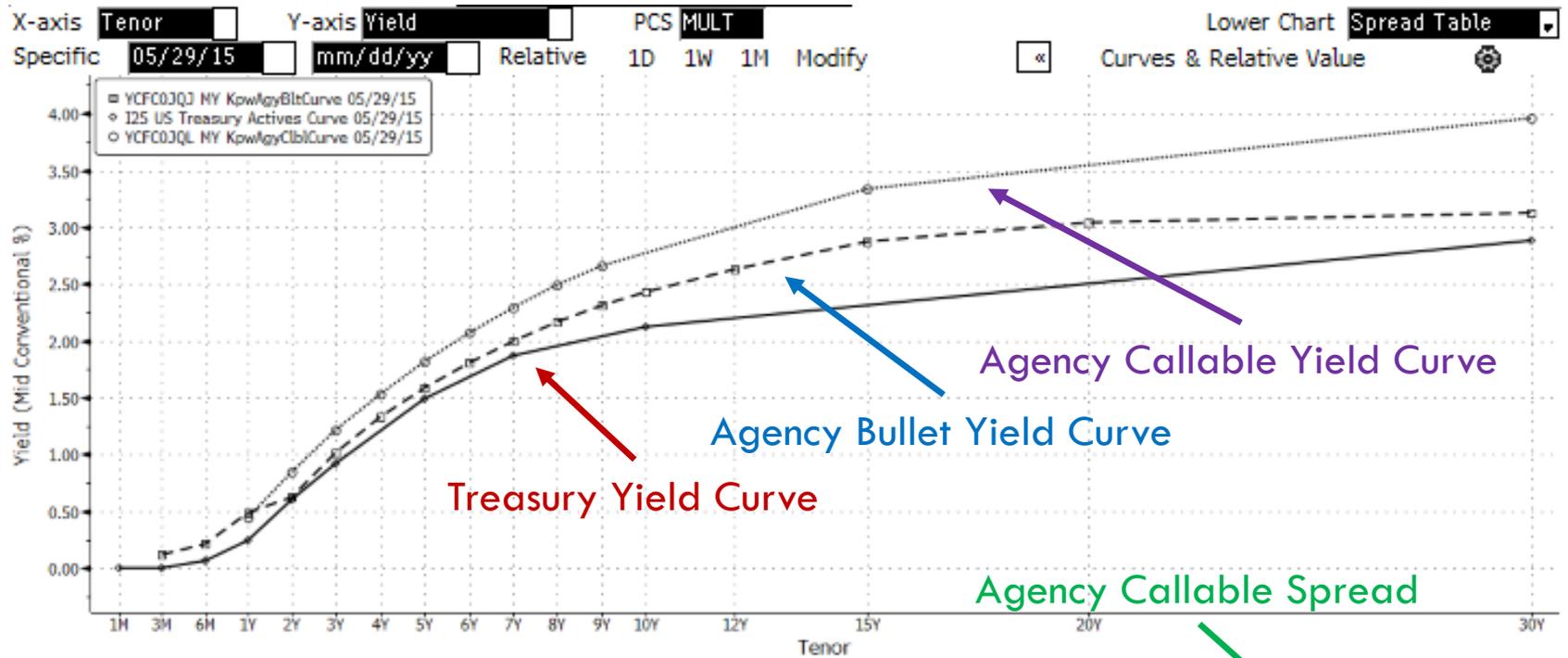


3) Show All Tenors >

Curve ID	3M	1Y	2Y	3Y	5Y	7Y	10Y	15Y	30Y
I25	0.003	0.247	0.607	0.926	1.486	1.867	2.121		2.878
YFCFC0JQL		0.454	0.861	1.223	1.827	2.296		3.345	3.983
YFCFC0JQL -		20.7	25.4	29.7	34.1	43.0			110.5

# Yield Curve/Spread Analysis: Tsy vs. Bullet vs. Callable

80



Curve ID	3M	1Y	2Y	3Y	5Y	7Y	10Y	15Y	30Y
YFCF0JQJ	0.120	0.493	0.630	1.015	1.584	1.995	2.430	2.868	3.127
I25	0.003	0.247	0.607	0.926	1.486	1.867	2.121		2.878
YFCF0JQL		0.443	0.847	1.211	1.821	2.296		3.341	3.959
YFCF0JQJ - I25	11.8	24.6	2.2	8.9	9.8	12.9	30.9		24.9
YFCF0JQL - I25		19.6	24.0	28.5	33.5	42.9			108.1

# Yield, Duration, Spread Problem/Solution

81

“Since callable bonds have more than one possible redemption date (their call dates and maturity), the collection of future cash flows contributing to their overall return is not clearly defined. ... an issue’s incremental risks are evaluated relative to its incremental return. When the return measure itself is flawed, the possibility of drawing catastrophically incorrect conclusions about risk and return becomes very real. ...

A more complete measure of return should fulfill the following requirements:

1. It should account for the risks posed by an uncertain redemption date by providing an objective measure of performance that is independent of any assumed redemption date.
2. It should provide a means of assessing the incremental return contained in the security relative to a riskless benchmark.”

[(2010-05-18). Introduction to Option-Adjusted Spread Analysis (Bloomberg Financial) (Kindle Locations 227-228, 240-242, 281-285). Wiley. Kindle Edition.]

# Spread Analysis: Two Approaches

82

**Yield Spread Analysis:** Usually quoted in basis points ( $1/100^{\text{th}}$  of 1%) by subtracting a benchmark bond yield (usually a US Treasury of similar maturity) from the yield of the bond being analyzed. The spread represents the incremental return over the benchmark the investor earns for taking on Interest Rate Risk, Reinvestment Risk, Call Risk and Credit Risk. This incremental return is to a specific date (usually maturity) and does not take into account the possibility of an early redemption.

**Option Adjusted Spread Analysis:** A financial-analysis method that analyzes the impact of any options embedded in a bond's structure and measures the issue's expected incremental return. Quoted in basis points, the OAS represents the constant spread applied to the benchmark rates in a fixed-income option model to recover the price of the bond being analyzed. The measure is called OAS because (1) it is a spread and (2) it adjusts the cash flows for the option when computing the spread to the benchmark interest rates.

# Yield Spread vs. OAS: Agency 5 Year Bullet

83

ICUR 6/22/20  
INTERPOLATED US YIELD FOR 6/22/20 ( 1846 DAYS) IS: **1.673**  
**OPTION-ADJUSTED SPREAD ANALYSIS**  
FANNIE MAE FNMA 1 1/2 06/20 98.633/98.696 (1.784/1.771) BVAL

OAS

Treasury Yield

Calculate (P,0,V) <input type="radio"/> P	Price 98.696	OAS (bp) 0) + 9.69	Volatility V) 0.00
Cusip / ID# 3135G0D75	Option Px Value: -0.00		
Settle 6/ 4/2015	Bench settle 6/ 4/2015	Vega: 0.00	
Spread 9.7bp	vs5Y T1.875 6/30/20 Govt @100-31 1/8	( 1.674)	

Yield Spread

This bond has no embedded options.

**Agency Bullet Yield**

	OAS Method	Option Free	To Maty on 6/22/2020	To Mty
Yld Sprd		1.771	1.771	1.771
M Dur	4.89	9.9	9.9	9.9
Risk	4.84		4.83	4.83
Cnvx	0.27		4.77	4.77
			0.26	0.26

Model  L=Lognormal

**Benchmark Rates (US Tsy)**

2) Customize

Curve 111 Semi US On/Off The Run

Dated 6/ 3/2015

Settle 6/ 4/2015

None

Shift +0(bps)

	Yield Spread
3m	0.005
6m	0.066
1y	0.255
2y	0.673
3y	1.038
4y	1.420
5y	1.661
7y	2.070
10y	2.328
20y	2.840
30y	3.071

88) REFRESH

# Yield Spread vs. OAS: Agency Callable (5YrNc1Yr-Dq)

84

ICUR 6/22/20  
INTERPOLATED US YIELD FOR 6/22/20 ( 1846 DAYS) IS: **1.673**  
**OPTION-ADJUSTED SPREAD ANALYSIS**  
FANNIE MAE FNMA 2 06/30/20 NOT PRICED

Treasury Yield

OAS

Calculate **Price** **OAS (bp)** **Volatility**  
(P,O,V)  P) **100** **0) + 5.44** V) **41.24**

Cusip / ID# 3136G2L70 Option Px Value: -1.37  
Settle **6/30/2015** Bench settle **6/ 4/2015** Vega: -0.04  
Spread **32.6bp** vs 5Y **T1.875 6/30/20 Govt @100-31<sup>1</sup>/<sub>8</sub>** **( 1.674)**

Yield  
Spread

{NUM}<Go> for:  
3) Call Schedule  
6/30/16 100.00  
9/30/16 100.00  
12/30/16 100.00  
3/30/17 100.00  
6/30/17 100.00  
9/30/17 100.00  
12/30/17 100.00  
3/30/18 100.00  
6/30/18 100.00  
9/30/18 100.00  
...more...

Agency  
Callable  
Yield

	OAS Method	Option Free	To Call on 6/30/2016	To Mty
Yld		1.712	2.000	2.000
Sprd		5.0	174.9	33.8
M Dur	3.33		0.99	4.74
Risk	3.33		0.99	4.74
Cnvx	-1.96		0.01	0.25

Benchmark Rates (US Tsy)

Model  L=Lognormal  
Exercise Premium **0.00**

2) Customize  
Curve  111 Semi  
US On/Off The Run  
Dated **6/ 3/2015**  
Settle 6/30/2015  
None  
Shift **+0(bps)**

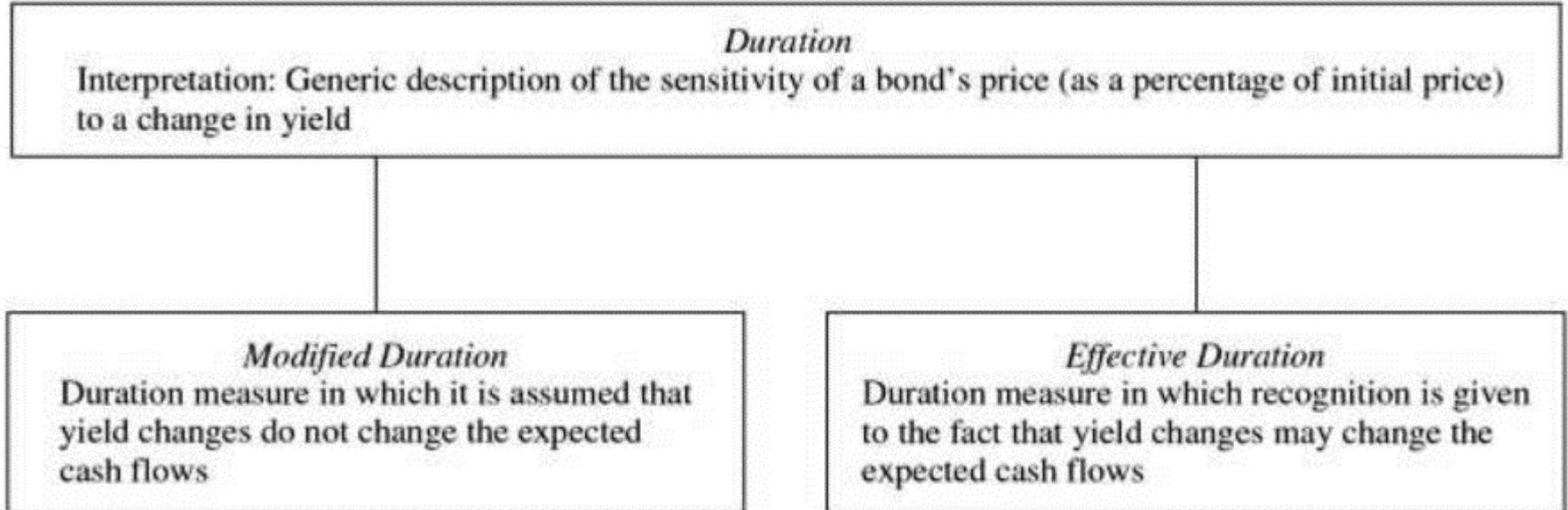
	Yield	Spread
3m	0.005	
6m	0.066	
1y	0.250	
2y	0.673	
3y	1.038	
4y	1.420	
5y	1.661	
7y	2.070	
10y	2.328	
20y	2.840	
30y	3.071	

88) REFRESH

# Yield Spread vs. OAS: Duration Differences

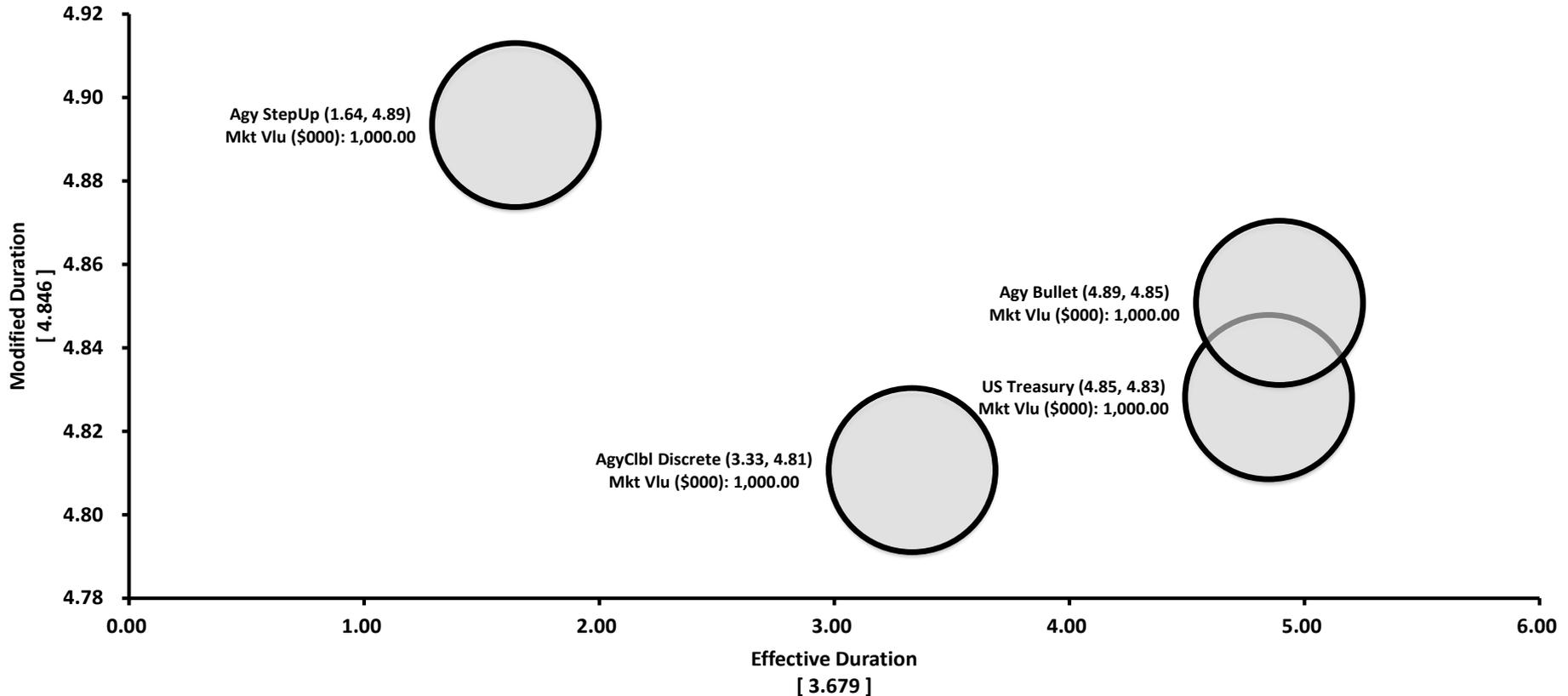
85

Bond Description	Purchase Yield [ 1.694 ]	Modified Duration [ 4.846 ]	Effective Duration [ 3.679 ]	OAS [ (4.18) ]
1.012MM 3135G0D75: FNMA1.50 06/22/20 (5.05Yrs)	1.572	4.851	4.894	9.694
1.000MM 3134G7AD3: FHLMC1.25 06/25/20 (5.0YrsNc3.0Mos-DqSu)	1.25	4.893	1.643	(31.492)
<b>0.983MM 912828VJ6: T1.875 06/30/20</b>	<b>1.952</b>	<b>4.828</b>	<b>4.848</b>	<b>0.02</b>
1.000MM 3136G2L70: FNMA2.00 06/30/20 (5.0YrsNc1.0Yrs-Dq)	2.00	4.811	3.331	5.056



# Visual Analysis: Modified Duration vs. Effective Duration

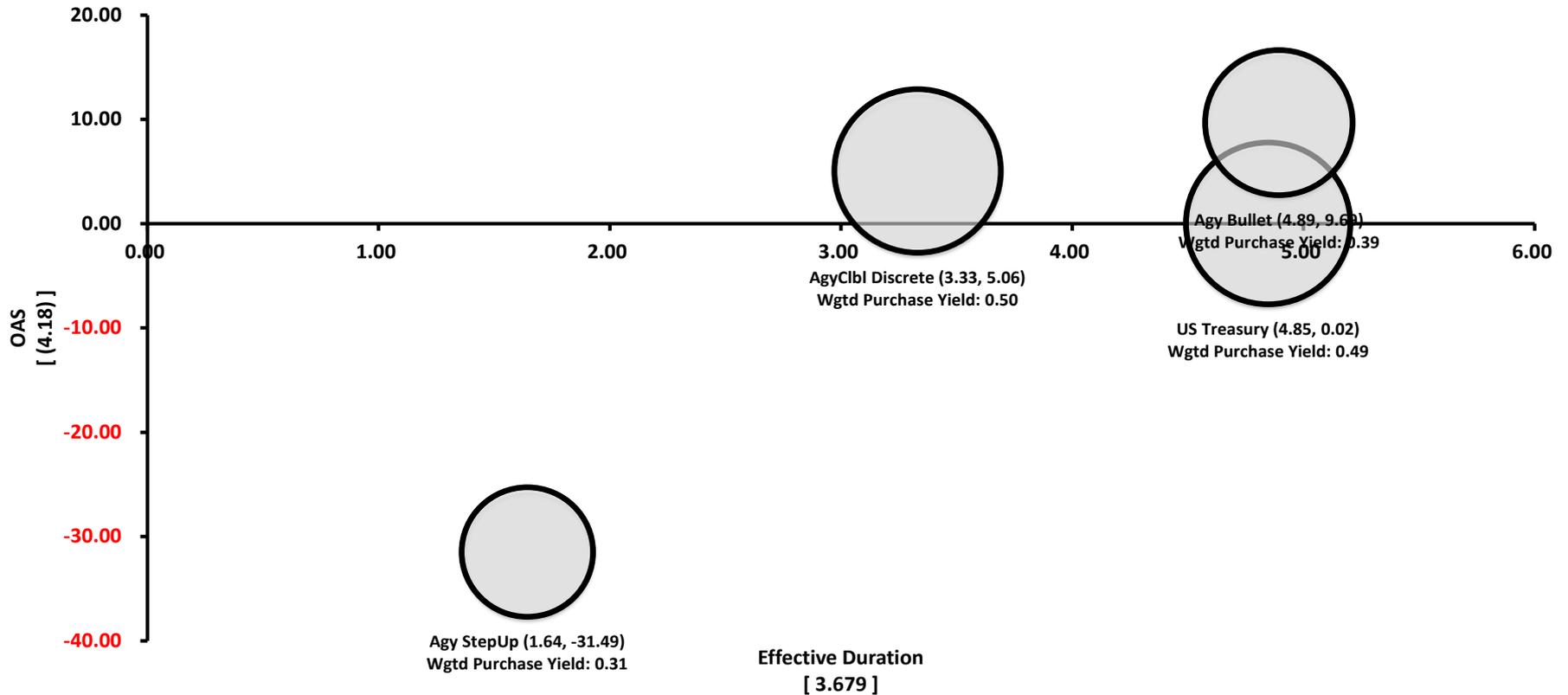
Sample Portfolio-20150603 (Using 06/03/15 Portfolio Data)  
Effective Duration versus Modified Duration Where Bubble Size is Mkt Vlu (\$000) [ 4,000.00 ]  
Par Amount (\$000): 3,994.18 | Purchase Yield: 1.69 | Effective Duration: 3.68



# Visual Analysis: Effective Duration vs. OAS vs. Yield Take 1

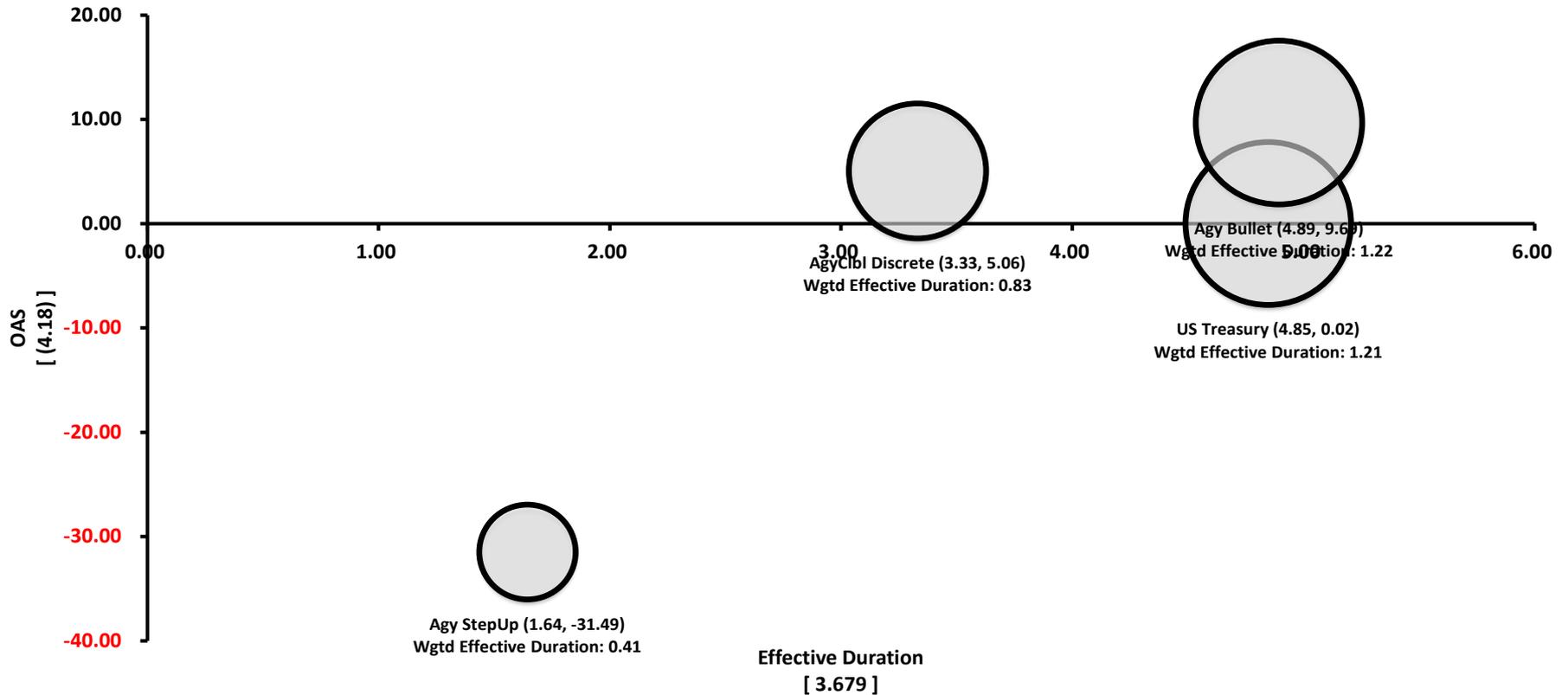
87

Sample Portfolio-20150603 (Using 06/03/15 Portfolio Data)  
Effective Duration versus OAS Where Bubble Size is MktWgt Purchase Yield [ 1.694 ]  
Par Amount (\$000): 3,994.18 | Purchase Yield: 1.69 | Effective Duration: 3.68



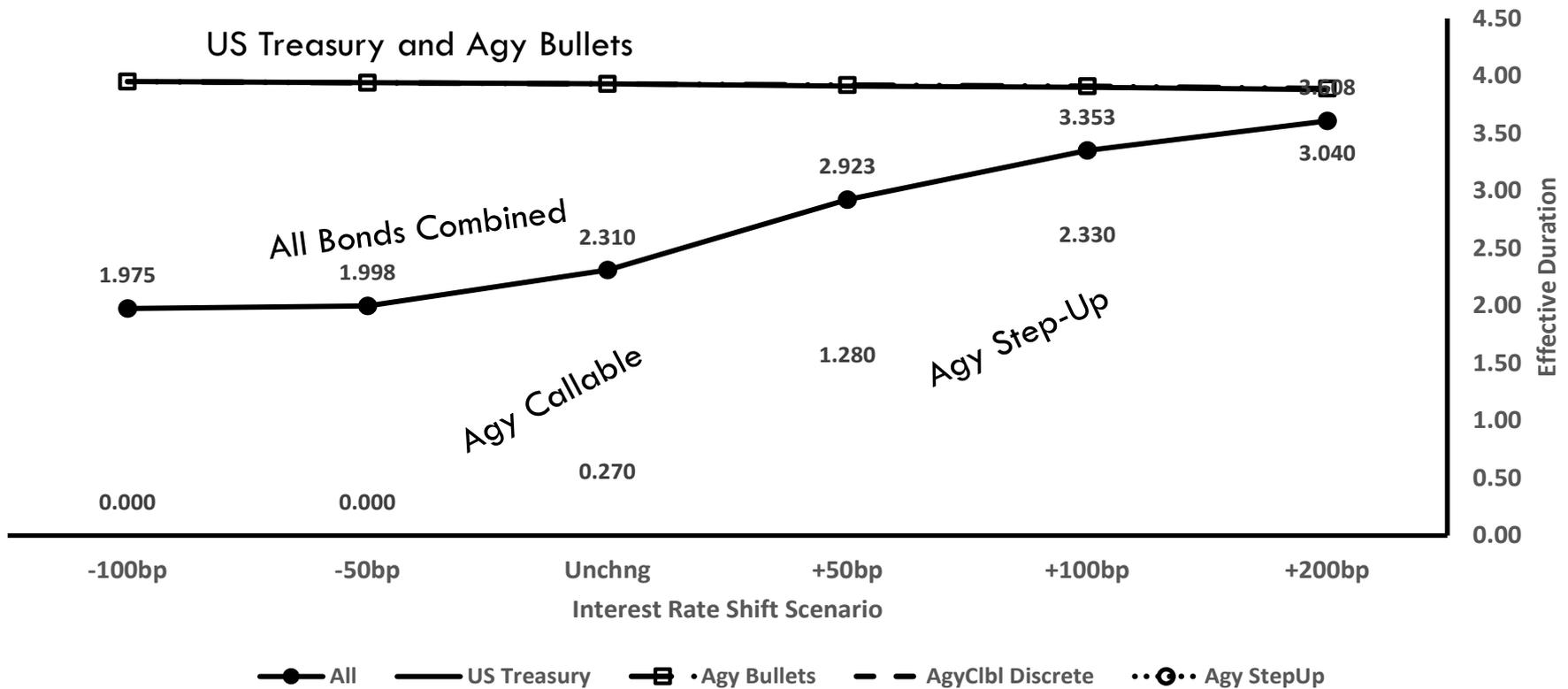
# Visual Analysis: Effective Duration vs. OAS Take 2

Sample Portfolio-20150603 (Using 06/03/15 Portfolio Data)  
Effective Duration versus OAS Where Bubble Size is MktWgt Effective Duration [ 3.679 ]  
Par Amount (\$000): 3,994.18 | Purchase Yield: 1.69 | Effective Duration: 3.68



# Visual Analysis: Change in Rates and Time

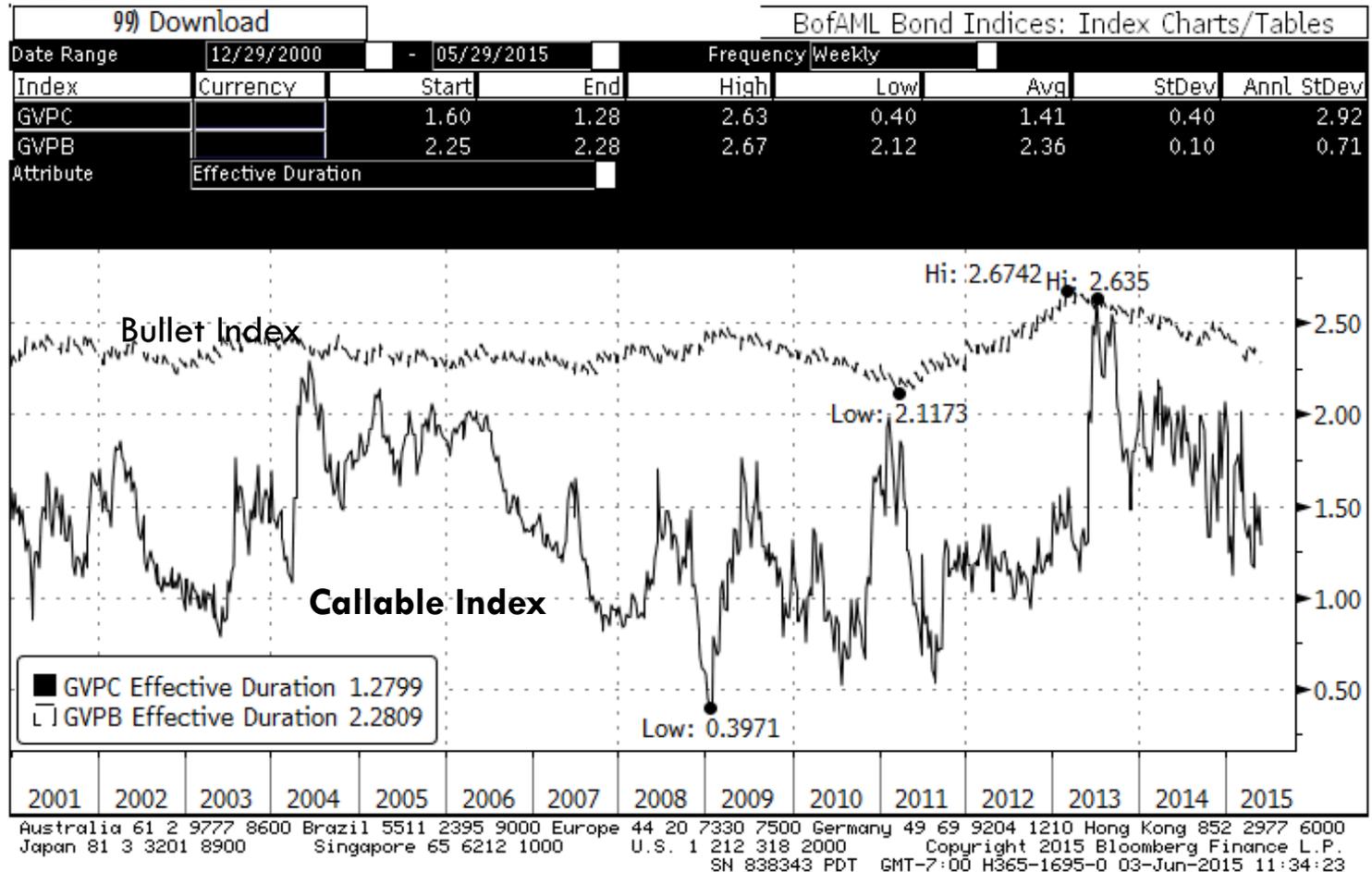
Sample Portfolio-20150603 Portfolio Duration Drift Analysis 12Mo Horizon



# Visual Analysis: Big Picture View Take 1

90

<HELP> for explanation.  
<Menu> to Return



# Visual Analysis: Big Picture View Take 2

<HELP> for explanation.

<Menu> to Return

99) Download				BofAML Bond Indices: Index Charts/Tables					
Date Range	12/29/2000	-	05/29/2015	Frequency	Weekly				
Index	Currency	Start	End	High	Low	Avg	StDev	Annl StDev	
GvPC		78	10	177	1	30	25	184	
GvPB		43	9	182	1	27	24	172	
Attribute	Govt OAS								



# QUESTIONS

# Public Investment Webinar Series: The Public Investment Portfolio

Webinar 3: Municipals	June 24
Webinar 4: Money Markets	
Part 1: Banker's Acceptances, Commercial Paper	July 8
Part 2: CDs, Deposit Placement Services and Collateralized Bank Deposits	July 22
Part 3: Repurchase Agreements, Reverse Repos and Securities Lending	August 5
Webinar 5: Corporates	August 19
Webinar 6: Asset-Backed Securities, Mortgage-Backed Securities and Collateralized Mortgage Obligations	Sept 2
Webinar 7: Mutual Funds, Money Market Mutual Funds and Local Government Pooled Investments	Sept 16

For more information or to register, go to

<http://www.treasurer.ca.gov/cdiac/webinars/2015/portfolio/description.asp>