Office of Debt Management
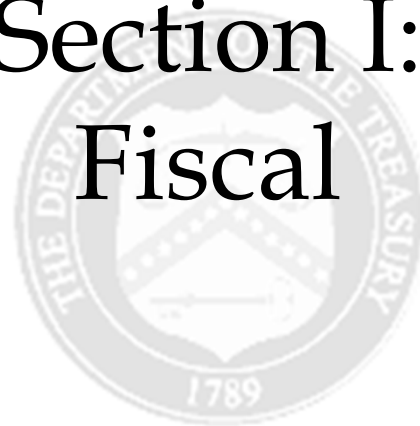
Fiscal Year 2013 Q2 Report
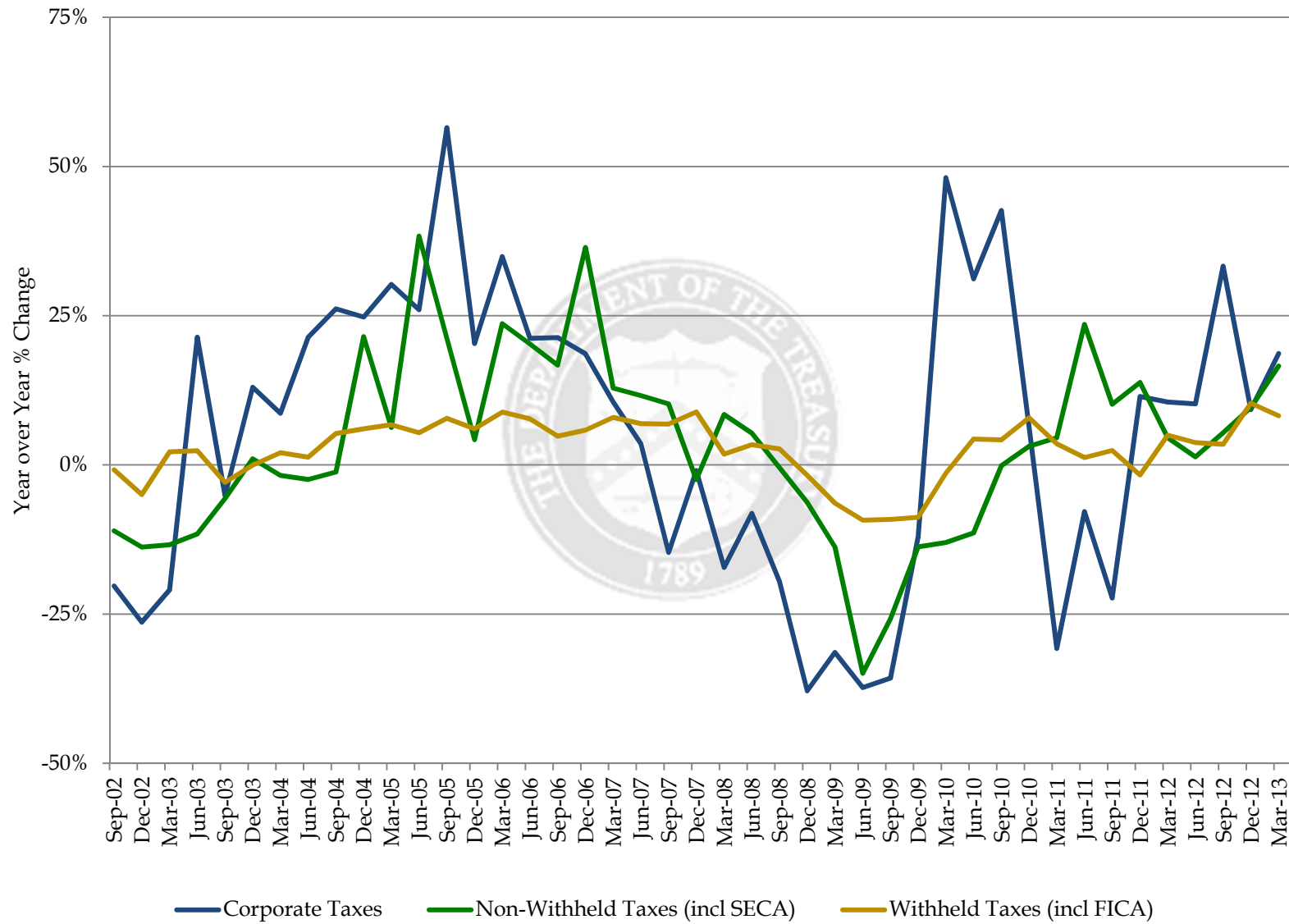
Table of Contents

Section I:
Fiscal

Quarterly Tax Receipts

Sept. 2002 year over year % change data point excluded from corporate taxes due to 9-11 impacts on data.

Monthly Receipt Levels
(12-Month Moving Average)
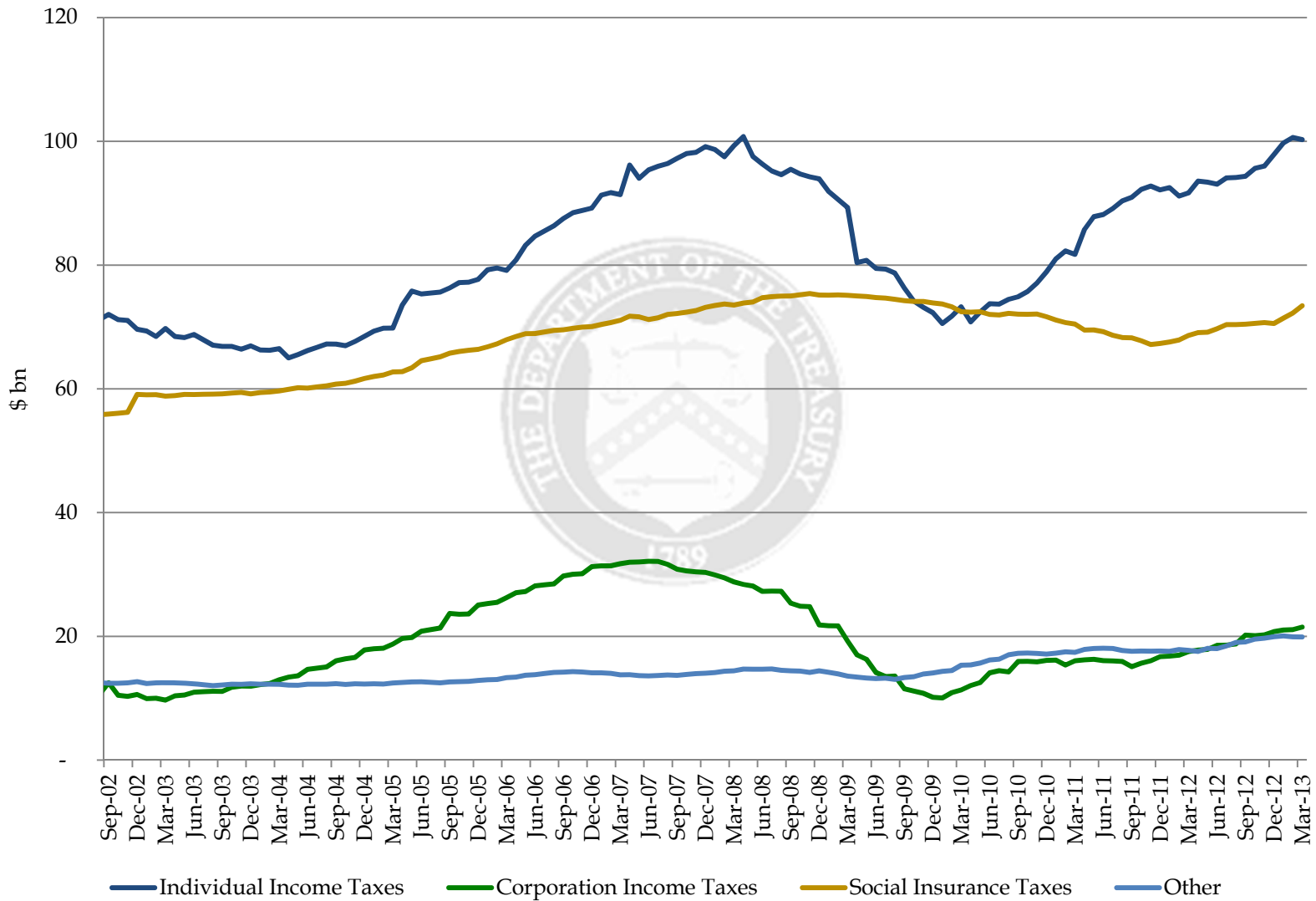
Individual Income Taxes include withheld and non-withheld. Social Insurance Taxes include FICA, SECA, RRTA, UTF deposits, FUTA and RUIA. Other includes excise taxes, estate and gift taxes, customs duties and miscellaneous receipts.

Eleven Largest Outlays

Legend: ■ Oct-Mar FY 2012   ■ Oct-Mar FY 2013

Y-axis: $ bn (0 to 500)

Categories: HHS, SSA, Defense, Treasury, Agriculture, Labor, VA, Transportation, OPM, Education, Other Defense Civil
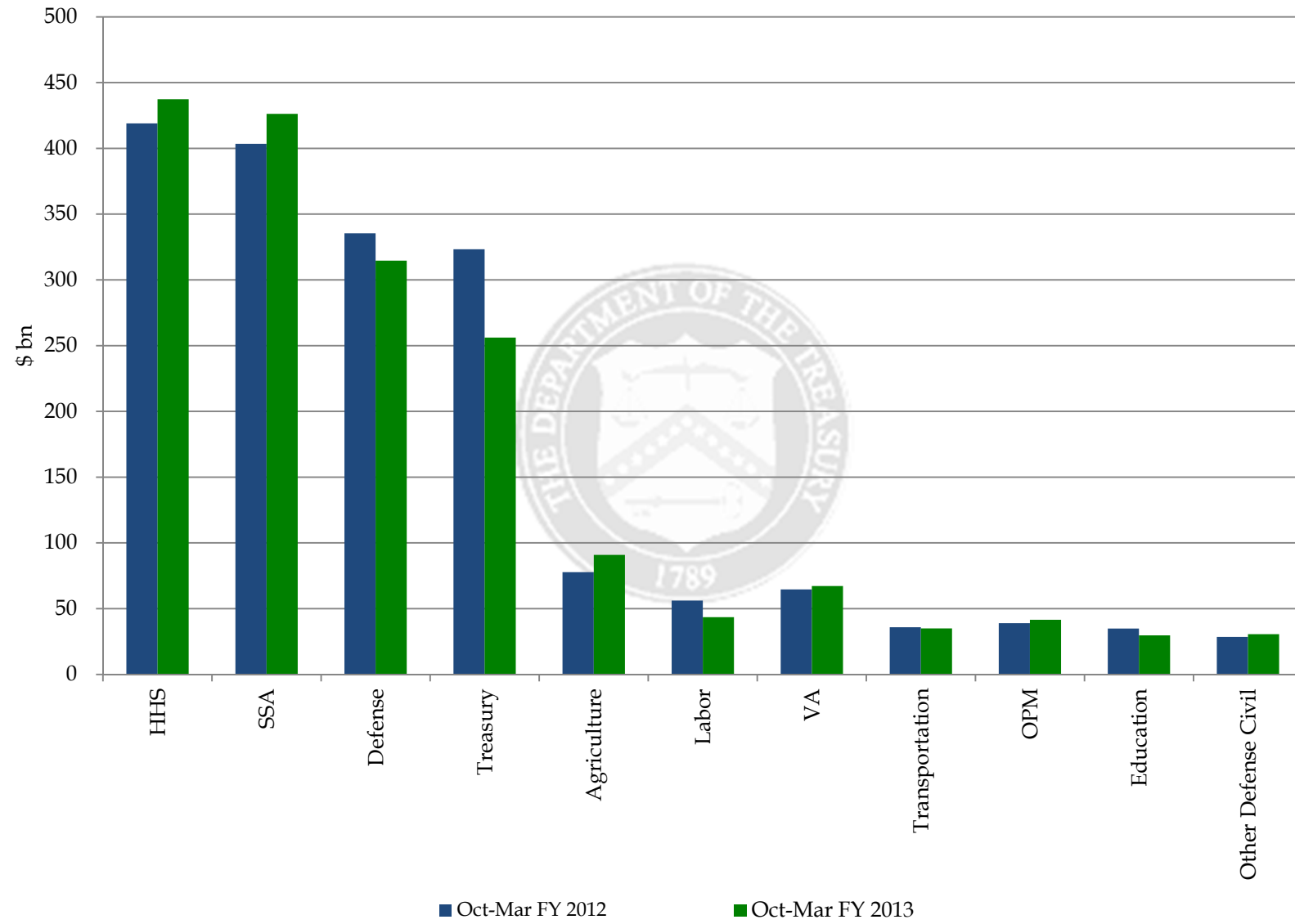
Treasury Net Nonmarketable Borrowing
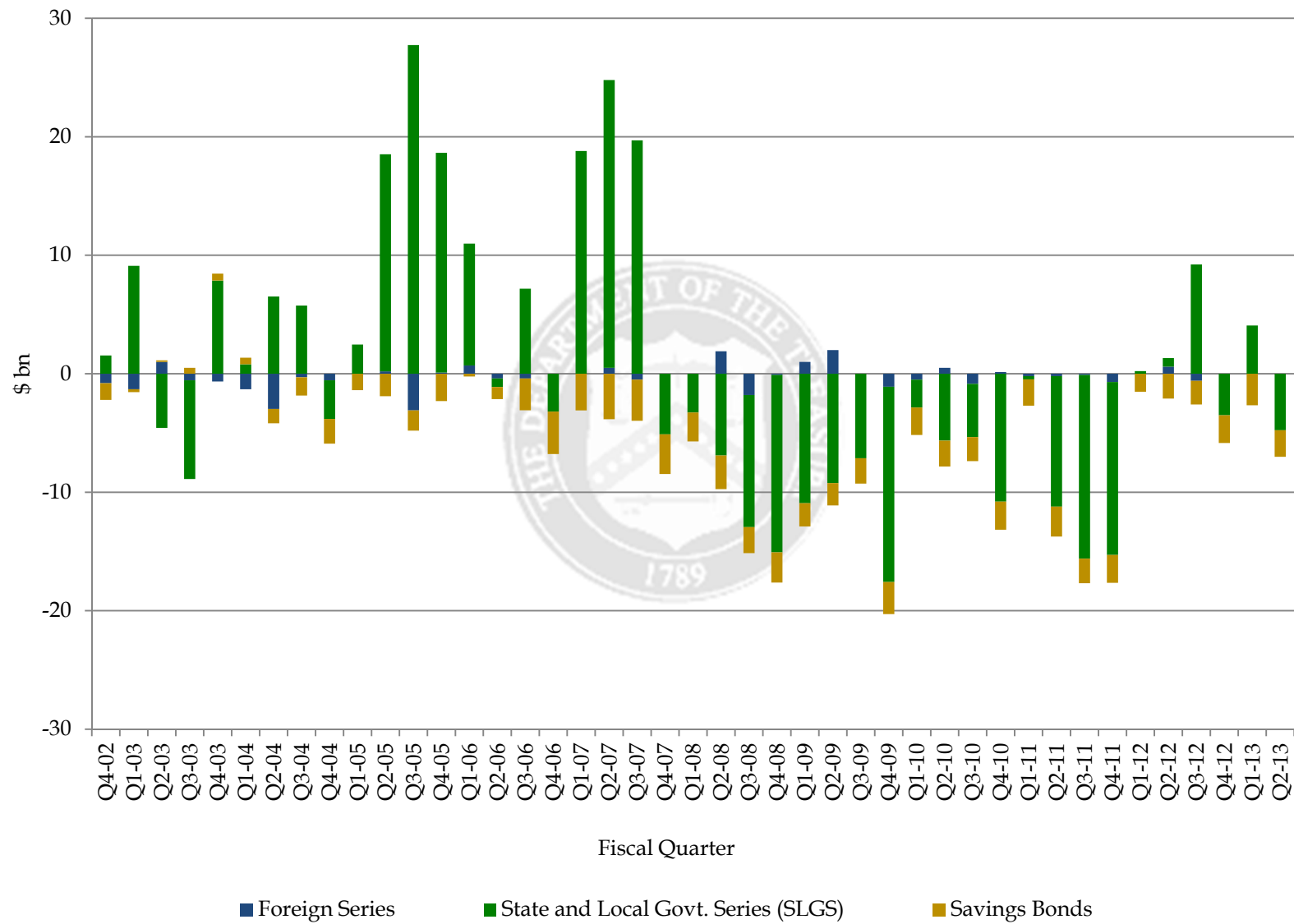
Cumulative Budget Deficits by Fiscal Year
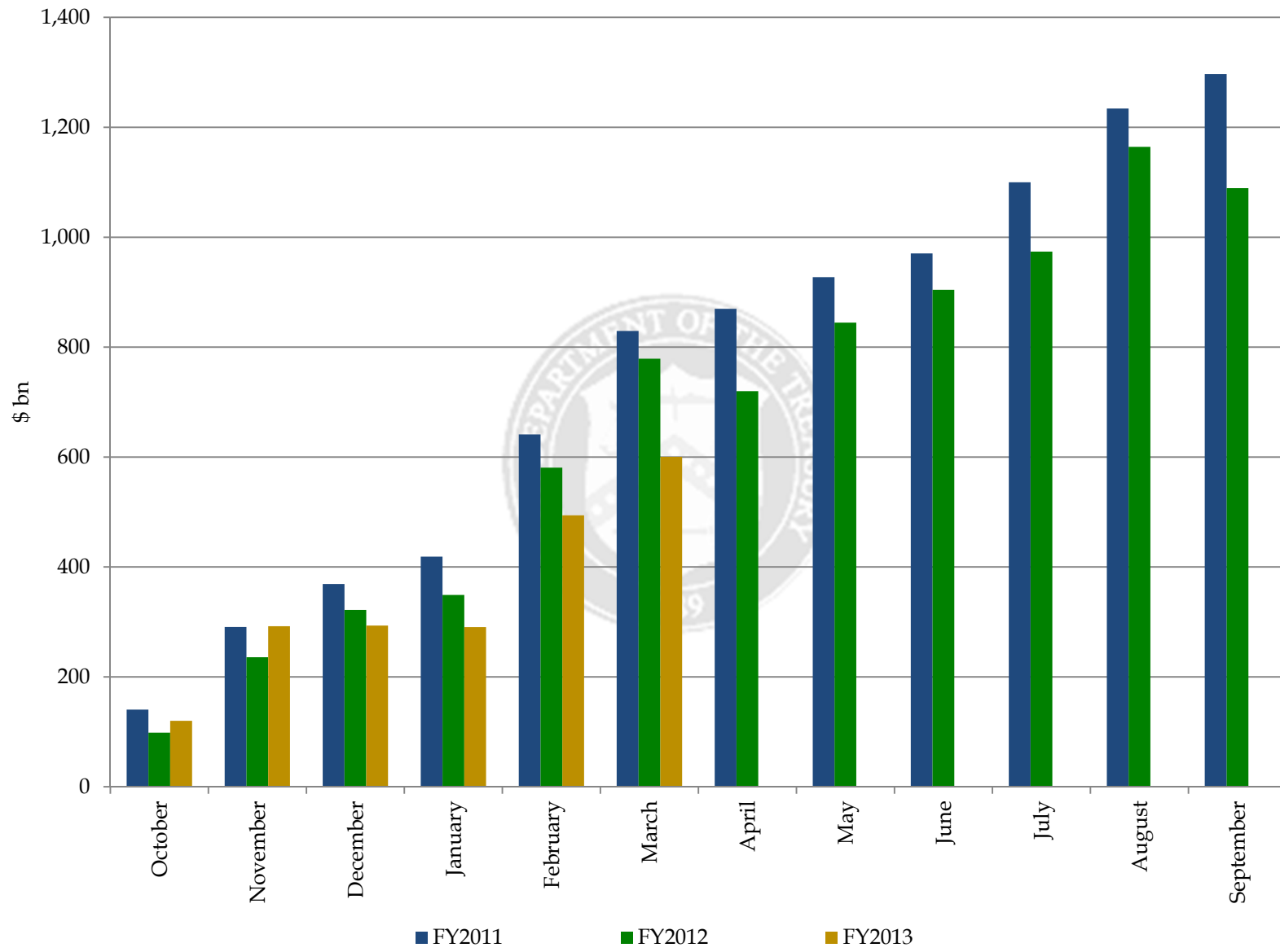
FY 2013-2015 Deficits and Net Marketable Borrowing Estimates   In $ Billions

	Primary Dealers[1]	CBO[2]	OMB[3]
FY 2013 Deficit Estimate	857	845	973
FY 2014 Deficit Estimate	711	616	744
FY 2015 Deficit Estimate	583	430	576
FY 2013 Deficit Range	660-960		
FY 2014 Deficit Range	582-900		
FY 2015 Deficit Range	430-850		
FY 2013 Net Marketable Borrowing Estimate	915	949	1,122
FY 2014 Net Marketable Borrowing Estimate	757	708	892
FY 2015 Net Marketable Borrowing Estimate	642	525	736
FY 2013 Net Marketable Borrowing Range	792-1,000		
FY 2014 Net Marketable Borrowing Range	564-890		
FY 2015 Net Marketable Borrowing Range	450-835		
Estimates as of:	Apr-13	Feb-13	Apr-13

[1]Based on primary dealer feedback on April 22, 2013. Estimates above are averages.
[2]Table 1-1 and 1-6 from "The Budget and Economic Outlook: Fiscal Years 2013 to 2023"
[3]Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government"

Budget Surplus/Deficit
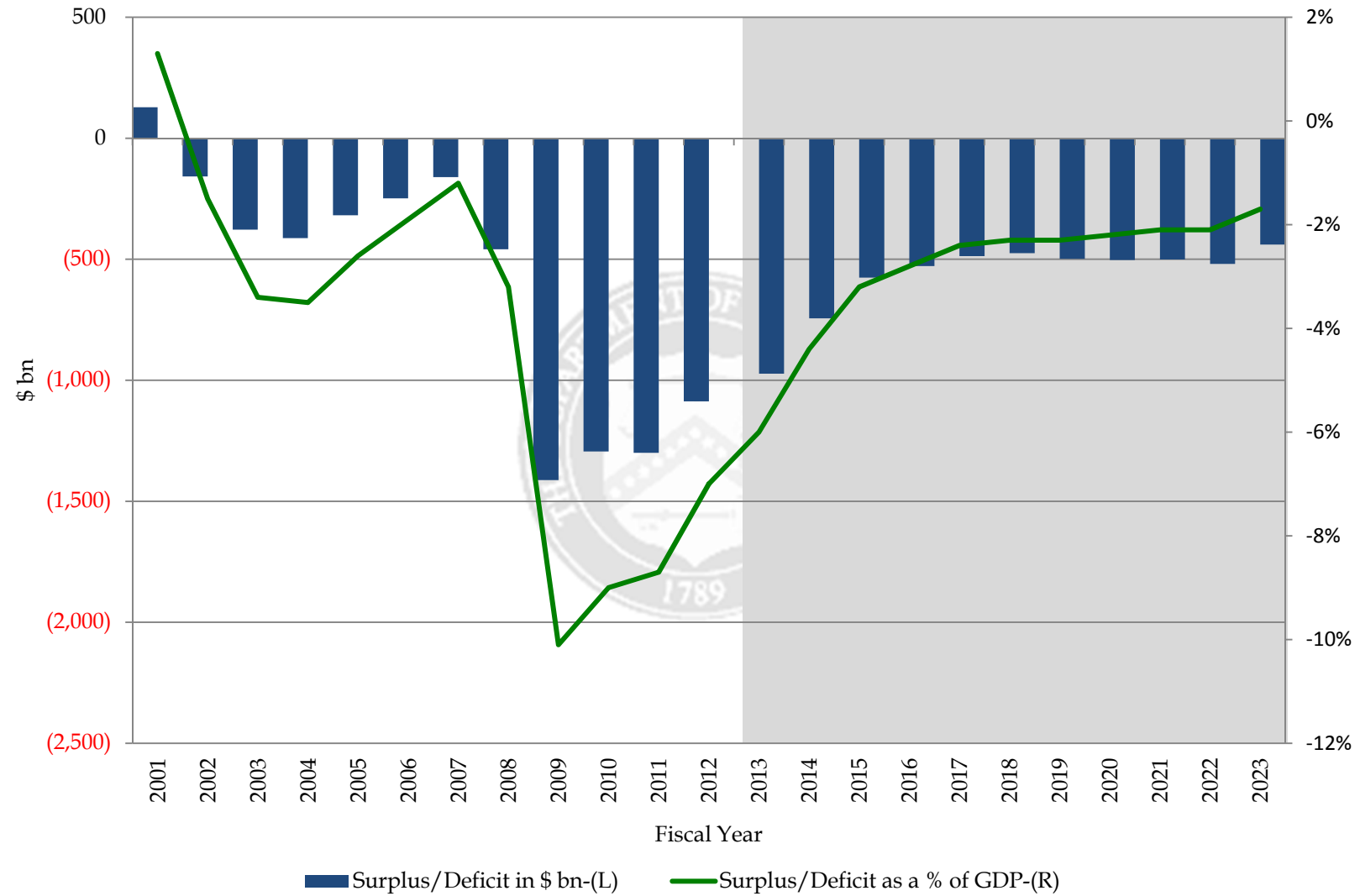
Surplus/Deficit in $ bn-(L)

Surplus/Deficit as a % of GDP-(R)

OMB's Projection

Projections are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government."

Section II: Financing

Sources of Financing in Fiscal Year 2013 Q2

January-March 2013	
Beginning Cash Balance	93
Ending Cash Balance	79
Subtotal: Funding from Drawdown of Cash	14
Net Bill Issuance	162
Net Coupon Issuance	187
Subtotal: Net Marketable Borrowing	349
Net Required Funding for FY 2013 Q2	362

Issuance	January-March 2013 Bill Issuance			Fiscal Year to Date		
	Gross	Maturing	Net	Gross	Maturing	Net
4-Week	535	515	20	1,040	1,020	20
13-Week	437	416	21	853	824	29
26-Week	378	360	18	742	719	23
52-Week	75	77	(2)	150	152	(2)
CMBs	105	0	105	210	105	105
Bill Subtotal	1,530	1,368	162	2,995	2,820	175

Issue	January-March 2013 Coupon Issuance			Fiscal Year to Date		
	Gross	Maturing	Net	Gross	Maturing	Net
2-Year	70	73	(3)	210	219	(9)
3-Year	96	127	(31)	192	251	(59)
5-Year	70	33	37	210	96	114
7-Year	58	0	58	174	0	174
10-Year	66	19	47	132	38	94
30-Year	42	0	42	84	0	84
5-Year TIPS	0	0	0	14	0	14
10-Year TIPS	28	0	28	41	0	41
30-Year TIPS	9	0	9	16	0	16
Coupon Subtotal	439	252	187	1,073	604	469

| Total | 1,969 | 1,620 | 349 | 4,068 | 3,424 | 644 |

Sources of Financing in Fiscal Year 2013 Q3
Assuming Constant Issuance Sizes as of 3/29/2013

April-June 2013	
Net Required Funding for FY 2013 Q3	(31)
Met with:	
Beginning Cash Balance	79
Treasury Annouced Estimate: Ending Cash Balance*	75
Subtotal: Funding from Drawdown of Cash	4
Assuming Constant Issuance Sizes as of 3/29/2013**:	
Net Bill Issuance	(63)
Net Coupon Issuance	210
Subtotal: Net Marketable Borrowing	147
Treasury Announced Estimate: Net Marketable Borrowing*	(35)
Implied: Decrease In FY 2013 Q3 Net Issuances	(182)

	April-June 2013 Bill Issuance			Fiscal Year to Date		
Issuance	Gross	Maturing	Net	Gross	Maturing	Net
4-Week	585	585	(0)	1,625	1,605	20
13-Week	455	437	18	1,308	1,261	47
26-Week	390	364	26	1,132	1,083	49
52-Week	100	102	(2)	250	254	(4)
CMBs	0	105	(105)	210	210	0
Bill Subtotal	1,530	1,593	(63)	4,525	4,413	112

	April-June 2013 Coupon Issuance			Fiscal Year to Date		
Issue	Gross	Maturing	Net	Gross	Maturing	Net
2-Year	105	112	(7)	315	330	(15)
3-Year	96	120	(24)	288	371	(83)
5-Year	105	62	43	315	158	157
7-Year	87	0	87	261	0	261
10-Year	66	18	48	198	56	142
30-Year	42	0	42	126	0	126
5-Year TIPS	18	16	2	32	16	16
10-Year TIPS	13	0	13	54	0	54
30-Year TIPS	7	0	7	23	0	23
Coupon Subtotal	539	329	210	1,612	932	680

Total	2,069	1,922	147	6,137	5,345	792

*Financing Estimates released by the Treasury can be found via the following url: http://www.treasury.gov/resource-center/data-chart-center/quarterly-refunding/Pages/Latest.aspx
**Keeping issuance sizes and patterns, as of 3/29/2013, constant for all securities.

OMB's Projections of Borrowing from the Public

FY 2013 - 2023 Cumulative Total		
	$ bn	%
Primary Deficit	1,116	14%
Net Interest	5,127	66%
Other	1,506	19%
Total	7,749	
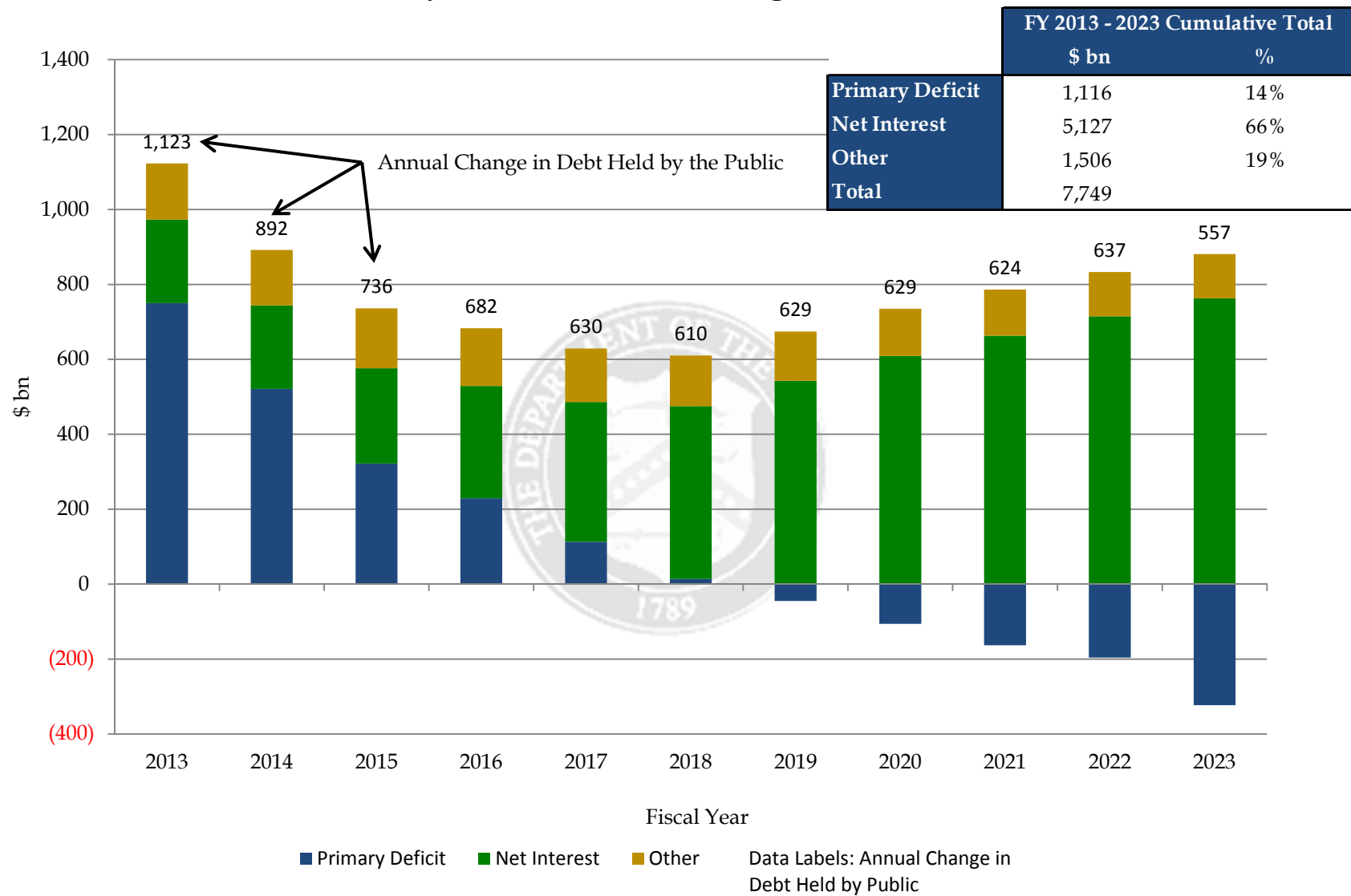
OMB's projections of borrowing from the public are from Table S-4 and S-13 of the "Fiscal Year 2014 Budget of the US Government." Data labels represent the change in debt held by the public in $ billions. "Other" represents borrowing from the public to provide direct and guaranteed loans, in addition to TARP activity. Data labels represent the annual change in debt held by the public.

Interest Rate Assumptions
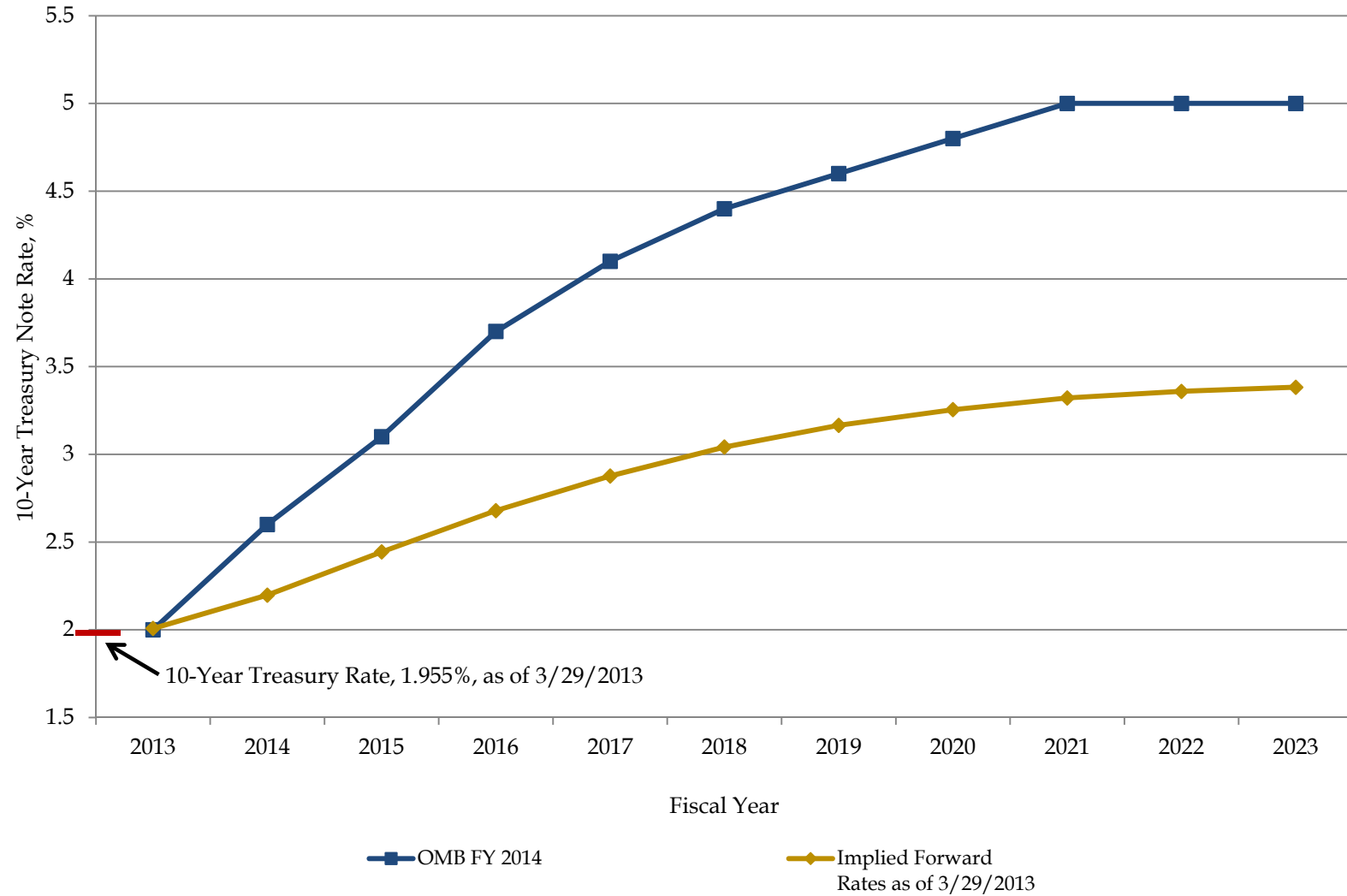
OMB's economic assumption of the 10-year Treasury note rates are from the Table S-12 of the "Fiscal Year 2014 Budget of the US Government." The implied 10-Year Treasury note forward rates are the averages for each fiscal year.

Historical Net Marketable Borrowing and Projected Net Borrowing Assuming Future Issuance Remains Constant

Legend: Bills | 2/3/5 | 7/10/30 | TIPS | Historical Net Marketable Borrowing/Projected Net Borrowing (data labels at bottom) | OMB's Projections of Borrowing from the Public

Data labels (End of Fiscal Year):

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1,786	1,483	1,104	1,115	1,044	754	635	666	503	631	544	394	286	276	177

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's March 2013 primary dealer survey. Assumes issuance sizes for Bills, Nominal Coupons and TIPS are unchanged from 3/29/2013 levels, along with SOMA reinvestment. The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. No attempt was ma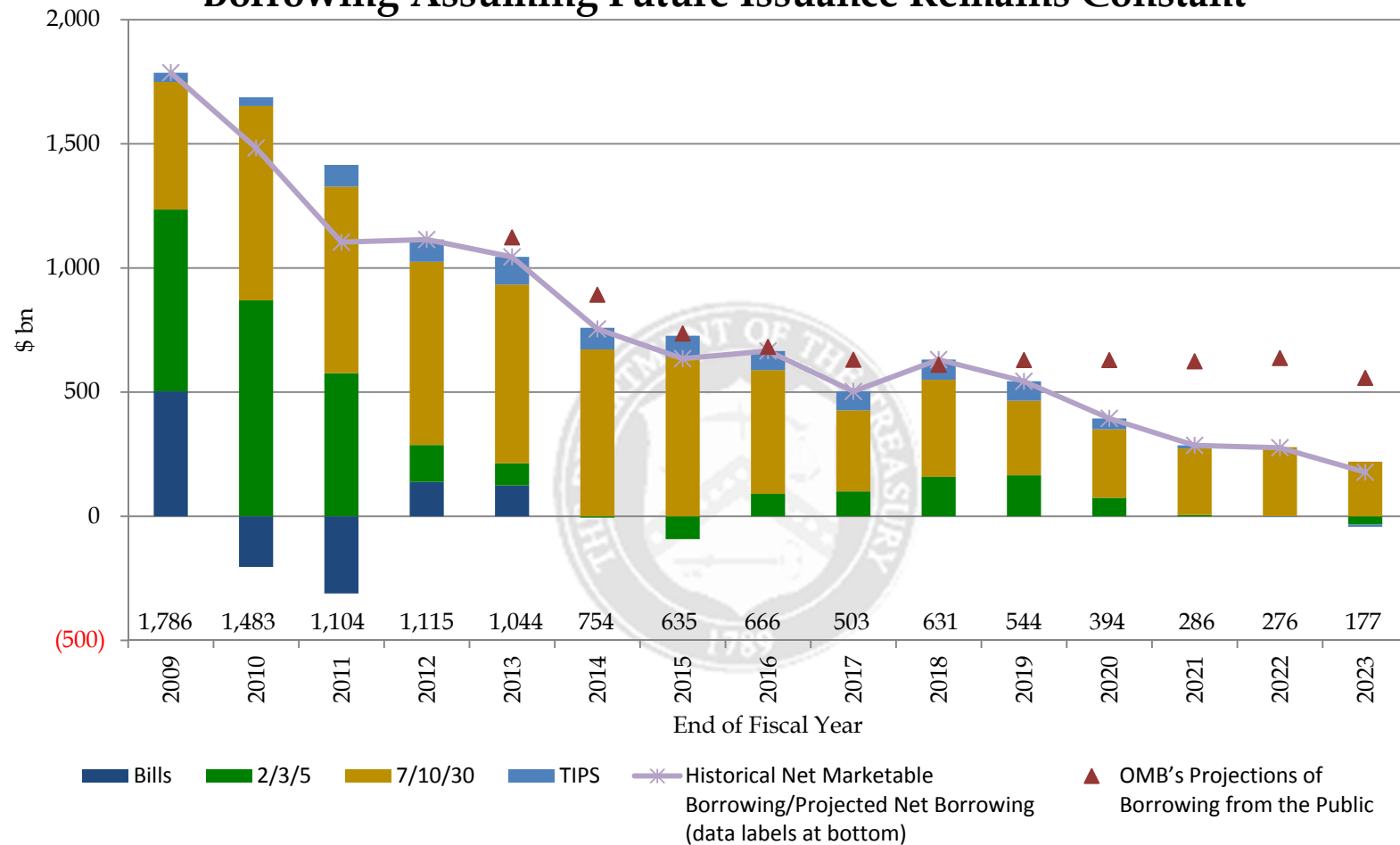de to match future financing needs. OMB's projections of borrowing from the public projections are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government."

Data labels represent historical net marketable borrowing and projected net borrowing assuming future issuance remains constant at current sizes. See table on the following page for details.

Historical Net Marketable Borrowing and Projected Net Borrowing*
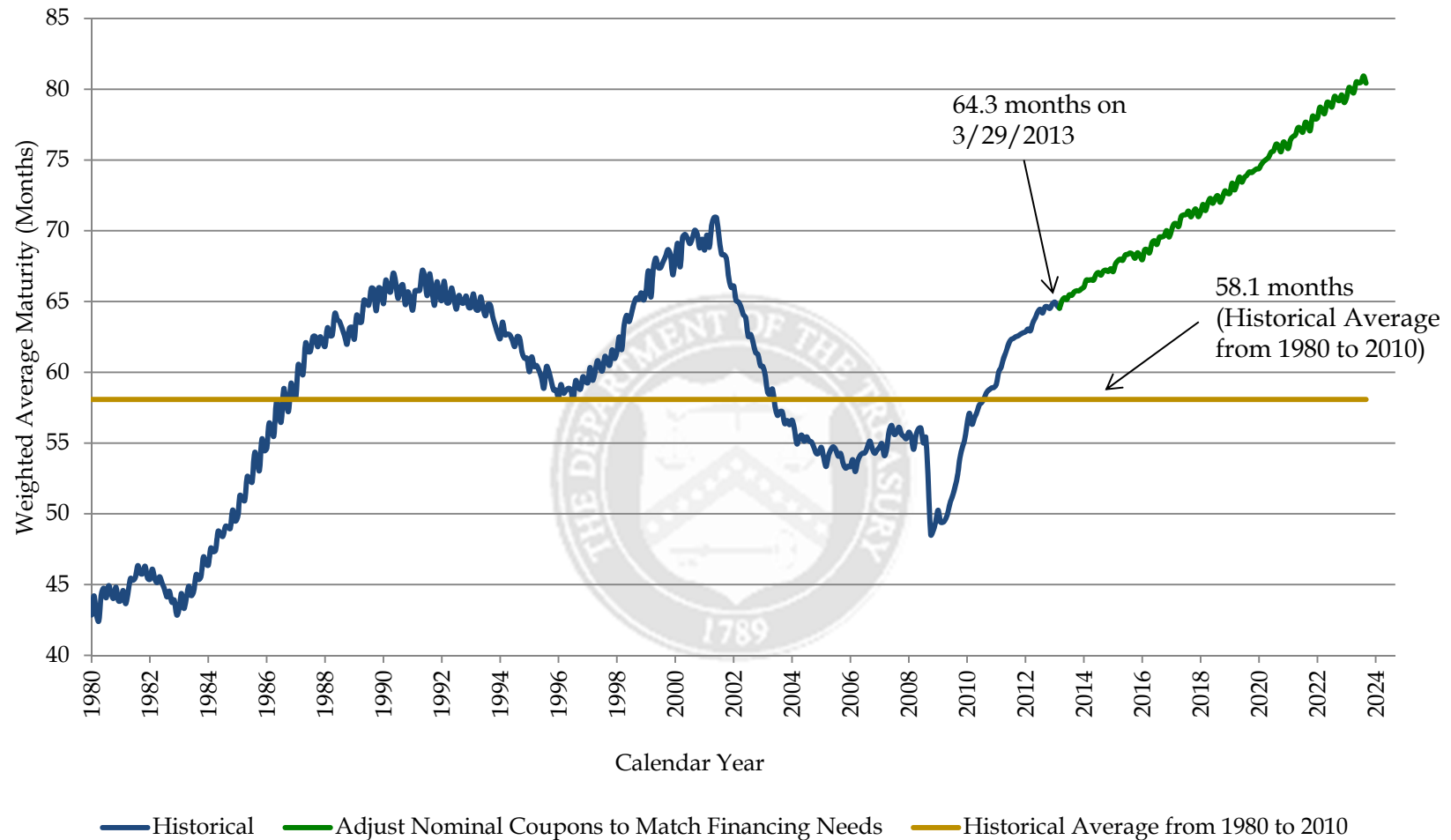## Assuming Future Issuance Remains Constant, $ Billion

End of Fiscal Year	Bills	2/3/5	7/10/30	TIPS	Historical Net Marketable Borrowing/Projected Net Borrowing Capacity	OMB's Projections of Borrowing from the Public
2009	503	732	514	38	1,786	
2010	(204)	869	783	35	1,483	
2011	(311)	576	751	88	1,104	
2012	139	148	738	90	1,115	
2013	124	90	720	111	1,044	1,123
2014	0	(5)	672	87	754	892
2015	0	(92)	641	86	635	736
2016	0	90	498	77	666	682
2017	0	100	326	76	503	630
2018	0	159	390	82	631	610
2019	0	165	300	78	544	629
2020	0	75	275	44	394	629
2021	0	5	268	12	286	624
2022	0	0	279	(3)	276	637
2023	0	(34)	220	(9)	177	557

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's March 2013 primary dealer survey. Assumes issuance sizes for Bills, Nominal Coupons and TIPS are unchanged from 3/29/2013 levels, along with SOMA reinvestment. The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. No attempt was made to match future financing needs. OMB's projections of borrowing from the public projections are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government."
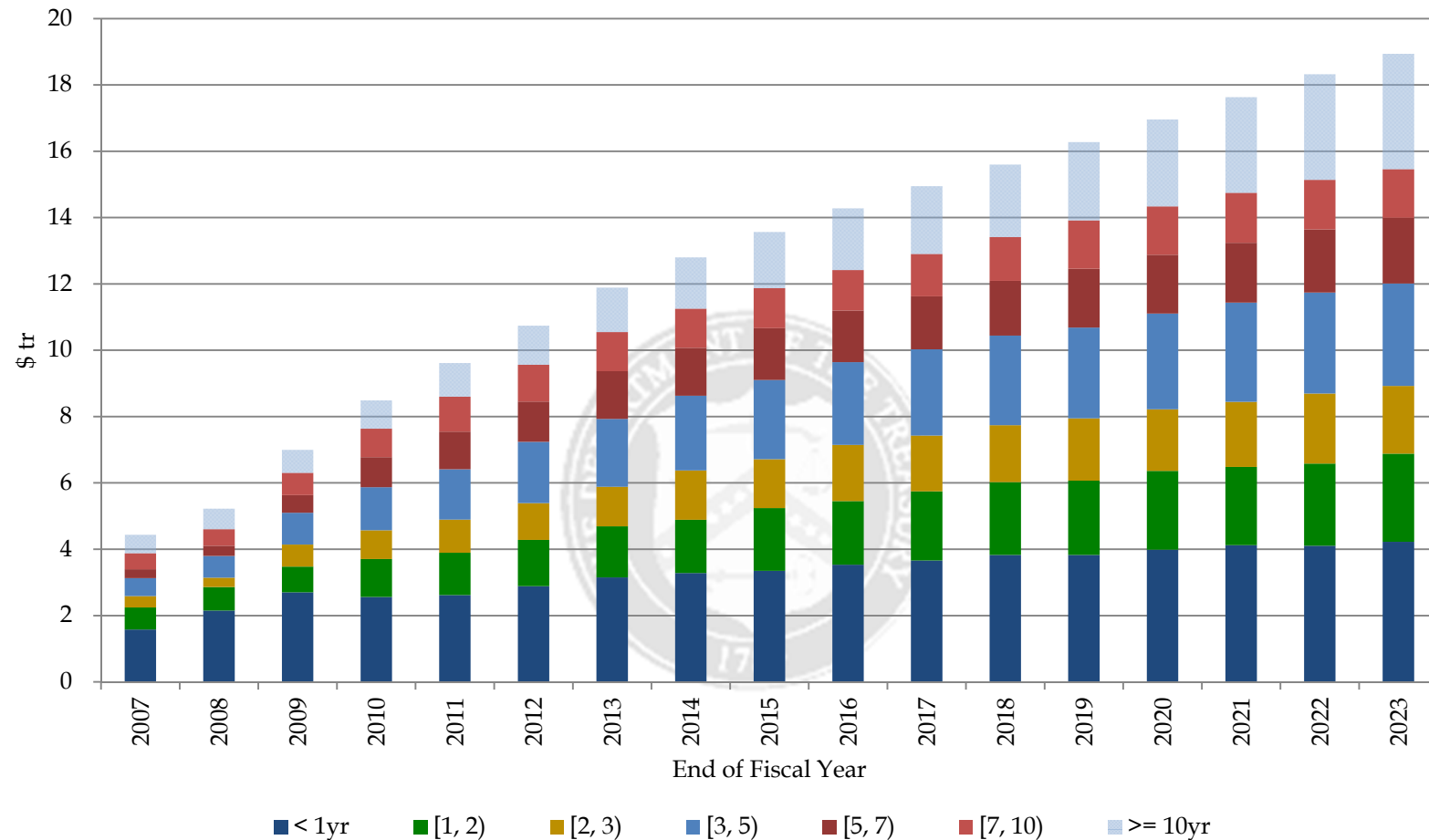
Section III:
Portfolio Metrics

Weighted Average Maturity of Marketable Debt Outstanding

64.3 months on 3/29/2013

58.1 months (Historical Average from 1980 to 2010)

Calendar Year

Weighted Average Maturity (Months)

——Historical   ——Adjust Nominal Coupons to Match Financing Needs   ——Historical Average from 1980 to 2010

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's March 2013 primary dealer survey. To match OMB's projected borrowing from the public for the next 10 years, nominal coupon securities (2-, 3-, 5-, 7-, 10-, and 30-year) were adjusted by the same percentage. OMB's projections of borrowing from the public are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government." The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. This scenario does not represent any particular course of action that Treasury is expected to follow. Instead, it is intended to demonstrate the basic trajectory of average maturity absent changes to the mix of securities issued by Treasury.

Recent and Future Maturity Profile, $ Trillion

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's March 2013 primary dealer survey. To match OMB's projected borrowing from the public for the next 10 years, nominal coupon securities (2-, 3-, 5-, 7-, 10-, and 30-year) were adjusted by the same percentage. OMB's projections of borrowing from the public are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government." The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. This scenario does not represent any particular course of action that Treasury is expected to follow. Instead, it is intended to demonstrate the basic trajectory of average maturity absent changes to the mix of securities issued by Treasury. See table on the following page for details.
Maturity distribution by original issuance type and term can be found in the appendix (slide 43).
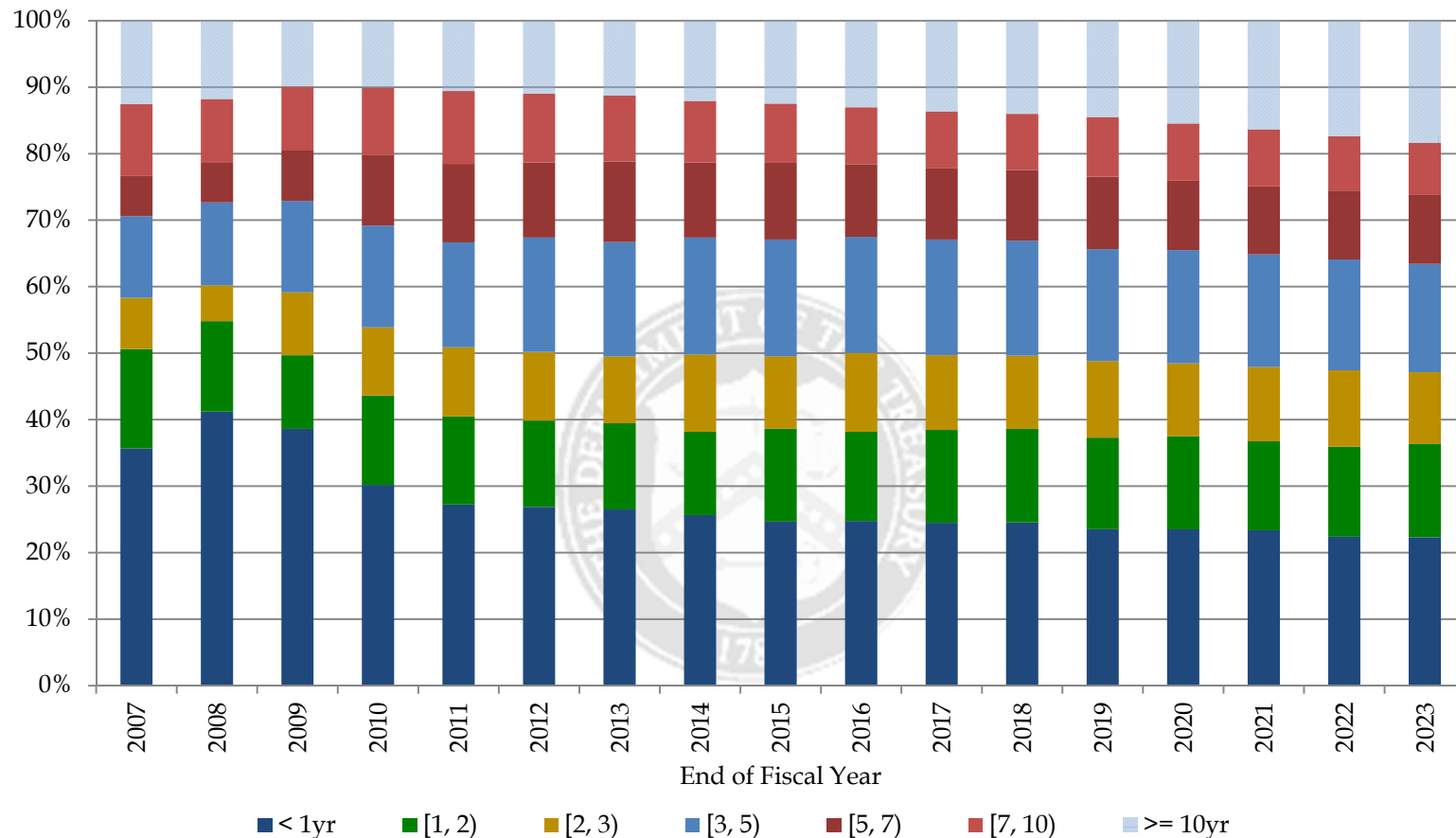
Recent and Future Maturity Profile, $ Billion

End of Fiscal Year	< 1yr	[1, 2)	[2, 3)	[3, 5)	[5, 7)	[7, 10)	>= 10yr	Total	[0, 5)
2007	1,581	663	341	545	267	480	557	4,434	3,130
2008	2,152	711	280	653	310	499	617	5,222	3,796
2009	2,702	774	663	962	529	672	695	6,998	5,101
2010	2,563	1,141	869	1,299	907	856	853	8,488	5,872
2011	2,620	1,272	1,002	1,516	1,136	1,053	1,017	9,616	6,410
2012	2,889	1,395	1,109	1,847	1,214	1,108	1,181	10,742	7,239
2013	3,150	1,542	1,193	2,045	1,439	1,180	1,340	11,888	7,929
2014	3,283	1,605	1,486	2,252	1,447	1,177	1,550	12,801	8,627
2015	3,347	1,896	1,474	2,385	1,563	1,206	1,694	13,565	9,103
2016	3,535	1,918	1,692	2,496	1,556	1,222	1,861	14,281	9,641
2017	3,661	2,087	1,680	2,600	1,597	1,278	2,045	14,948	10,028
2018	3,830	2,194	1,716	2,700	1,653	1,319	2,188	15,601	10,441
2019	3,829	2,240	1,878	2,738	1,772	1,458	2,363	16,277	10,685
2020	3,986	2,377	1,857	2,888	1,770	1,457	2,623	16,957	11,108
2021	4,121	2,360	1,965	2,989	1,806	1,505	2,887	17,633	11,435
2022	4,105	2,480	2,108	3,049	1,901	1,495	3,186	18,325	11,742
2023	4,225	2,657	2,044	3,087	1,980	1,464	3,483	18,939	12,012

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's March 2013 primary dealer survey. To match OMB's projected borrowing from the public for the next 10 years, nominal coupon securities (2-, 3-, 5-, 7-, 10-, and 30-year) were adjusted by the same percentage. OMB's projections of borrowing from the public are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government." The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. This scenario does not represent any particular course of action that Treasury is expected to follow. Instead, it is intended to demonstrate the basic trajectory of average maturity absent changes to the mix of securities issued by Treasury.
Maturity distribution by original issuance type and term can be found in the appendix (slide 43).

Recent and Future Maturity Profile, Percent

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's March 2013 primary dealer survey. To match OMB's projected borrowing from the public for the next 10 years, nominal coupon securities (2-, 3-, 5-, 7-, 10-, and 30-year) were adjusted by the same percentage. OMB's projections of borrowing from the public are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government." The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. This scenario does not represent any particular course of action that Treasury is expected to follow. Instead, it is intended to demonstrate the basic trajectory of average maturity absent changes to the mix of securities issued by Treasury. See table on the following page for details.

Maturity distribution by original issuance type and term can be found in the appendix (slide 43).

Recent and Future Maturity Profile, Percent

End of Fiscal Year	< 1yr	[1, 2)	[2, 3)	[3, 5)	[5, 7)	[7, 10)	>= 10yr	[0, 3)	[0, 5)
2007	35.7%	15.0%	7.7%	12.3%	6.0%	10.8%	12.6%	58.3%	70.6%
2008	41.2%	13.6%	5.4%	12.5%	5.9%	9.6%	11.8%	60.2%	72.7%
2009	38.6%	11.1%	9.5%	13.7%	7.6%	9.6%	9.9%	59.1%	72.9%
2010	30.2%	13.4%	10.2%	15.3%	10.7%	10.1%	10.0%	53.9%	69.2%
2011	27.2%	13.2%	10.4%	15.8%	11.8%	10.9%	10.6%	50.9%	66.7%
2012	26.9%	13.0%	10.3%	17.2%	11.3%	10.3%	11.0%	50.2%	67.4%
2013	26.5%	13.0%	10.0%	17.2%	12.1%	9.9%	11.3%	49.5%	66.7%
2014	25.6%	12.5%	11.6%	17.6%	11.3%	9.2%	12.1%	49.8%	67.4%
2015	24.7%	14.0%	10.9%	17.6%	11.5%	8.9%	12.5%	49.5%	67.1%
2016	24.8%	13.4%	11.8%	17.5%	10.9%	8.6%	13.0%	50.0%	67.5%
2017	24.5%	14.0%	11.2%	17.4%	10.7%	8.5%	13.7%	49.7%	67.1%
2018	24.6%	14.1%	11.0%	17.3%	10.6%	8.5%	14.0%	49.6%	66.9%
2019	23.5%	13.8%	11.5%	16.8%	10.9%	9.0%	14.5%	48.8%	65.6%
2020	23.5%	14.0%	11.0%	17.0%	10.4%	8.6%	15.5%	48.5%	65.5%
2021	23.4%	13.4%	11.1%	17.0%	10.2%	8.5%	16.4%	47.9%	64.9%
2022	22.4%	13.5%	11.5%	16.6%	10.4%	8.2%	17.4%	47.4%	64.1%
2023	22.3%	14.0%	10.8%	16.3%	10.5%	7.7%	18.4%	47.1%	63.4%

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's March 2013 primary dealer survey. To match OMB's projected borrowing from the public for the next 10 years, nominal coupon securities (2-, 3-, 5-, 7-, 10-, and 30-year) were adjusted by the same percentage. OMB's projections of borrowing from the public are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government." The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. This scenario does not represent any particular course of action that Treasury is expected to follow. Instead, it is intended to demonstrate the basic trajectory of average maturity absent changes to the mix of securities issued by Treasury.
Maturity distribution by original issuance type and term can be found in the appendix (slide 43).

Section IV: Demand
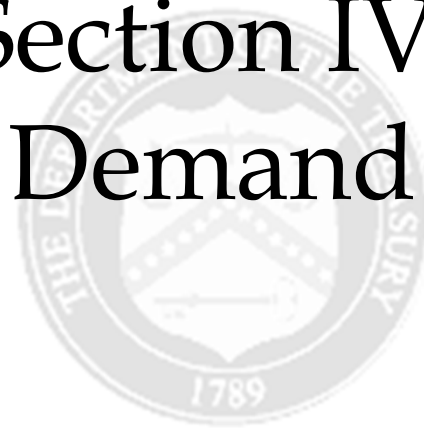
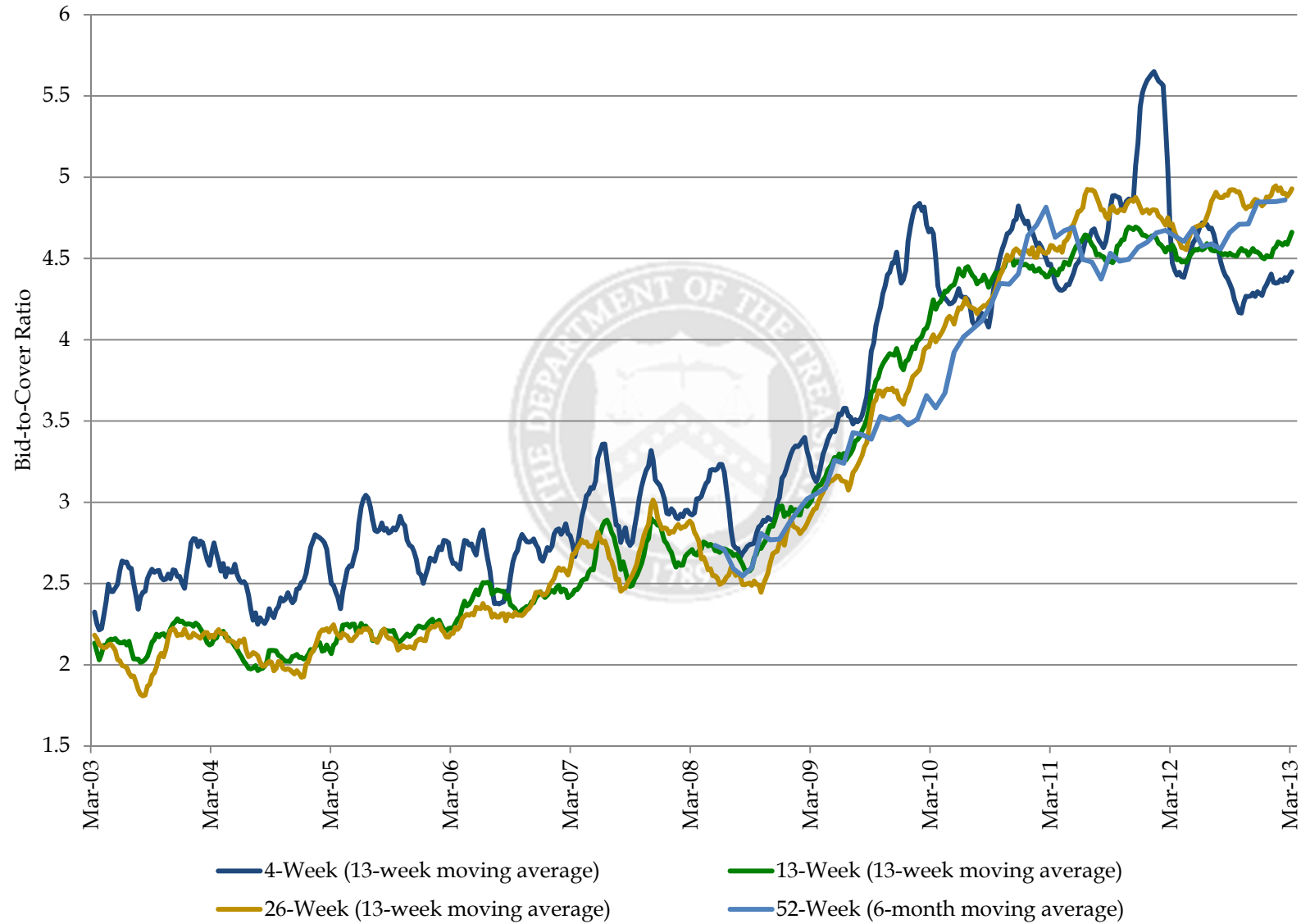# Summary Statistics for Fiscal Year 2013 Q2 Auctions

Security Type	Term	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($ bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($ bn)	SOMA Add Ons ($ bn)	10-Yr Equivalent ($ bn)**
Bill	4-Week	0.081	4.4	530.3	64.1%	8.0%	27.8%	3.7	0.0	4.57
Bill	13-Week	0.087	4.7	426.7	71.5%	7.1%	21.4%	6.6	0.0	12.14
Bill	26-Week	0.114	4.9	364.5	61.5%	7.1%	31.4%	5.8	0.0	21.01
Bill	52-Week	0.145	4.8	74.4	68.9%	6.9%	24.1%	0.5	0.0	8.33
Bill	CMBs	0.111	4.6	105.0	76.4%	8.1%	15.5%	0.0	0.0	1.83
Coupon	2-Year	0.272	3.5	69.5	49.2%	30.8%	20.0%	0.3	0.0	15.55
Coupon	3-Year	0.402	3.6	95.6	52.1%	25.5%	22.3%	0.1	0.0	31.94
Coupon	5-Year	0.833	2.9	69.9	43.7%	15.6%	40.7%	0.1	0.0	38.13
Coupon	7-Year	1.338	2.6	58.0	45.2%	19.0%	35.8%	0.0	0.0	43.07
Coupon	10-Year	1.982	2.9	65.9	42.5%	23.1%	34.4%	0.1	0.0	66.27
Coupon	30-Year	3.167	2.7	42.0	49.3%	12.2%	38.6%	0.0	0.0	91.06
TIPS	5-Year									
TIPS	10-Year	(0.617)	2.7	27.9	38.9%	8.7%	52.4%	0.1	0.0	30.85
TIPS	30-Year	0.639	2.5	9.0	31.6%	14.0%	54.5%	0.0	0.0	27.24

|	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($ bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($ bn)	SOMA Add Ons ($ bn)	10-Yr Equivalent ($ bn)**
Total Bills	0.096	4.6	1,500.9	66.7%	7.5%	25.8%	16.6	0.0	47.89
Total Coupons	1.140	3.1	400.9	47.3%	22.0%	30.8%	0.6	0.0	286.03
Total TIPS	(0.311)	2.7	36.9	37.1%	10.0%	52.9%	0.1	0.0	58.10

*Weighted averages of Competitive Awards.
**Approximated using prices at settlement and includes both Competitive and Non-Competitive Awards. For TIPS' 10-Year Equivalent, a constant auction BEI is used as the inflation assumption.
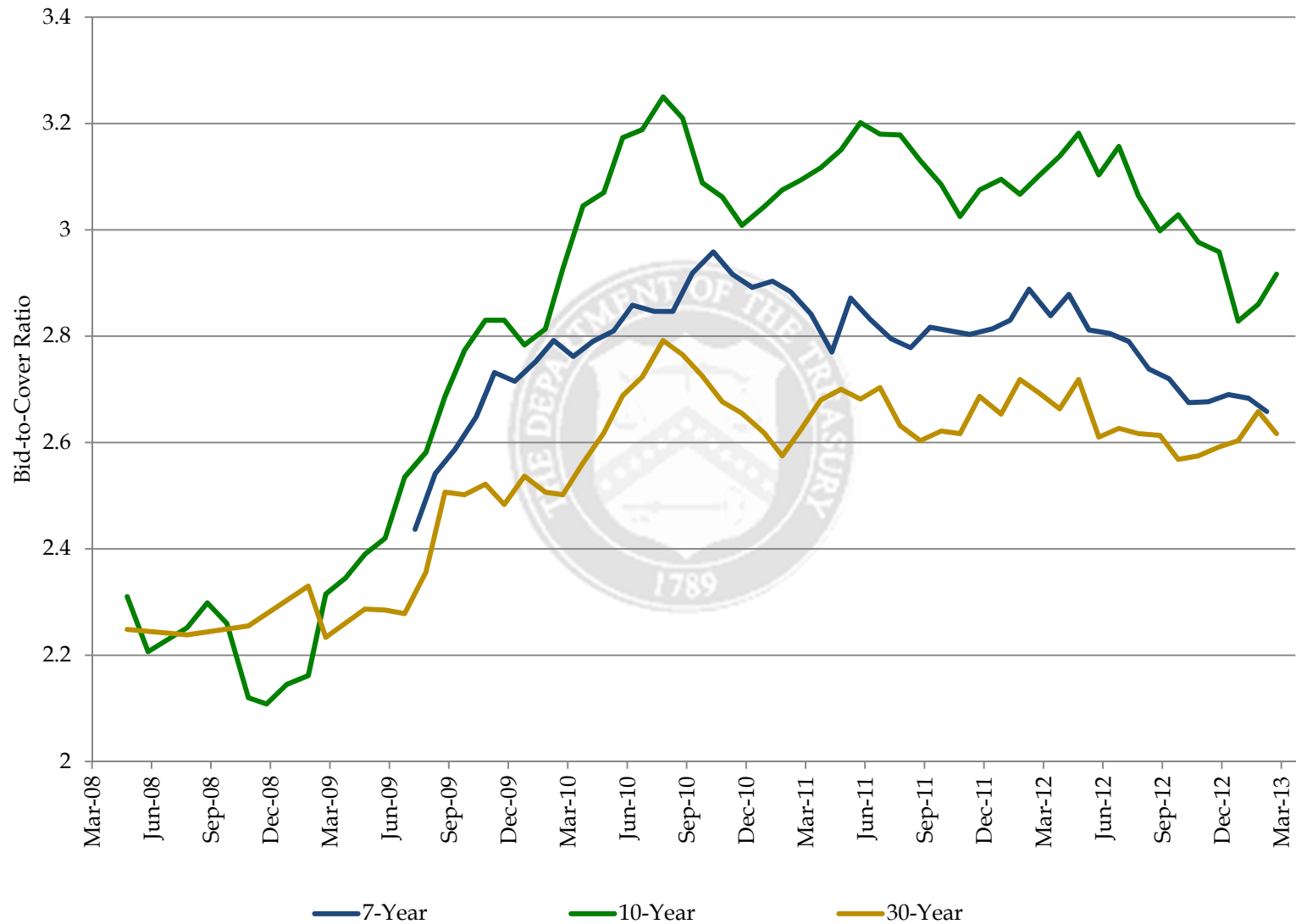
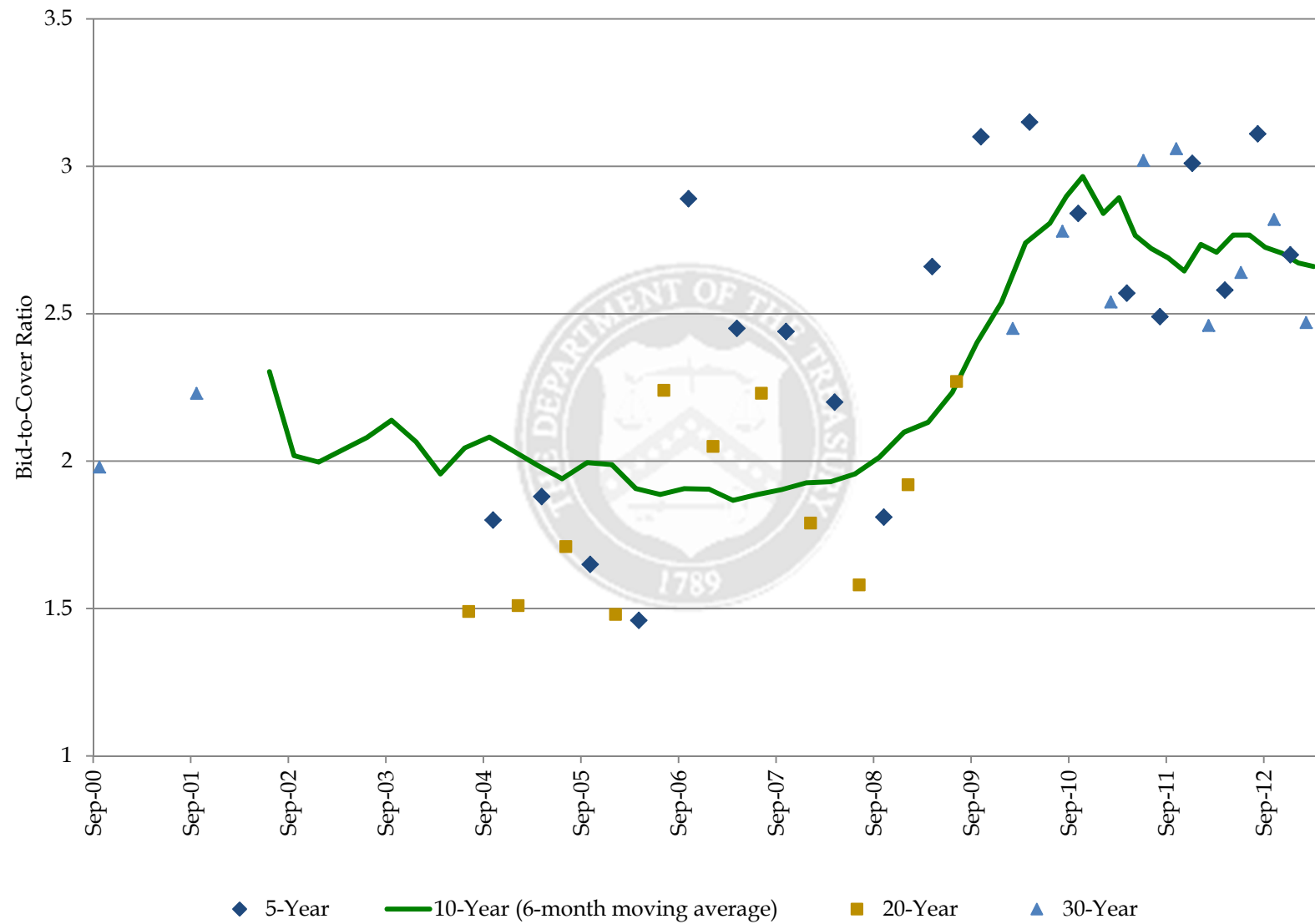# Bid-to-Cover Ratios for Treasury Bills

4-Week (13-week moving average)   13-Week (13-week moving average)
26-Week (13-week moving average)   52-Week (6-month moving average)

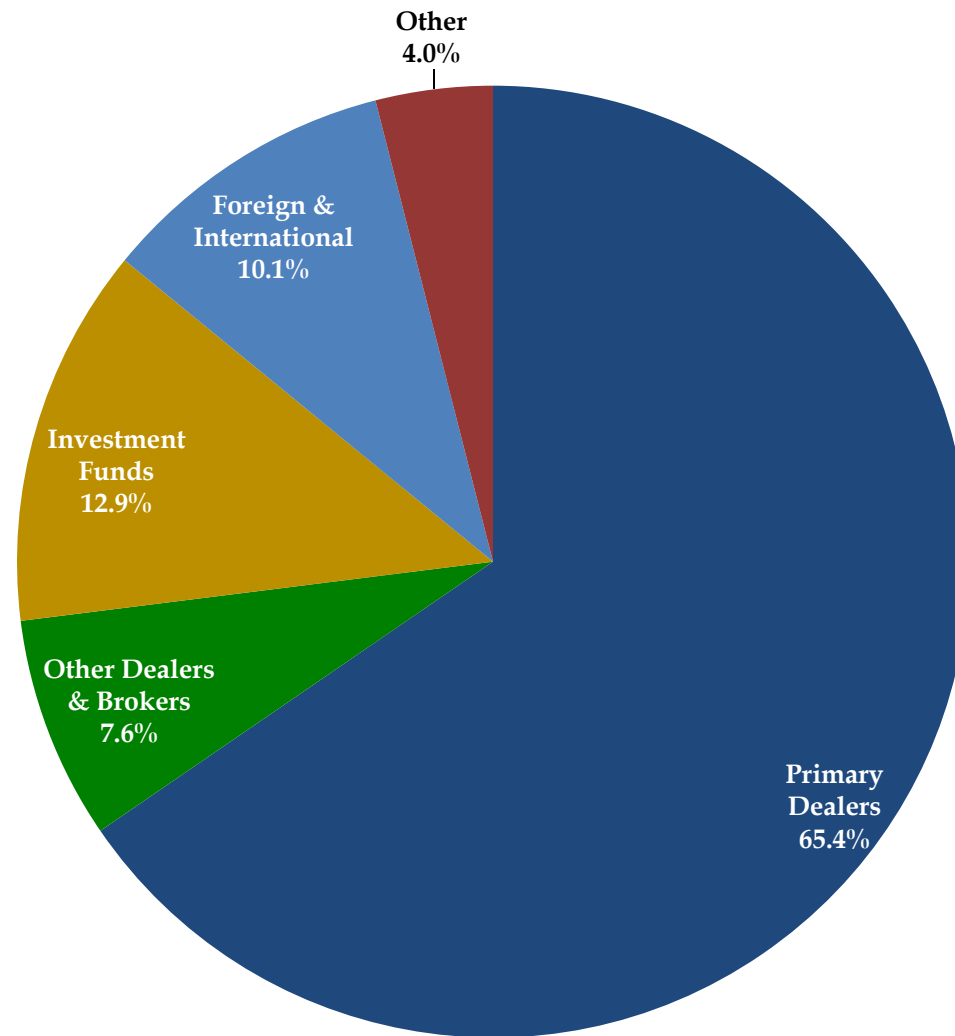# Bid-to-Cover Ratios for 2-, 3-, and 5-Year Nominal Securities
(6-Month Moving Average)
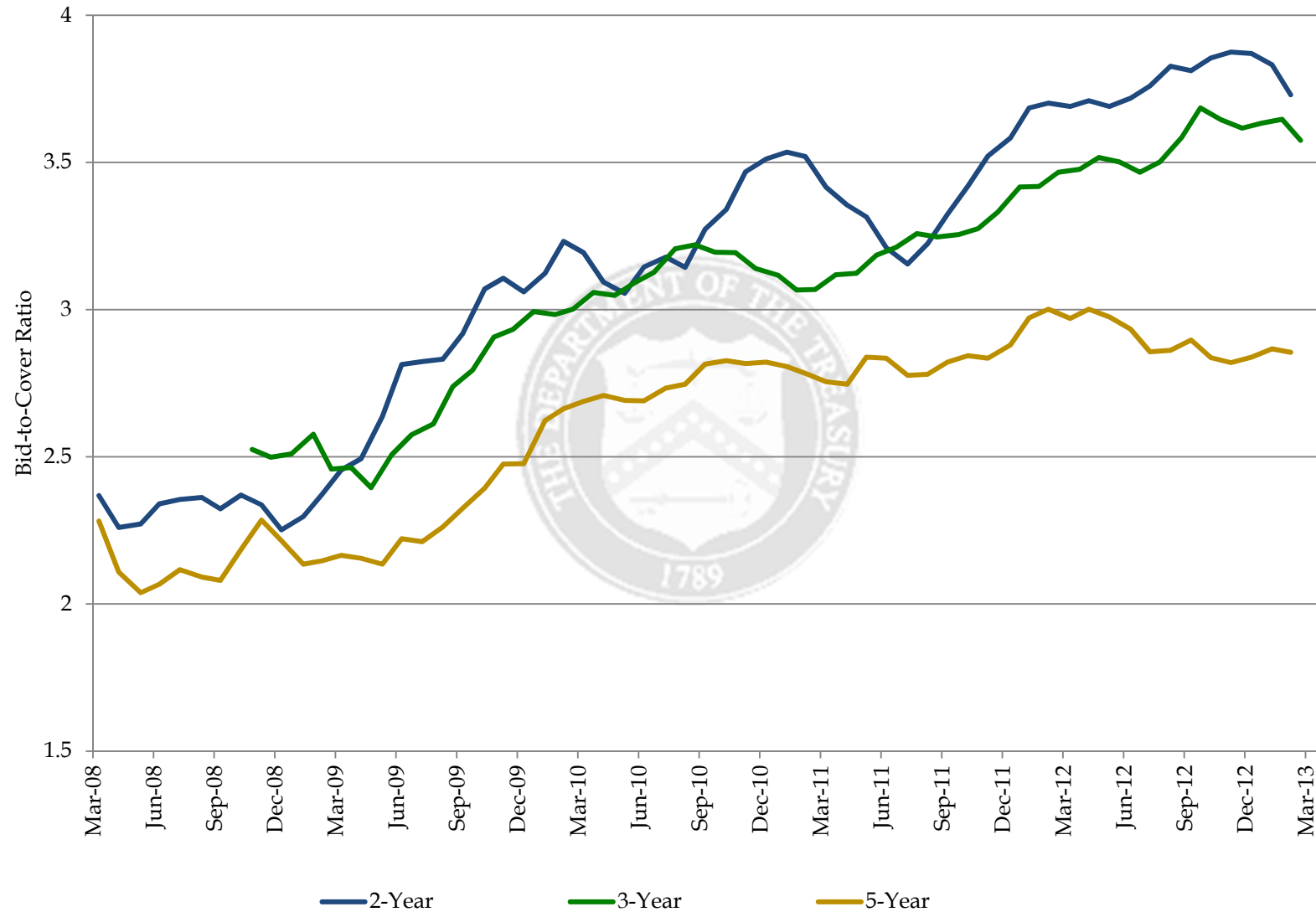
Bid-to-Cover Ratios for 7-, 10-, and 30-Year Nominal Securities
(6-Month Moving Average)

Bid-to-Cover Ratios for TIPS

Legend: ◆ 5-Year ━━ 10-Year (6-month moving average) ■ 20-Year ▲ 30-Year

Investor Class Auction Awards: Bills
Fiscal Year 2013-Q2

Other
4.0%

Foreign &
International
10.1%

Investment
Funds
12.9%

Other Dealers
& Brokers
7.6%

Primary
Dealers
65.4%

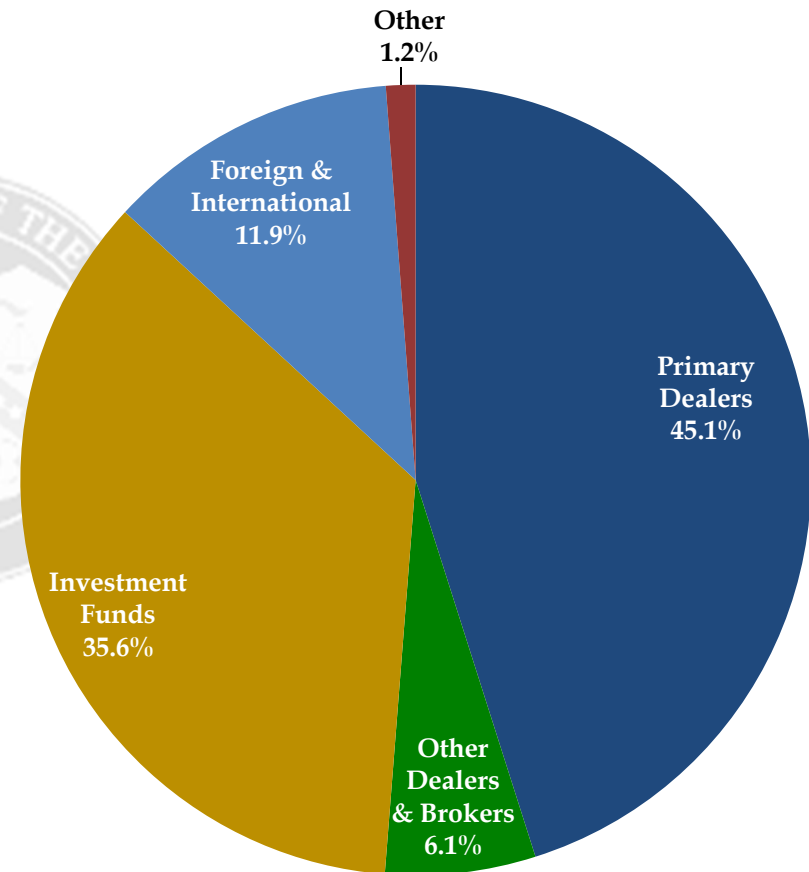Excludes SOMA add-ons. The "Other" category includes categories that are each less than 2%, which include Depository Institutions, Individuals, Pension and Insurance.

Change in Demand Over the Last Year in Bills, Auction Awards by Investor Class
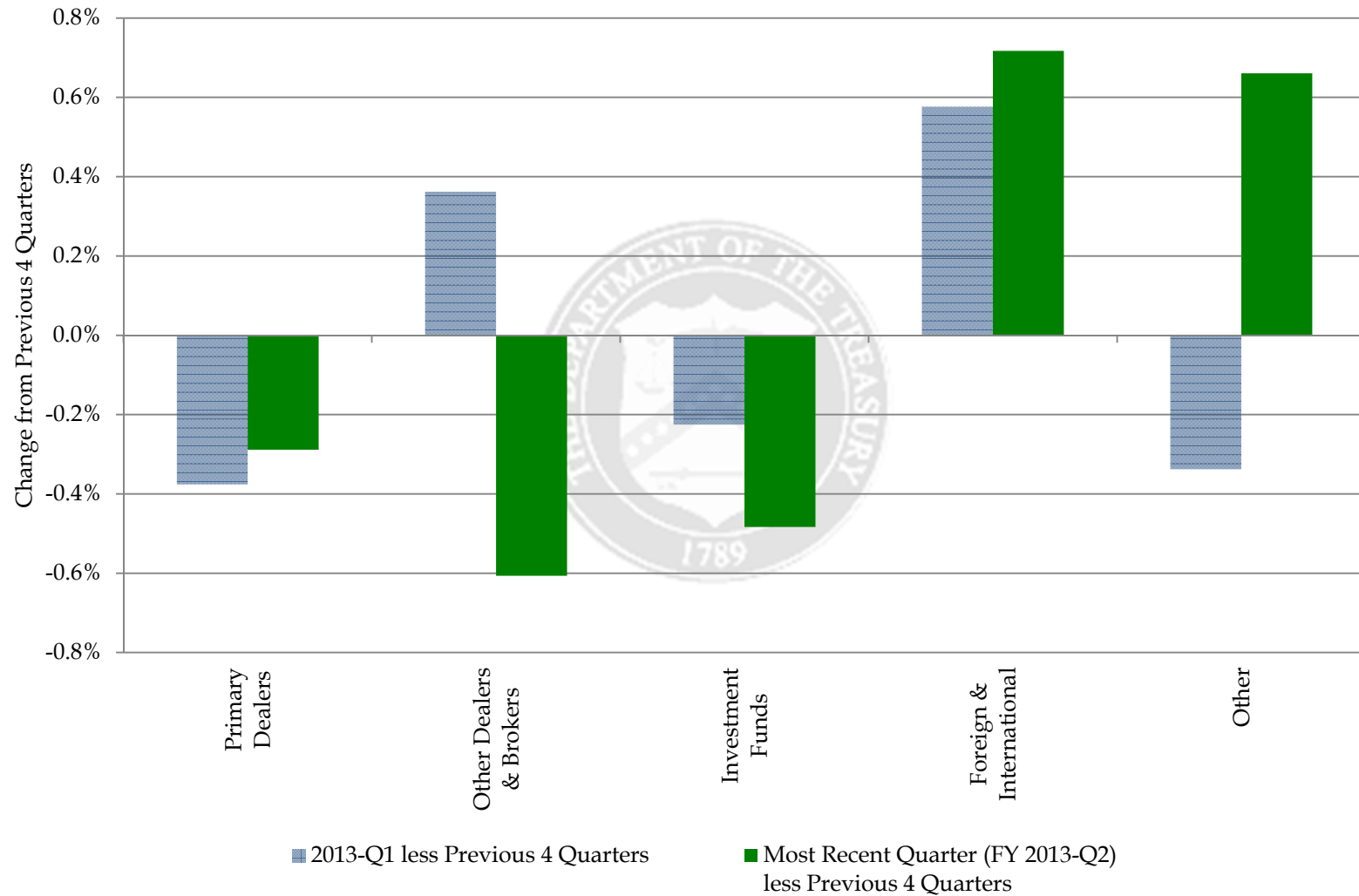
■ 2013-Q1 less Previous 4 Quarters ■ Most Recent Quarter (FY 2013-Q2) less Previous 4 Quarters

Excludes SOMA add-ons. The "Other" category includes categories that are each less than 2%, which include Depository Institutions, Individuals, Pension and Insurance. These results may include seasonal effects.
"Previous 4 Quarters" = Total Awards for the previous 4 quarters divided by Total Auction Awards of the previous 4 quarters

Investor Class Auction Awards:
## 2-, 3-, and 5-Year Nominal Securities
Fiscal Year 2013-Q2

Other
1.1%

Foreign &
International
14.2%

Primary
Dealers
48.2%

Investment
Funds
28.4%

Other
Dealers
& Brokers
8.1%
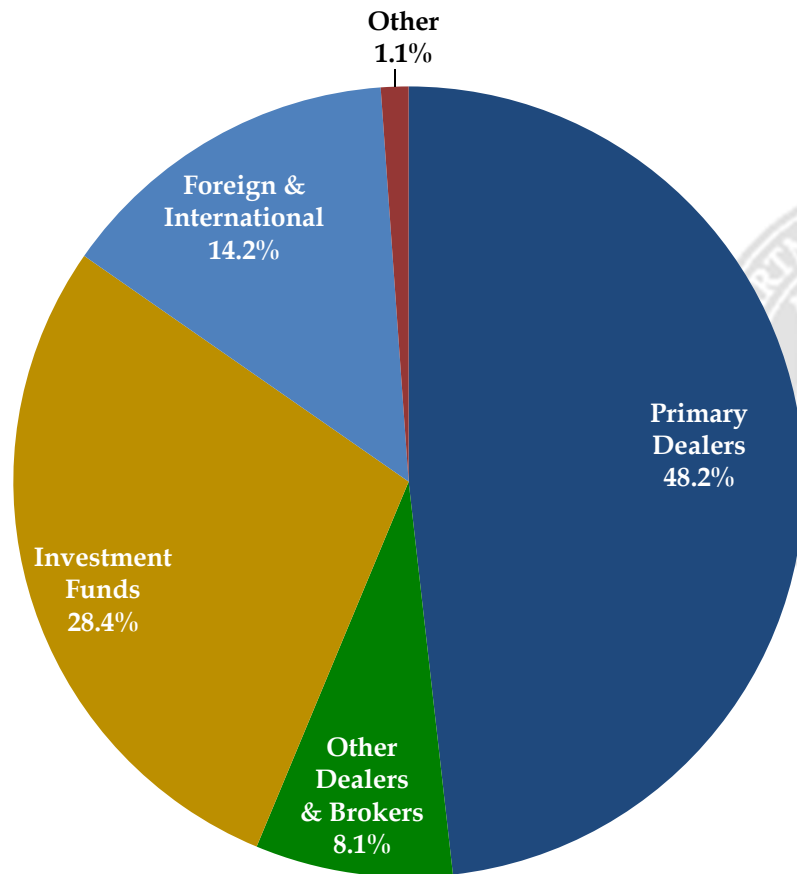
Investor Class Auction Awards:
7-, 10-, and 30-Year Nominal Securities
Fiscal Year 2013-Q2

Other
1.2%

Foreign &
International
11.9%

Primary
Dealers
45.1%

Investment
Funds
35.6%

Other
Dealers
& Brokers
6.1%

Excludes SOMA add-ons. The "Other" category includes categories that are each less than 2%, which include Depository Institutions, Individuals, Pension and Insurance.
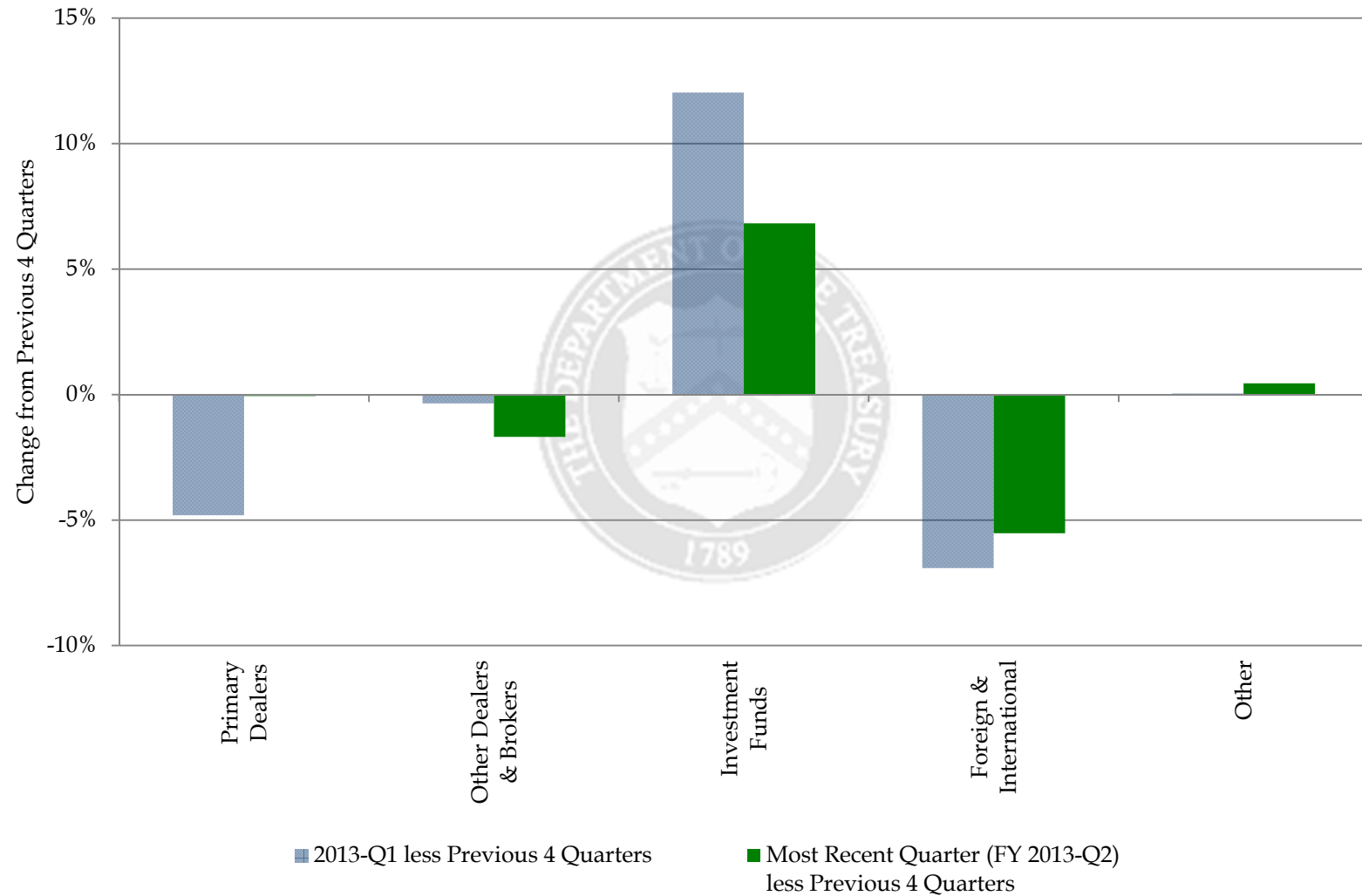
Change in Demand Over the Last Year in 2-, 3-, 5-Year Nominal Securities, Auction Awards by Investor Class
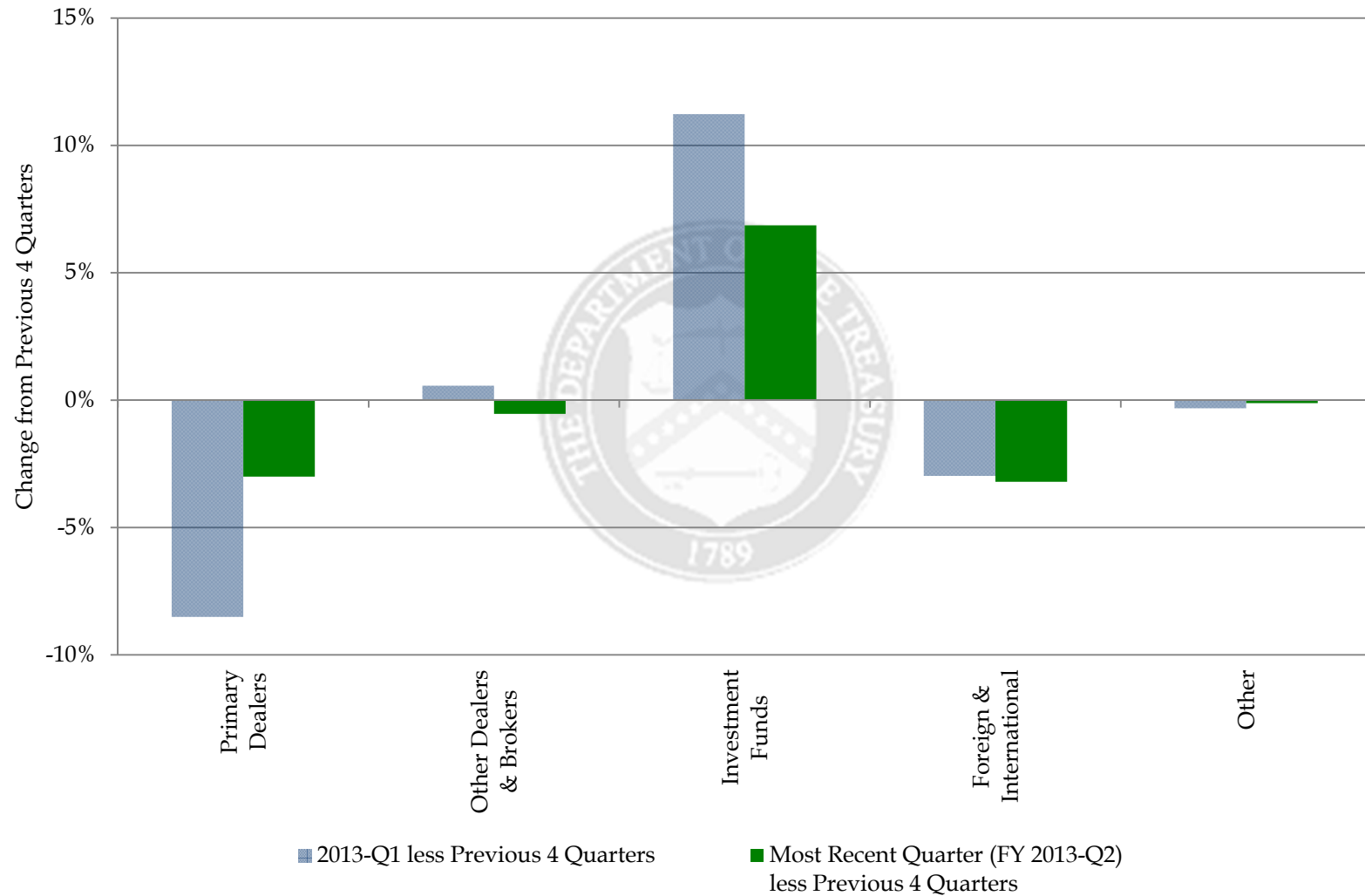
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 2%, which include Depository Institutions, Individuals, Pension and Insurance. These results may include seasonal effects.
"Previous 4 Quarters" = Total Awards for the previous 4 quarters divided by Total Auction Awards of the previous 4 quarters
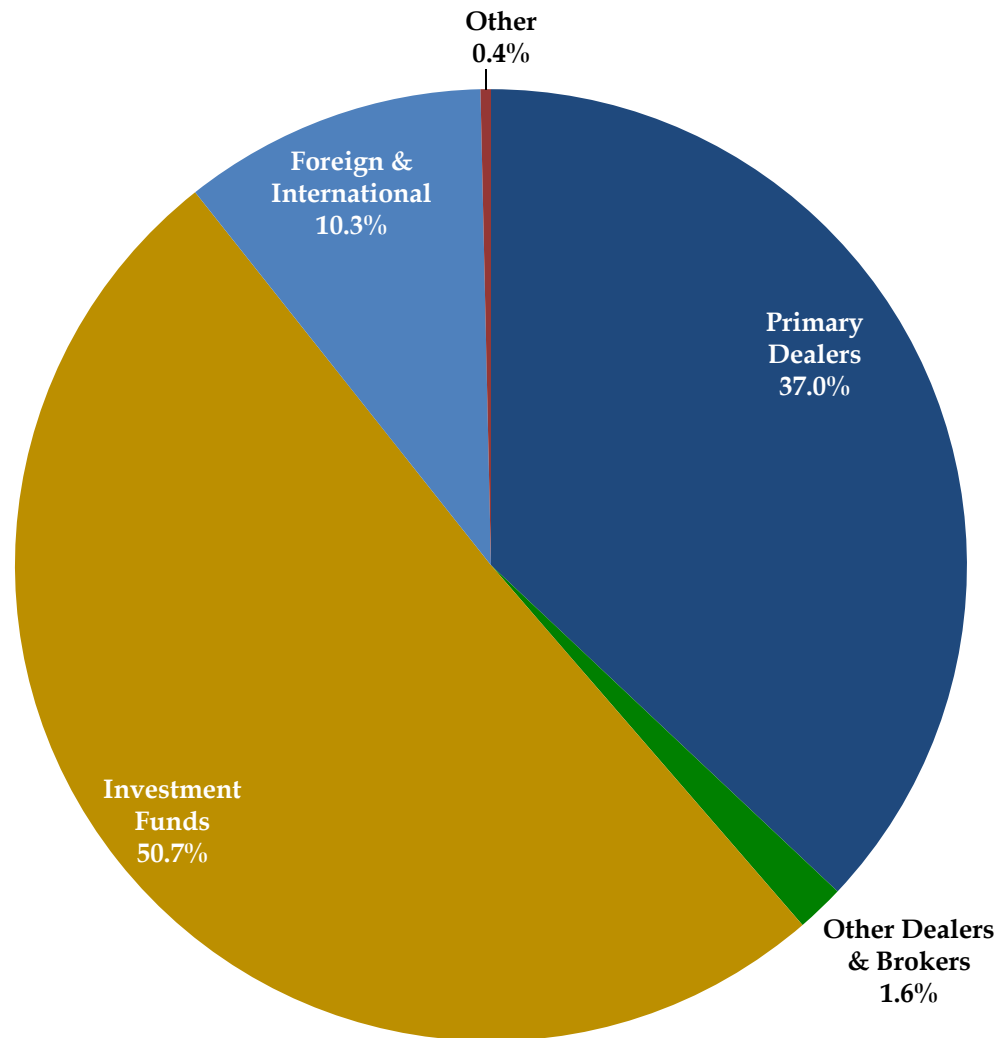
Change in Demand Over the Last Year in 7-, 10-, 30-Year Nominal Securities, Auction Awards by Investor Class

Excludes SOMA add-ons. The "Other" category includes categories that are each less than 2%, which include Depository Institutions, Individuals, Pension and Insurance. These results may include seasonal effects.
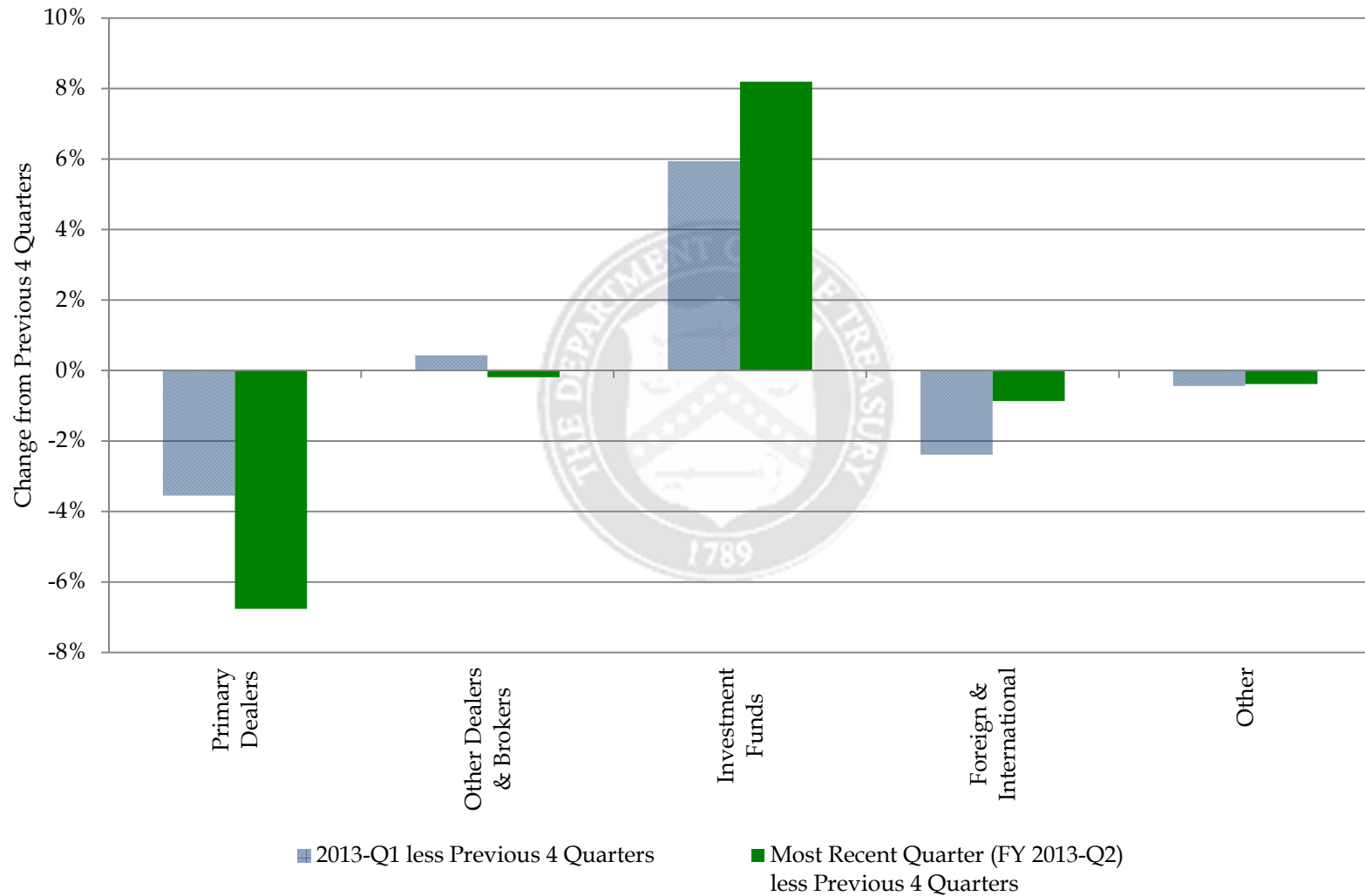"Previous 4 Quarters" = Total Awards for the previous 4 quarters divided by Total Auction Awards of the previous 4 quarters

Investor Class Auction Awards:
TIPS
Fiscal Year 2013-Q2

Excludes SOMA add-ons. The "Other" category includes categories that are each less than 2%, which include Depository Institutions, Individuals, Pension and Insurance.

Change in Demand Over the Last Year in TIPS, Auction Awards by Investor Class

■ 2013-Q1 less Previous 4 Quarters　　　■ Most Recent Quarter (FY 2013-Q2) less Previous 4 Quarters

Excludes SOMA add-ons. The "Other" category includes categories that are each less than 2%, which include Depository Institutions, Individuals, Pension and Insurance. These results may include seasonal effects.
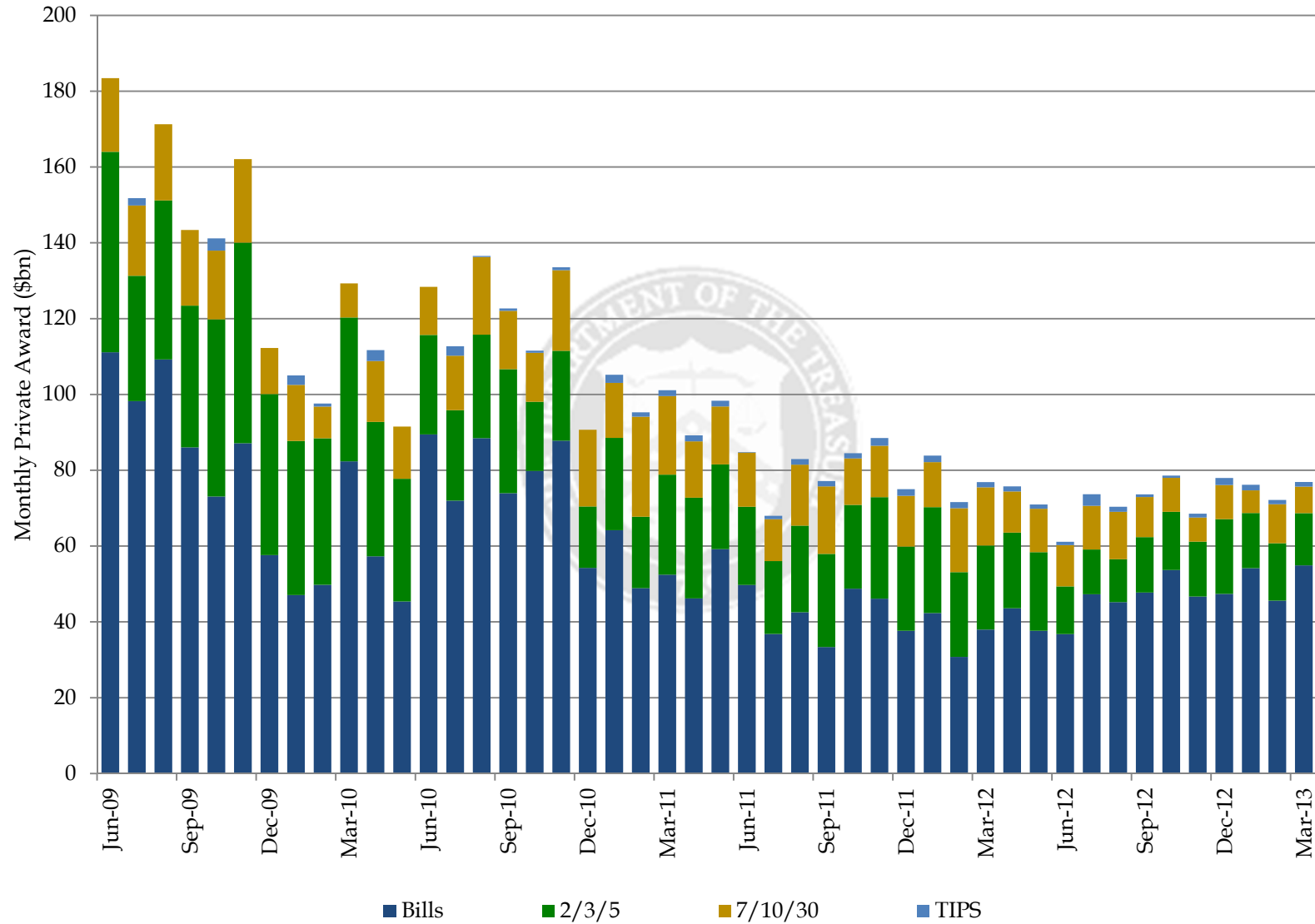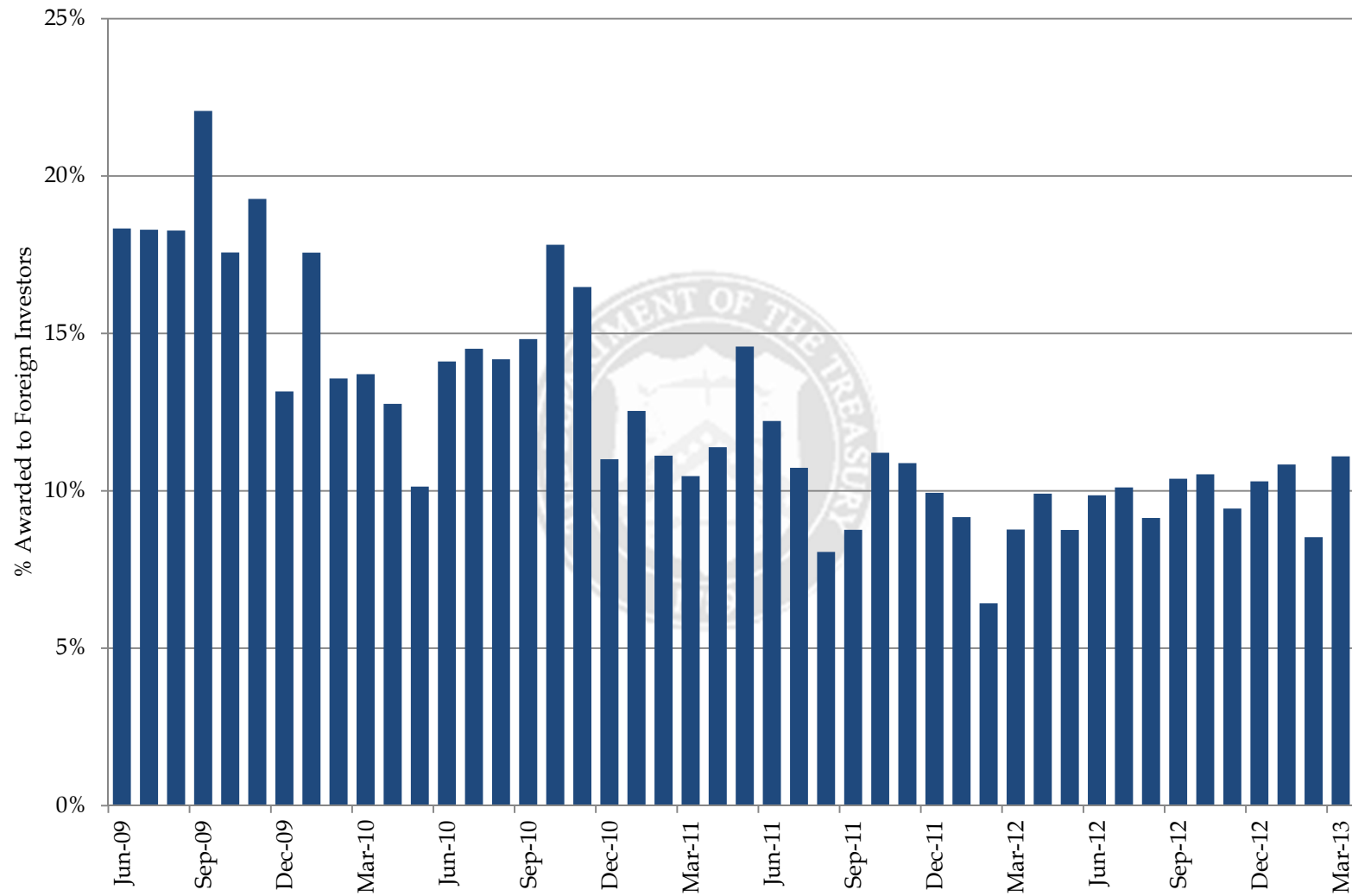"Previous 4 Quarters" = Total Awards for the previous 4 quarters divided by Total Auction Awards of the previous 4 quarters

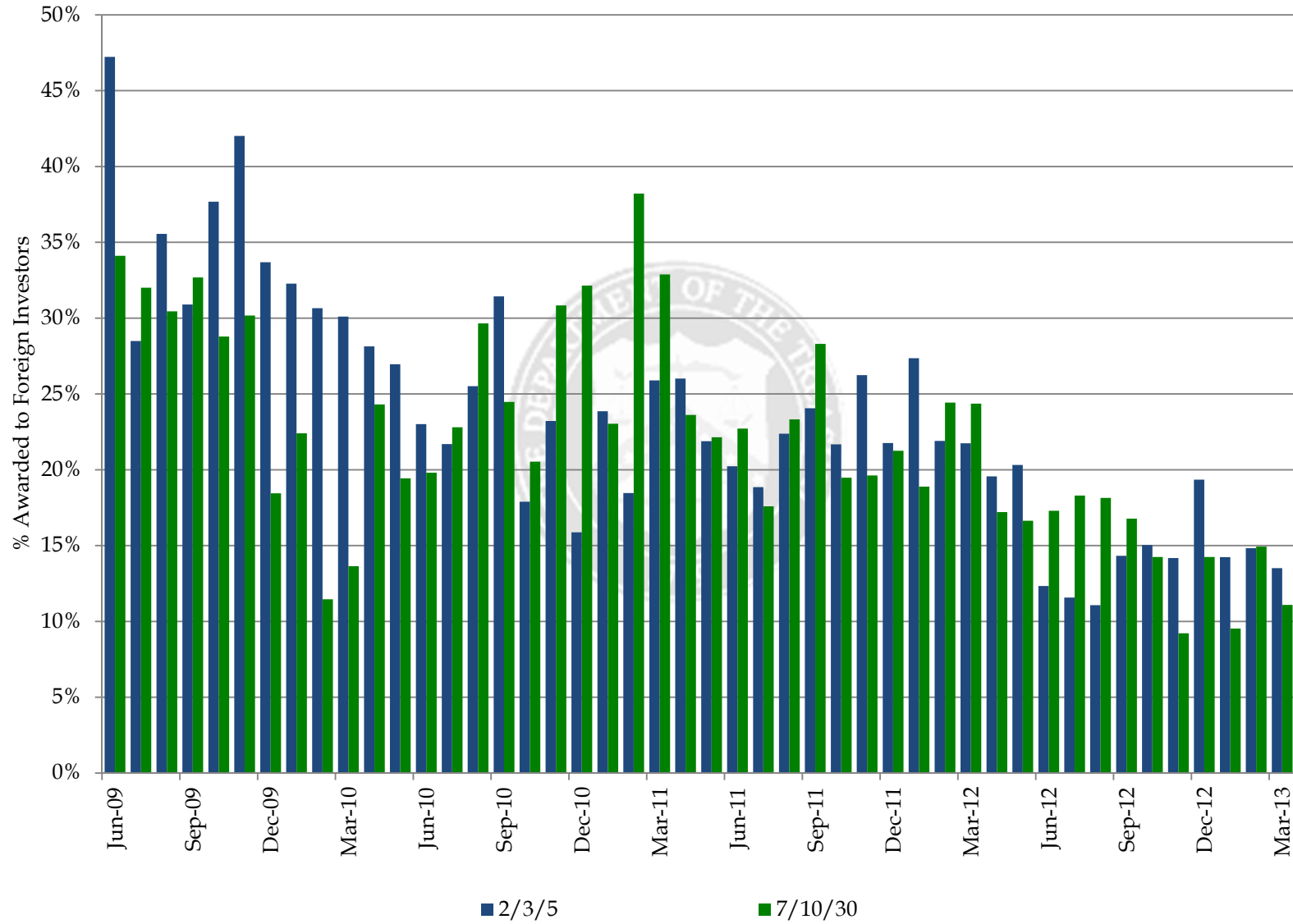# Total Foreign Awards of Treasuries at Auction, $ Billion

Foreign includes both private sector and official institutions.

Foreign Awards of Bills at Auction, Percent

Excludes SOMA add-ons. Foreign includes both private sector and official institutions.

Foreign Awards of Nominal Coupons at Auction, Percent
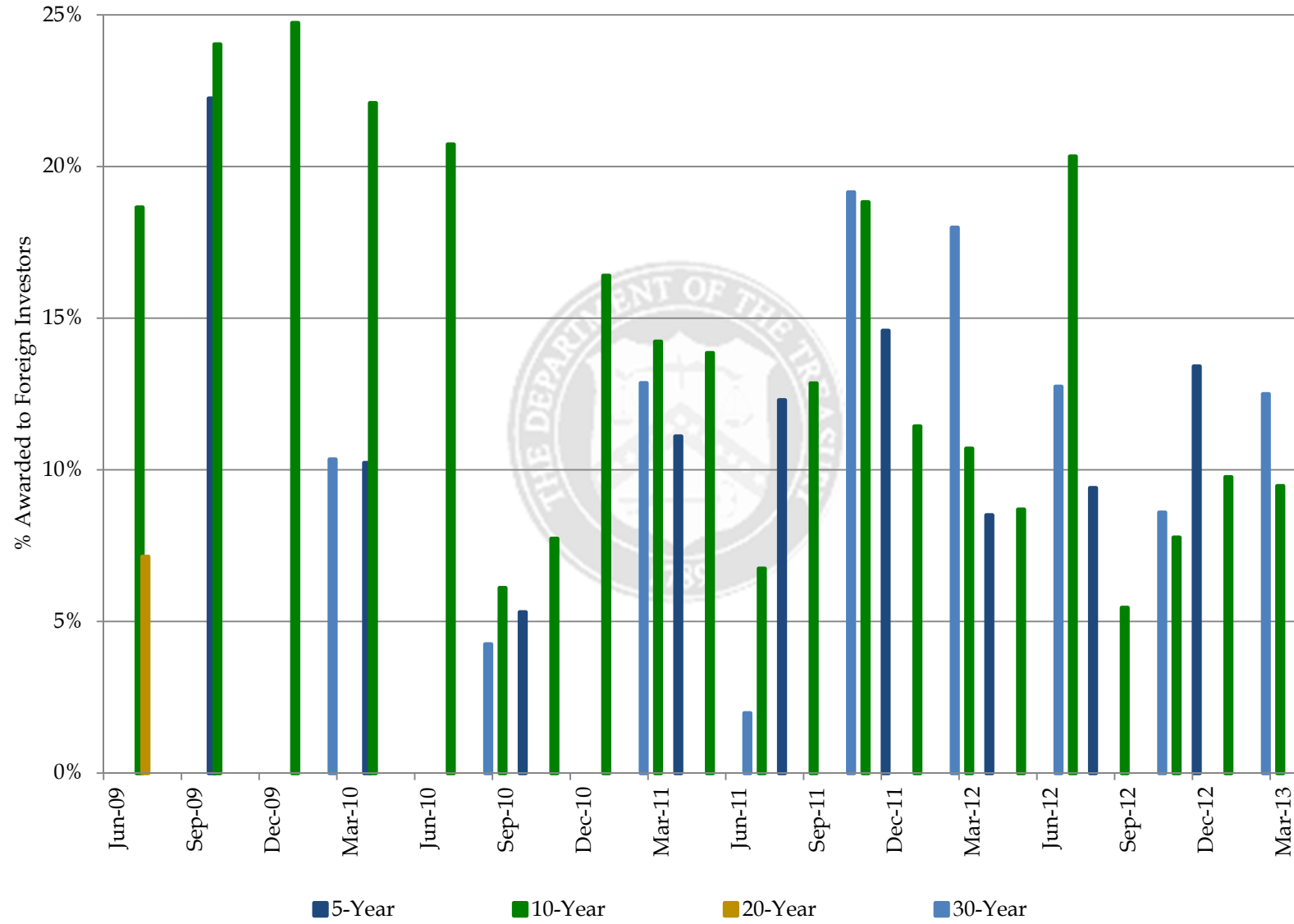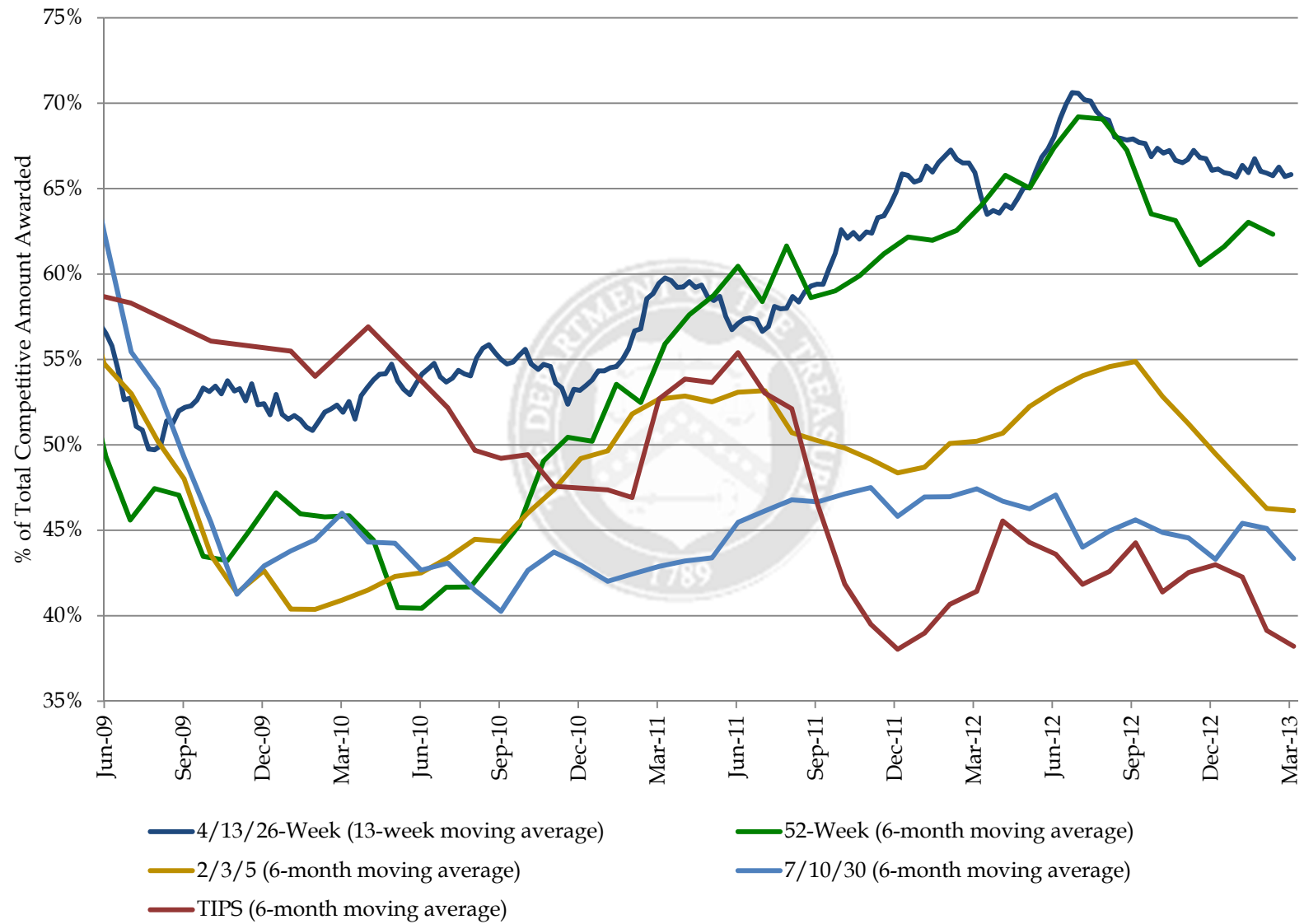

Excludes SOMA add-ons. Foreign includes both private sector and official institutions.

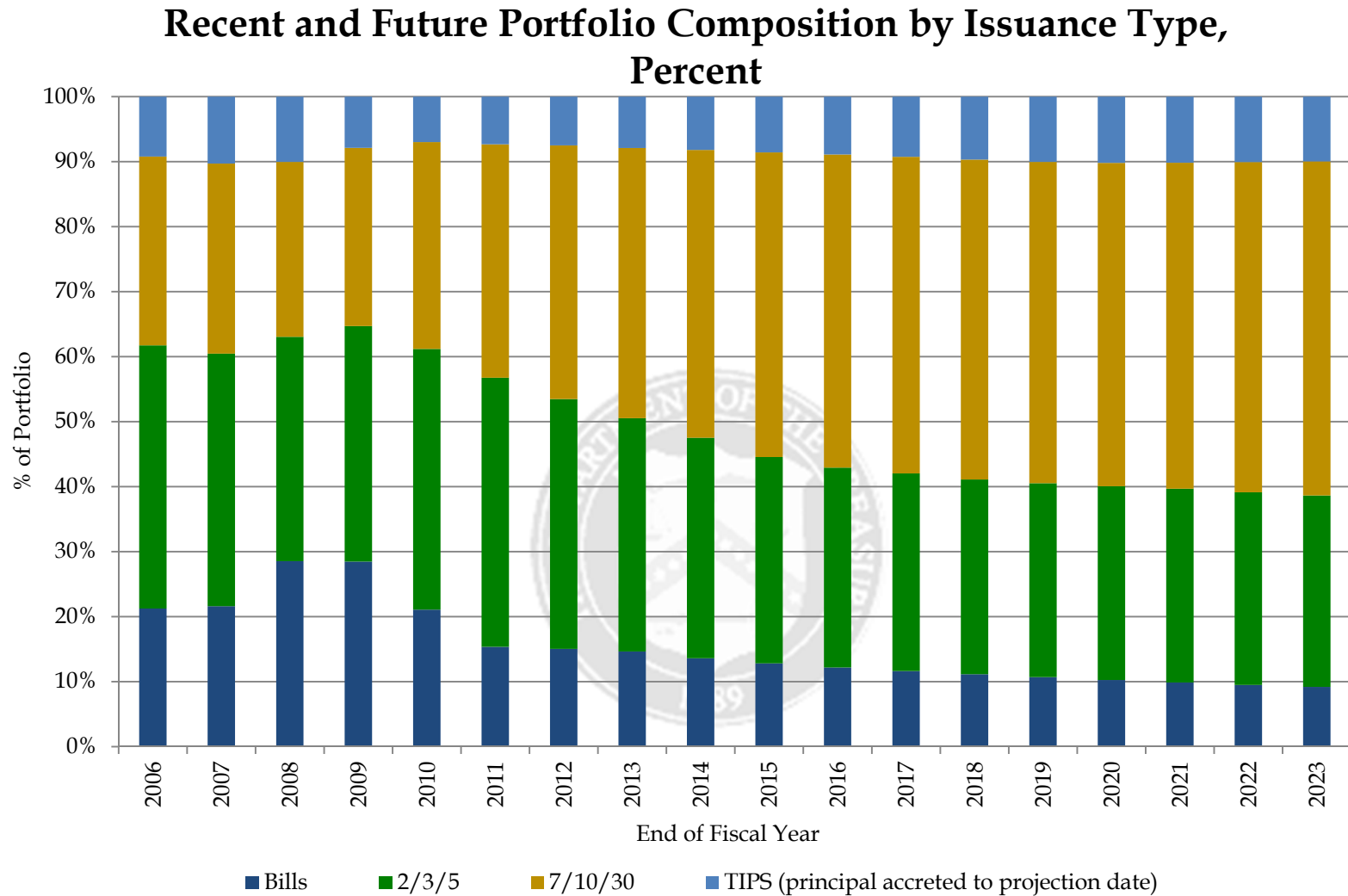# Foreign Awards of TIPS at Auction, Percent

Excludes SOMA add-ons. Foreign includes both private sector and official institutions.

Primary Dealer Awards at Auction, Percent

Appendix

Recent and Future Portfolio Composition by Issuance Type, Percent

Bills ■ 2/3/5 ■ 7/10/30 ■ TIPS (principal accreted to projection date)

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's most recent primary dealer survey. To match OMB's projected borrowing from the public for the next 10 years, nominal coupon securities (2-, 3-, 5-, 7-, 10-, and 30-year) were adjusted by the same percentage. OMB's projections of borrowing from the public are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government." The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. This scenario does not represent any particular course of action that Treasury is expected to follow. Instead, it is intended to demonstrate the basic trajectory of average maturity absent changes to the mix of securities issued by Treasury. See table on the following page for details.

Recent and Future Portfolio Composition by Issuance Type, Percent

End of Fiscal Year	Bills	2-, 3-, 5-Year Nominal Coupons	7-, 10-, 30-Year Nominal Coupons	Total Nominal Coupons	TIPS (principal accreted to projection date)
2006	21.3%	40.5%	29.0%	69.5%	9.2%
2007	21.6%	38.9%	29.2%	68.1%	10.3%
2008	28.5%	34.5%	26.9%	61.4%	10.0%
2009	28.5%	36.2%	27.4%	63.6%	7.9%
2010	21.1%	40.1%	31.8%	71.9%	7.0%
2011	15.4%	41.4%	35.9%	77.3%	7.3%
2012	15.0%	38.4%	39.0%	77.4%	7.5%
2013	14.6%	35.9%	41.6%	77.4%	7.9%
2014	13.6%	33.9%	44.3%	78.2%	8.2%
2015	12.8%	31.7%	46.9%	78.6%	8.6%
2016	12.2%	30.7%	48.2%	78.9%	8.9%
2017	11.6%	30.4%	48.7%	79.1%	9.3%
2018	11.2%	29.9%	49.2%	79.2%	9.7%
2019	10.7%	29.8%	49.4%	79.3%	10.0%
2020	10.3%	29.8%	49.7%	79.5%	10.2%
2021	9.9%	29.8%	50.2%	80.0%	10.2%
2022	9.5%	29.6%	50.8%	80.4%	10.1%
2023	9.2%	29.5%	51.4%	80.8%	10.0%

Portfolio & SOMA holdings as of 3/29/2013 and estimated projections of the Large Scale Asset Purchase program announced on 12/12/2012 by the Federal Reserve assumed to last for about 1 year. This assumption is based on the Federal Reserve's most recent primary dealer survey. To match OMB's projected borrowing from the public for the next 10 years, nominal coupon securities (2-, 3-, 5-, 7-, 10-, and 30-year) were adjusted by the same percentage. OMB's projections of borrowing from the public are from Table S-5 and S-13 of the "Fiscal Year 2014 Budget of the US Government." The principal on the TIPS securities were accreted to each projection date based on market ZCIS levels. This scenario does not represent any particular course of action that Treasury is expected to follow. Instead, it is intended to demonstrate the basic trajectory of average maturity absent changes to the mix of securities issued by Treasury.

				Bill Issues						
Issue	Settle Date	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($ bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($ bn)	SOMA Add Ons ($ bn)	10-Yr Equivalent ($ bn)**
4-Week	1/3/2013	0.075	4.40	39.65	65.8%	5.7%	28.5%	0.25	0.00	0.34
4-Week	1/10/2013	0.055	4.50	39.72	64.0%	7.5%	28.5%	0.28	0.00	0.34
4-Week	1/17/2013	0.095	4.44	34.64	59.5%	9.2%	31.3%	0.36	0.00	0.30
4-Week	1/24/2013	0.060	4.86	29.70	61.7%	9.7%	28.5%	0.30	0.00	0.26
4-Week	1/31/2013	0.035	4.58	29.51	74.4%	11.2%	14.4%	0.24	0.00	0.26
4-Week	2/7/2013	0.065	4.65	44.73	58.4%	6.9%	34.7%	0.27	0.00	0.39
4-Week	2/14/2013	0.080	4.19	44.68	66.4%	8.0%	25.6%	0.32	0.00	0.39
4-Week	2/21/2013	0.115	4.35	44.70	52.5%	4.4%	43.2%	0.30	0.00	0.38
4-Week	2/28/2013	0.110	4.18	44.73	66.3%	8.3%	25.4%	0.27	0.00	0.38
4-Week	3/7/2013	0.085	4.40	44.74	71.7%	9.3%	19.0%	0.26	0.00	0.38
4-Week	3/14/2013	0.100	4.40	44.70	64.6%	8.2%	27.2%	0.30	0.00	0.39
4-Week	3/21/2013	0.080	4.39	44.69	60.0%	9.9%	30.1%	0.31	0.00	0.39
4-Week	3/28/2013	0.075	4.10	44.06	70.3%	7.5%	22.2%	0.25	0.00	0.39
13-Week	1/3/2013	0.075	4.54	31.34	75.1%	7.2%	17.7%	0.51	0.00	0.88
13-Week	1/10/2013	0.065	4.80	31.35	68.3%	9.0%	22.6%	0.50	0.00	0.88
13-Week	1/17/2013	0.075	4.53	31.38	67.8%	6.2%	26.1%	0.52	0.00	0.89
13-Week	1/24/2013	0.075	4.68	31.49	85.0%	7.6%	7.4%	0.51	0.00	0.89
13-Week	1/31/2013	0.075	4.98	30.61	66.1%	6.2%	27.7%	0.45	0.00	0.89
13-Week	2/7/2013	0.070	4.72	31.39	62.1%	6.8%	31.0%	0.51	0.00	0.89
13-Week	2/14/2013	0.085	4.73	34.38	65.5%	5.7%	28.9%	0.52	0.00	0.98
13-Week	2/21/2013	0.115	4.62	34.38	74.1%	7.5%	18.4%	0.52	0.00	0.97
13-Week	2/28/2013	0.125	4.46	33.67	73.0%	6.8%	20.1%	0.52	0.00	0.97
13-Week	3/7/2013	0.110	4.59	34.21	76.9%	6.1%	17.0%	0.49	0.00	0.97
13-Week	3/14/2013	0.095	4.49	34.47	79.6%	6.2%	14.2%	0.53	0.00	0.98
13-Week	3/21/2013	0.085	4.92	34.40	65.4%	9.9%	24.7%	0.50	0.00	0.98
13-Week	3/28/2013	0.075	4.53	33.66	69.6%	7.3%	23.1%	0.53	0.00	0.98
26-Week	1/3/2013	0.120	4.98	26.72	60.0%	10.0%	30.0%	0.46	0.00	1.55
26-Week	1/10/2013	0.105	5.21	26.92	57.8%	7.2%	35.0%	0.46	0.00	1.55
26-Week	1/17/2013	0.105	4.95	27.14	57.2%	7.5%	35.3%	0.46	0.00	1.55
26-Week	1/24/2013	0.095	4.94	27.08	62.6%	7.7%	29.7%	0.52	0.00	1.55
26-Week	1/31/2013	0.110	5.01	26.55	66.3%	8.0%	25.7%	0.45	0.00	1.56
26-Week	2/7/2013	0.110	4.92	27.01	60.1%	8.4%	31.5%	0.49	0.00	1.56
26-Week	2/14/2013	0.120	4.60	28.91	74.5%	5.5%	20.1%	0.49	0.00	1.68
26-Week	2/21/2013	0.130	5.12	29.06	56.8%	6.4%	36.8%	0.46	0.00	1.66
26-Week	2/28/2013	0.135	4.50	28.66	67.4%	5.0%	27.6%	0.39	0.00	1.66
26-Week	3/7/2013	0.120	5.18	29.20	41.8%	4.3%	54.0%	0.40	0.00	1.67
26-Week	3/14/2013	0.115	4.81	29.20	73.3%	6.2%	20.5%	0.40	0.00	1.67
26-Week	3/21/2013	0.110	5.00	29.31	70.6%	8.5%	20.9%	0.38	0.00	1.67
26-Week	3/28/2013	0.105	4.85	28.78	50.9%	7.7%	41.3%	0.43	0.00	1.68
52-Week	1/10/2013	0.140	4.72	24.84	83.0%	7.0%	10.0%	0.16	0.00	2.76
52-Week	2/7/2013	0.145	4.56	24.75	67.3%	6.4%	26.3%	0.15	0.00	2.79
52-Week	3/7/2013	0.150	4.98	24.85	56.4%	7.4%	36.2%	0.15	0.00	2.78
CMBs	2/13/2013	0.100	4.27	40.00	81.8%	8.9%	9.3%	0.00	0.00	0.79
CMBs	2/20/2013	0.130	4.58	34.99	84.2%	6.8%	9.0%	0.01	0.00	0.68
CMBs	3/6/2013	0.105	5.05	30.00	60.3%	8.5%	31.2%	0.00	0.00	0.37

*Weighted averages of Competitive Awards.
**Approximated using prices at settlement and includes both Competitive and Non-Competitive Awards.

			Nominal Coupon Securities							
Issue	Settle Date	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($ bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($ bn)	SOMA Add Ons ($ bn)	10-Yr Equivalent ($ bn)**
2-Year	1/31/2013	0.288	3.77	34.73	52.0%	30.0%	18.0%	0.17	0.00	7.79
2-Year	2/28/2013	0.257	3.33	34.75	46.4%	31.6%	22.0%	0.15	0.00	7.75
2-Year	4/1/2013	0.255	3.27	34.70	57.6%	21.8%	20.6%	0.17	0.00	7.82
3-Year	1/15/2013	0.385	3.62	31.87	45.2%	26.4%	28.4%	0.03	0.00	10.59
3-Year	2/15/2013	0.411	3.59	31.86	55.1%	26.9%	18.0%	0.04	0.00	10.70
3-Year	3/15/2013	0.411	3.51	31.85	56.0%	23.4%	20.6%	0.05	0.00	10.66
5-Year	1/31/2013	0.889	2.88	34.97	43.5%	16.8%	39.7%	0.03	0.00	19.08
5-Year	2/28/2013	0.777	2.85	34.98	44.0%	14.3%	41.7%	0.02	0.00	19.05
5-Year	4/1/2013	0.760	2.73	34.98	37.1%	16.8%	46.1%	0.02	0.00	19.22
7-Year	1/31/2013	1.416	2.60	28.99	42.0%	19.7%	38.2%	0.01	0.00	21.54
7-Year	2/28/2013	1.260	2.65	28.99	48.4%	18.2%	33.4%	0.01	0.00	21.53
7-Year	4/1/2013	1.248	2.56	28.99	45.0%	19.5%	35.5%	0.01	0.00	21.81
10-Year	1/15/2013	1.863	2.83	20.99	56.7%	14.8%	28.5%	0.01	0.00	20.99
10-Year	2/15/2013	2.046	2.68	23.96	47.7%	24.2%	28.0%	0.04	0.00	24.28
10-Year	3/15/2013	2.029	3.19	20.98	22.3%	30.0%	47.7%	0.02	0.00	20.99
30-Year	1/15/2013	3.070	2.77	12.99	45.5%	16.7%	37.8%	0.01	0.00	28.56
30-Year	2/15/2013	3.180	2.74	15.98	49.1%	14.5%	36.4%	0.02	0.00	34.67
30-Year	3/15/2013	3.248	2.43	12.99	53.1%	4.9%	42.0%	0.01	0.00	27.83

			TIPS							
Issue	Settle Date	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($ bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($ bn)	SOMA Add Ons ($ bn)	10-Yr Equivalent ($ bn)**
10-Year	1/31/2013	(0.630)	2.71	14.93	35.4%	11.3%	53.3%	0.07	0.00	16.63
10-Year	3/28/2013	(0.602)	2.74	12.99	43.0%	5.7%	51.3%	0.01	0.00	14.23
30-Year	2/28/2013	0.639	2.47	8.98	31.6%	14.0%	54.5%	0.02	0.00	27.24

*Weighted averages of Competitive Awards.
**Approximated using prices at settlement and includes both Competitive and Non-Competitive Awards. For TIPS' 10-Year Equivalent, a constant auction BEI is used as the inflation assumption.

DRAFT – Preliminary and Subject to Change

TREASURY FLOATING RATE NOTE TERM SHEET

I. ISSUER   United States Treasury

II. ISSUE DATE   The last Friday of a calendar month.

III. MATURITY DATE   Last calendar day of the month two years after the issue date.

IV. MATURITY PAYMENT   Principal will be paid on the last business day of the maturity month unless that day is not a business day, then interest is paid on the following business day.

V.INTEREST DATES   Quarterly from the Issue Date, to and including the Maturity Date, on the last calendar day of a month.

VI. INTEREST PAYMENTS   Interest will be paid on the last business day of the month unless that day is not a business day, then interest is paid on the following business day.

VII. INTEREST:

    A. ACCRUAL PERIOD   From and including the Issue Date or last Interest Date to, but excluding, the next Interest Date.

    B. INTEREST ACCRUAL   In general, accrued interest for a particular calendar day in an Accrual Period shall be the Index Rate from the most recent auction of 13-week Treasury bills that took place before the accrual day, plus the Spread, divided by 360, subject to a minimum of zero.

                                                  However, for purposes of calculating FRN auction settlement amounts and quarterly FRN interest payments, a 13-week bill auction that takes place in the two business day Lock-Out Period prior to the FRN auction settlement date or FRN Interest Date shall be excluded from the calculation of accrued interest for purposes of that settlement amount or interest payment.

    C. INDEX RATE   The High Rate from a 13-week Treasury bill auction as announced by the Bureau of the Public Debt, converted to a simple-interest money market yield on an actual/360 basis.

    D. SPREAD   As determined in the security's initial auction; expressed in tenths of a basis point.

DRAFT – Preliminary and Subject to Change

E. MINIMUM DAILY
INTEREST ACCRUAL   0.000 percent

F. RESET FREQUENCY   Daily, if not a Business Day then the preceding Business
Day.

G. DAY COUNT
CONVENTION   actual/360

H. LOCK-OUT PERIOD   The two business days preceding an FRN auction Issue
date or an FRN Interest Date.

VIII. BUSINESS DAY   Any day other than a Saturday, a Sunday, or a day on
which the Federal Reserve Bank of New York is closed.

IX. STRIPS ELIGIBLE   No

X. CALCULATION AGENT   United States Treasury

XI. ORIGINAL ISSUE PRICE   Determined at auction

XII. AUCTION TECHNIQUE   A single price auction format in which each competitive
tender specifies a Discount Margin (which can be positive,
zero, or negative, expressed in tenths of a basis point).

Treasury will first accept in full all noncompetitive tenders
up to $5 million per submitter received by the closing time
specified in the offering announcement.

Competitive tenders will be accepted in order of Discount
Margin, starting from the lowest Discount Margin, up to
the Discount Margin needed to fill the public offering.

The usual Treasury proration rules will apply if the amount
of tenders indicating the highest accepted Discount Margin
exceeds the amount of the public offering remaining.

The Spread on a floating rate note offered in an original
issue auction will be set at the highest accepted Discount
Margin in that auction.

The Spread on a floating rate note offered in a reopening
auction will be as set in the note's original issue auction.

DRAFT – Preliminary and Subject to Change

XIII. MINIMUM AND
MULTIPLES TO BID,
HOLD AND TRANSFER   The minimum to bid, hold and transfer is $100 original principal value. Larger amounts must be in multiples of $100.

XIV. MAXIMUM
NONCOMPETITIVE
AWARD $5 million

Committee Charge Presentation to the Treasury

Availability of High-Quality Collateral

A variety of market, regulatory, and policy developments have increased, or have the potential to increase, demand for high-quality fixed income securities. Please discuss the impact of these developments on Treasury market functioning, Treasury financing, and interest rates more broadly. Please consider the impact of both domestic and international developments.

Confidential

Availability of High-Quality Collateral

Table of Contents

I. Market Definitions of High Quality Collateral

Five definitions, based on history and current observations:

High quality collateral is …

1. Hard currency cash.

ISDA Survey of OTC Collateral Usage

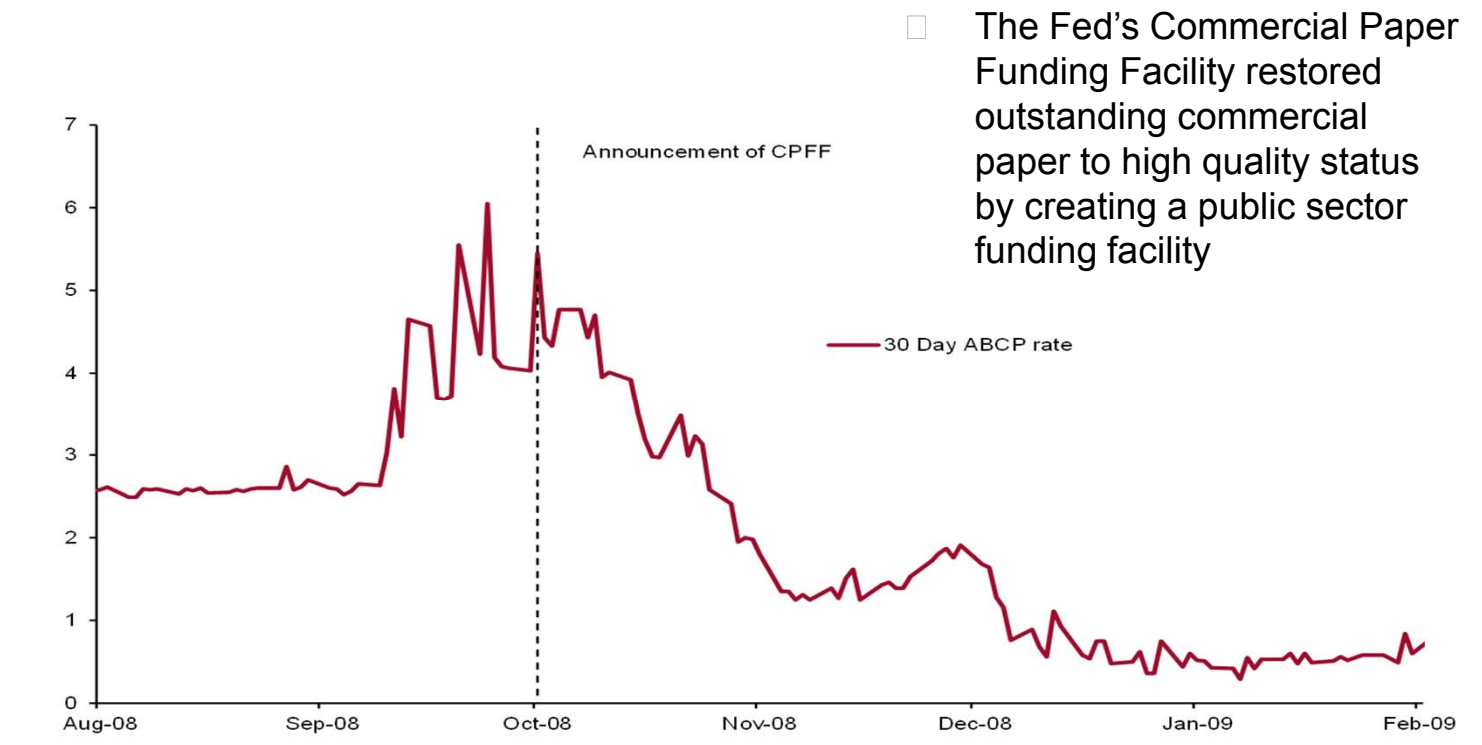|		Collateral Received		Percent		Collateral Delivered		Percent	
		2012	2011	2012	2011	2012	2011	2012	2011
Cash	USD	436,018	389,908	33.0	35.9	357,219	325,678	31.3	36.2
	EUR	537,450	429,500	40.8	39.6	438,191	331,542	38.4	36.9
	GBP	23,871	18,160	1.8	1.7	29,316	21,020	2.6	2.3
	JPY	27,222	24,232	2.1	2.2	25,267	26,839	2.2	3.0
	Other	14,988	15,752	1.1	1.5	11,722	10,365	1.1	1.2
	Subtotal	1,039,549	877,552	78.8	80.9	861,715	715,444	75.6	79.6
Government Securities	United States	60,926	38,606	4.6	3.6	78,974	48,409	6.9	5.4
	European Union	30,733	22,943	2.3	2.1	109,677	66,705	9.6	7.4
	UK	13,459	10,948	1.1	1.0	22,736	13,414	2.0	1.5
	Japan	33,064	21,005	2.5	1.9	22,738	17,438	2.0	1.9
	Other	13,869	13,196	1.1	1.2	7,237	8,854	0.7	1.0
	Subtotal	152,051	106,697	11.6	9.8	241,362	154,821	21.2	17.2
Others	Government agency/Securities GSEs	28,607	17,425	2.2	1.6	12,861	10,075	1.1	1.1
	Supranational bonds	1,090	2,067	0.1	0.2	2,139	723	0.2	0.1
	US Municipal Bonds	1,789	1,449	0.1	0.1	0	0	0.0	0.0
	Covered Bonds	914	6,545	0.1	0.6	2,097	255	0.2	0.0
	Corporate Bonds	40,711	28,514	3.1	2.7	13,090	4,349	1.1	0.5
	Letters of Credit	9,125	9,917	0.7	0.9	0	600	0.0	0.1
	Equities	24,815	25,453	1.8	2.3	902	6,896	0.1	0.7
	Metals and Other Commodities	148	101	0.0	0.0	0	653	0.0	0.1
	Other Assets	19,661	9,228	1.5	0.9	5,997	5,592	0.5	0.6
	Subtotal	126,860	100,699	9.6	9.3	37,086	29,143	3.2	3.2
	Total Collateral	1,318,460	1,084,949			1,140,163	899,408		
	Grand Total					2,458,623	1,984,357		

Source: ISDA

High Quality Collateral is…

2. Money-like assets (assets with low credit risk, low duration risk, and low liquidity risk
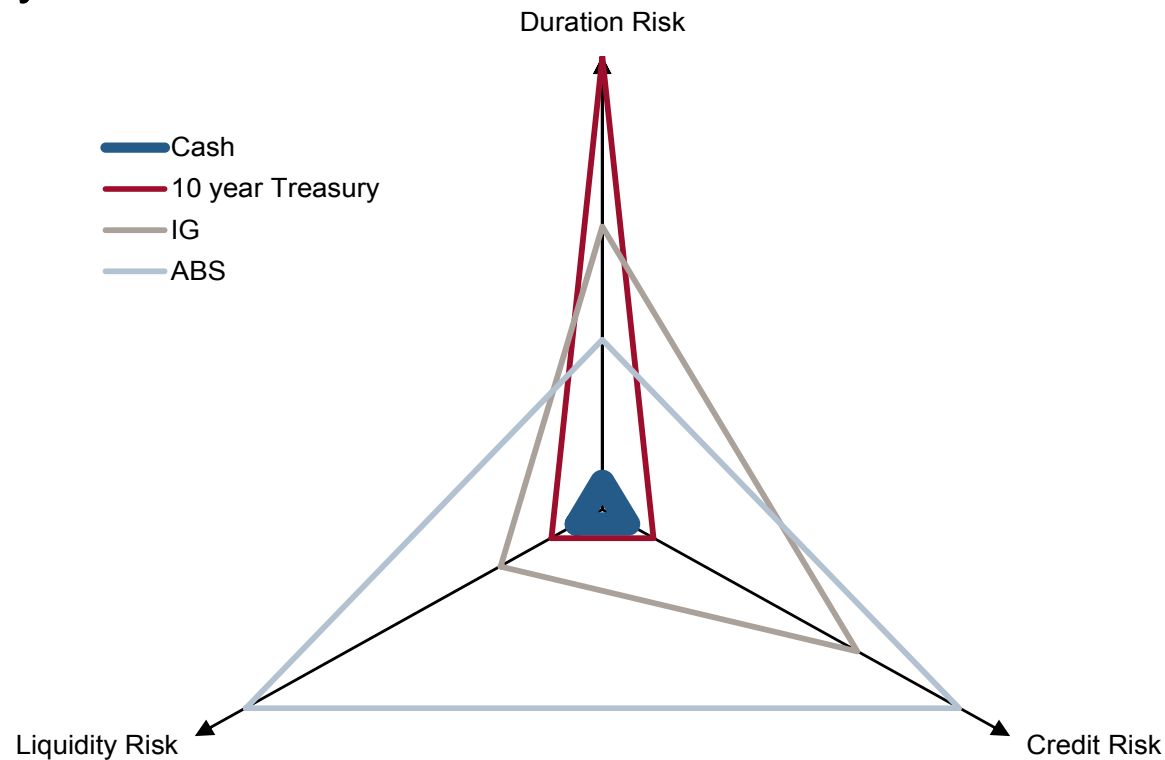
If these risks are credibly hedged, the asset holder has a quasi T-bill position
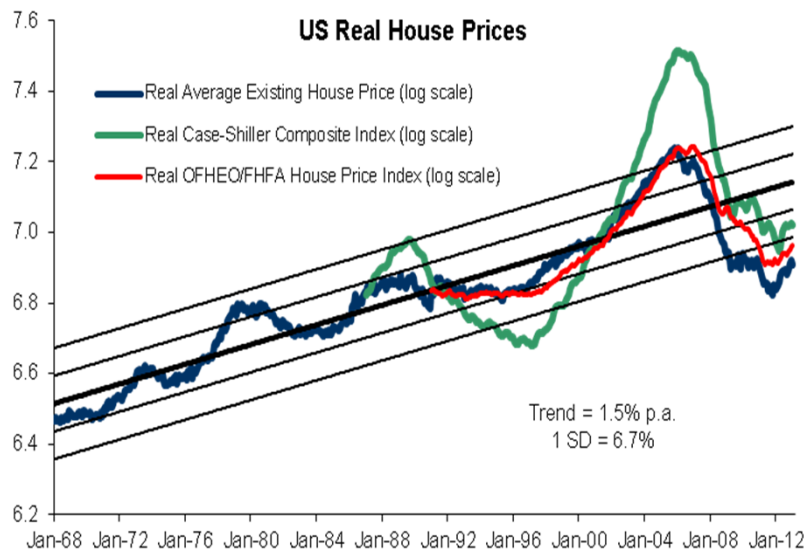
High Quality Collateral is…

3. Whatever the central bank dictates

The Fed's Commercial Paper Funding Facility restored outstanding commercial paper to high quality status by creating a public sector funding facility

Source: Thomson Reuters DataStream, Federal Reserve Board

High Quality Collateral is…

4. An asset not expected to depreciate

US Real House Prices

Real Average Existing House Price (log scale)
Real Case-Shiller Composite Index (log scale)
Real OFHEO/FHFA House Price Index (log scale)

Trend = 1.5% p.a.
1 SD = 6.7%

Brokers' Borrowings on Collateral (NYSE) $ Mn

8.2% of GDP

Reg T

Source: New York Stock Exchange

During the housing boom, homes became a key source of collateral for households and backed trillions in highly rates private label MBS
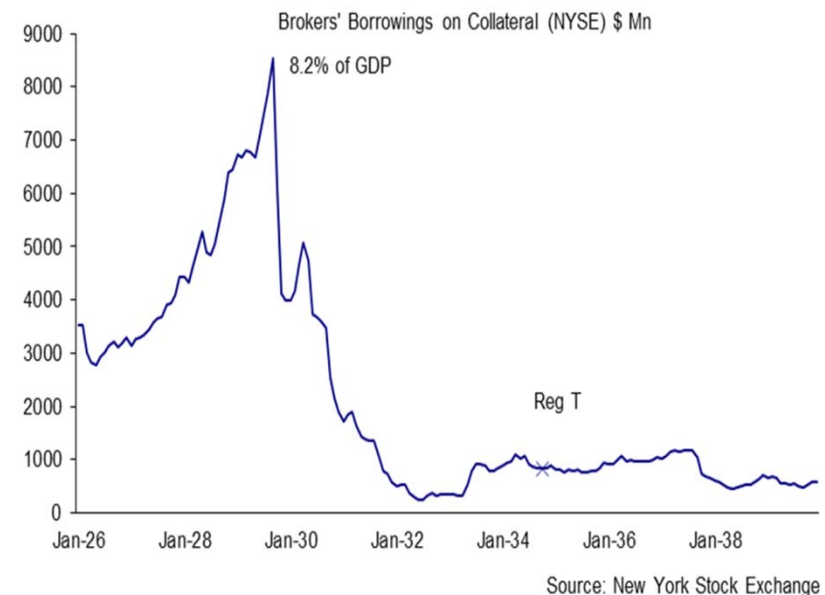
During the 1920s stock market boom, borrowing against equities fueling further price appreciation before accelerating the collapse

Source: Thomson Reuters DataStream

High Quality Collateral is…

5. Low haircut securities.

IG Corporates	
AAA	3%
AA	5%
A	5-7.5%
BBB	7.5-15%
HY Corporates	
BBB	10-20%
B	15-30%
CCC	20-40%
P/L mtgs	15-50% (depending on rating, pricing)
CDOs and CLOs	20-50% (depending on rating, structure, and pricing)

Indicative market levels

Repo Haircuts over time (%)
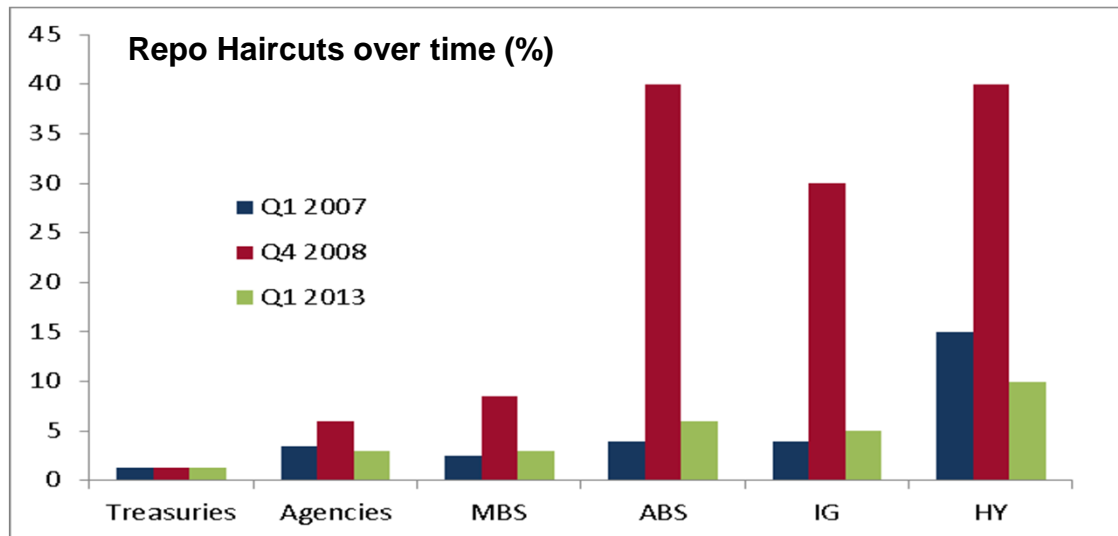
In Summary

High-Quality Collateral can be defined as cash or fungible stock that can be used to rapidly secure cash borrowings at minimal haircut

"High Quality"			"Low Quality"	
Domestic Sovereign	**Domestic Rates**	**"Foreign" Cash / Sovereign**	**Credit**	**Other**
Cash US Treasury Bills US Treasury Notes US Treasury Bonds Strips / TIPS	Government Agencies Mortgage-Backed Securities Certain Guaranteed ABS	Non-USD Sovereign Bills Non-USD Sovereign Notes Non-USD Sovereign Bonds Non-USD Linkers	IG Domestic Corporates NIG Domestic Corporates IG Foreign Corporates NIG Domestic Corporates	Major-Index Equities Physical Commodities Real Estate Structured Financial Products

II. Supply and Demand Considerations

II(a). Demand for Collateral

High-Quality Collateral – Demand Drivers Overview

Incremental HQC Demand Drivers

- Incremental drivers of demand for high quality collateral include the following:

Incremental HQC Demand[1]	=	1. Prudential Regulation	+	2. Market Regulation (Derivative Clearing)	+	3. Market Regulation (Bilateral Margin)	+	4. Economic Environment / Uncertainty
		Increased prudential liquidity requirements		Increased IM requirements for cleared derivatives		Increased IM requirements for non-cleared derivatives		Cyclical HQC investment demand (FTQ flows)
		$1.0-2.5tt[2]		• $0.8-2.0tt (normal)[3] • $1.8-4.6tt (stressed)[3]		• $0.8-1.2tt (normal)[4] • $1.8-4.1tt (stressed)[4]		Varies (multi-$trillions)

Total "phased-in" potential incremental HQC demand (*normal market conditions*):	$2.6-5.7tt
Total "phased-in" potential incremental HQC demand (*stressed market conditions*):	$4.6-11.2tt + FTQ Flows

- New regulation could **significantly increase pro-cyclical demand of HQC** (dynamic IM calculations for derivative clearing and proposed bilateral margin requirements)

1. Estimates only; market assumptions vary widely and a vast number of uncertainties make accurate quantification impossible; potential impacts are directional considerations only
2. Sources: BIS, The Clearing House Organization
3. Sources: TABB Group, ISDA, DTCC, CME, WFE
4. Sources: ISDA

High-Quality Collateral Demand – Prudential Regulation

Impact of Prudential Regulatory Requirements

- **New prudential regulation** requiring increased capital (primarily) for banks will increase the demand for cash and non-cash HQC

    - **Basel III ("B3") Liquidity Coverage Ratio ("LCR") requirements** may be most (first-order) impactful

    - Cash and 0% RWA assets are (in most markets) efficient in meeting LCR requirements, and therefore will incrementally add to bank HQC demand

- Beyond first-order demand impacts, increasing prudential requirements can have follow-on credit / collateral creation effects

    - **Banks less-willing to create risky assets under new prudential regime = pro-cyclical impact**

1. Prudential Regulation			
Sample Impact Estimation[1]	HQC Relevance	Phase-In Period	Uncertainties
$1.0 – 2.5tt[2]	Mandatory increases in HQC holdings under B3 LCR requirements; can additionally limit new collateral / credit creation	2013 – 2019	• Bank industry behavioral change • Regulation fluidity / delays • LCR asset composition

1. Estimates only; market assumptions vary widely and a vast number of uncertainties make accurate quantification impossible; potential impacts are directional considerations only
2. Sources: BIS, The Clearing House Organization

High-Quality Collateral Demand – Derivative Clearing

Impact of Derivative Clearing Requirements

- Clearing of standardized derivatives will increase HQC Initial Margin ("IM") requirements and preclude rehypothecation

  - **This will require "the system" to segregate HQC, eliminating its velocity entirely (i.e. precluding its re-use)**

- Due to exchange risk netting and portfolio margining, IM requirements will most affect large net-long or net-short standardized derivative users

  - Most-affected: ALM hedgers (insurance, pension, etc.); VA hedgers (insurance); credit funds

  - Least-affected: dealers, long / short single asset class traders, etc.

2. Market Regulation (Derivative Clearing)			
Sample Impact Estimation[1]	HQC Relevance	Phase-In Period	Uncertainties
• **$0.8-2.0tt (normal)[2]** • **$1.8-4.6tt (stressed)[2]**	Quantum of new IM and stringent eligible collateral requirements for IM and VM; pro-cyclical considering dynamic IM modeling	2013+ (USA) 2014+ (ROW)	• Regulation fluidity / new transaction adoption on exchange • Eligible collateral expansion • Derivative trading behavior

1. Estimates only; market assumptions vary widely and a vast number of uncertainties make accurate quantification impossible; potential impacts are directional considerations only
2. Sources: TABB Group, ISDA, DTCC, CME, WFE

High-Quality Collateral Demand – Bilateral Margin

Impact of Bilateral Margin Requirements

- Bilateral margin requirements for non-centrally-cleared derivatives will impose increased HQC IM requirements and preclude rehypothecation[1]

  - **This will further require "the system" to segregate HQC, eliminating its velocity entirely**

  - During bilateral margin requirement phase-in, dealers will likely be more directly-affected than with clearing-related margin requirements due to risk mismatches and inability to net – for example between (bilateral) swaptions and (exchange-cleared) swap hedges

  - Most-affected: ALM hedgers (insurance, pension, etc.); VA hedgers (insurance); dealers (during phase-in period)

3. Market Regulation (Bilateral Margin)			
Sample Impact Estimation[2]	HQC Relevance	Phase-In Period	Uncertainties
• **$0.8-1.2tt (normal)[3]** • **$1.8-4.1tt (stressed)[3]**	Stringent Eligible Collateral requirements for IM and VM. Pro-cyclical impact considering dynamic IM modeling and thresholds	2015 – 2019[1]	• Cleared product universe expansion • Eligible collateral codification • Derivative trading behavior

1. Note that IOSCO has only *proposed* its "near-final" requirements, i.e. international guidance on the rules and their regional implementation are not final at this time
2. Estimates only; market assumptions vary widely and a vast number of uncertainties make accurate quantification impossible; potential impacts are directional considerations only
3. Sources: ISDA

High-Quality Collateral Demand – Economic Uncertainty

Impact of Economic Uncertainty

- Flight-to-Quality ("FTQ") flows may dominate in crisis when coupled with the "new" pro-cyclical regulatory-driven HQC demand
  - FTQ flows coupled with pro-cyclical regulatory-driven demand could amplify HQC scarcities at precisely the "wrong times"
- FTQ flows are event / scenario-specific, and therefore global quantitative estimates of hypothetical scenarios have little meaning
  - Sample – between Q4 2007 and Q4 2012, FDIC-Insured Commercial Banks and Savings Institutions increased High Quality Liquid Assets ("HQLA") by ~$1tt[1]

4. Economic Environment / Uncertainty			
Sample Impact Estimation	HQC Relevance	Phase-In Period	Uncertainties
• **Varies** • Sample: HQLA increase of ~$1tt at FDIC banks since Q4 2007[1]	FTQ flows typically to HQC in distress / crisis – exacerbating potential HQC disequilibrium during those times	NA	• All market / scenario-specific

1. Source: FDIC

II(b). Supply of Collateral

High-Quality Collateral – Supply Drivers Overview

Incremental HQC Supply Drivers

- **HQC supply** must be considered with reference to incremental sources of supply (primary issuance) and "new" restrictions on supply
  - These new "restrictions" relate to lack of rehypothecation rights for HQC to be posted to exchange or as bilateral margin requirements

Incremental HQC Supply[1]	=	1. Primary Creation	+	2. Lack of Rehypothecation (clearing and bilateral margin)
		High-quality collateral creation by AAA / AA sovereigns		Lack of rehypothecation rights on posted IM
		Currently ~$2.0tt per annum[2]		• -($1.4 to 2.8tt) (normal)[3], after full phase-in • -($3.2 to 7.6tt) (stressed)[3], after full phase-in

- QE is a transformation of non-cash HQC to cash HQC

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1. The potential impacts are estimates only; market assumptions vary widely and a vast number of uncertainties make accurate quantification of incremental supply factors impossible
2. Sources: IMF
3. Sources: TABB Group, ISDA, DTCC, CME, WFE, IMF

High-Quality Collateral Supply – Primary Creation

Impact of Primary HQC Creation

- "Primary Creation" is AAA / AA net issuance created by the public sector Includes AAA / AA sovereign and sovereign guaranteed issuance, projected at $2.225tt for 2013[1]

    - Once issued, assume 35% of this amount is re-used on average 2.5 times[2]

  - Note also that Primary Creation is of course not "incremental" due to new regulation, but is important nonetheless to frame the total potential impact of incremental HQC supply / demand drivers

- Primary HQC Creation is flexible (to a practical extent, i.e. no unlimited deficits) and therefore a highly variable supply factor

1. "Primary Creation"			
Sample Impact Estimation[3]	HQC Relevance	Phase-In Period	Uncertainties
Currently ~$2.0tt per annum[2]	Increase in quantum of HQC supply irrespective of other incremental or transitory supply / demand effects	NA	• Deficit ratios • Potential downgrade impacts • Regional issuance blend (changes velocity) • Re-use / velocity functions

1. Estimates include Japan, USA, France, Canada, UK, the Netherlands, Germany, Australia, European SSAs and other USD issuance (MBS, GSE, SSA)
2. Sources: IMF
3. Estimates only; market assumptions vary especially in relation to public issuance and deficit policy, this impact can vary rapidly and significantly

High-Quality Collateral Supply – Rehypothecation

Impact of Rehypothecation on Supply

- Derivatives clearing and bilateral margin requirements not only affect HQC demand, but because rehypothecation is precluded, it impacts *supply*
  - HQC posted as IM to exchange by definition has a re-use proportion and velocity of zero; this reduces (private sector) HQC "new" collateral creation
- Consequently, there are dual pro-cyclical effects caused by IM requirements for derivative clearing and bilateral margining:
  - Increased quantum of IM demand in volatile markets caused by regulatory-required dynamic IM margin models
  - Decreased incremental supply caused by the "opportunity cost" of additional, non-rehypothecable IM being posted to exchange

2. Lack of Rehypothecation (Clearing and Bilateral Margin)			
Sample Impact Estimation[1]	HQC Relevance	Phase-In Period	Uncertainties
• **-($1.4 to 2.8tt) (normal)[2]** • **-($3.2 to 7.6tt) (stressed)[2]**	No multiplicative effect of HQC lending-driven collateral expansion	2013+ (USA) 2014+ (ROW)	• Regulation fluidity • Eligible collateral expansion • Derivative trading behavior • Clearing exchange policy

1. Estimates only; market assumptions vary especially in relation to public issuance and deficit policy, this impact can vary rapidly and significantly
2. Sources: TABB Group, ISDA, DTCC, CME, WFE, IMF

II(c). Supply and Demand Conclusions

Supply/Demand Conclusions

1. In non-stressed market environments, new regulatory requirements will likely not create a macro shortage in HQC

Incremental Aggregate HQC Demand Estimate by 2020 ("Normal Markets")[1]	
• Prudential Regulation:	$1.0 to 2.5tt
• Derivative Clearing:	$0.8 to 2.0tt
• Bilateral Margin:	$0.8 to 1.2tt
• Total:	$2.6 to 5.7tt

Incremental Aggregate HQC Supply Estimate by 2020 ("Normal Markets")[1]	
• Primary Creation:	$12tt+[2]
• Rehypothecation Losses:	-($1.4 to 2.8tt)
• Total:	$9.2-10.6tt

2. However, pro-cyclical demand for HQC in stressed markets could cause major macro market issues

- Incremental demand in stressed markets could approach $10tt when considering clearing, bilateral margining, and FTQ flows
- This pro-cyclical impact will be greatest after "full phase-in" of all incremental regulation, i.e. 2020+

Supply/Demand Conclusions (con't)

3. Certain market participants will be disproportionately-affected by new HQC demand

- Those with low HQC allocations and large net long or short derivative portfolios (for example, insurers)
- Non-directional derivative users and dealers will likely be less directly affected

4. Market development and financial innovation may help to fill incremental HQC demand

- Collateral transformation, tri-party repo market development, release of more custodial-held HQC assets, etc.

III. Policy and Macro Considerations

Policy Conclusion I: Collateral Cycles are Policy Relevant

Collateral moneyness is pro-cyclical, and has a major impact on money demand and monetary equilibrium.

Policymakers must cautiously observe private shadow money growth during booms and busts

An asset which will not depreciate is good collateral, but markets often mistakenly make judgments of the likelihood of depreciation based on extrapolating recent price trends rather than assessing historical valuations.

The moneyness of the stock of collateral is just as important of the total amount of collateral or "usable collateral."

In a collateral shortage, some form of government or central bank facility would likely be needed to meet demand (e.g. Australia)

Household Money Demand and HELOCs
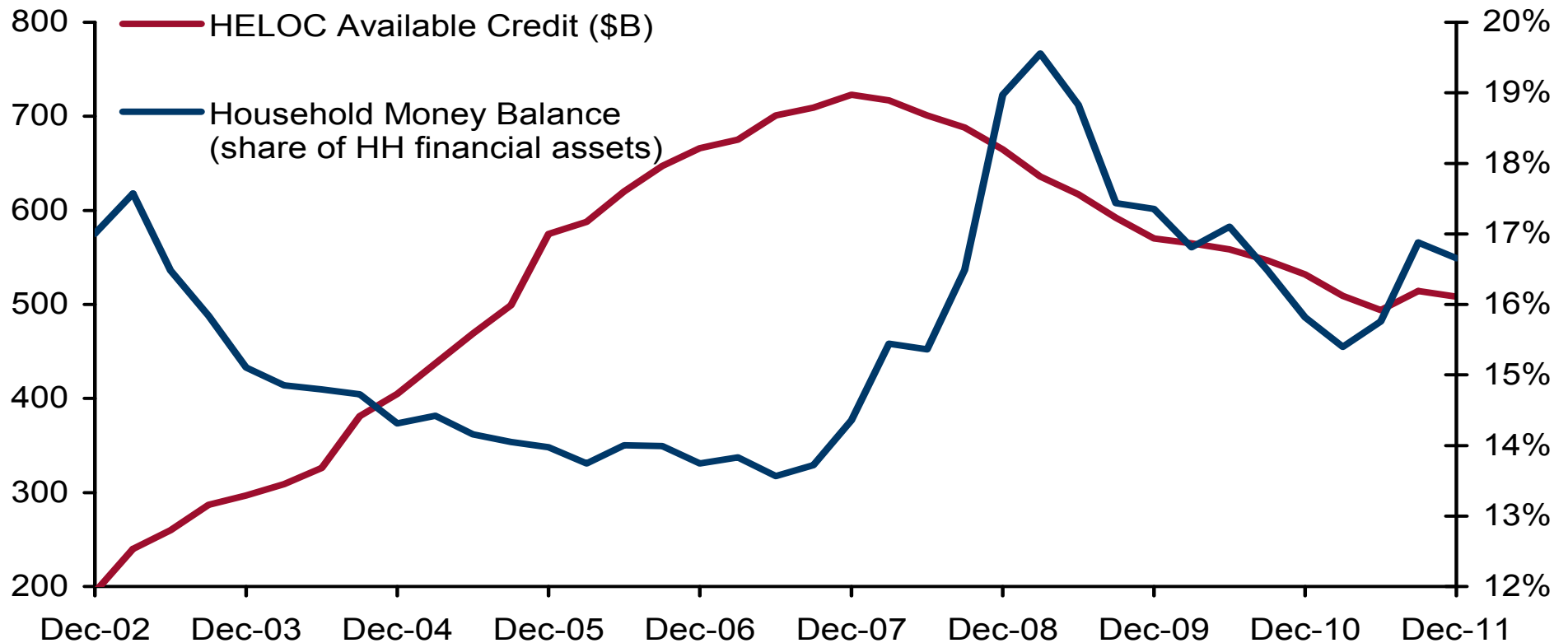
As the moneyness of houses rose in the boom, households chose to hold less cash. When moneyness fell, cash holdings rose abruptly.

Source: Federal Reserve Flow of Funds, New York Fed

Measurement: Shadow Money

We define shadow money as the value of outstanding bonds times one minus the average repo haircut on those bonds.

For example, a bond worth $100 with a 5% haircut is $95 of shadow money.

We calculate public shadow money (treasuries, agencies, agency MBS) and private shadow money (IG and HY corporates, non-agency MBS, ABS, CMBS) using estimated average repo haircuts for each type of debt.

Private shadow money grew sharply before 2007 but collapsed by $3 trillion in 2008 as haircuts rose, net issuance fell, and debt values slumped. It recovered with haircuts, but trend growth remains elusive.

Public shadow money has grown sharply, reflecting large deficits and the public provision of safe liquid moneylike collateral.

Private Shadow Money vs. Public Shadow Money
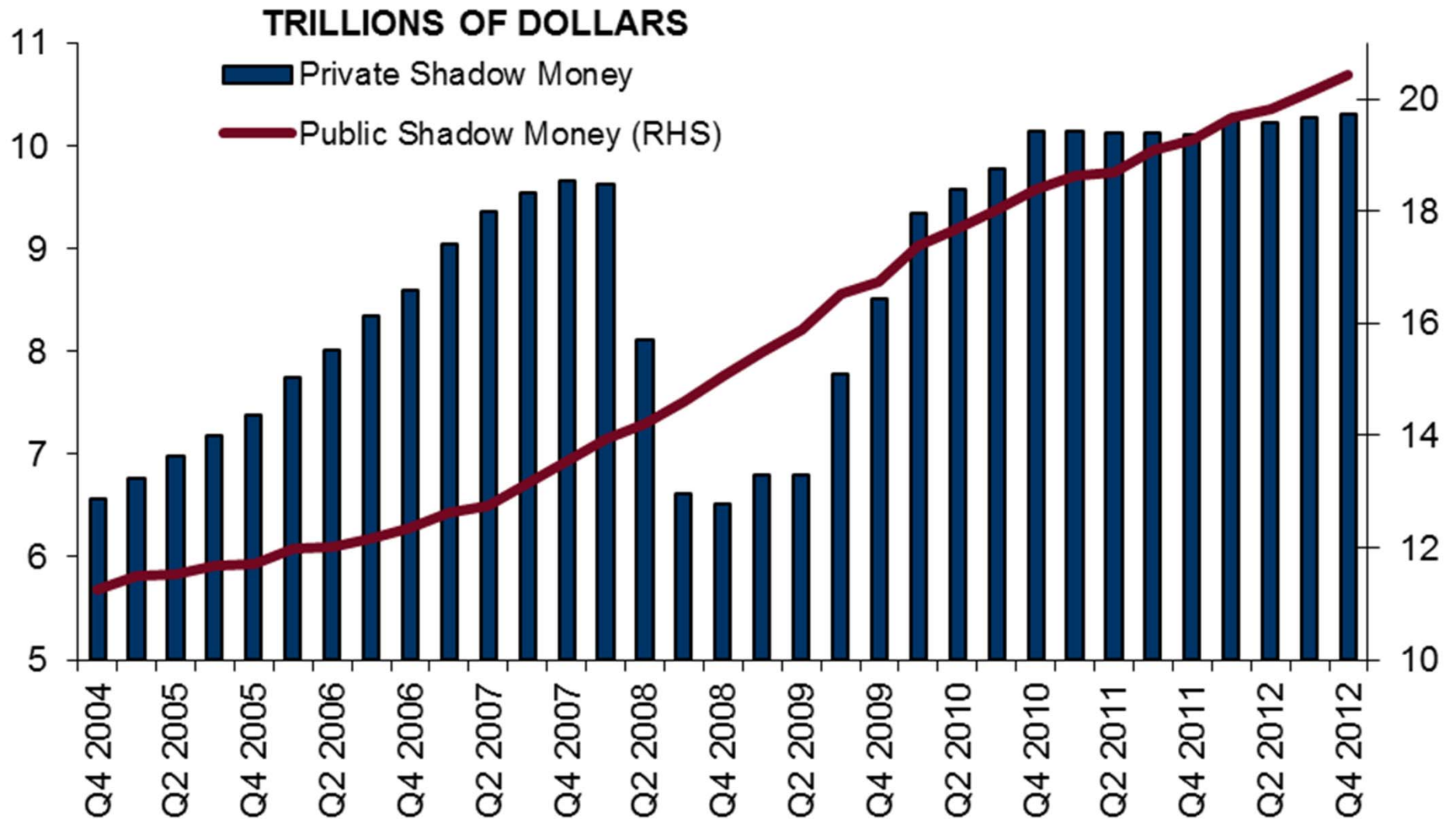
US Money Stock Estimates
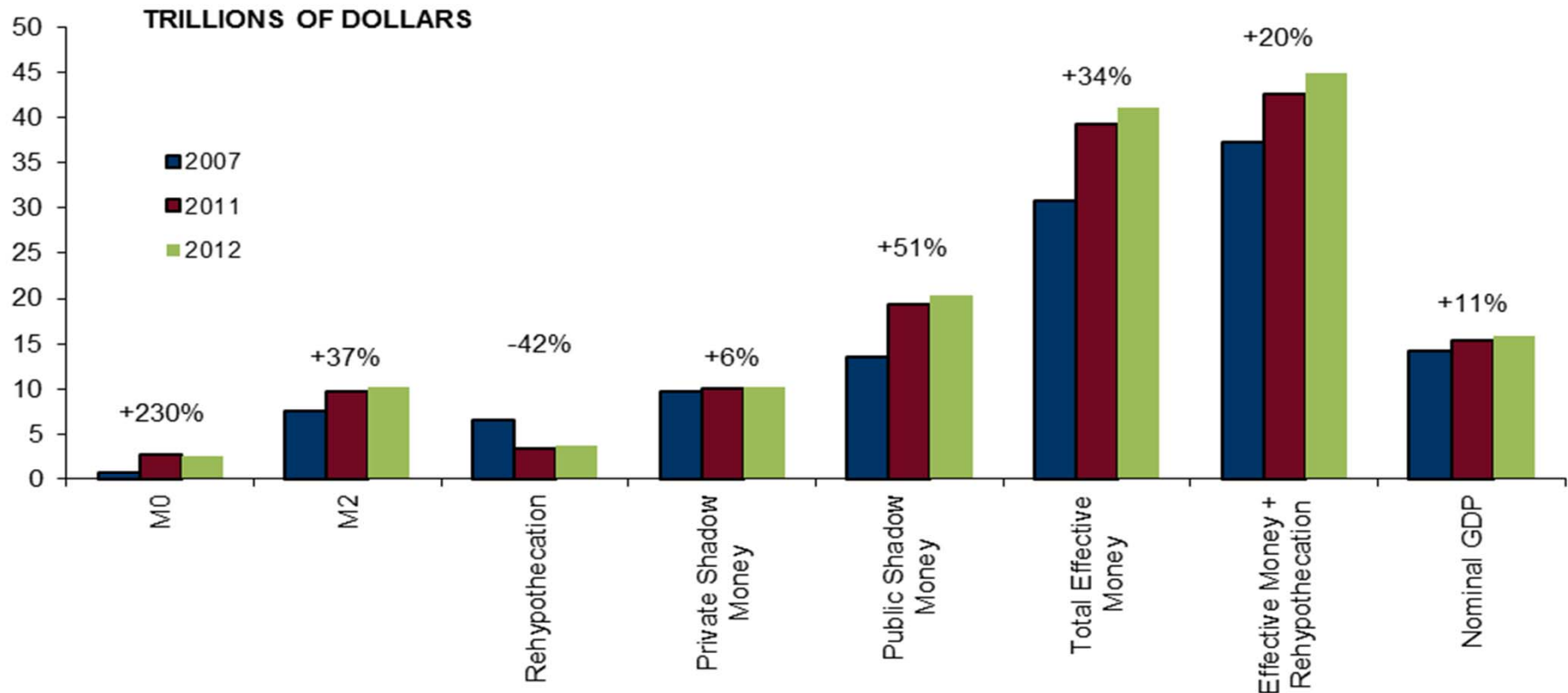
Effective money = shadow money + M2. Broad concepts of money have grown modestly more than NGDP since the crisis.

Source: The BLOOMBERG PROFESSIONAL™ service; Thomson Reuters DataStream

G3+ 10yr Nominal Yield
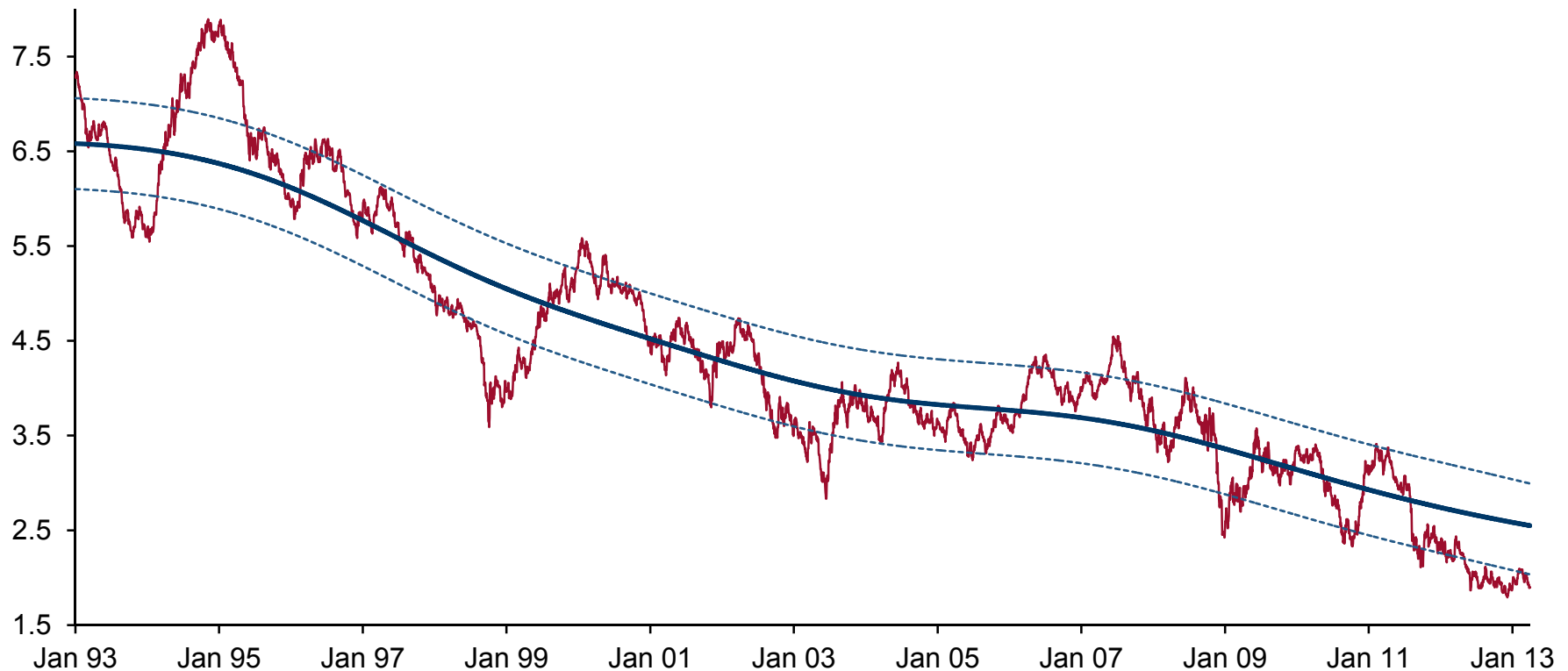
Low long term interest rates hints that the demand for safe liquid assets remains strong and inflationary pressure remains low

Policy Conclusion 2: Liquid Private Collateral is a Good Thing (usually)

Private sector generation of moneylike collateral helps policymakers over long periods by:

   Slowly reducing the demand for money

   Increasing financial deepening

   Supporting financial globalization

The more restricted the private sector's ability to create safe, liquid, and moneylike collateral, the harder the public sector must work to supply it through deficits and easy monetary policy. This too has risks!

US Financial and Government Debt
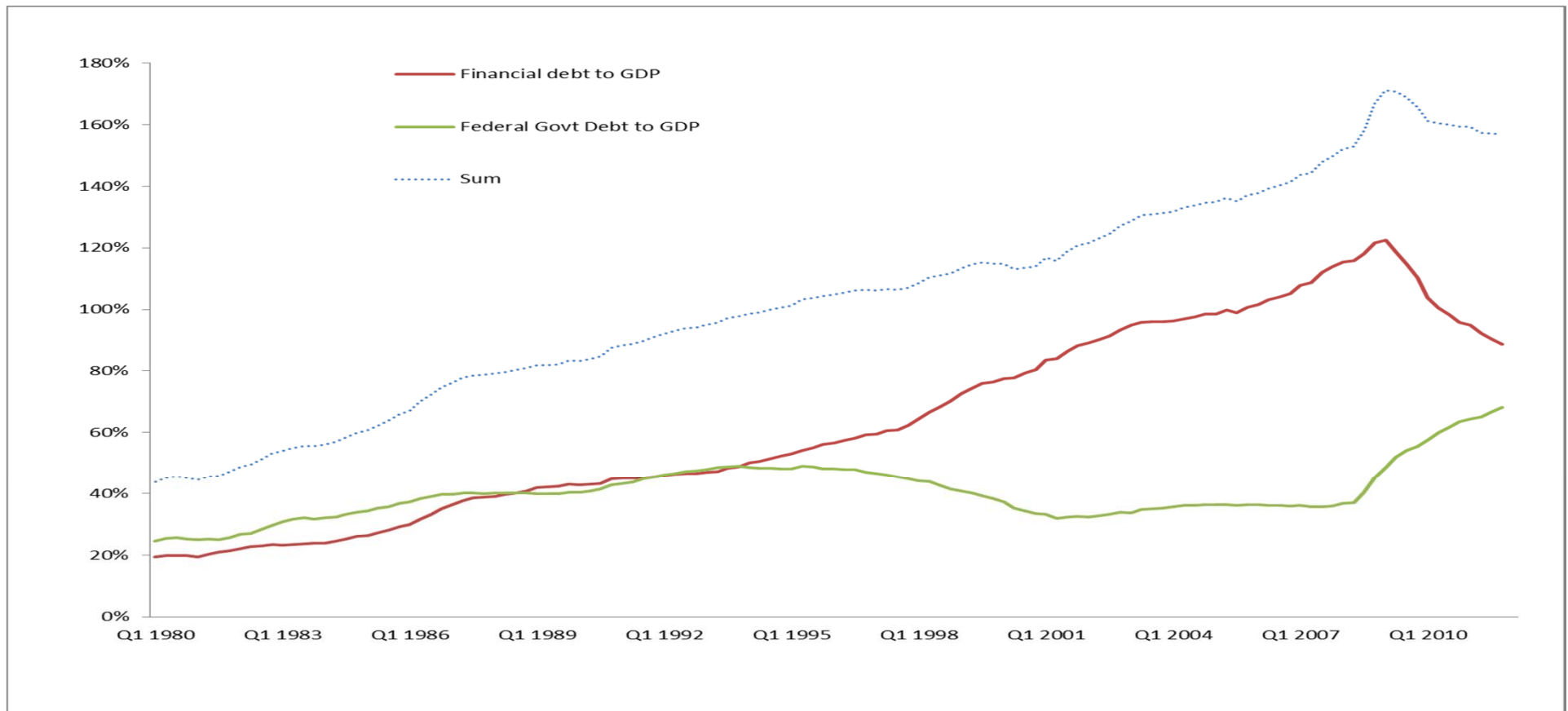
When the private sector collateral generation broke, the public sector had to adjust. The sum of financial and government debt has an oddly stable trend.

CLO Issuance and Spreads
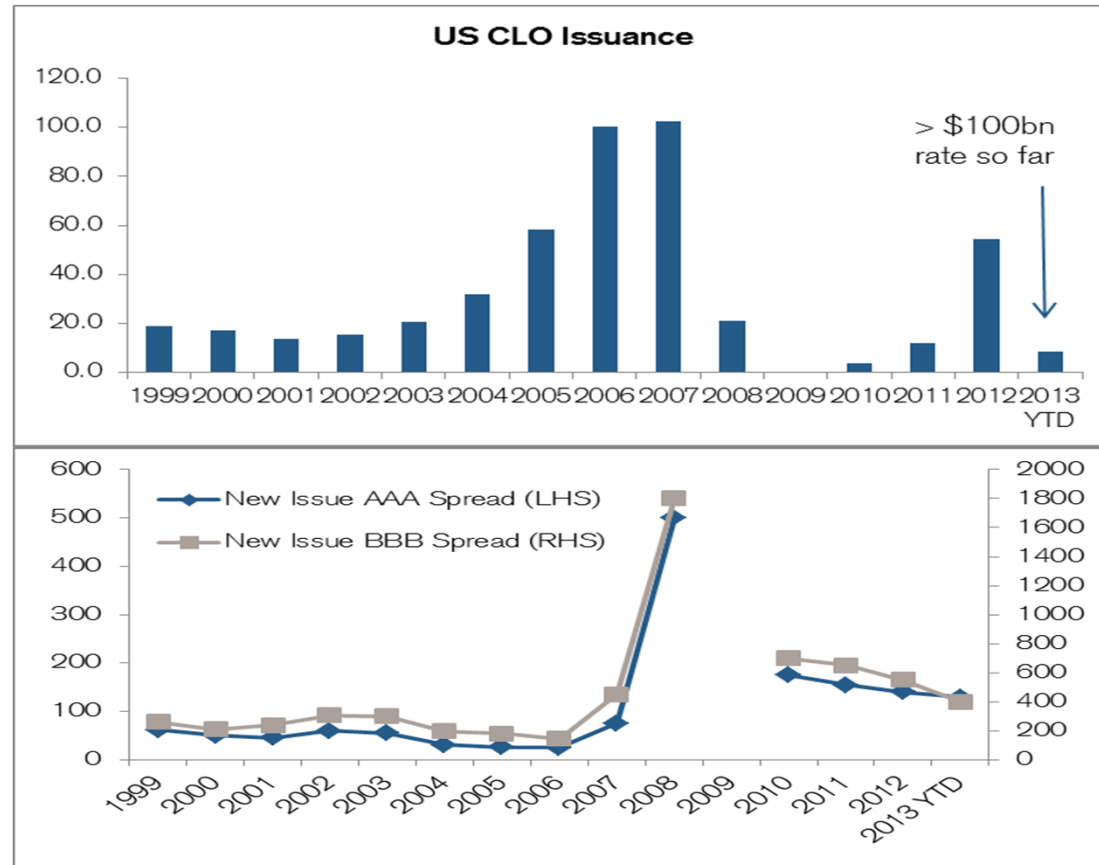
Securitization is an important technology for private sector collateral creation. Its comeback has begun…

Source: Thomson Reuters DataStream, Federal Reserve Flow of Funds

Appendix Slides

Bilateral Margin Requirements – Proposed Rules and Timing

Currently-Proposed Rules, Scope and Timing[1]

	Centrally-Cleared Trades		Non-Centrally-Cleared Trades	
Region	US	EMEA	US	Global
Regulator(s)	US Prudential (incl. CFTC, SEC)	EU Commission / Council, European Parliament ; European Supervisory Authorities, ESMA, EBA & EIOPA ; National Sec. & Banking Regulators	US Prudentials (OCC, Fed, FDIC, FCA, FHFA)	IOSCO
Covered Entities	US Persons (Supra, End User Exemptions)	EU Financial counterparties; EU Non-Financial Counterparties exceeding threshold; Pensions exempt for 3y	Covered swap counterparties (end-user exemption char's.)	All covered entities with some exemptions (end-user, non-systemic)
Timing	Cat. 1 / 2 / 3 Phase-In (Mar-Sep 2013)	Mid 2014 (some CCPs projecting earlier implementation)	Unknown (likely before IOSCO)	2015 (>€3tt); 2016 (>€2.25tt); 2017 (€1.5tt); 2018 (€0.75tt); 2019 (€8bb)[3]
Covered Trade Scope	IRS, Basis Swaps, FRA, OIS, CDS (2013); more later	IRS, Basis Swaps, FRA, OIS, CDS (mid 2014); more later	All non-cleared swaps / security-based swaps for covered entities	All non-centrally-cleared derivatives
IM Amount[2]	5d 99% VAR (dynamic, exchange-calc.) (~0.3-10.0% Notional)	Follow Basel-IOSCO requirements: 5d 99.5% for OTC derivatives 2d 99.0% for Other Instruments	• 10d 99% VAR (reg-approved); or • Standardized Schedule	• 10d 99% VAR (reg-approved); or • Standardized Schedule • Both with €50mm Threshold
IM Eligible Collateral	• Liquid collateral (cash / UST) given best terms • Less liquid collateral limited / haircut	Cash, Financial Instruments, Commercial Bank Guarantee, Gold, Guarantee Issued by Central Bank	Cash, UST, GSEs	Determined by National Supervisors from a suggested (but not exhaustive) list including cash, sovereigns, corps, converts, major index equities, gold
IM Treatment	• Bilateral, net (portfolio) basis • Segregated, not re-hypothecated	• Bilateral, net (portfolio) basis • Segregated, not re-hypothecated • Agency concentration limits	• One-way (to covered swap entity) with varying thresholds • Two-way bilateral (covered entities) • Segregated, not re-hypothecated	• Bilateral, net (portfolio) basis • Segregated, not re-hypothecated
VM Eligible Collateral	• Cash, net basis	Cash, net basis	• Cash • UST	Same as IM Composition
VM Eligible Collateral Treatment	• Bilateral, net (portfolio) basis • Re-hypothecation permitted	• Bilateral, net (portfolio) basis • Re-hypothecation permitted	• Bilateral, net basis • Re-hypothecation permitted	• Bilateral, net (portfolio) basis • Re-hypothecation permitted

1. This is *not* meant as an exhaustive and "official" list of all new regulatory requirements. In fact, all information in this table is subject to change as regulatory requirements, regulator definitions, etc. are also fluid
2. In general, non-centrally-cleared amounts will be greater than analogous amounts for those for centrally-cleared amounts (net of thresholds)
3. Each January (starting 2015), 3m look-back on gross non-cleared derivative notional – if greater than threshold, new margin rules apply

Appendix – Centrally-Cleared IM Requirements

Massive Market Changes to be Implemented

- Changes in the OTC derivative markets that result from Dodd-Frank regulation implementation will have a significant impact on those who use derivatives for investment or hedging purposes

- Beyond conduct and reporting rules, exchange clearing of standardized derivatives will play a major role in the new regulatory regime
  - Mandatory clearing of many interest rate swaps, basis swaps, FRAs, overnight index swaps, and credit default swaps are scheduled to begin for certain participants in March of 2013

- One of the largest impacts to be felt once central clearing is enacted will be that generated from Initial Margin ("IM") and Variation Margin ("VM") requirements
  - Many market participants unaccustomed to posting IM will now be forced to do so and may only use exchange-eligible collateral
  - Additionally, while many large / active market participants already post VM, its composition for centrally-cleared transactions (cash only) may be vastly different from VM collateral composition in current bilateral OTC agreements

- Because IM will be based on the entire *portfolio* of counterparty transactions cleared on a specific exchange, offsetting transactions will reduce IM requirements based on the offsetting risks
  - What this means is that those who typically carry derivative portfolios that are net long or net short for real business purposes (for example, ALM hedgers with net long positions) will be more-affected by IM rules than those who may trade actively but in a tactical, offsetting fashion

Sample IRS IM Tables

- IM requirements will change over time (and in line with changes to clearing counterparties methodologies) and will most likely cover trailing 5-day VAR with a 99% confidence interval

Currency	Maturity	CME		LCH	
		Payer	Receiver	Payer	Receiver
USD	2	0.39%	0.59%	0.22%	0.36%
USD	5	1.41%	2.62%	0.88%	0.97%
USD	10	3.09%	4.10%	3.07%	2.87%
USD	30	9.56%	8.39%	10.61%	8.11%
EUR	2	0.23%	0.32%	0.30%	0.27%
EUR	5	1.00%	1.03%	0.91%	0.94%
EUR	10	2.55%	2.25%	2.49%	2.40%
EUR	30	9.97%	6.76%	9.66%	10.94%
GBP	2	0.53%	0.60%	0.47%	0.40%
GBP	5	1.16%	1.43%	1.23%	0.96%
GBP	10	2.16%	2.28%	2.05%	2.35%
GBP	30	6.37%	3.97%	6.61%	5.15%
JPY	2	0.08%	0.08%	0.09%	0.12%
JPY	5	0.25%	0.37%	0.30%	0.43%
JPY	10	1.01%	1.17%	1.55%	1.34%
JPY	30	6.06%	3.67%	10.43%	8.26%

Sources: CME and LCH; subject to change

Appendix – Centrally-Cleared IM / VM Composition

Eligible Collateral Composition

- On top of the requirement for increased IM and standardized daily VM, central clearers must consider not just the *requirement* to post such margin, but the relative stringencies applied to collateral-type *eligibility and haircuts*
  - Most IM will need be composed of cash and high-grade government securities, while VM will need be composed of cash
  - See below (and, more importantly, reference the footnote links to CME and LCH sample eligibility stipulations as requirements have, in the past, been extremely fluid and remain subject to change and amendment)

CME[1]	**LCH[2]**
Category 1	- Cash (USD, GBP, EUR, CAD, CHF, JPY, SEK, NOK)
- Cash (USD, or 5% haircut on AUD / GBP / CAD / EUR / JPY / CHF)	
- US Treasury bills / notes / bonds (0.5-6% haircut)	- Government Securities of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, United Kingdom, and the United States (0.1-13% haircut)
- Strips (11% haircut)	
Category 2 (max 40% of core requirement)	
- US Government Agencies (3.5-7.0% haircut)	- US MBS (GNMA) (2.0-14% haircut)
- FNMA, FHLMC and GNMA MBS (11% haircut)	
- TLGP Securities (10% haircut)	- FNMA, FHLMC, FHLB (0.4% to 4.9% haircut)
Category 3 (max if 40% of core requirement or USD 3bb)	- Euro Agencies (0.6-6.3% haircut)
- Gold (15% haircut)	
- Foreign Sovereign Debt of Canada, France, Germany, Japan, Sweden and the United Kingdom (5.0%-10.5% haircut)	- Government guaranteed bonds / CDs of Australia, Austria, France, Germany, Netherlands, Norway, Spain, Sweden, United Kingdom, and United States (0.1-2.9% haircut)
- Corporate Bonds (CME-approved, min A- rating, >USD 300mm outstanding, 20% haircut)	- Gold (14% haircut)

"There can be no doubt that besides the regular types of the circulating medium, such as coin, notes and bank deposits, which are generally recognised to be money or currency, and the quantity of which is regulated by some central authority or can at least be imagined to be so regulated, there exist still other forms of media of exchange which occasionally or permanently do the service of money.

Now while for certain practical purposes we are accustomed to distinguish these forms of media of exchange from money proper as being mere substitutes for money, it is clear that, other things equal, any increase or decrease of these money substitutes will have exactly the same effects as an increase or decrease of the quantity of money proper, and should therefore, for the purposes of theoretical analysis, be counted as money."

Friedrich Hayek, *Prices and Production* 1931 - 1935.

Committee Charge
Presentation to the Treasury

Potential Impacts of the Federal Reserve's Exit Strategy on Treasury Financing

We would like the Committee's views regarding the expected timing of the Federal Reserve's "exit strategy," the steps that are expected to be taken, and any resulting impact on both the Treasury market and Treasury financing.

Presentation to TBAC

April 30th 2013

Executive summary: expect significant Treasury market repricing

- Treasury yield curve implies a very benign path of monetary tightening relative to private sector/FOMC forecasts

- Treasury yields could reprice notably when the market is convinced that policy tightening is imminent

- There is a risk that markets may overshoot to higher-than-fair yield levels due to:
  - Concerns about Fed portfolio unwind
  - Inadequate interest hedging in certain asset classes
  - Portfolio rebalancing by retail investors

Executive summary: expect significant strain on public finances

- Annual interest cost on public debt to increase more than 400% (from $205 bn in 2013 to $855 bn in 2023)
  - Main driver : Increase in WAC from 1.7% to 4.3%
  - Secondary factor : ~ 65% increase in stock of debt

- Fed remittance decline is not likely to be dramatic
  - assuming no asset sales, annual remittance rate to decline from $80 bn in 2012 to an average $60 bn over 2014 -2023
  - This is still higher than pre-2007 levels

- Fed asset sales have marginal effect on debt service and remittances. Relative to base case:
  - Total interest cost of public debt over 2014-2023 increases by $50 bn
  - Cumulative Fed remittances over 2014-2023 decline by $65 bn

Key recommendations

- Continue to extend the WAM of Treasury issuance as per current plan

- Assure markets of stable issuance pattern to prevent excessive build-up in term premium
  - Sharp increase in WAM will marginally *increase* cost of financing even assuming no change in rate forecasts
  - The primary risk is for a significant increase in interest rates relative to our forecasts

Agenda

- Market expectations of exit strategy

- Implication of exit on rates markets

- Implications of Fed exit for Treasury financing

Market expectations of exit strategy

Investor feedback suggest the following timeline…

- Q4 2013 : Fed begins to taper asset purchases

- Q2 2014 : Fed stops asset purchases

- Q2 2015 : Fed stops reinvesting paydowns
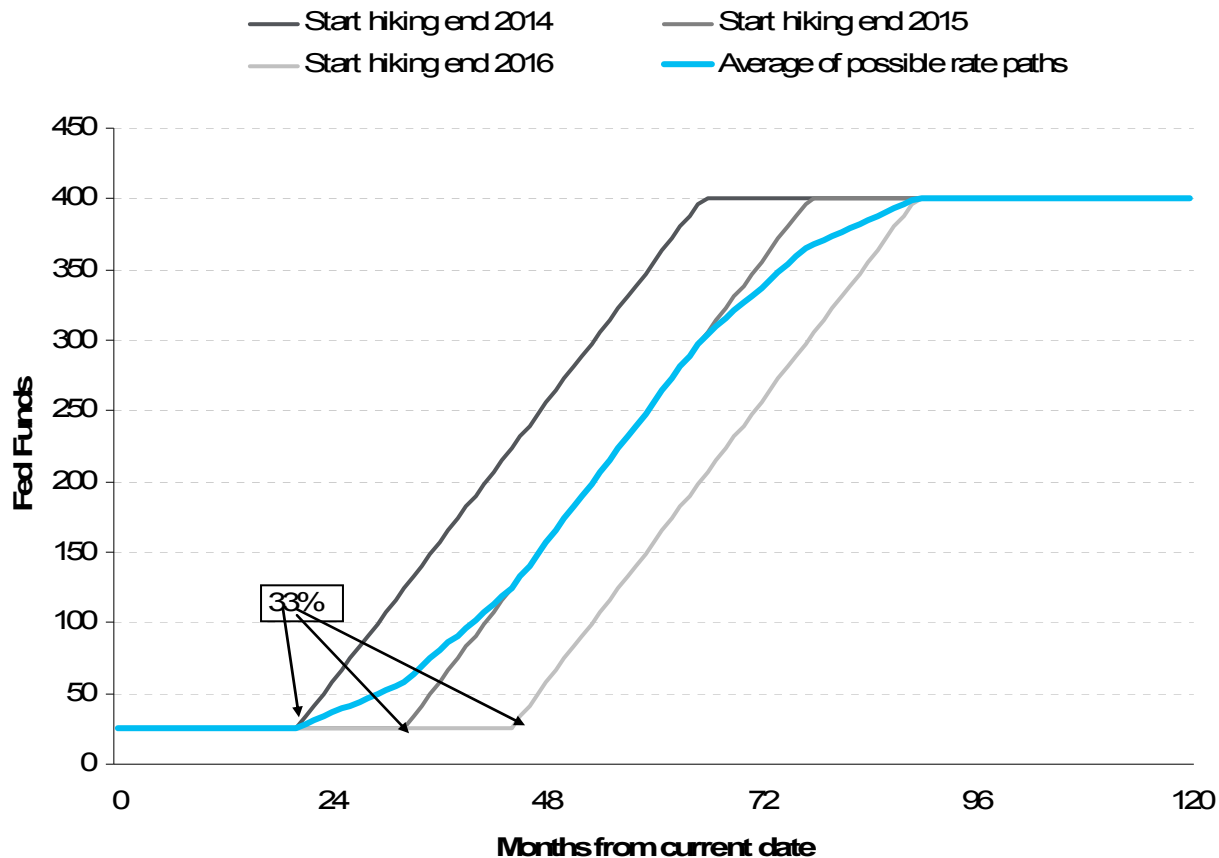
- Q4 2015 : Fed starts increasing policy rate

Notes: Based on investor surveys, Bloomberg Survey of Primary Dealers, April 23rd

Inferring the implied tightening path: deterministic rate path

Legend: Market forward curve — Convexity adjusted — Expected path of Fed Funds

Y-axis: Yield (bp), ranging 0 to 450
X-axis: Months, 0 to 120

Gradual pace of tightening starting 3 years out
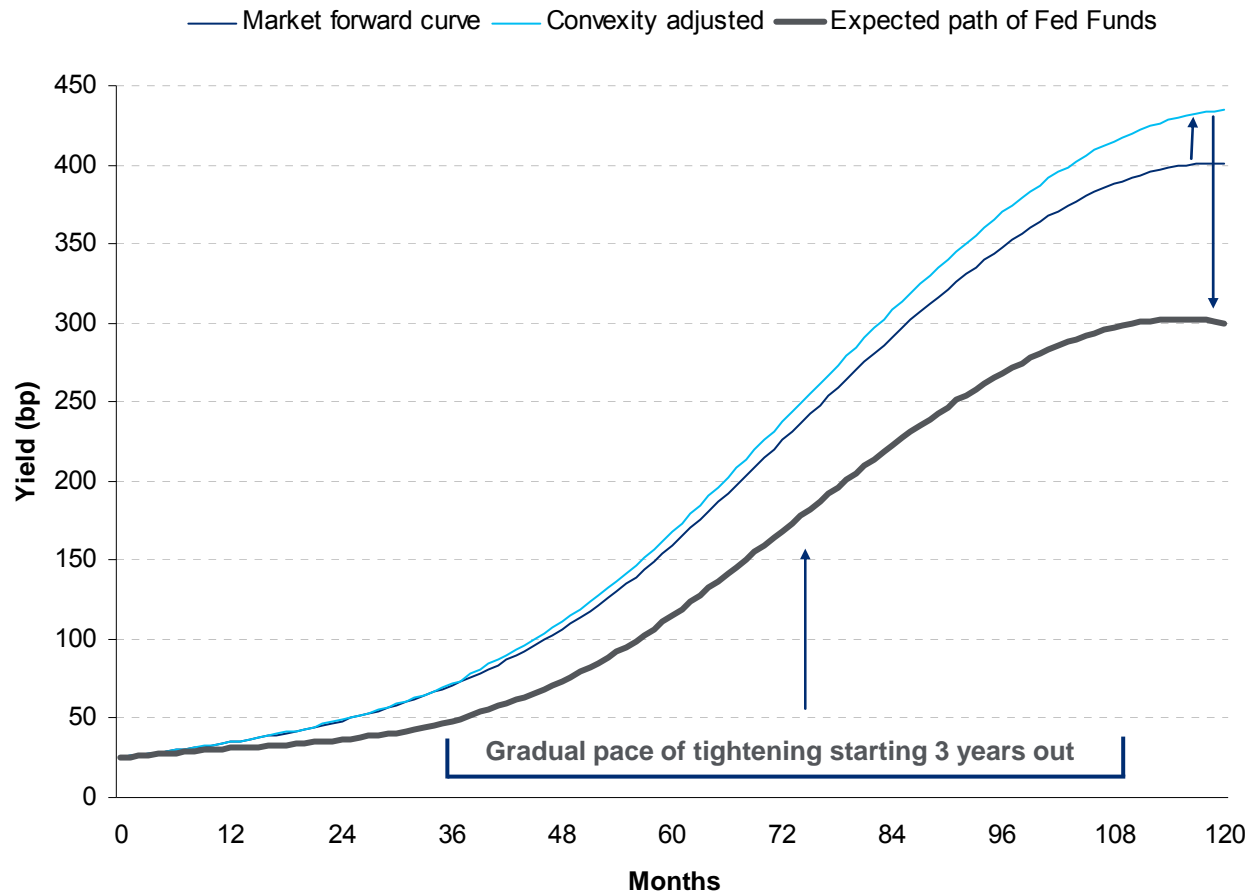
Notes: Analysis date April 18th 2013. Instantaneous forward curve is inferred from constant maturity Treasury yields. Convexity adjustment consistent with current structure of short dated volatility. Convexity adjusted curve is adjusted lower to account for term premium. Term premium is based on historical estimates and adjusted for the current lower volatility structure (see appendix)

Constructing yield curves from probabilistic rate paths: projected curve is too high and steep

Legend: Start hiking end 2014 — Start hiking end 2015 — Start hiking end 2016 — Average of possible rate paths

Y-axis: Fed Funds (0 to 450)
X-axis: Months from current date (0 to 120)

33%

	2y	5y	10y
Avg. short rate (bp)	26	87	229
Term premium & convexity adj. (bp)	6	27	75
Model yield (%)	**0.32**	**1.11**	**2.82**
Actual yield (%)	0.23	0.69	1.70
Earliest hike (mo.)	20	(end 2014)	
Median hike (mo.)	32	(end 2015)	
Terminal rate (bp)	400		

Notes: Analysis date April 18th 2013. We assume equal probability for each hike date

Allowing a more uncertain tightening date flattens 5s10s, but projected rates still too high

Average of possible rate paths
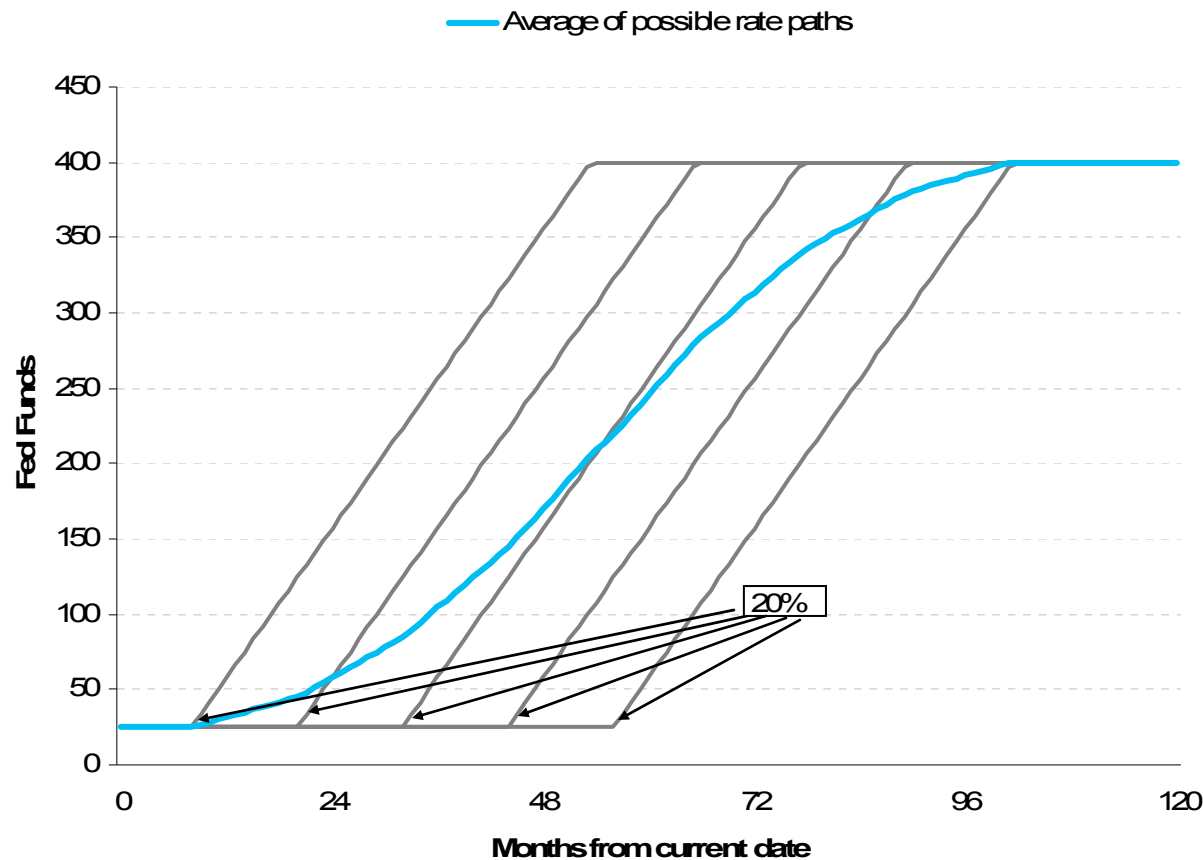
	2y	5y	10y
Avg. short rate (bp)	35	99	229
Term premium & convexity adj. (bp)	6	27	75
Model yield (%)	**0.41**	**1.23**	**2.82**
Actual yield (%)	0.23	0.69	1.70
Earliest hike (mo.)	8	(end 2013)	
Median hike (mo.)	32	(end 2015)	
Terminal rate (bp)	400		

Notes: Analysis date April 18th 2013. We assume equal probability for each hike date

Lowering the terminal rate allows a better fit to 10-year rates

Average of possible rate paths
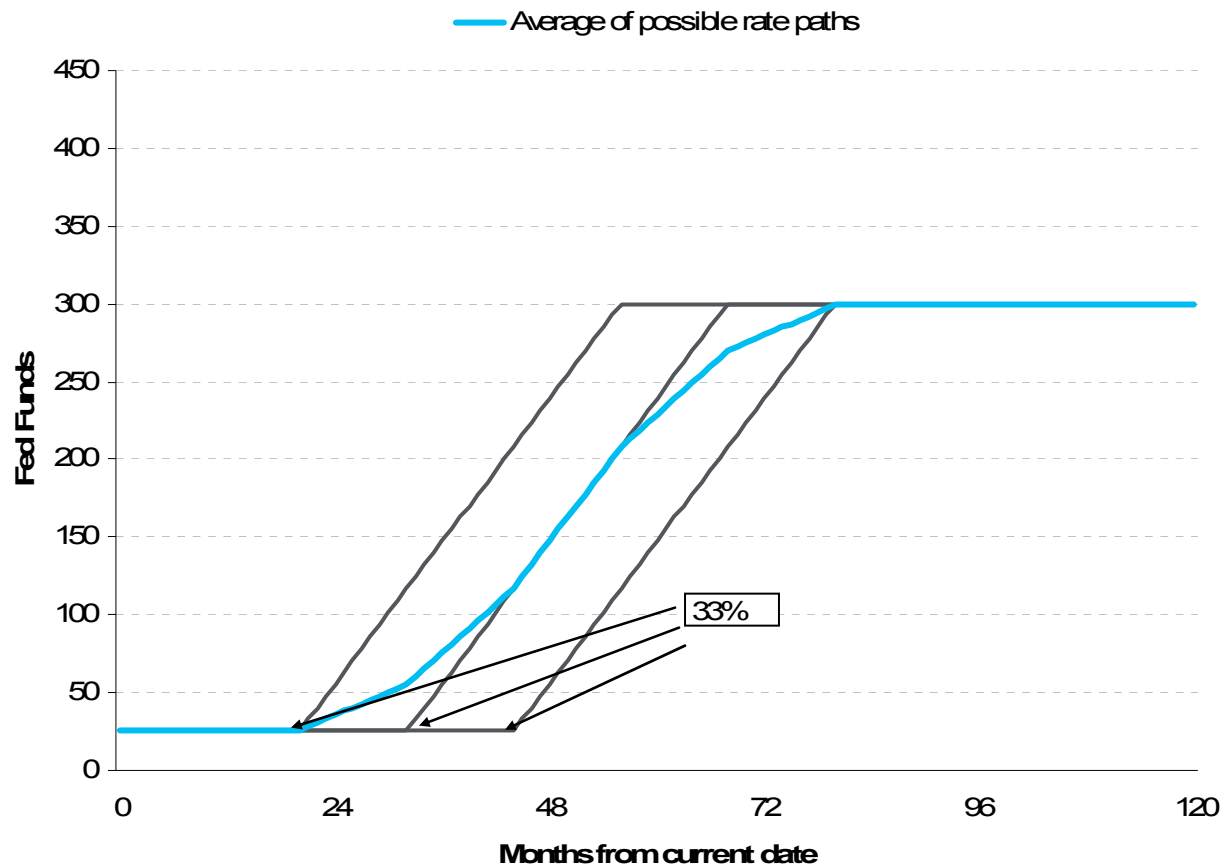
	2y	5y	10y
Avg. short rate (bp)	26	82	185
Term premium & convexity adj. (bp)	6	27	75
Model yield (%)	**0.32**	**1.06**	**2.39**
Actual yield (%)	0.23	0.69	1.70

Earliest hike (mo.)	20	(end 2014)
Median hike (mo.)	32	(end 2015)
Terminal rate (bp)	300	

Notes: Analysis date April 18th 2013. We assume equal probability for each hike date

A recipe for inferring market expectations of Fed tightening path

- Structure
  - Par yields are a function of the Fed Funds rate path adjusted for term premium and convexity
  - There is uncertainty as to the start of rate hikes and the terminal Funds rate
  - Hiking cycle completed in three years

- We optimize over….
  - The parameters of the probability distribution of first hike date (lognormal distribution)
  - The terminal Funds rate

- ….To fit the Treasury yield curve out to 10 years

Market pricing very delayed hiking cycle and 3.25% terminal rate

Legend: — Fitted lognormal pdf — Average of possible rate paths

	2y	5y	10y
Avg. short rate (bp)	25	42	121
Term premium & convexity adj. (bp)	6	28	80
Model yield (%)	**0.32**	**0.67**	**1.79**
Actual yield (%)	0.23	0.69	1.70
Mode hike date (months)	48 (q1 2017)		
Terminal rate (bp)	322		
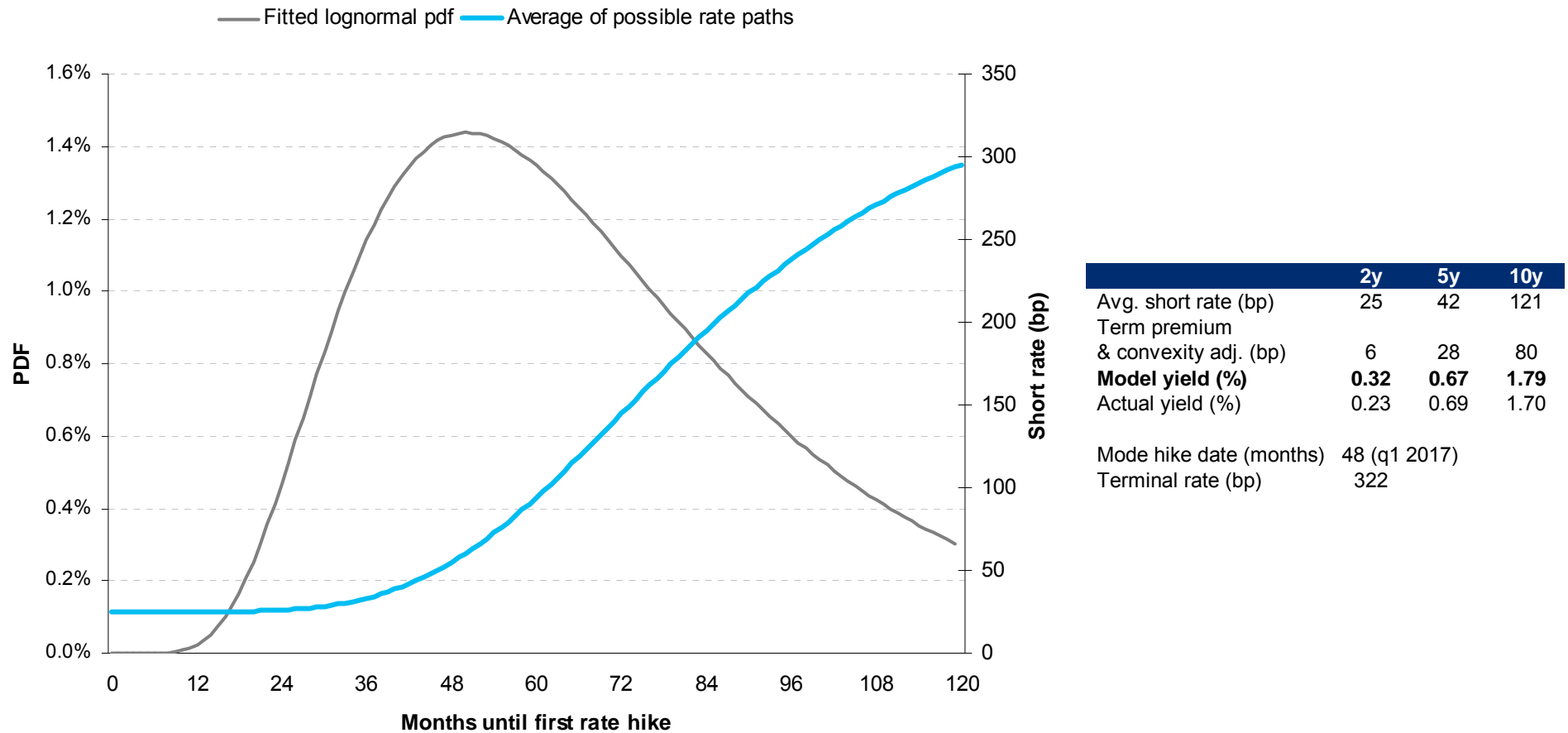
Analysis date April 18th 2013. We assume a 3-year hiking cycle and use historical term premium adjusted lower for current volatility conditions. We estimate the probability of first hike date and terminal rate so as to fit the current Treasury curve out to ten years.

Market implying benign tightening path relative to FOMC projections

Model output – most probable date of first hike is q1 2017, terminal rate of 3.25%

	2y	5y	10y
Avg. short rate (bp)	25	42	121
Term premium & convexity adj. (bp)	6	28	80
Model yield (%)	**0.32**	**0.67**	**1.79**
Actual yield (%)	0.23	0.69	1.70

Mode hike date (months	48 (q1 2017)
Terminal rate (bp)	322

Fed projections – Rate hikes seen in 2015, terminal rate of 4%
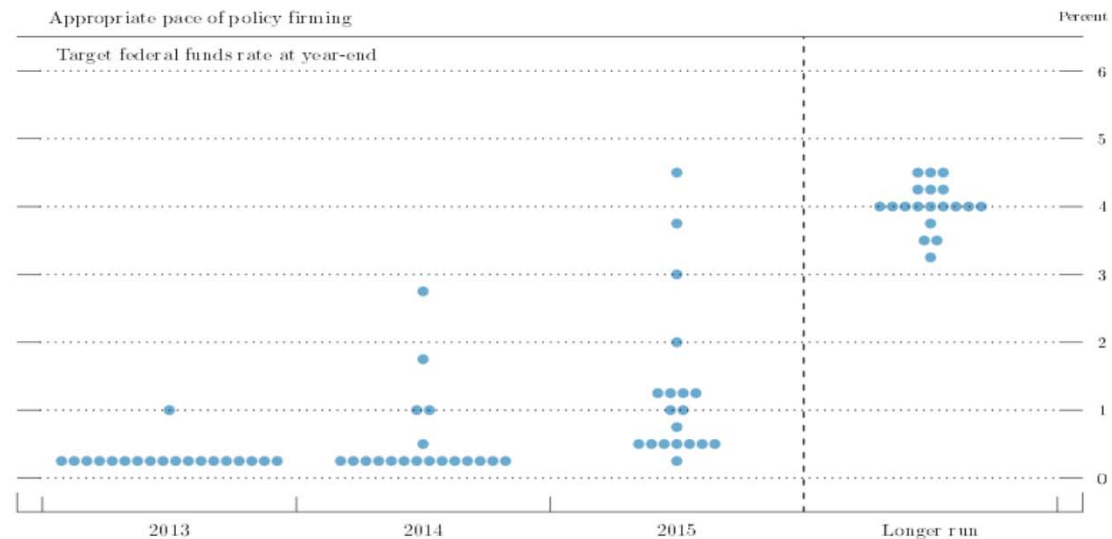
Source: Federal Reserve Economic Projections 20th 2013. Modeling methodology described in slide 12.

Implications of exit on rates markets

Baseline assumptions for rates scenarios

Scenario date	Median time to first hike	Terminal rate	Volatility structure
Parameters consistent with April 18th market conditions	q1 2018	3.25%	current market levels
Parameter assumptions used in yield curve projections			
End 2013	q1 2017	3.60%	Average of current and Q1 2010
End 2014	q4 2015	4.00%	Q1 2010
End 2015 to End 2018	Deterministic rate path to terminal rate of 4% by end 2015. Q1 2010 volatility structure. No asset sales.		

Notes: Parameter assumptions are consistent with the timeline suggested by investor surveys. By end 2013, the Fed has begun tapering purchases. By end 2014, the Fed is signaling an end to paydown reinvestment and markets price Fed tightening by end 2015. Structure of volatility markets is then similar to Q1 2010 when markets priced imminent Fed tightening.

Expect sharp repricing as market adjusts expectations

Legend: Current - 19 Apr 2013 | 2013 | 2014 | 2015 | 2018

End of 2015 - Fed begins tightening, 3 year cycle

End of 2014 - Market reprices tightening to begin at 2015 year end

End of 2013 - Market prices tightening to begin 2016 year end

Year Ended	10-year rate forecast (%)	Forward Rate (%)	Difference (bp)
2013	2.76	1.99	77
2014	3.88	2.22	166
2015	4.27	2.45	182
2016	4.58	2.65	193
2017	4.77	2.82	195
2018	4.83	3.10	173

Notes: Yield curve scenarios are generated based on pricing assumptions described in slide 16 consistent with investor surveys. Yield curves are generated based on the methodology described in slides 9 through 12.

Unhedged interest rate risk may exacerbate rate increases

While traditional agency MBS convexity risk is muted...

Episode	A large shift in portfolio duration (change)			Duration extension as % of FI universe duration	Asset price effect (changes)		
	10-yr tsy (bp)	MBS Index duration (yrs)	Duration of active hedgers ($bn 10-yr equiv)		10-yr swap spread (bp)	1y10y implied vol (bp)	Par-coupon MBS OAS (bp)
June 24th '03 to Aug 1st '03	131	2.7	470	12%	34	22	24
April 18th (Hypothetical)	100	1.7	284	3%	?	?	?

- Post-Crisis mortgage convexity risks are muted due to
  - Reduced refinancing efficiency (less duration extension in a sell-off)
  - Shifting ownership to non-hedgers, notably the Fed
  - The smaller share of MBS in the overall fixed-income market as Treasury issuance surged

- This was confirmed in the 100bp backup in 10yr Treasury yields in 2010, which did not have near the convexity hedging participation as 2003

Notes: MBS duration calculations are from Yield Book. Fed, overseas investors, banks and money managers are deemed non-active hedgers.

…there is unhedged interest rate risk in non-agency MBS..

- Over last several years, empirical duration of mortgage credit has been correlated Treasury yields – suggesting a negatively convexity price profile

- However, thus far mortgage credit convexity flows have not occurred

- This is likely because most post-crisis investors in mortgage credit have not hedged interest rate exposure at all
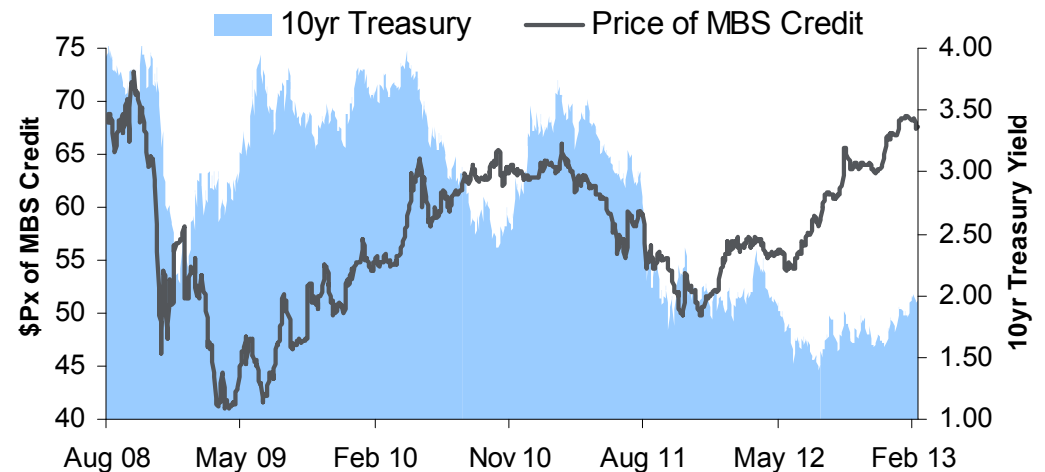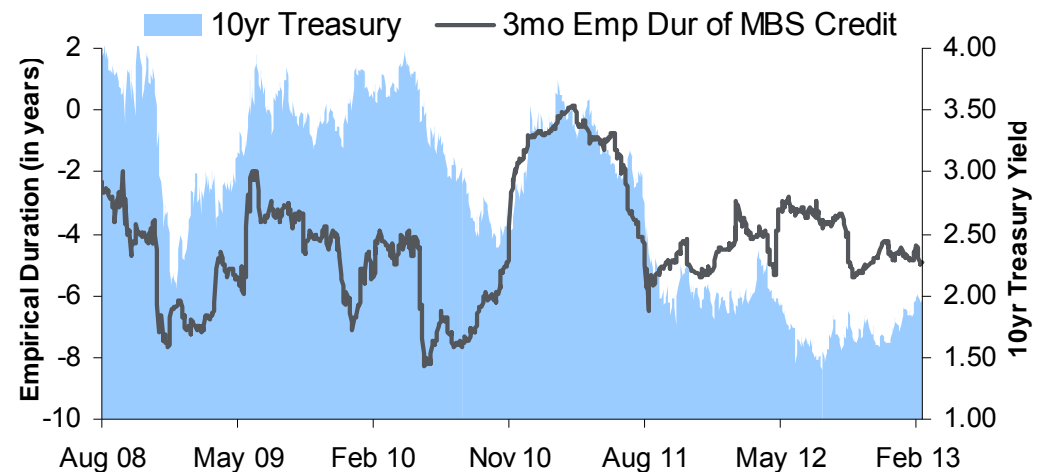
Notes: ABX prices are used to proxy for the non-agency mortgage universe. Empirical duration computed as regression of daily prices changes on 10-yr yield changes over trailing 3-month window

… and in corporate credit
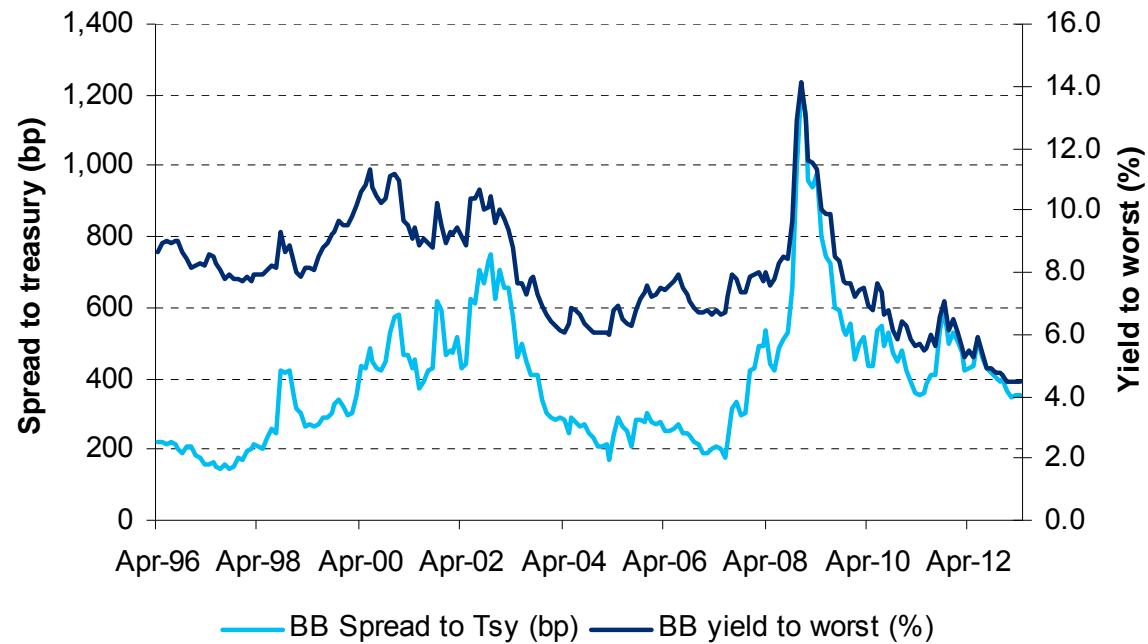
- Limited room for High Yield spreads to compress further suggesting that interest rate risk is increasing

Source: Yield Book.

The risk from reversal of retail fixed-income flows

Fixed-income inflows outstrip equities post crisis

Cumulative mutual fund inflows
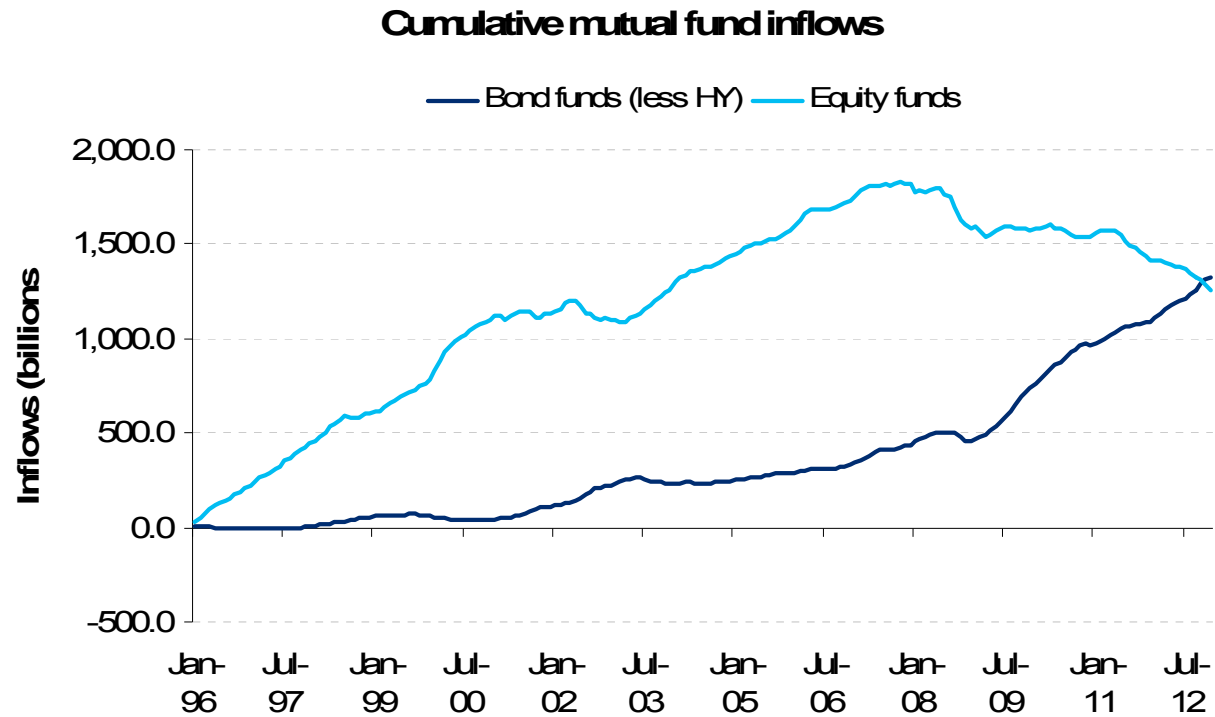
Source: ICI

Hot money outflows could strain spread product

- Inflow pattern suggests 'return chasing' behavior among retail investors

Return quartile	Returns in prior quarter on CITI BIG Index	Net quarterly inflows into taxable fixed-income
1	-0.7%	0.3%
2	0.8%	2.7%
3	2.3%	1.0%
4	3.8%	2.7%

Notes: Quarterly data since 1996 is sorted by prior quarter returns on the CITI BIG index into four quartiles. Source: ICI, Yield Book

- Mutual fund assets have increased dramatically relative to dealer risk provision

— Retail assets in taxable fixed-income ($bn)
— Primary dealer corporate bond inventory ($ bn)
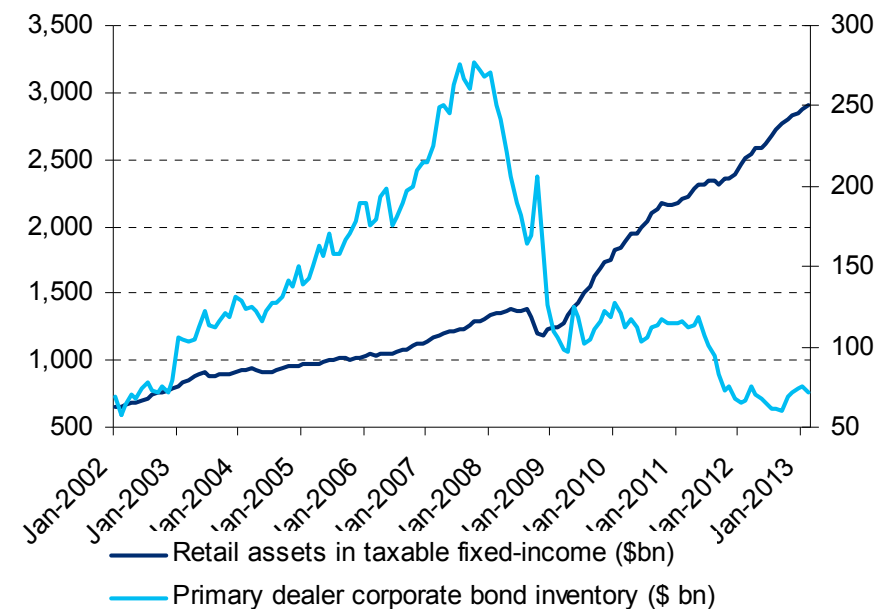
Source: ICI, Federal Reserve

Implications of exit on Treasury financing costs and Fed remittances

Higher marginal cost of financing will raise the average cost
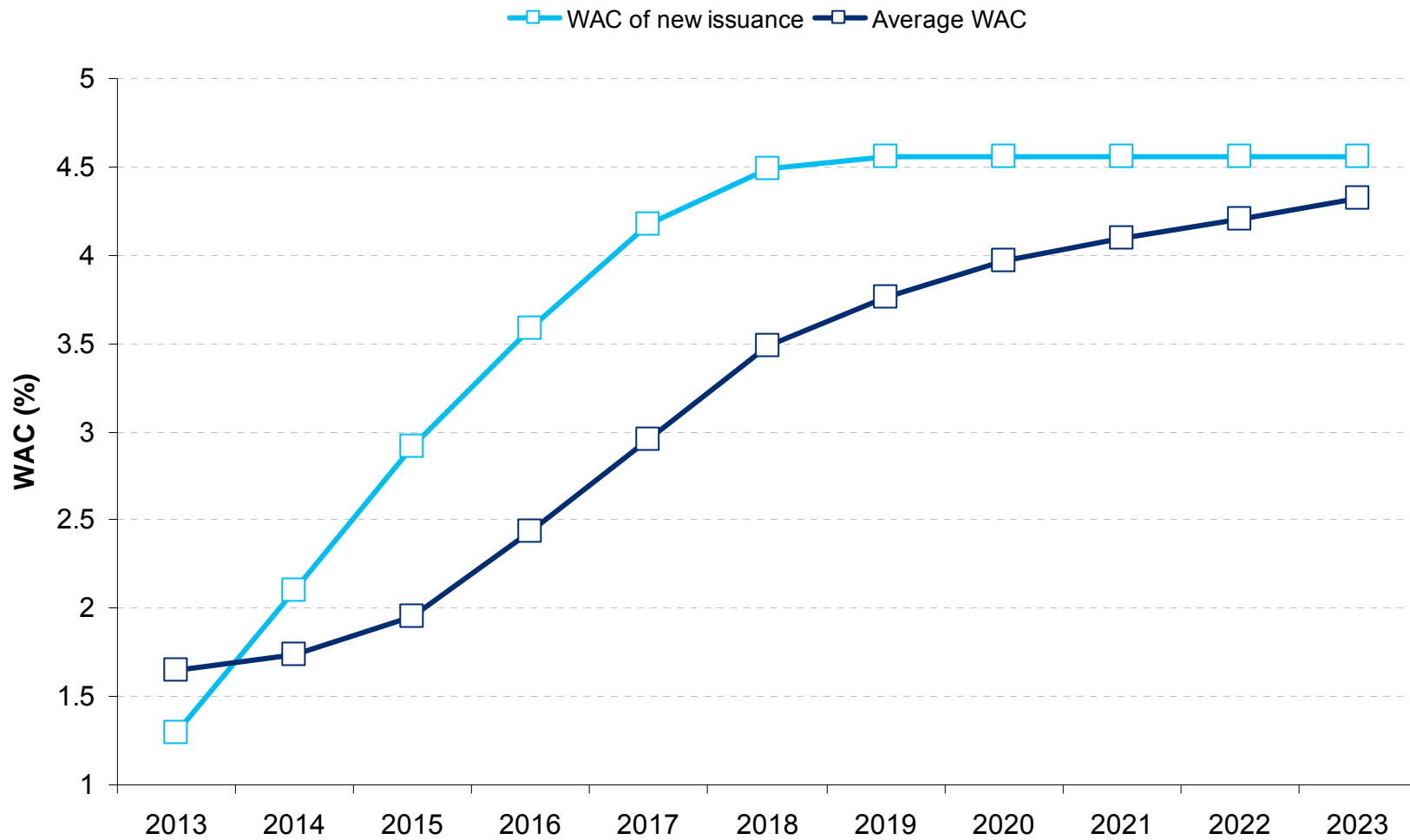
Notes:. We use CBO budget deficit estimates out to 2023 as published on February 2013. We maintain the current proportion of bills to total public debt (15%) and maintain the current issuance pattern in coupons. Financing costs differ marginally from CBO estimates because of different interest rate assumptions (projections summarized on slide 17)

Higher interest rates mainly drive the higher financing burden
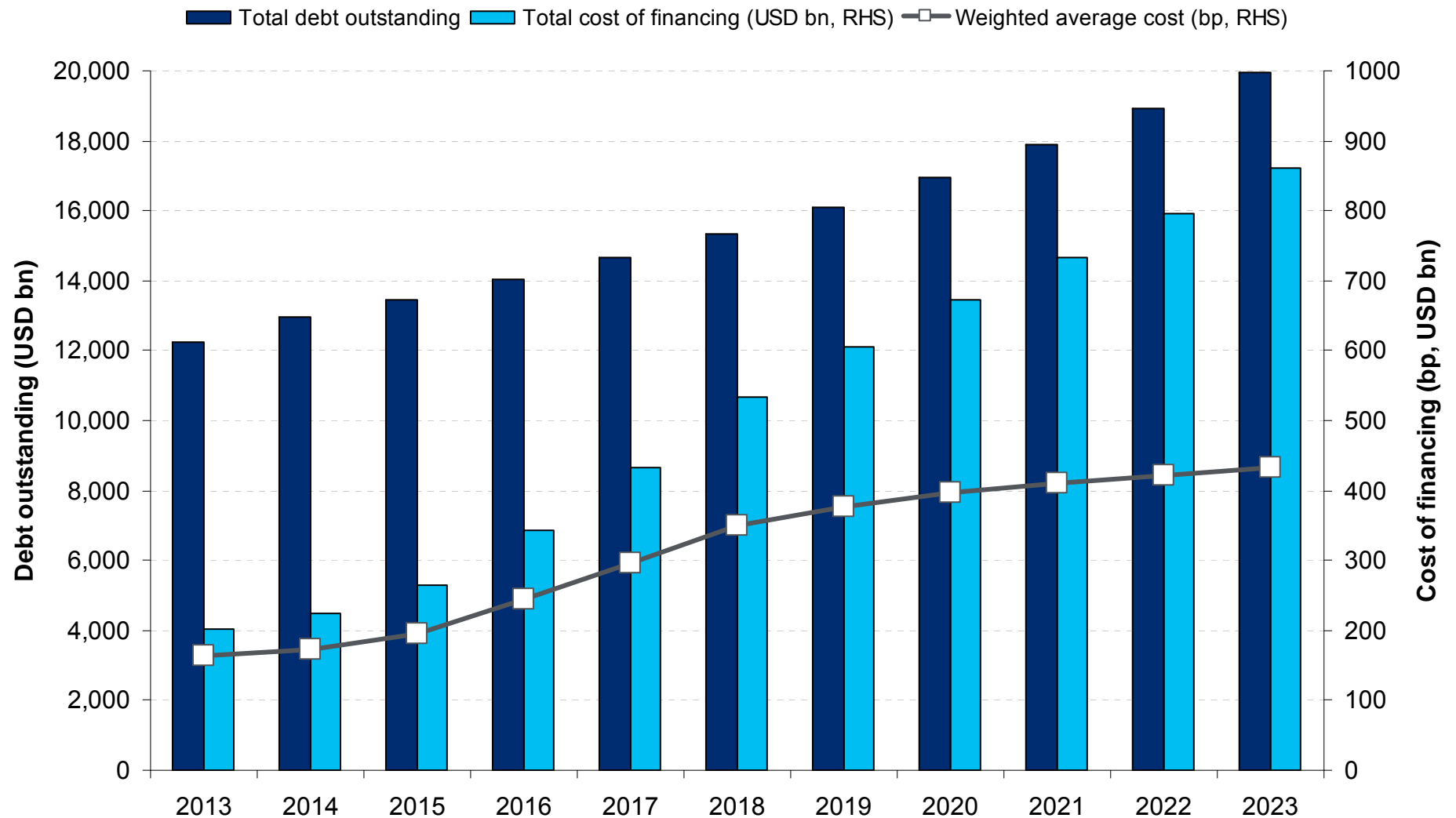
Notes:. We use CBO budget deficit estimates out to 2023 as published on February 2013. We maintain the current proportion of bills to total public debt (15%) and maintain the current issuance pattern in coupons. Financing costs differ marginally from CBO estimates because of different interest rate assumptions (projections summarized on slide 17)

Fed treasury redemptions would increase auctions by ~10%
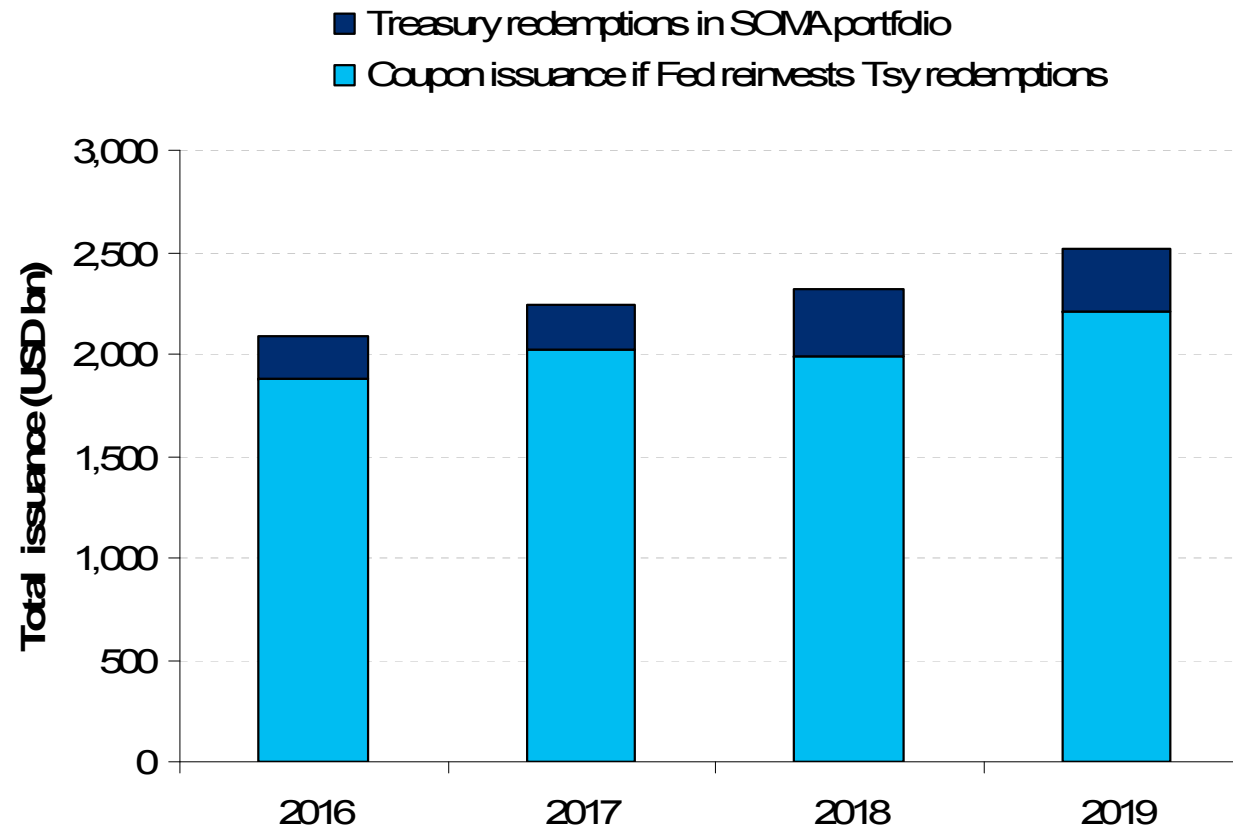
Notes:. We use CBO budget deficit estimates out to 2023 as published on February 2013. We maintain the current proportion of bills to total public debt (15%) and maintain the current issuance pattern in coupons.

Projected evolution of Fed Balance Sheet : assumptions

- *Assets*
  - QE expected to continue a current pace until end 2013
  - Fed stops reinvesting paydowns by end 2014
  - In "no asset sales" scenario
    - Fed balance sheet allowed to run-off until it reaches trend level in 2022
    - Trend defined as 2006 level, adjusted for nominal GDP growth (5% in 2013/2014 and 4.5% thereafter)
  - In "asset sales" scenario
    - Approximately $100 bn/year in MBS sales from 2016 to 2020
    - Capital losses on sales reflect projected yield curves described on slide 17
    - Fed balance sheet reached trend level by 2020

- *Liabilities*
  - Non-interest bearing liabilities (currency, vault cash) reach trend level (see above) by 2020
  - Residual financing needs are met by interest bearing instruments (excess reserves, repos, deposits)

- *Funding cost*
  - IOER projected to begin increasing by end 2015
  - Reaches terminal 4% rate by end 2018

Limited asset sales required to restore Fed balance sheet to trend level

- Expected portfolio runoff and trend growth in balance sheet suggests Fed balance sheet to be at trend level by 2022 without asset sales

- $100 bn/year of asset sales starting 2016 would restore trend level by 2020 (much lower than rate of purchases)

Fed: Total financial assets
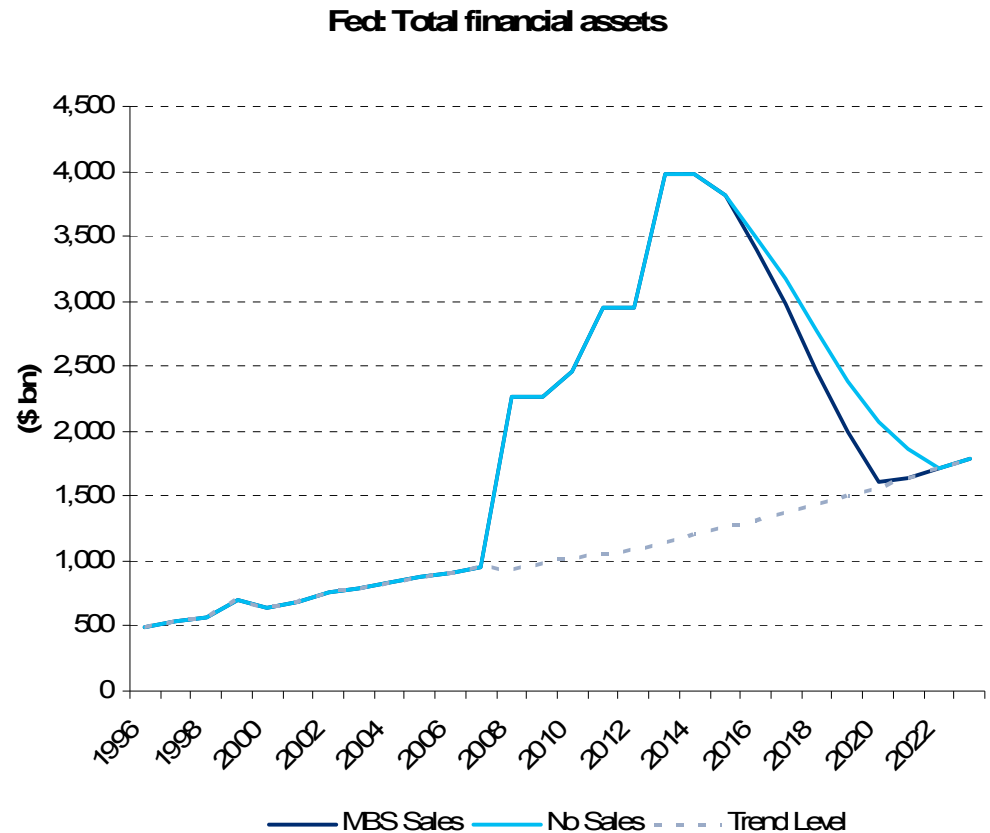
Notes: Trend level of balance sheet projected to increase at rate of norninal GDP with 2016 as start date. MBS prepayments estimated using Yield Book prepayment model and yield curve projections summarized on slide 17.

Fed selling worth an additional 10bp in 10s and 30s

2015 Yield curve projections				
	2y	**5y**	**10y**	**30y**
Base case	1.74	3.42	4.27	4.90
Fed selling	1.77	3.47	4.37	5.00
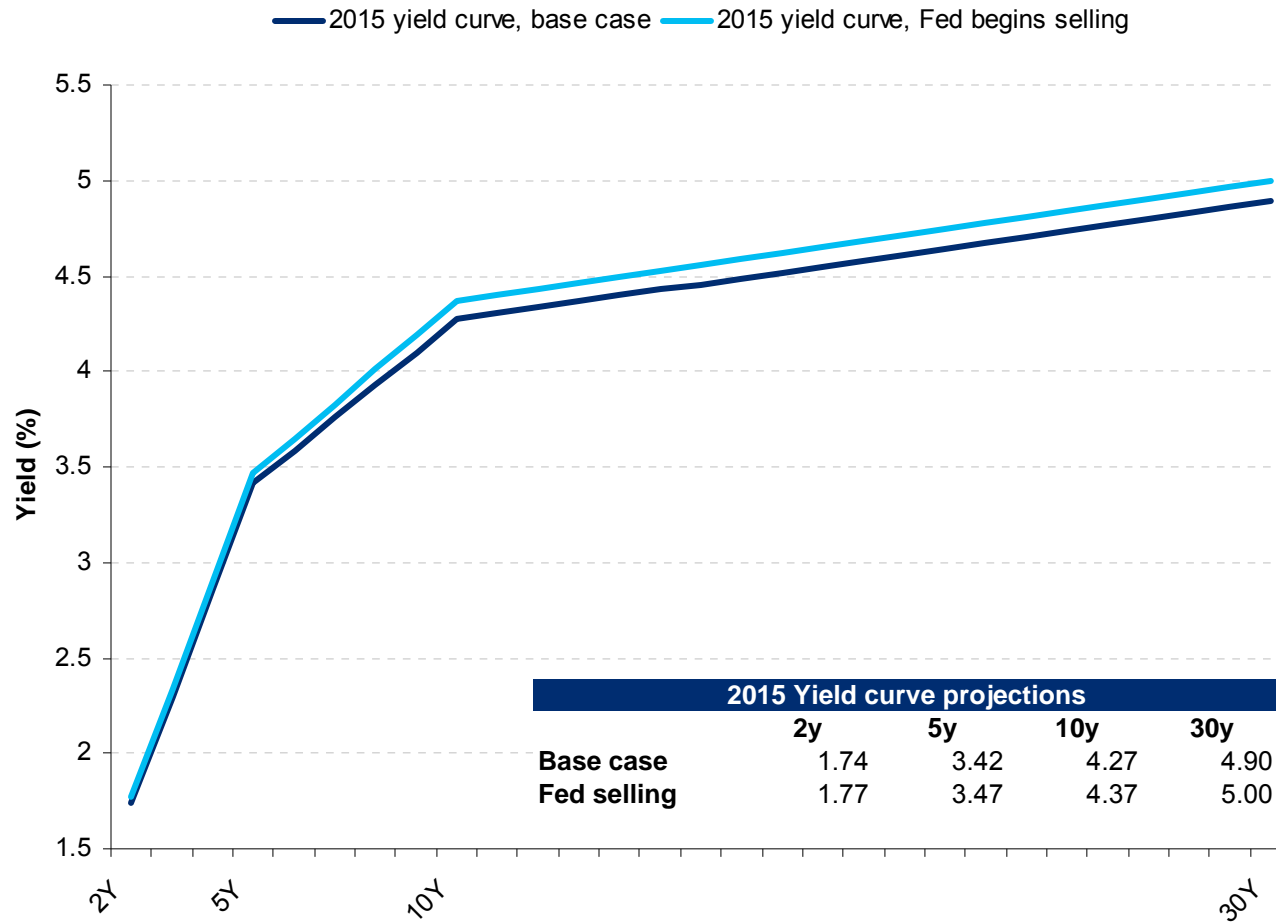
Notes: We estimate sales of $100 bn/year of MBS from years 2016 through 2020. MBS sold have an average duration of 7 years. Rate impact of sales based on Fed estimates of effect of purchases ($500bn/year worth 50 bp on the 10-year rate).

Fed asset sales to marginally increase debt interest burden

■ Base case financing costs ■ Fed selling financing costs ■ Cumulative additional cost
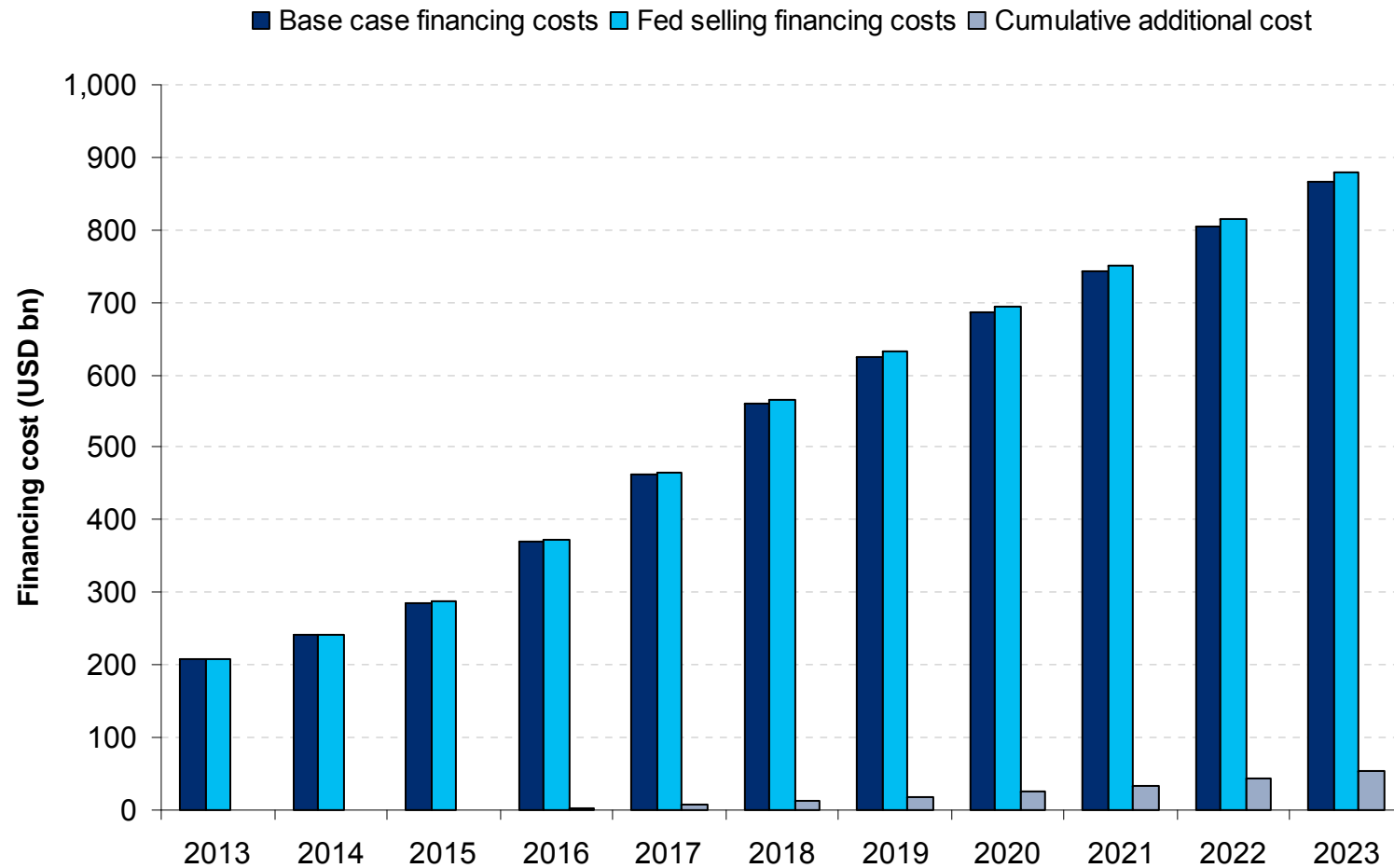
Source: CBO. We use CBO budget deficit estimates out to 2023 (February 2013 projections). We maintain the current proportion of bills as proportion of total public debt (15%) and maintain the current issuance pattern in coupons. Financing costs differ marginally from CBO estimates because of different interest rate assumptions (ours are detailed on slide 17). Fed selling projected to increases yields by around 10 bp at the 10-year point.

High proportion of currency financing limits effective Fed funding cost

Percent of non-interest bearing liabilities in Fed Balance Sheet

Fed: effective cost of financing
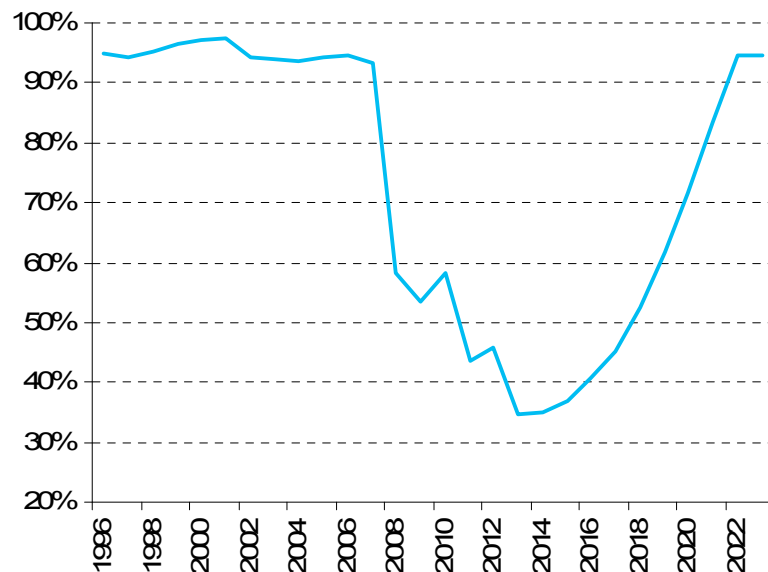
Notes: Trend level of Fed's currency liabilities projected to increase at rate of norninal GDP (with 2006 as start date). Fed assets evolve as described in slide 29.Difference between assets and currency financing assumed funded by interest bearing instruments (excess reserves/repos/deposits)
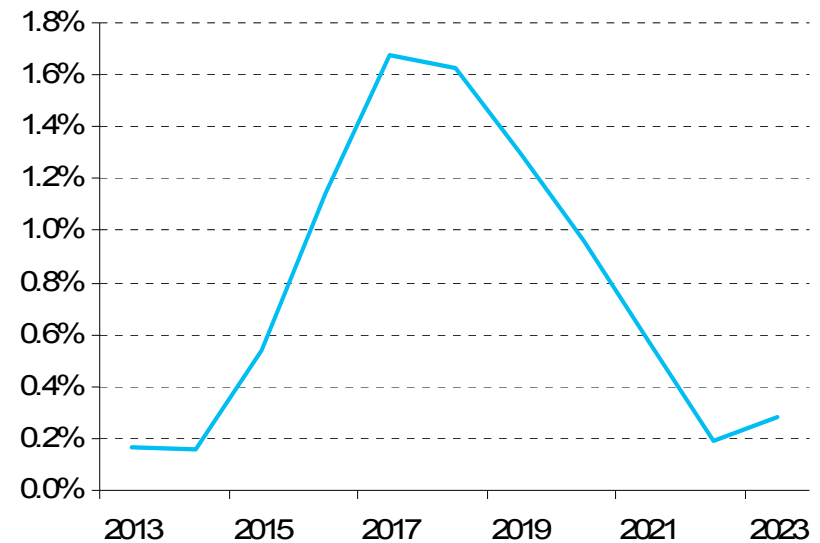
Notes: The blended cost of Fed borrowing; currency at zero cost and reserves/repos at IOER. IOER projected to begin increasing at the end of 2015 and rise to 4% by end 2018.

# Asset sales reduce but not eliminate Fed remittances
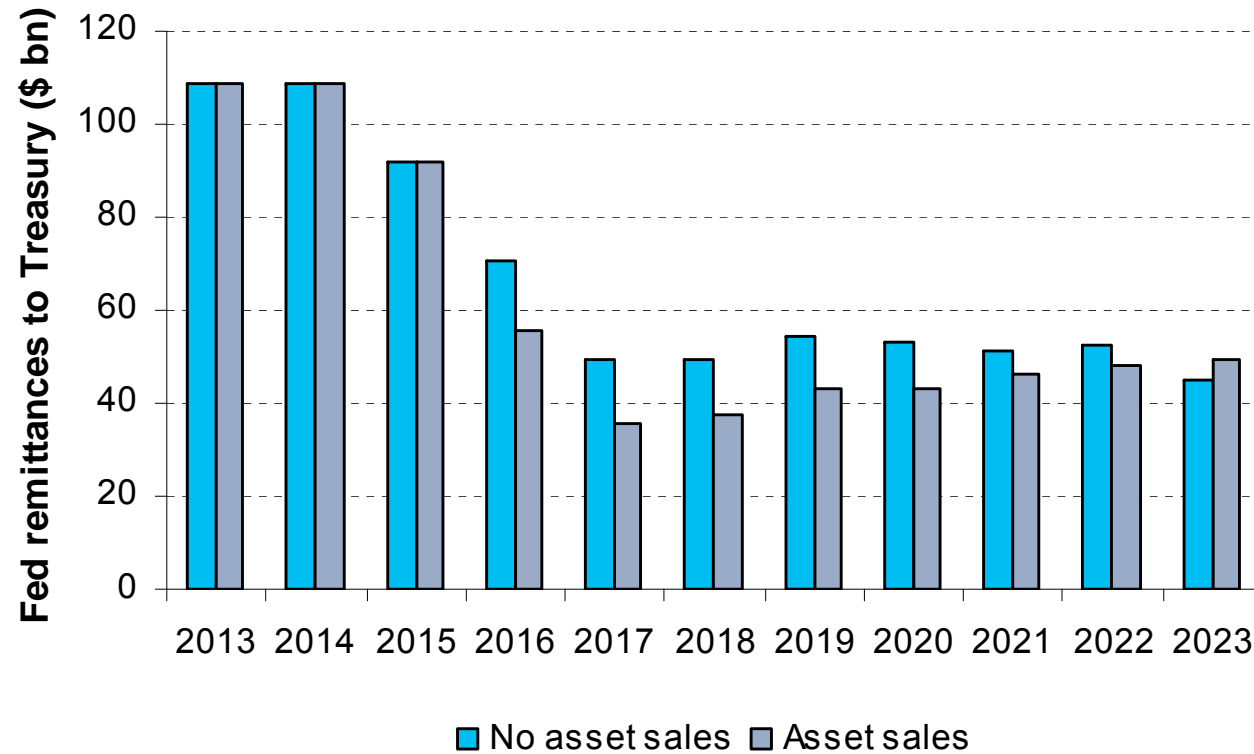
Notes: Based on assumptions stated on slide 28. Slide 29 describes evolution of Fed assets and slide 32 of Fed liabilities. Excess of interest earned over financing costs are remitted to the Treasury.

Extending average maturity of issuance increases portfolio WAC
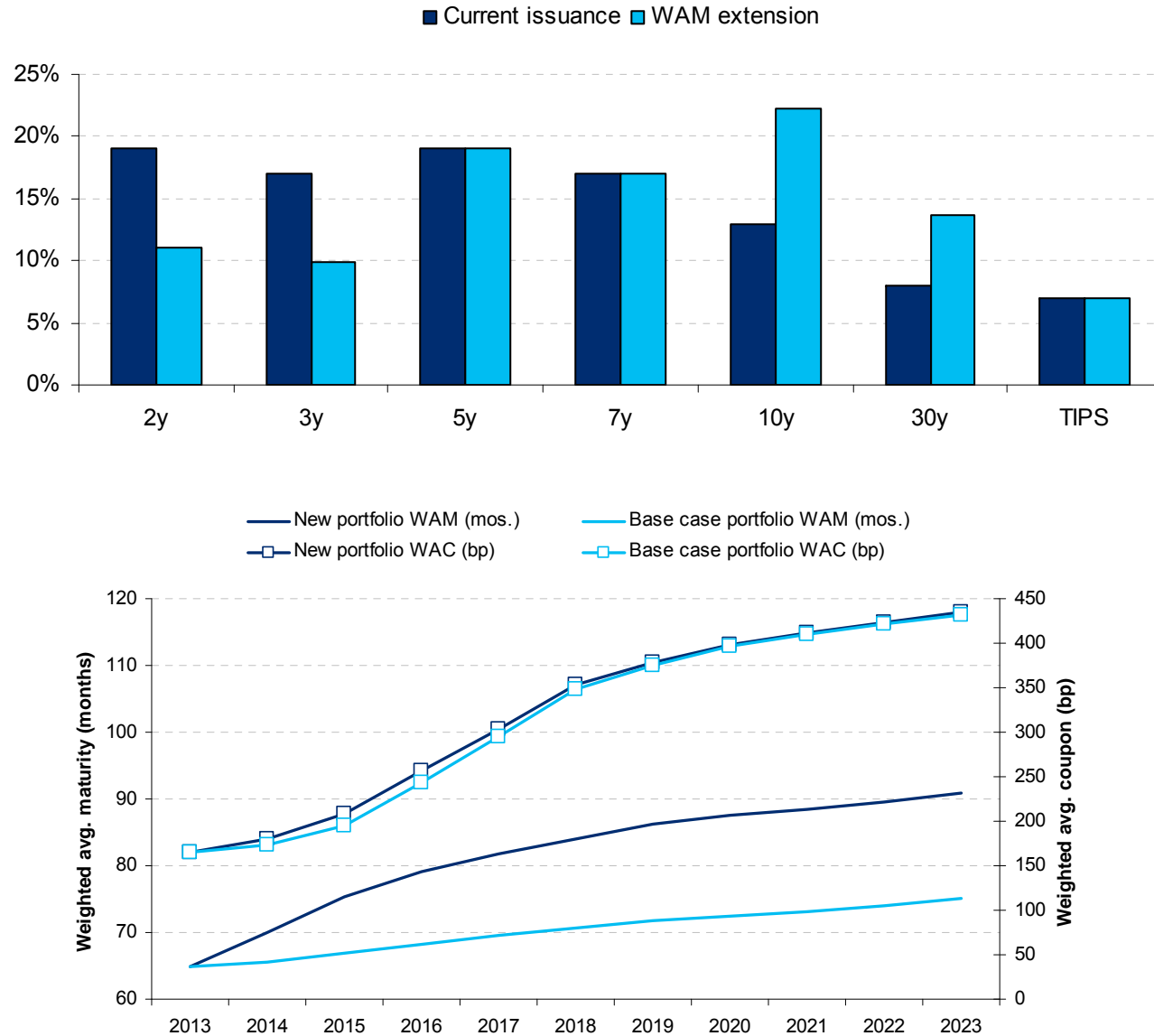
Legend (top chart): ■ Current issuance ■ WAM extension

Legend (bottom chart): New portfolio WAM (mos.) — Base case portfolio WAM (mos.) — New portfolio WAC (bp) — Base case portfolio WAC (bp)

Notes: CBO estimates of deficits and our rate forecasts on slide 17 to determine future financing costs.
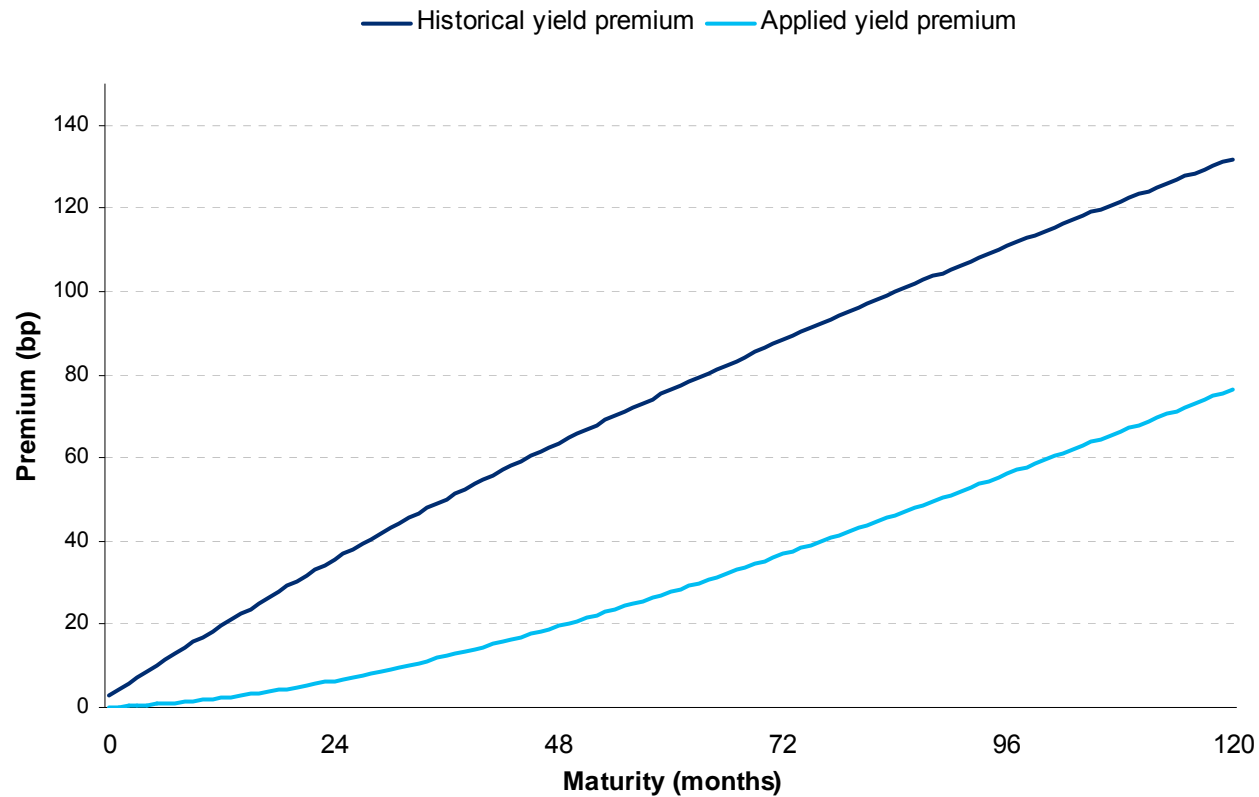
WAM extension more costly than current issuance pattern
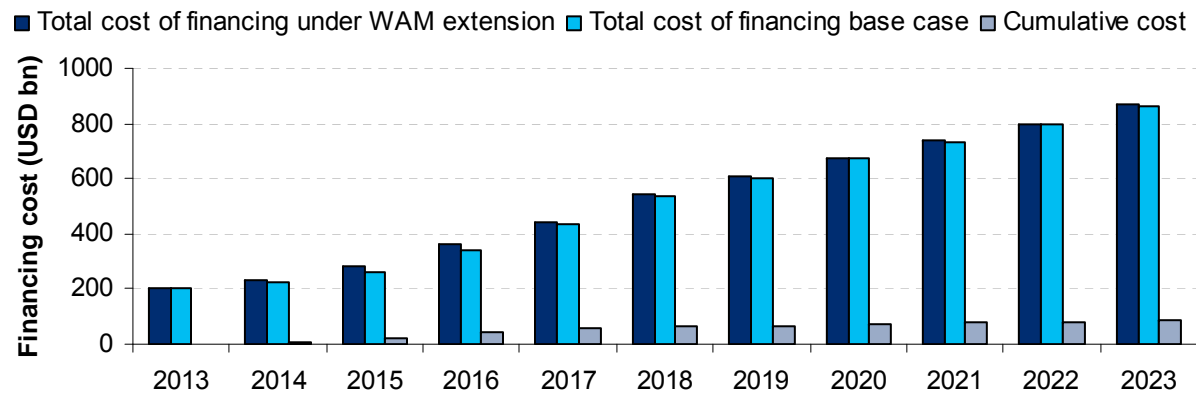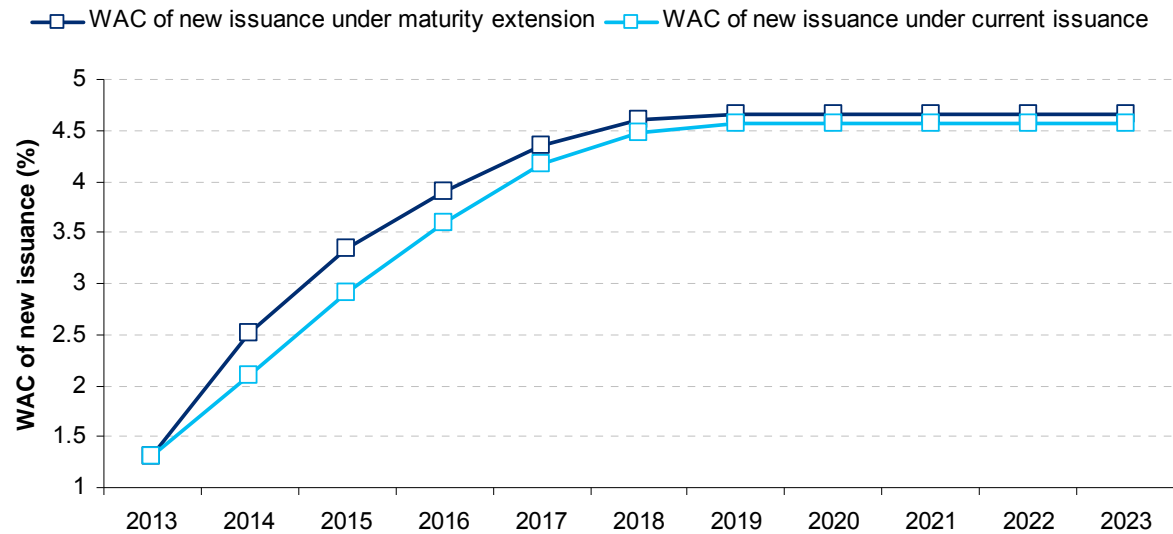
Notes: CBO estimates of deficits and our rate forecasts on slide 17 to determine future financing costs.

Appendix

Historical yield premium adjusted lower given muted volatility