Treasury Presentation to TBAC

Office of Debt Management

Fiscal Year 2017 Q2 Report

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Section I:
Executive Summary

Highlights of Treasury's May 2017 Quarterly Refunding Presentation to the Treasury Borrowing Advisory Committee (TBAC)

Receipts and Outlays

- Fiscal year-to-date, corporate receipts are $25 billion (or 17%) lower than the same period of the previous year, due largely to a statutory change in the due date for certain corporate taxes, from mid-March to mid-April.
- Fiscal year-to-date, outlays related to Health and Human Services (HHS) have increased by $24 billion (or 5%) year-over-year; this increase was driven by increased Medicare and Medicaid payments.
- Fiscal year-to-date, Treasury outlays increased by $24 billion (or 8%) as compared to the same period of the previous year, due largely to an increase in the inflation adjustment on TIPS.
- Fiscal year-to-date, Social Security Administration (SSA) expenditures increased by $13 billion (or 3%) year-over-year, resulting from an increase in program enrollment.

Sources of Financing in Fiscal Year 2017

- Based on the Quarterly Borrowing Estimate, Treasury's Office of Fiscal Projections currently projects a net marketable borrowing need of $26 billion for Q3 FY 2017, with an end-of-June cash balance of $200 billion. For Q4 FY 2017, net marketable borrowing need is projected to be $98 billion, with an end-of-September cash balance of $115 billion.

Projected Net Marketable Borrowing

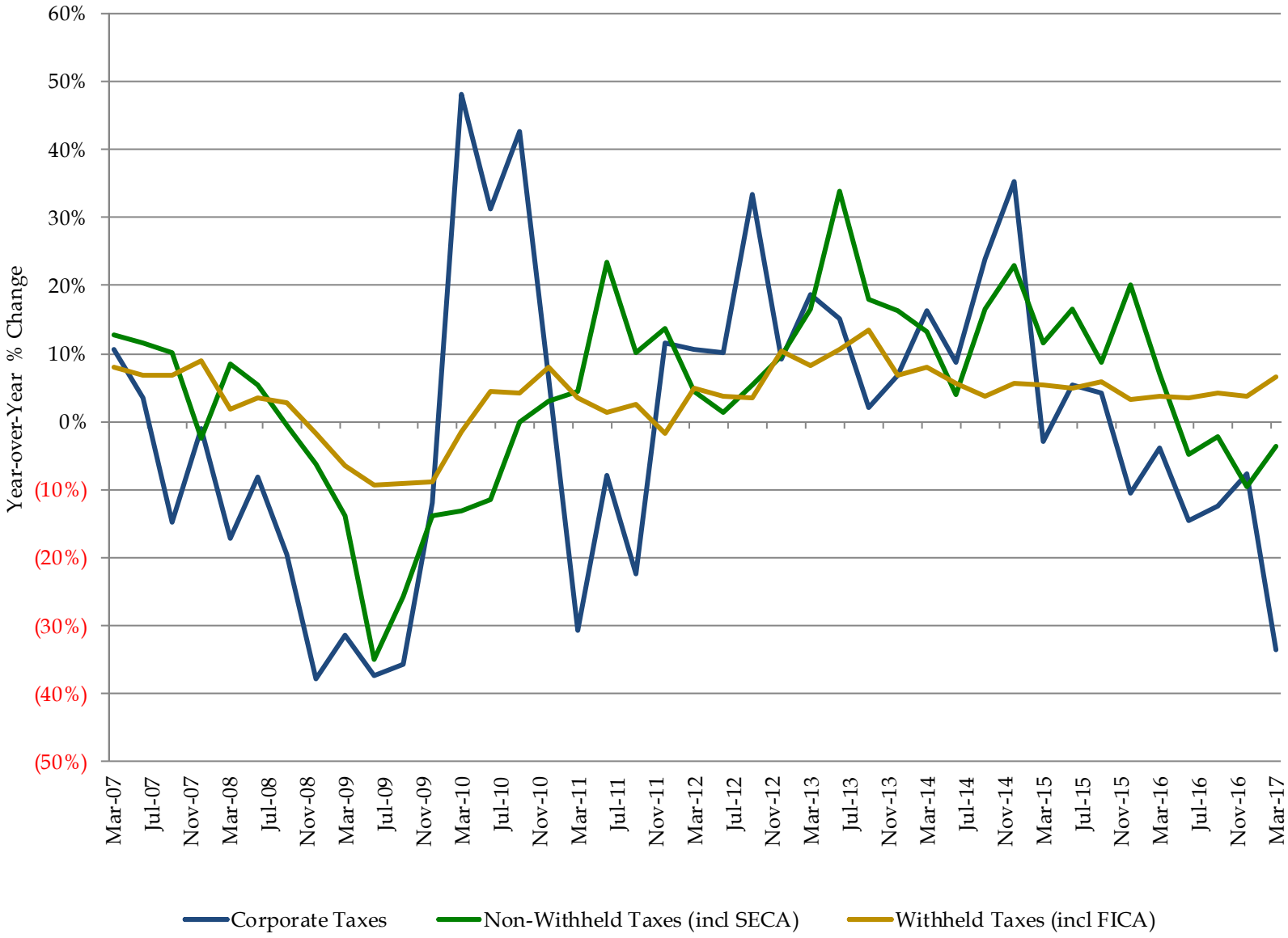
- Between FY 2017 and 2019 Treasury's net marketable borrowing could rise notably if the Federal Reserve allows the Treasury securities held in the SOMA portfolio to mature without reinvesting.
- As of the January 2017 Survey of Primary Dealers, the median expectation was for SOMA reinvestments to continue until June 2018.

Bid-to-Cover Ratios (BTC)

- BTC ratios for all securities were stable over the January to March period.

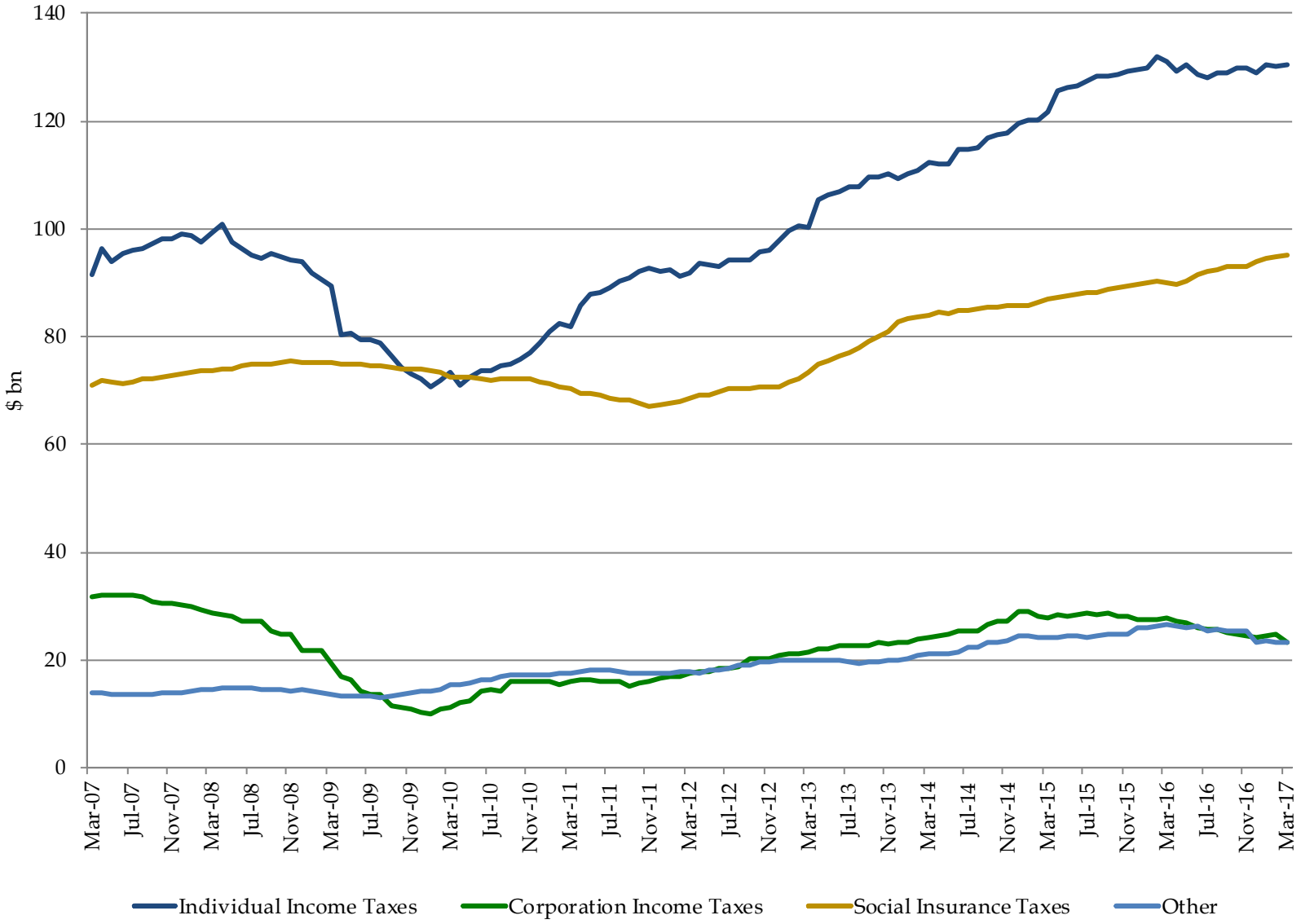
Section II: Fiscal

Quarterly Tax Receipts



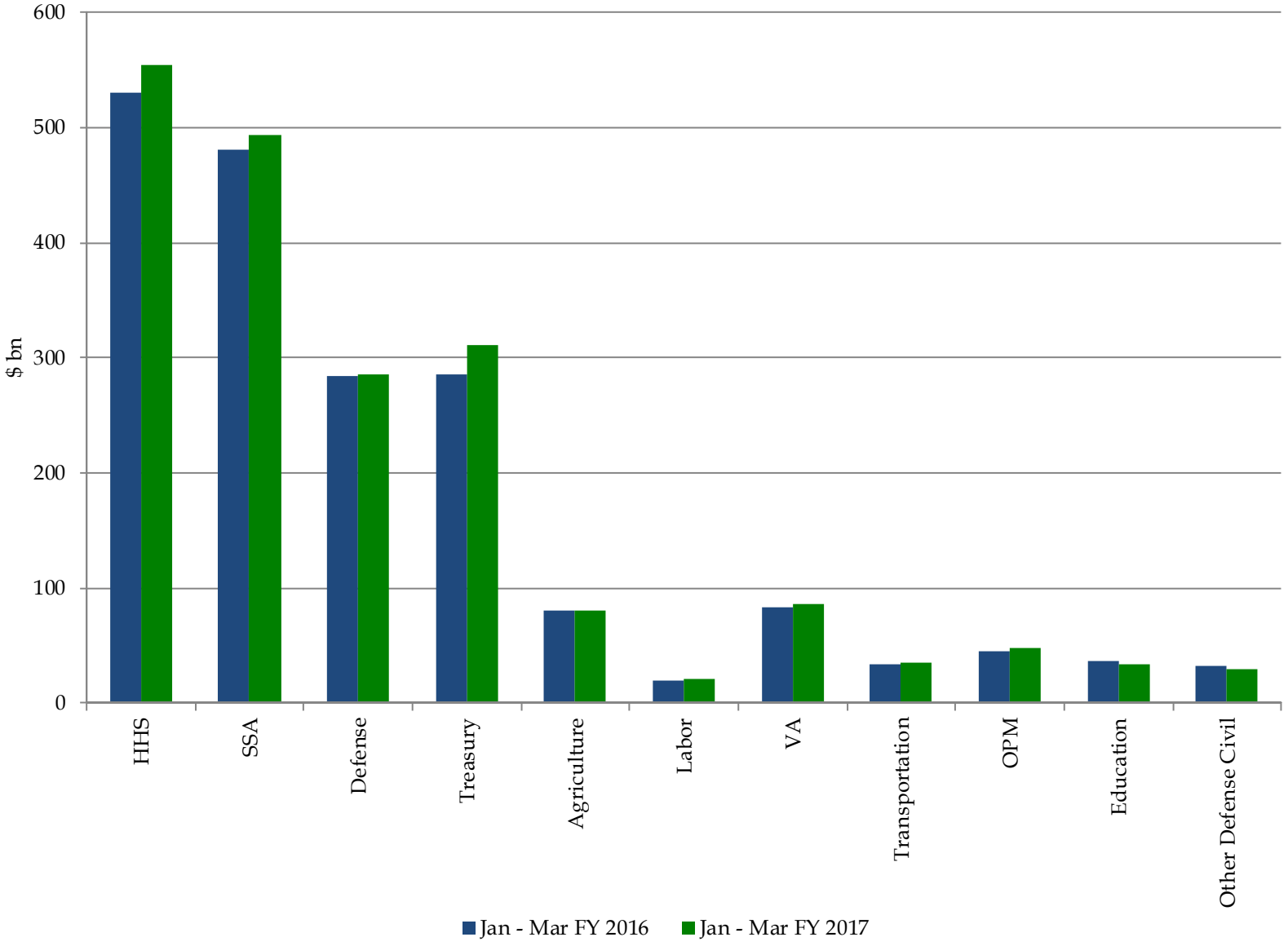
Source: United States Department of the Treasury

Monthly Receipt Levels
(12-Month Moving Average)



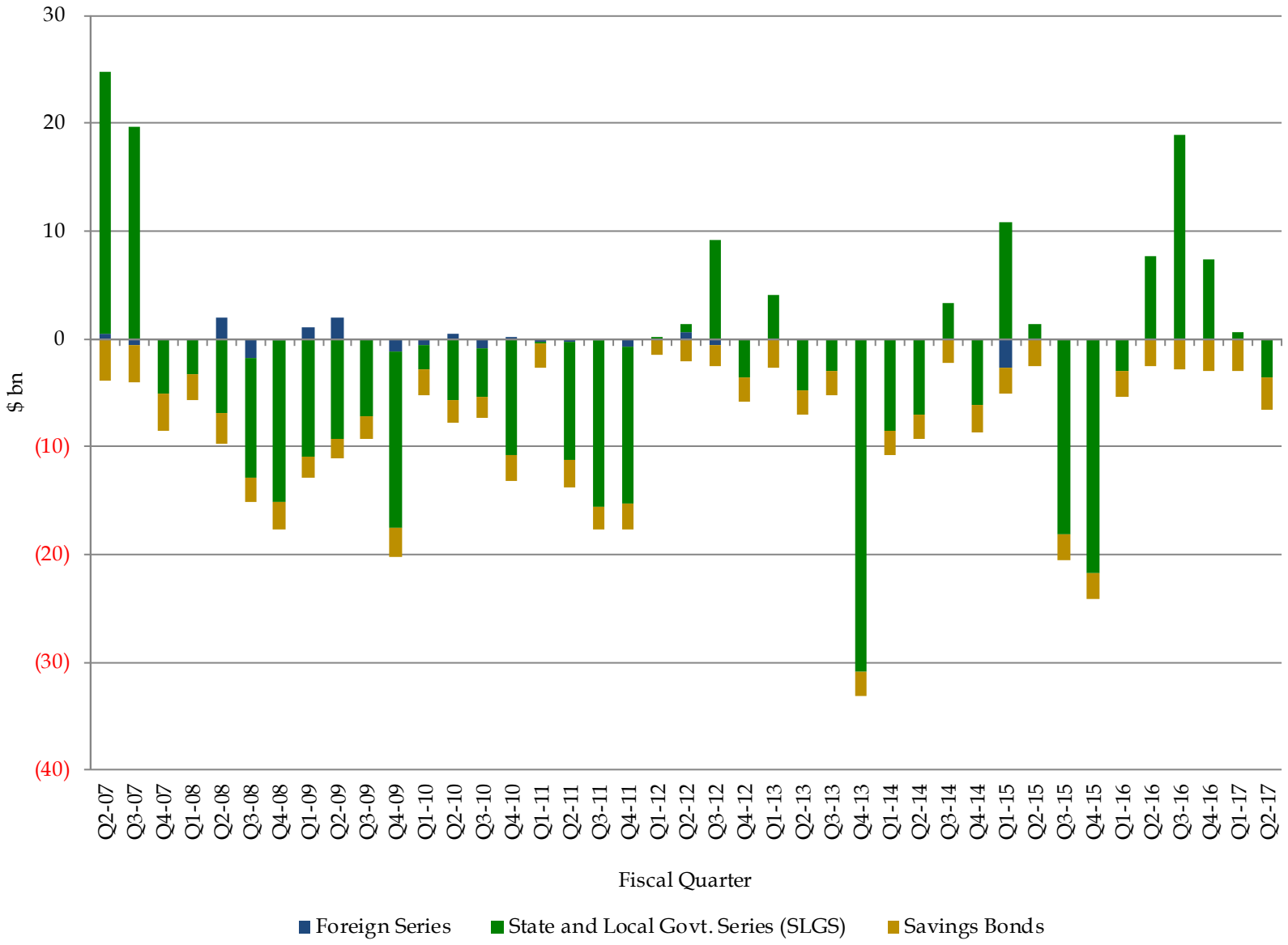
Individual Income Taxes include withheld and non-withheld. Social Insurance Taxes include FICA, SECA, RRTA, UTF deposits, FUTA and RUIA. Other includes excise taxes, estate and gift taxes, customs duties and miscellaneous receipts.
Source: United States Department of the Treasury

Eleven Largest Outlays



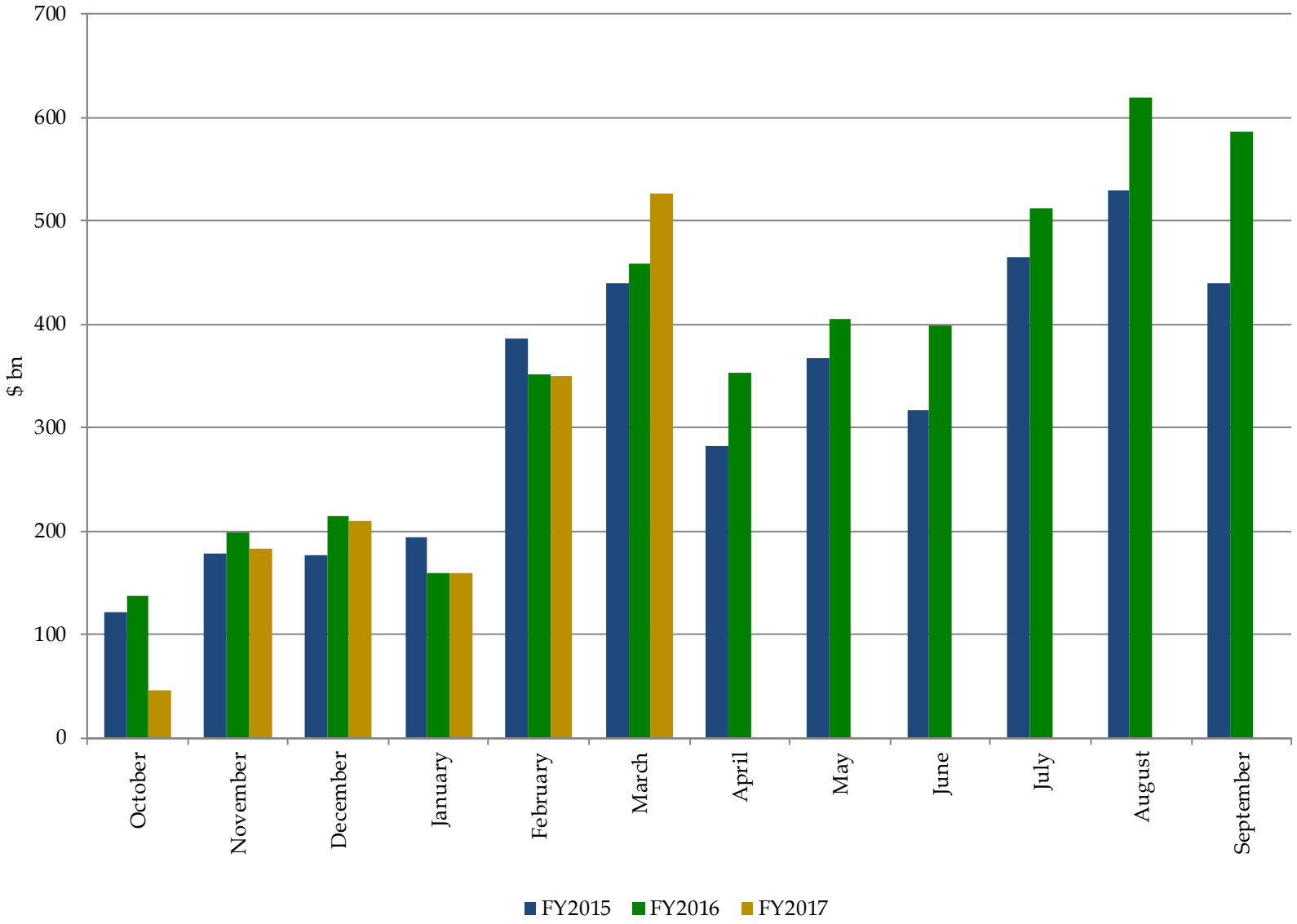
Source: United States Department of the Treasury

Treasury Net Nonmarketable Borrowing



Source: United States Department of the Treasury

Cumulative Budget Deficits by Fiscal Year



Source: United States Department of the Treasury

FY 2017-2019 Deficits and Net Marketable Borrowing Estimates

In $ billions

	Primary Dealers[1]	CBO[2]	CBO[3]	OMB MSR[4]	OMB[5]
FY 2017 Deficit Estimate	606	559	433	441	504
FY 2018 Deficit Estimate	699	487	383	330	454
FY 2019 Deficit Estimate	788	601	518	427	550
FY 2017 Deficit Range	500-700				
FY 2018 Deficit Range	478-951				
FY 2019 Deficit Range	600-950				
FY 2017 Net Marketable Borrowing Estimate	593	670	508	419*	419*
FY 2018 Net Marketable Borrowing Estimate	799	578	452	436	561
FY 2019 Net Marketable Borrowing Estimate	869	676	578	534	659
FY 2017 Net Marketable Borrowing Range	406-785				
FY 2018 Net Marketable Borrowing Range	550-1150				
FY 2019 Net Marketable Borrowing Range	670-1100				
Estimates as of:	Apr-17	Jan-17	Mar-16	Jul-16	Feb-16

1Based on primary dealer feedback on April 24, 2017. Estimates above are averages.

2Summary Table 1 of CBO's "The Budget and Economic Outlook: 2017 to 2027"

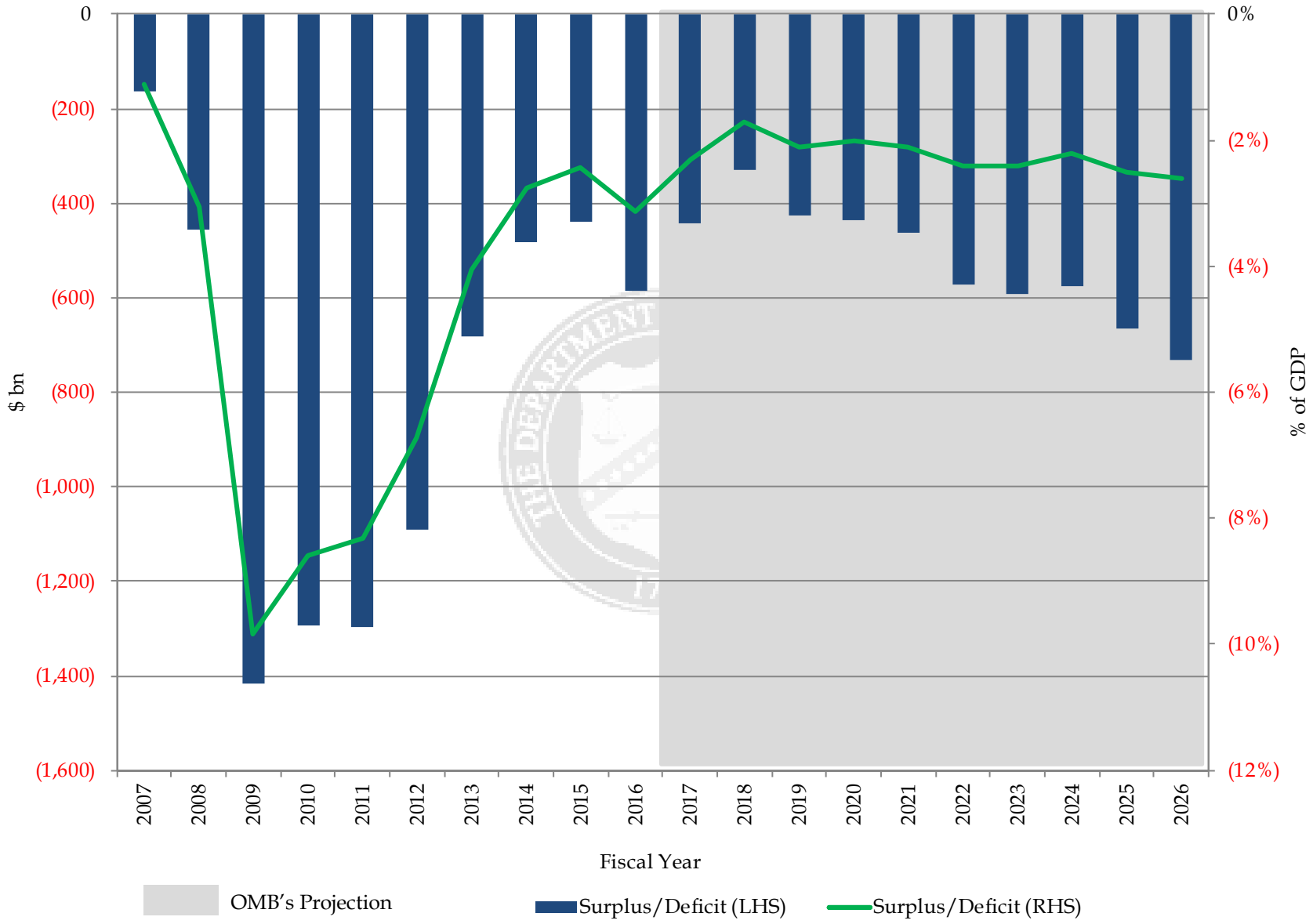
3Table 1 and 2 of CBO's "An Analysis of the President's 2017 Budget"

4Table S-11 of OMB's "The FY2017 Mid-Session Review"

5Table S-13 of OMB's "Budget of the United States Government, Fiscal Year 2017"

* OFP's FY 2017 Net Marketable Borrowing Estimate.

Budget Surplus/Deficit



Projections are from Table S-11 of "The FY2017 Mid-Session Review."

Section III: Financing

Assumptions for Financing Section (pages 15 to 21)

- Portfolio and SOMA holdings as of 03/31/2017.
- SOMA reinvestments until June 2018, followed by SOMA redemptions until and including February 2022. These assumptions are based on the median expectations from the January 2017 FRB-NY Survey of Primary Dealers.
- Assumes announced issuance sizes and patterns constant for Nominal Coupons, TIPS, and FRNs as of 03/31/2017, while using an average of ~$1.8 trillion of Bills outstanding.
- The principal on the TIPS securities was accreted to each projection date based on market ZCIS levels as of 03/31/2017.
- No attempt was made to match future financing needs.

Sources of Financing in Fiscal Year 2017 Q2

January - March 2017	
Net Bill Issuance	(61)
Net Coupon Issuance	101
Subtotal: Net Marketable Borrowing	40
Ending Cash Balance	92
Beginning Cash Balance	399
Subtotal: Change in Cash Balance	(307)
Net Implied Funding for FY 2017 Q2*	347

Security	January - March 2017 Bill Issuance			Fiscal Year-to-Date Bill Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
4-Week	548	563	(15)	1,203	1,173	30
13-Week	450	505	(55)	955	1,007	(52)
26-Week	372	437	(65)	799	765	34
52-Week	80	74	6	140	110	30
CMBs	138	70	68	138	70	68
Bill Subtotal	1,588	1,649	(61)	3,235	3,125	110

Security	January - March 2017 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	44	41	3	85	82	3
2-Year	116	105	11	172	162	10
3-Year	76	90	(14)	153	180	(27)
5-Year	152	143	8	225	216	9
7-Year	125	131	(7)	185	196	(11)
10-Year	67	22	45	135	45	89
30-Year	41	0	41	84	19	65
5-Year TIPS	0	0	0	14	0	14
10-Year TIPS	26	21	5	38	21	18
30-Year TIPS	8	0	8	13	0	13
Coupon Subtotal	654	553	101	1,106	921	185

Total	2,242	2,202	40	4,341	4,046	295

*An end-of-March 2017 cash balance of $92 billion versus a beginning-of-January 2017 cash balance of $399 billion. By keeping the cash balance constant, Treasury arrives at the net implied funding number.
Gross issuance values include SOMA add-ons.

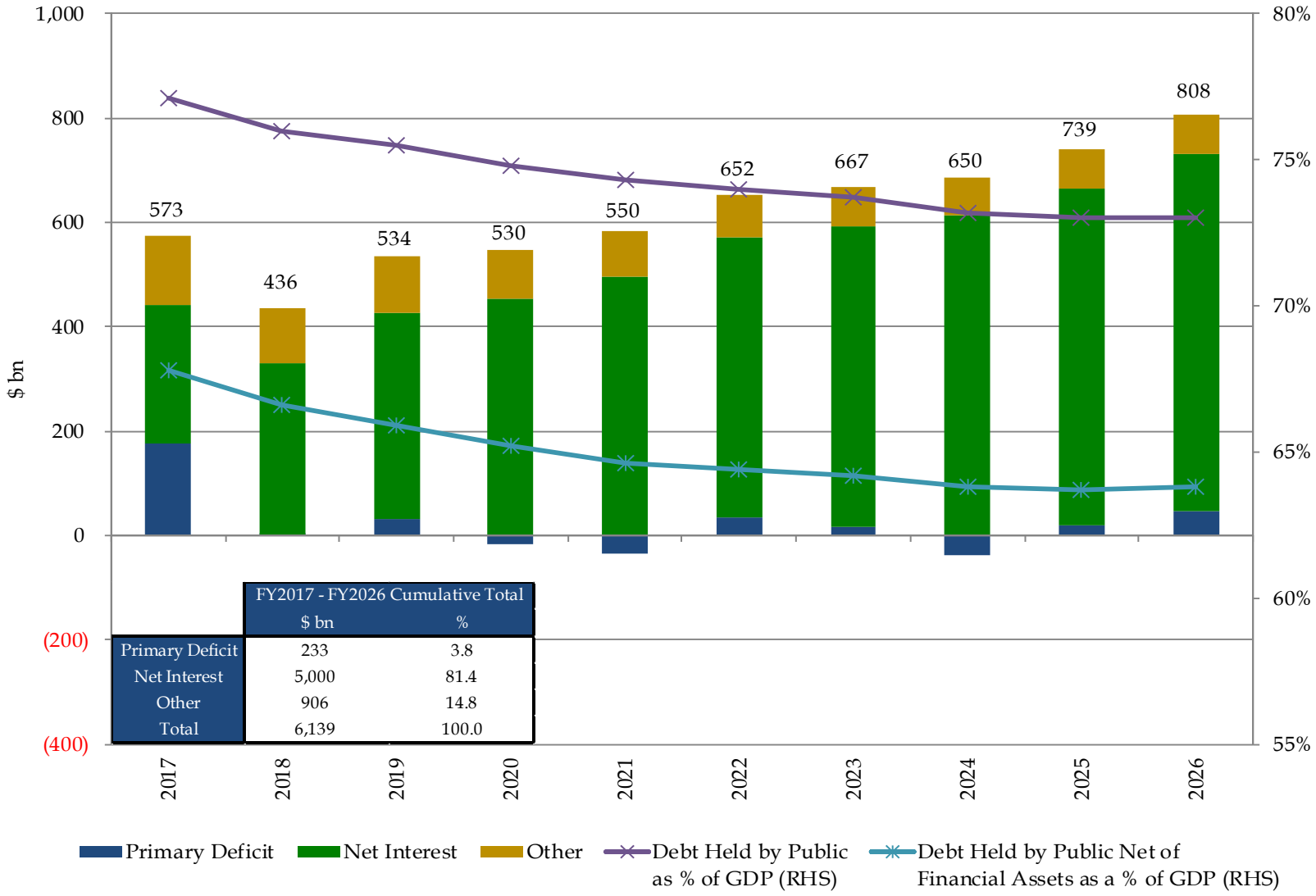
Sources of Financing in Fiscal Year 2017 Q3

April - June 2017	
Assuming Constant Coupon Issuance Sizes*	
Treasury Announced Net Marketable Borrowing**	26
Net Coupon Issuance	74
Implied Change in Bills	(48)

Security	April - June 2017 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	45	41	4	130	123	7
2-Year	88	52	36	260	214	46
3-Year	80	87	(7)	233	267	(34)
5-Year	115	132	(17)	340	348	(8)
7-Year	95	95	(1)	280	291	(11)
10-Year	71	26	45	206	71	134
30-Year	44	16	28	128	34	93
5-Year TIPS	16	48	(32)	30	48	(18)
10-Year TIPS	12	0	12	51	21	30
30-Year TIPS	6	0	6	19	0	19
Coupon Subtotal	571	496	74	1,676	1,417	259

*Keeping announced issuance sizes and patterns constant for Nominal Coupons, TIPS, and FRNs as of 03/31/2017.
**Assumes an end-of-June 2017 cash balance of $200 billion versus a beginning-of-April 2017 cash balance of $92 billion.
Financing Estimates released by the Treasury can be found here: http://www.treasury.gov/resource-center/data-chart-center/quarterly-refunding/Pages/Latest.aspx

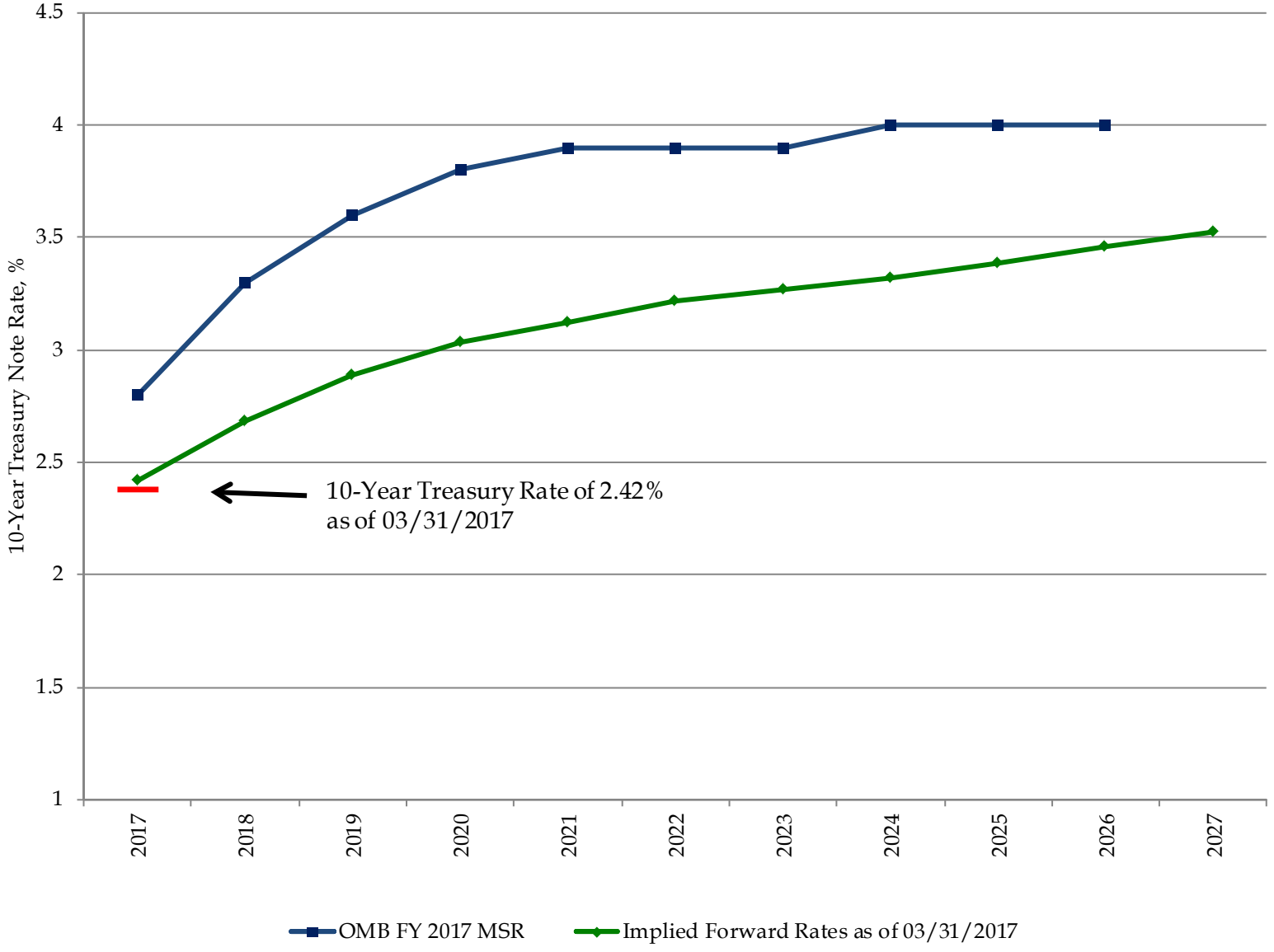
OMB's Projection of Borrowing from the Public



	FY2017 - FY2026 Cumulative Total	
	$ bn	%
Primary Deficit	233	3.8
Net Interest	5,000	81.4
Other	906	14.8
Total	6,139	100.0

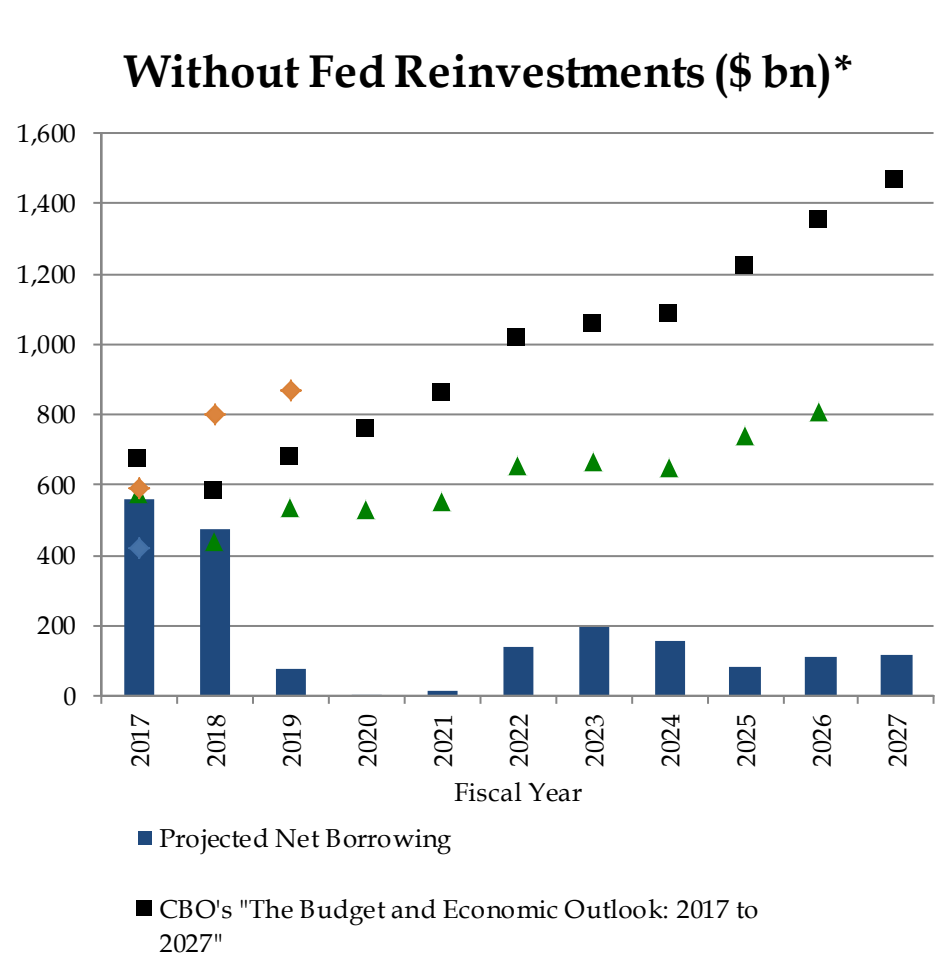
OMB's projections of net borrowing from the public are from Table S-11 of "The FY2017 Mid-Session Review." Data labels at the top represent the change in debt held by the public in $ billions. "Other" represents borrowing from the public to provide direct and guaranteed loans.

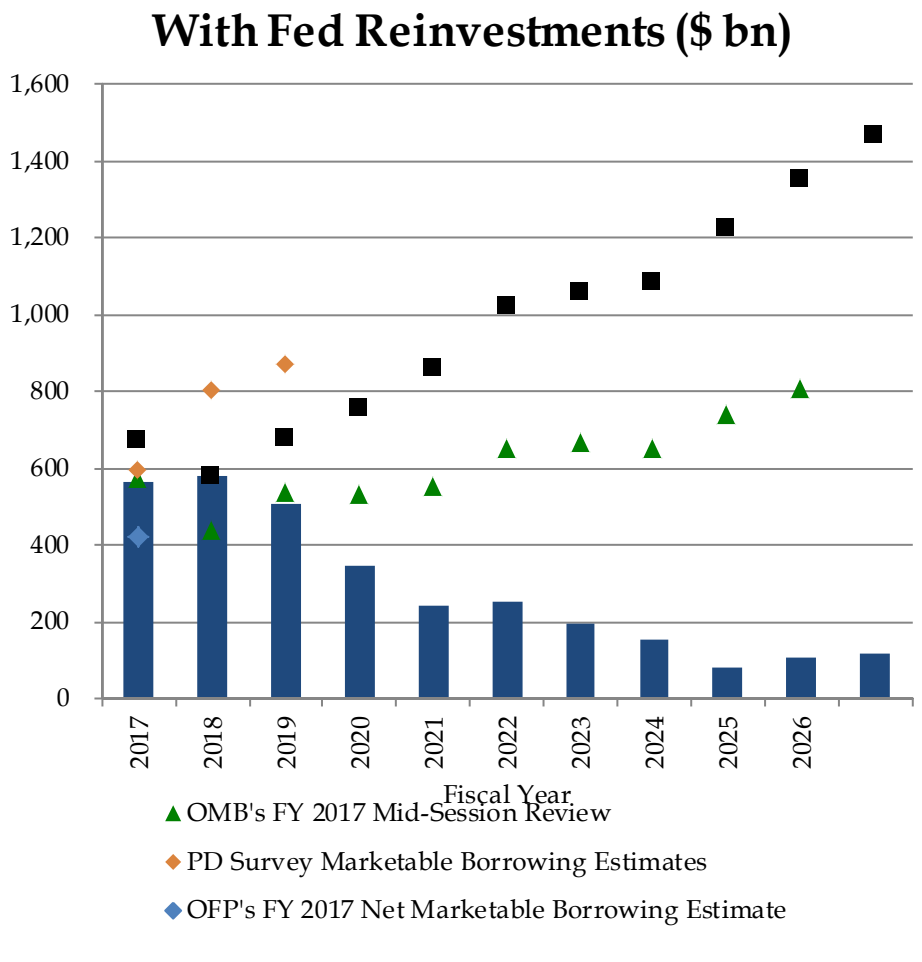
Interest Rate Assumptions: 10-Year Treasury Note



OMB's economic assumption of the 10-Year Treasury Note rates are from Table S-11 of "The FY2017 Mid-Session Review." The forward rates are the implied 10-Year Treasury Note rates on March 31 of that year.

Impact of SOMA Actions on Projected Net Borrowing Assuming Future Issuance Remains Constant

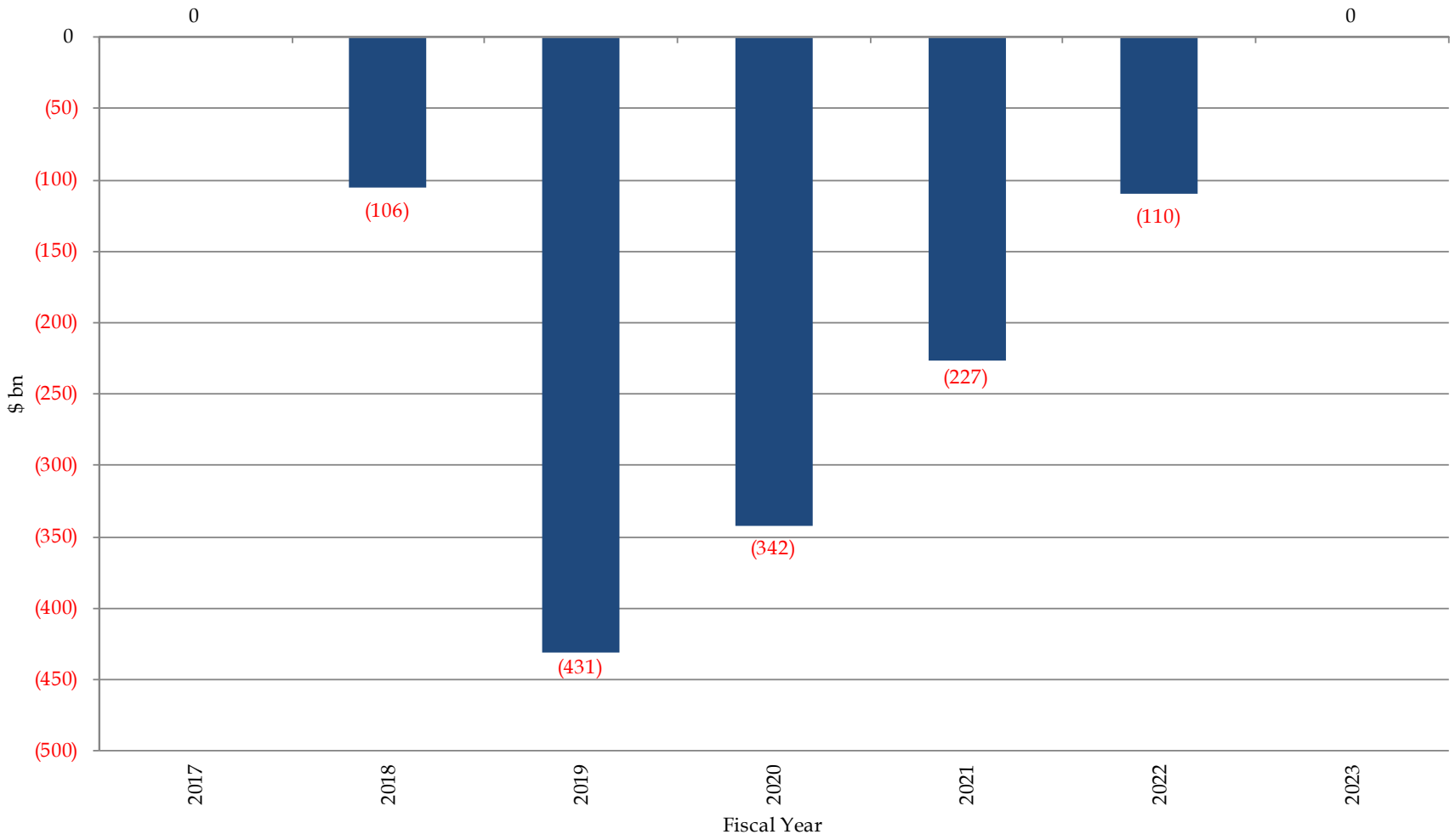




Treasury's primary dealer survey estimates can be found on page 11. OMB's projections of net borrowing from the public are from Table S-11 of "The FY2017 Mid-Session Review." CBO's estimates of the borrowing from the public are Summary Table 1 of "The Budget and Economic Outlook: 2017 to 2027." See table at the end of this section for details.

*Does not reflect SOMA reinvestments after June 2018 and before February 2022.

Additional Funding Gap Assuming No SOMA Roll after June 2018



Assumes normalization will be complete by FY 2023, which implies no additional funding gap.

Historical Net Marketable Borrowing and Projected Net Borrowing Assuming Future Issuance Remains Constant, $ billions

Fiscal Year	Bills	2/3/5	7/10/30	TIPS	FRN	Historical/Projected Net Borrowing Capacity	OMB's FY 2017 Mid-Session Review	CBO's "The Budget and Economic Outlook: 2017 to 2027"	Primary Dealer Survey
2012	139	148	738	90	0	1,115			
2013	(86)	86	720	111	0	830			
2014	(119)	(92)	669	88	123	669			
2015	(53)	(282)	641	88	164	558			
2016	289	(82)	477	64	47	795			
2017	198	9	292	55	9	562	419*	670	593
2018	0	121	293	55	3	472	436	578	799
2019	0	(24)	67	42	(9)	76	534	676	869
2020	0	(86)	83	15	(9)	3	530	753	
2021	0	(76)	99	(5)	0	17	550	859	
2022	0	12	141	(14)	2	141	652	1,017	
2023	0	44	157	(13)	7	195	667	1,055	
2024	0	30	136	(13)	1	154	650	1,082	
2025	0	13	123	(53)	(1)	82	739	1,220	
2026	0	(18)	174	(45)	(2)	109	808	1,352	
2027	0	5	151	(36)	(3)	117		1,463	

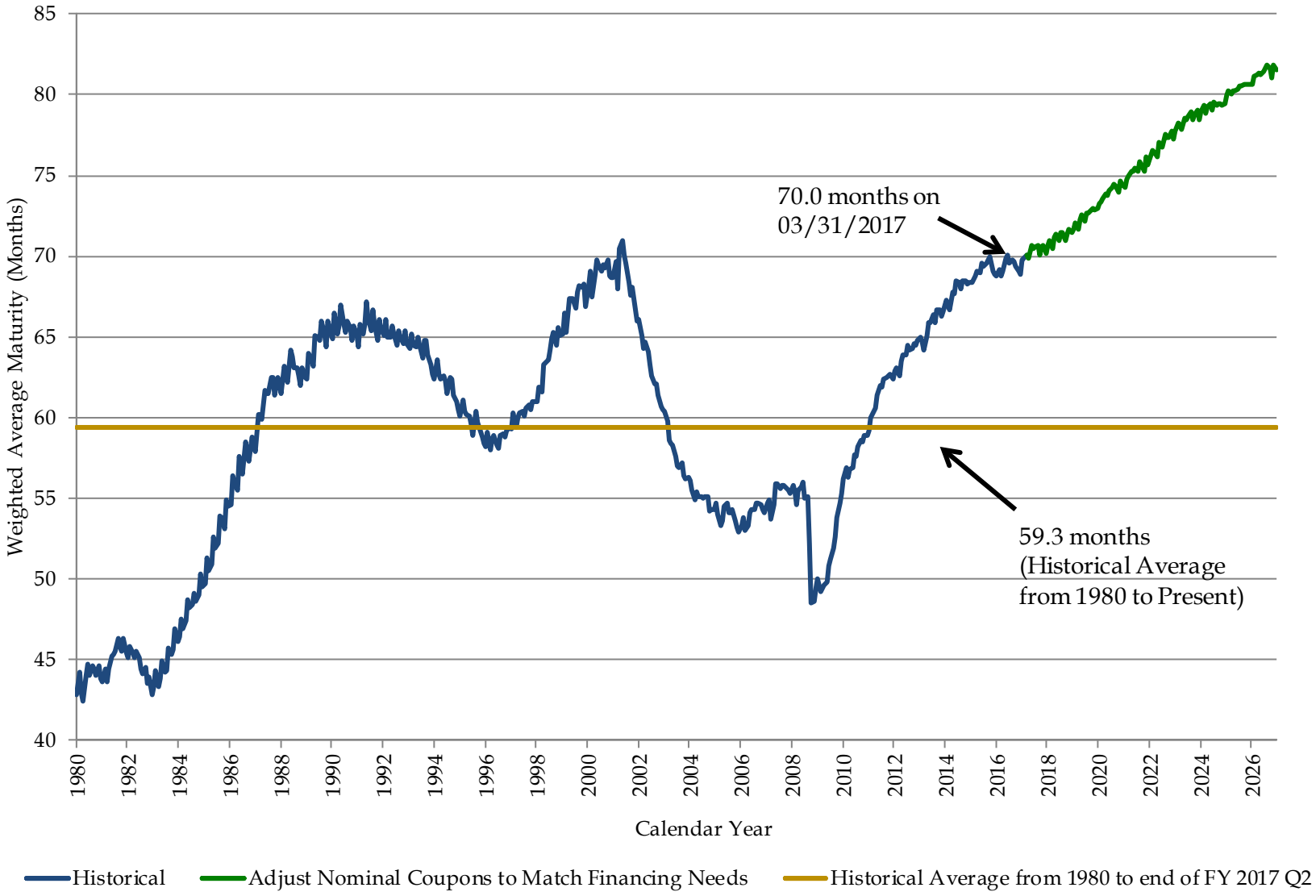
Net Borrowing capacity does not reflect SOMA reinvestments after June 2018 and before February 2022.
Treasury's primary dealer survey estimates can be found on page 11. OMB's projections of net borrowing from the public are from Table S-11 of "The FY2017 Mid-Session Review." CBO's estimates of the borrowing from the public are from Table 1 and 2 of "The Budget and Economic Outlook: 2017 to 2027."
*OFP's FY 2017 Net Marketable Borrowing Estimate

Section IV:
Portfolio Metrics

Assumptions for Portfolio Metrics Section (pages 24 to 28) and Appendix

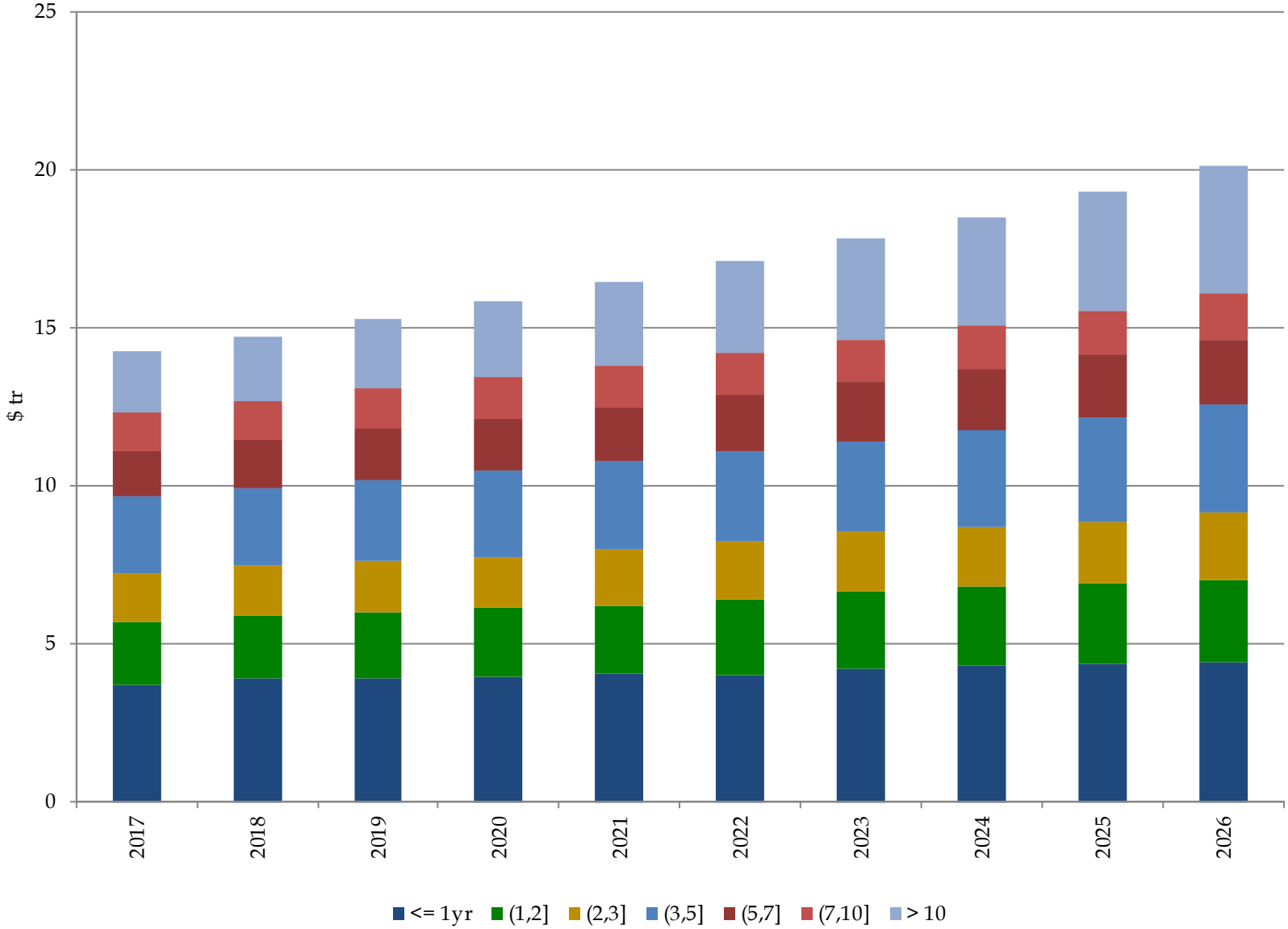
- Portfolio and SOMA holdings as of 03/31/2017.
- SOMA reinvestments until June 2018, followed by SOMA redemptions until and including February 2022. These assumptions are based on the median expectations from the January 2017 FRB-NY Survey of Primary Dealers.
- Assumes announced issuance sizes and patterns constant for Nominal Coupons, TIPS, and FRNs as of 03/31/2017, while using an average of ~$1.8 trillion of Bills outstanding.
- 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.
- The principal on the TIPS securities was accreted to each projection date based on market ZCIS levels as of 03/31/2017.
- OMB's estimates of borrowing from the public are Table S-11 of the "Fiscal Year 2017 Mid-Session Review."

Weighted Average Maturity of Marketable Debt Outstanding



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.

Projected Maturity Profile from end of Fiscal Year



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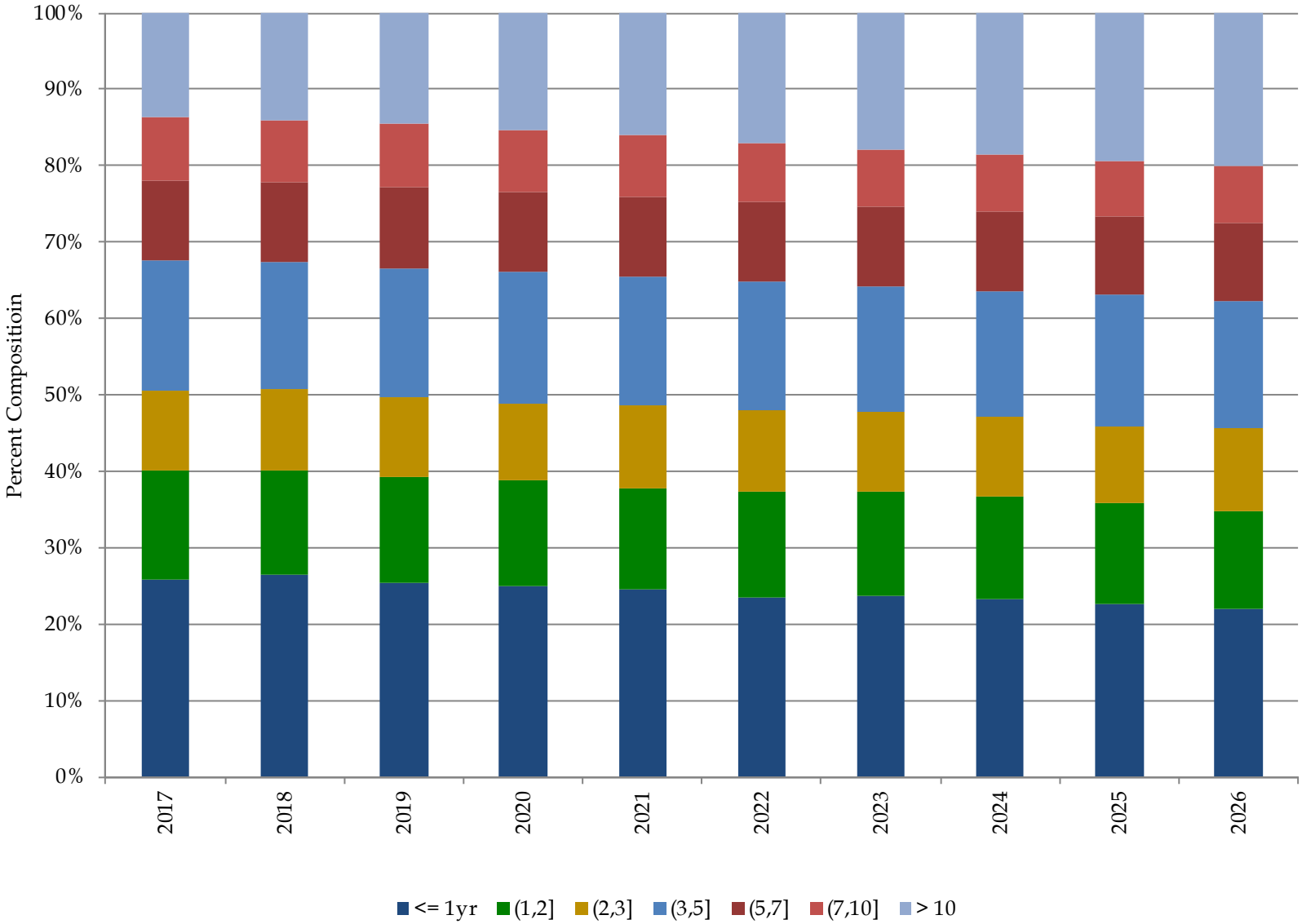
Recent and Projected Maturity Profile, $ billions

End of Fiscal Year	<= 1yr	(1,2]	(2,3]	(3,5]	(5,7]	(7,10]	> 10	Total	(0,5]
2009	2,702	774	663	962	559	643	695	6,998	5,101
2010	2,563	1,141	895	1,273	907	856	853	8,488	5,872
2011	2,620	1,334	980	1,541	1,070	1,053	1,017	9,616	6,476
2012	2,951	1,373	1,104	1,811	1,214	1,108	1,181	10,742	7,239
2013	2,939	1,523	1,242	1,965	1,454	1,136	1,331	11,590	7,669
2014	2,935	1,739	1,319	2,207	1,440	1,113	1,528	12,281	8,199
2015	3,097	1,775	1,335	2,382	1,478	1,121	1,654	12,841	8,589
2016	3,423	1,828	1,538	2,406	1,501	1,151	1,800	13,648	9,195
2017	3,675	2,029	1,507	2,436	1,469	1,182	1,948	14,245	9,646
2018	3,905	2,010	1,540	2,470	1,526	1,194	2,061	14,707	9,926
2019	3,890	2,097	1,619	2,569	1,628	1,269	2,200	15,273	10,175
2020	3,945	2,190	1,607	2,726	1,666	1,286	2,414	15,834	10,468
2021	4,038	2,156	1,777	2,788	1,690	1,331	2,636	16,418	10,760
2022	4,005	2,383	1,826	2,869	1,794	1,328	2,898	17,103	11,083
2023	4,232	2,422	1,863	2,900	1,871	1,345	3,177	17,809	11,417
2024	4,309	2,495	1,899	3,036	1,946	1,368	3,443	18,497	11,740
2025	4,344	2,582	1,927	3,321	1,961	1,400	3,741	19,276	12,175
2026	4,432	2,572	2,163	3,377	2,069	1,480	4,033	20,125	12,544

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. Portfolio composition by original issuance type and term can be found in the appendix (Page 44).

Projected Maturity Profile from end of Fiscal Year



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 following page for details.

Recent and Projected Maturity Profile, percent

End of Fiscal Year	<= 1yr	(1,2]	(2,3]	(3,5]	(5,7]	(7,10]	> 10	(0,3]	(0,5]
2009	38.6	11.1	9.5	13.7	8.0	9.2	9.9	59.1	72.9
2010	30.2	13.4	10.5	15.0	10.7	10.1	10.0	54.2	69.2
2011	27.2	13.9	10.2	16.0	11.1	10.9	10.6	51.3	67.3
2012	27.5	12.8	10.3	16.9	11.3	10.3	11.0	50.5	67.4
2013	25.4	13.1	10.7	17.0	12.5	9.8	11.5	49.2	66.2
2014	23.9	14.2	10.7	18.0	11.7	9.1	12.4	48.8	66.8
2015	24.1	13.8	10.4	18.5	11.5	8.7	12.9	48.3	66.9
2016	25.1	13.4	11.3	17.6	11.0	8.4	13.2	49.7	67.4
2017	25.8	14.2	10.6	17.1	10.3	8.3	13.7	50.6	67.7
2018	26.5	13.7	10.5	16.8	10.4	8.1	14.0	50.7	67.5
2019	25.5	13.7	10.6	16.8	10.7	8.3	14.4	49.8	66.6
2020	24.9	13.8	10.1	17.2	10.5	8.1	15.2	48.9	66.1
2021	24.6	13.1	10.8	17.0	10.3	8.1	16.1	48.6	65.5
2022	23.4	13.9	10.7	16.8	10.5	7.8	16.9	48.0	64.8
2023	23.8	13.6	10.5	16.3	10.5	7.6	17.8	47.8	64.1
2024	23.3	13.5	10.3	16.4	10.5	7.4	18.6	47.1	63.5
2025	22.5	13.4	10.0	17.2	10.2	7.3	19.4	45.9	63.2
2026	22.0	12.8	10.7	16.8	10.3	7.4	20.0	45.6	62.3

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. Portfolio composition by original issuance type and term can be found in the appendix (Page 44).

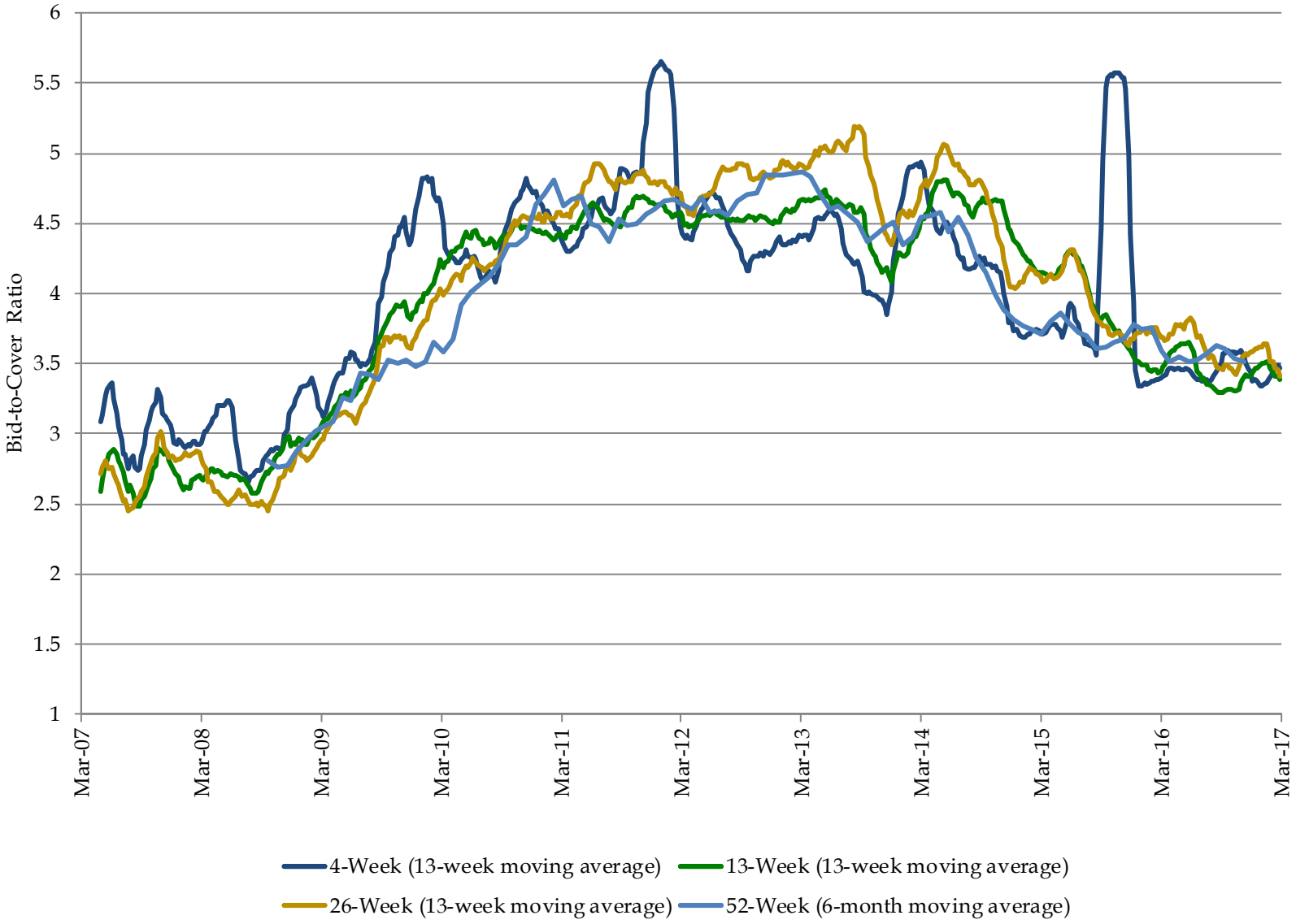
Section V: Demand

Summary Statistics for Fiscal Year 2017 Q2 Auctions

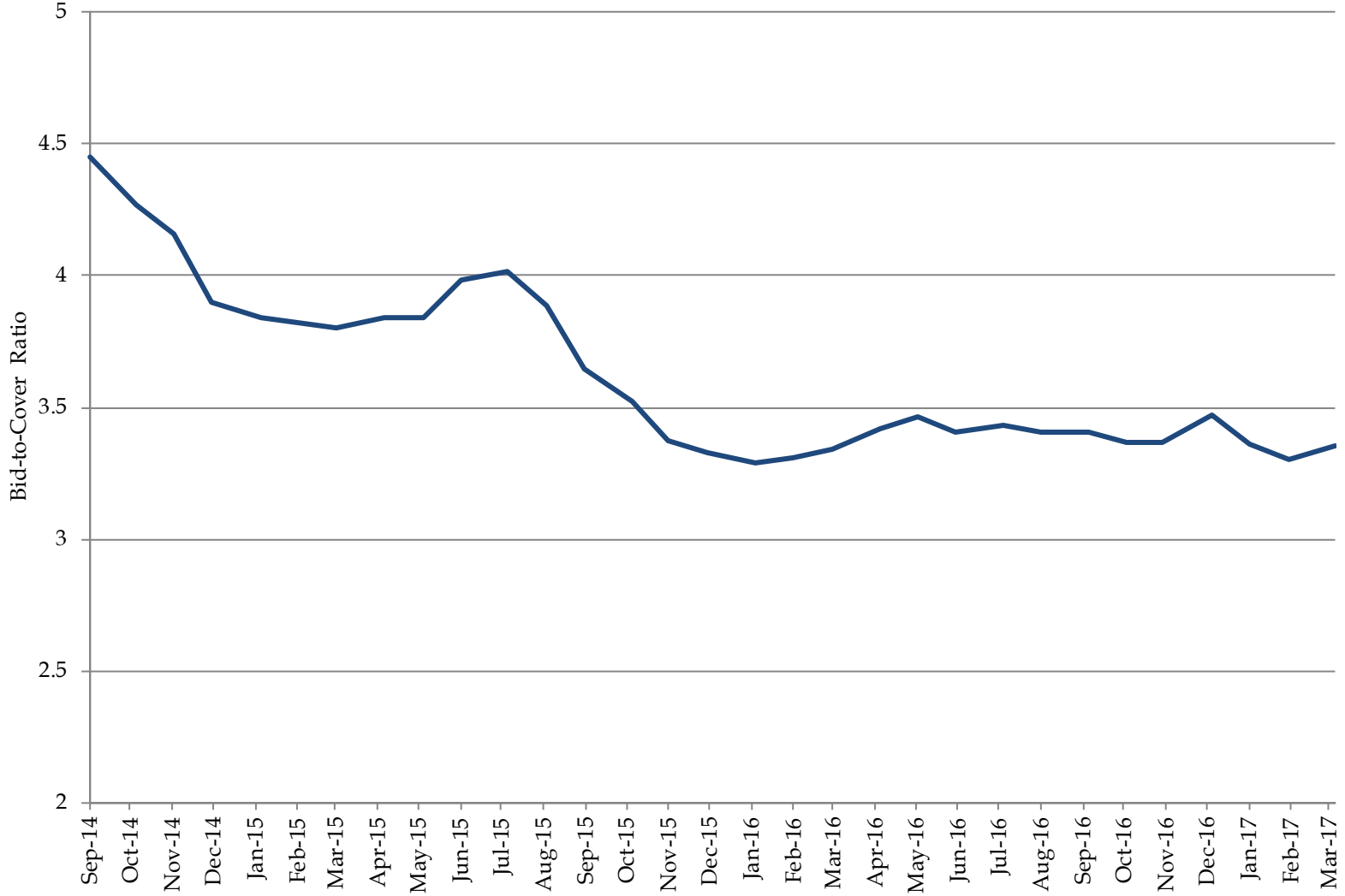
Security Type	Term	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($bn)	SOMA Add Ons ($bn)	10-Year Equivalent ($bn)**
Bill	4-Week	0.575	3.4	542.1	58.9	8.4	32.7	4.6	0.0	4.8
Bill	13-Week	0.601	3.4	440.5	59.1	7.9	33.0	5.7	0.0	12.7
Bill	26-Week	0.712	3.4	361.2	54.3	2.6	43.1	5.2	0.0	21.0
Bill	52-Week	0.887	3.3	78.2	51.0	3.1	45.9	0.8	0.0	9.0
Bill	CMB	0.647	3.4	138.0	61.9	4.3	33.8	0.0	0.0	1.4
Coupon	2-Year	1.234	2.7	77.4	35.9	13.4	50.7	0.5	8.4	19.3
Coupon	3-Year	1.508	2.8	71.7	38.6	7.7	53.7	0.2	4.1	25.3
Coupon	5-Year	1.958	2.3	101.8	30.6	5.9	63.5	0.2	11.0	60.9
Coupon	7-Year	2.249	2.5	84.0	22.0	8.8	69.2	0.0	9.0	68.2
Coupon	10-Year	2.408	2.5	62.9	23.6	9.4	67.0	0.1	3.8	67.1
Coupon	30-Year	3.028	2.3	39.0	27.9	7.3	64.8	0.0	2.4	92.5
TIPS	10-Year	0.450	2.3	23.9	17.9	11.0	71.1	0.1	2.2	28.8
TIPS	30-Year	0.923	2.3	7.0	23.6	6.6	69.8	0.0	1.0	23.6
FRN	2-Year	0.128	3.2	41.0	61.5	0.9	37.6	0.0	2.5	0.0
Total Bills		0.636	3.4	1,559.9	57.8	6.3	36.0	16.4	0.0	48.9
Total Coupons		1.972	2.5	436.9	29.9	8.7	61.3	0.9	38.7	333.4
Total TIPS		0.557	2.3	30.9	19.2	10.0	70.8	0.1	3.1	52.3
Total FRN		0.128	3.2	41.0	61.5	0.9	37.6	0.0	2.5	0.0

*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.

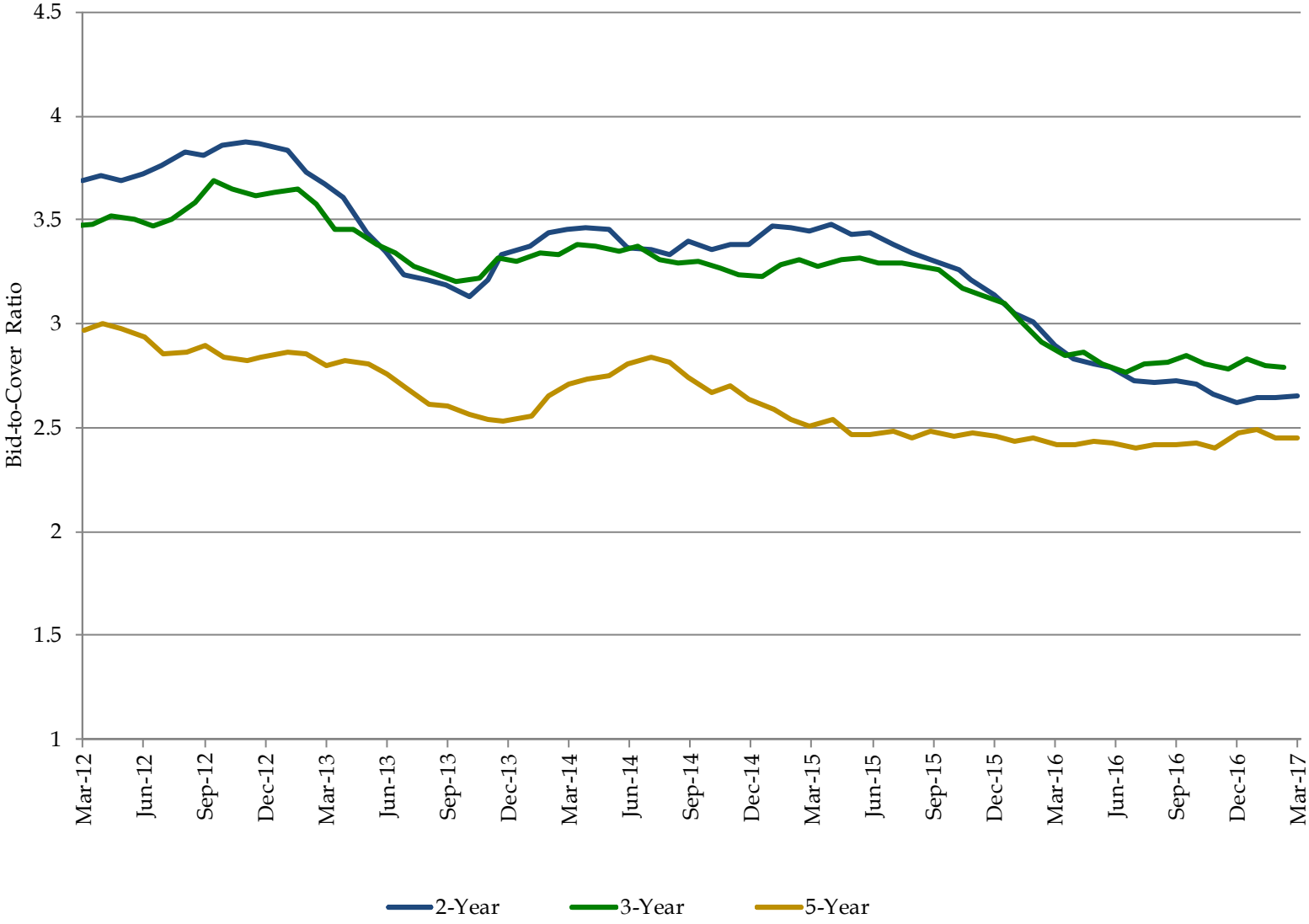
Bid-to-Cover Ratios for Treasury Bills



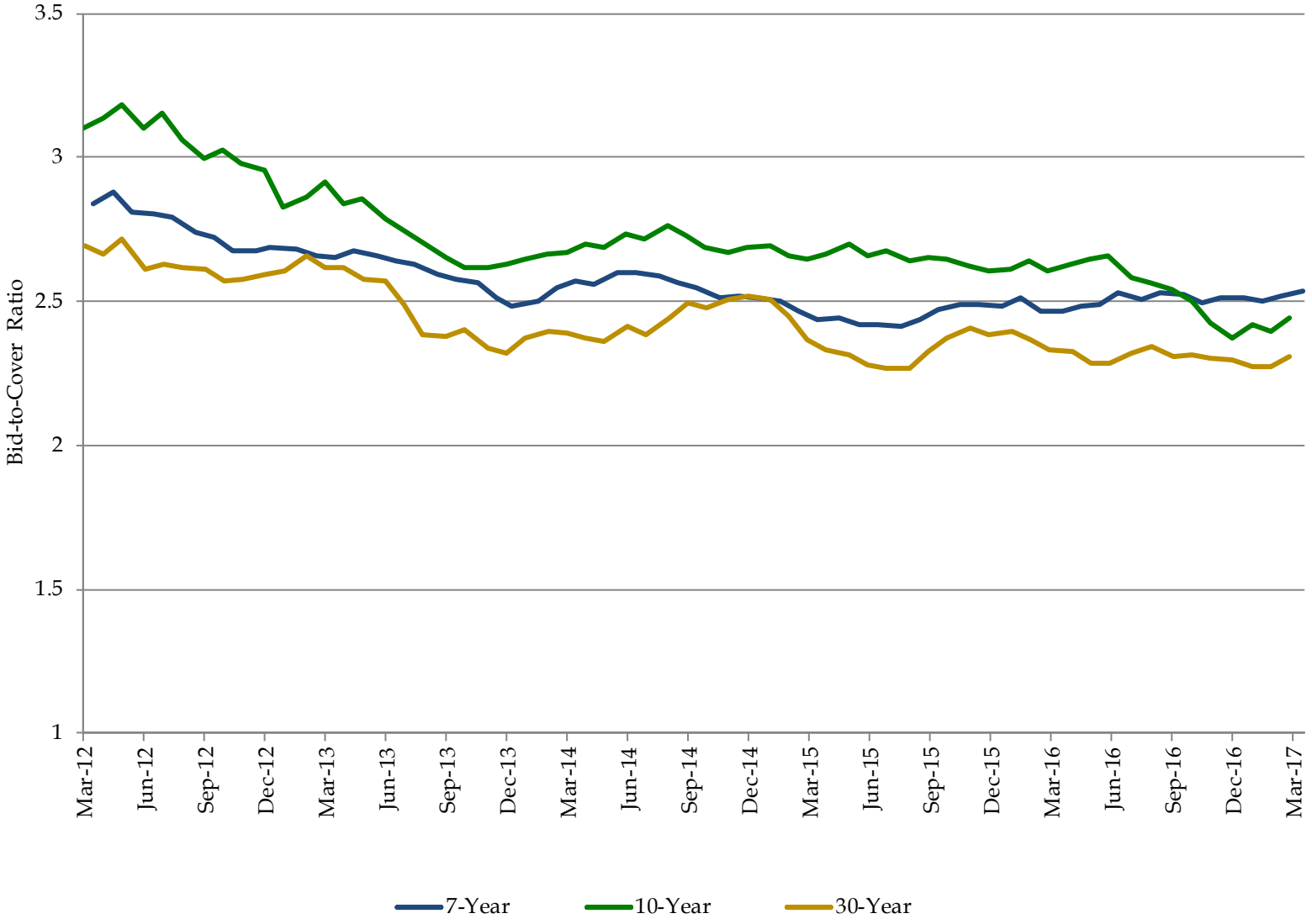
Bid-to-Cover Ratios for FRNs
(6-Month Moving Average)



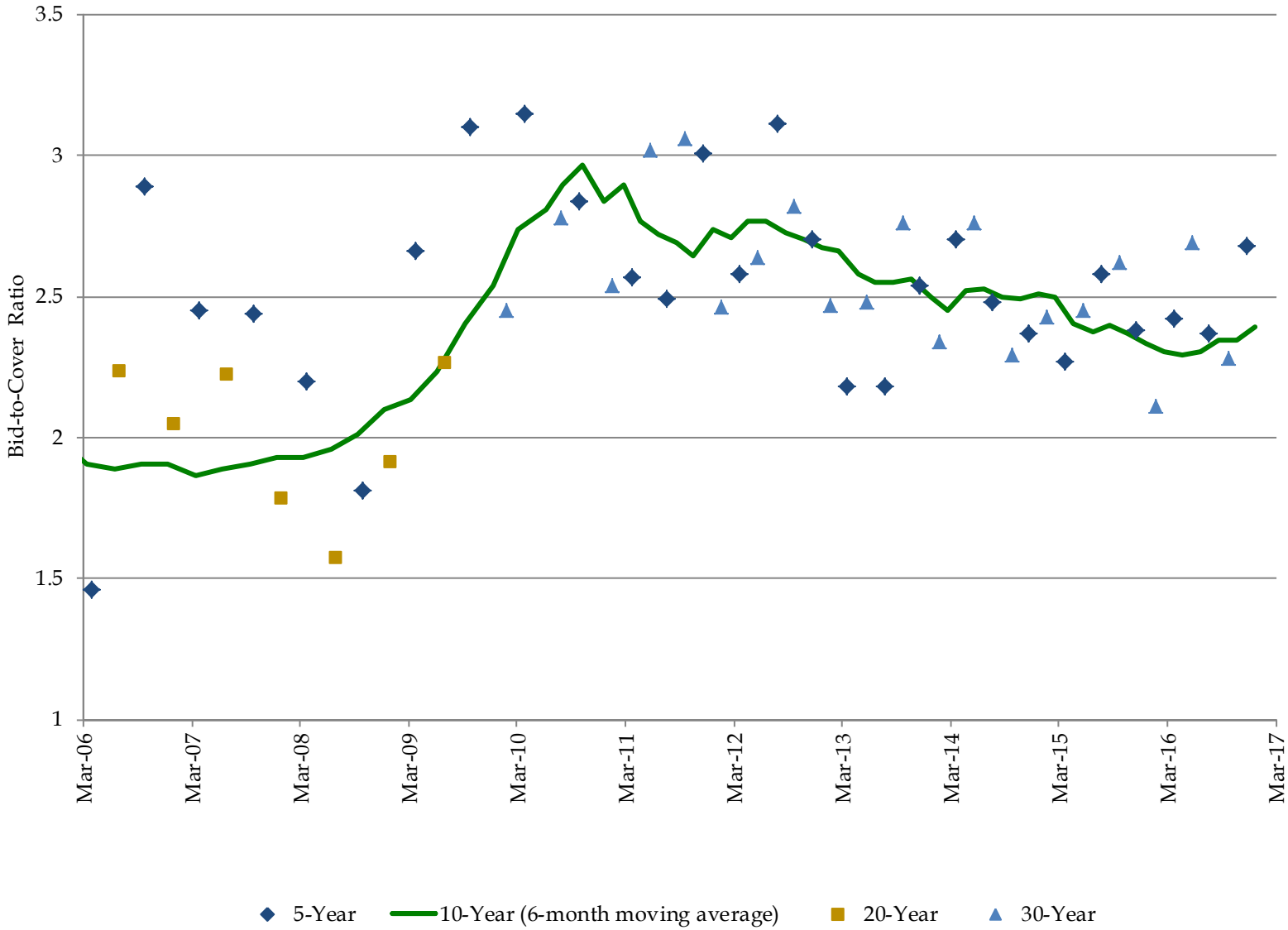
Bid-to-Cover Ratios for 2-, 3-, and 5-Year Nominal Securities (6-Month Moving Average)



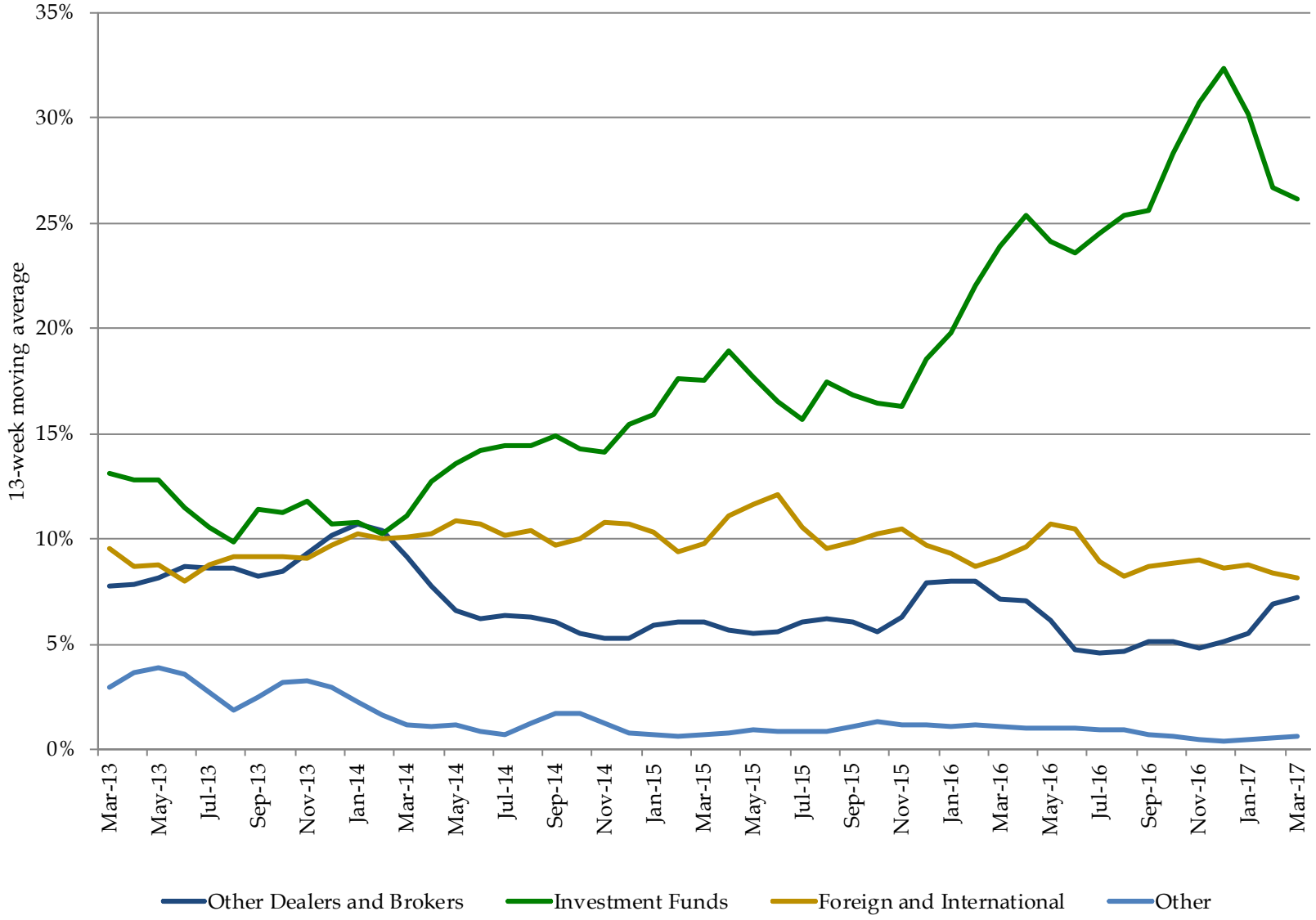
Bid-to-Cover Ratios for 7-, 10-, and 30-Year Nominal Securities (6-Month Moving Average)



Bid-to-Cover Ratios for TIPS

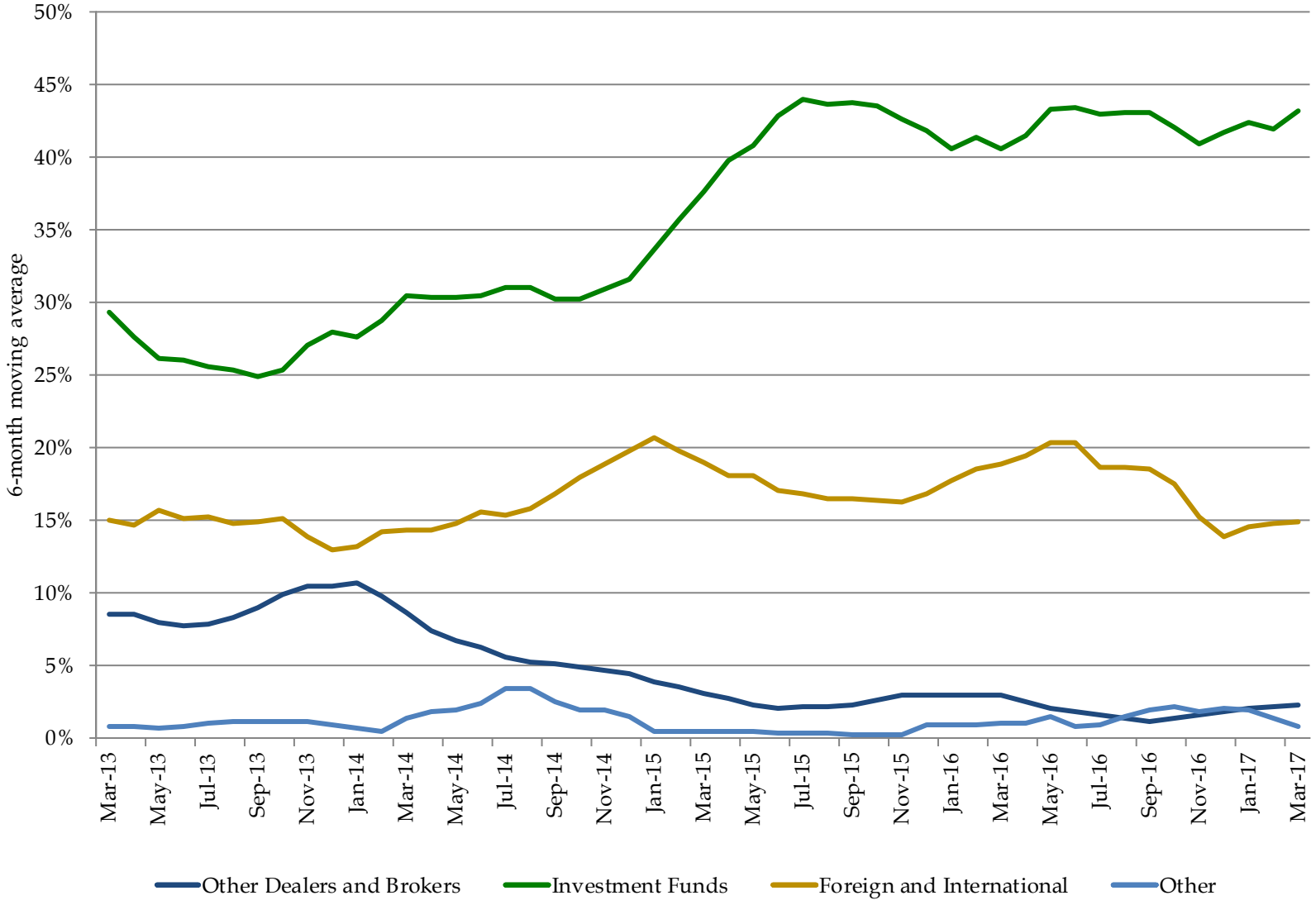


Percent Awarded in Bill Auctions by Investor Class (13-Week Moving Average)



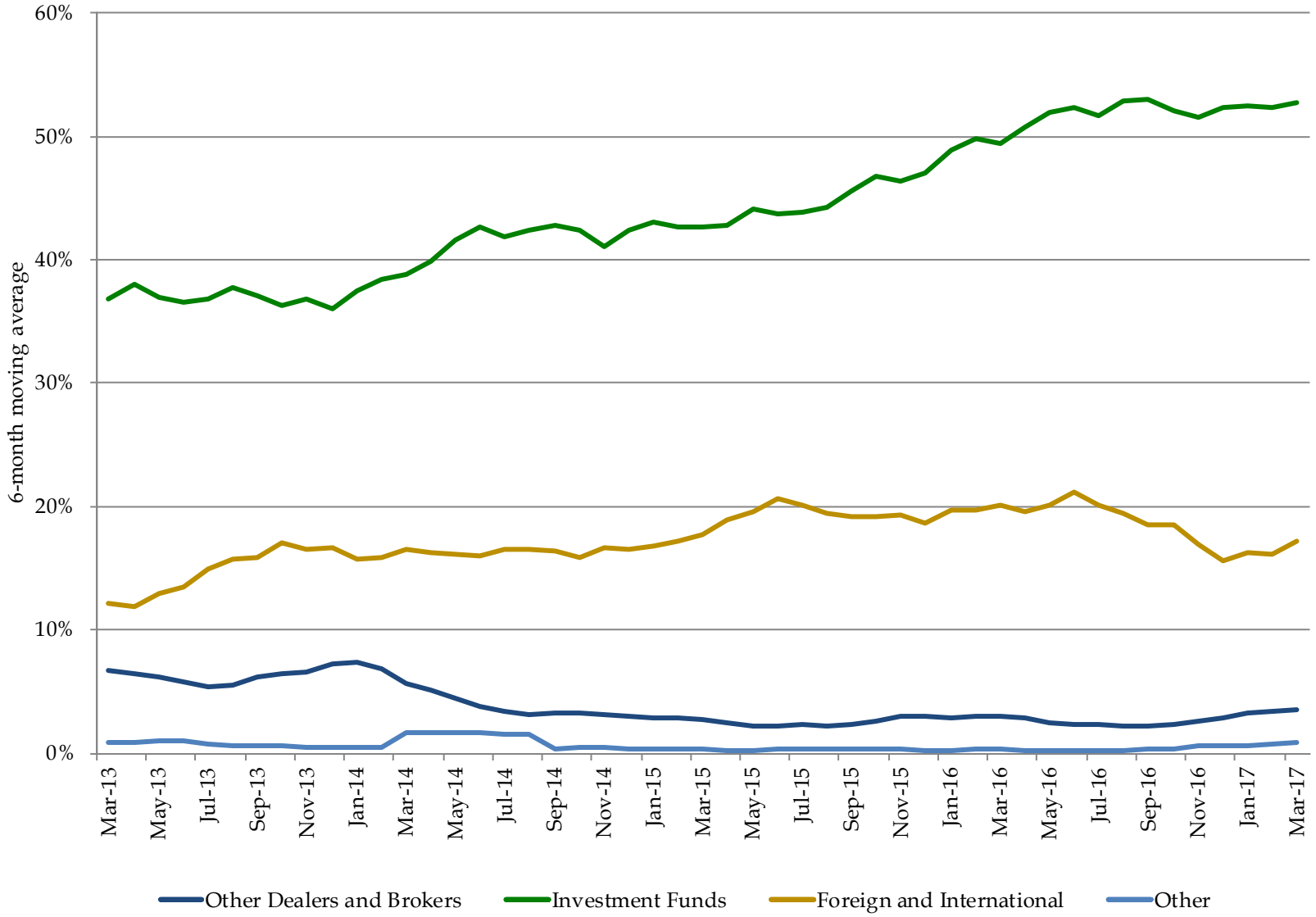
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

Percent Awarded in 2-, 3-, and 5-Year Nominal Security Auctions by Investor Class (6-Month Moving Average)



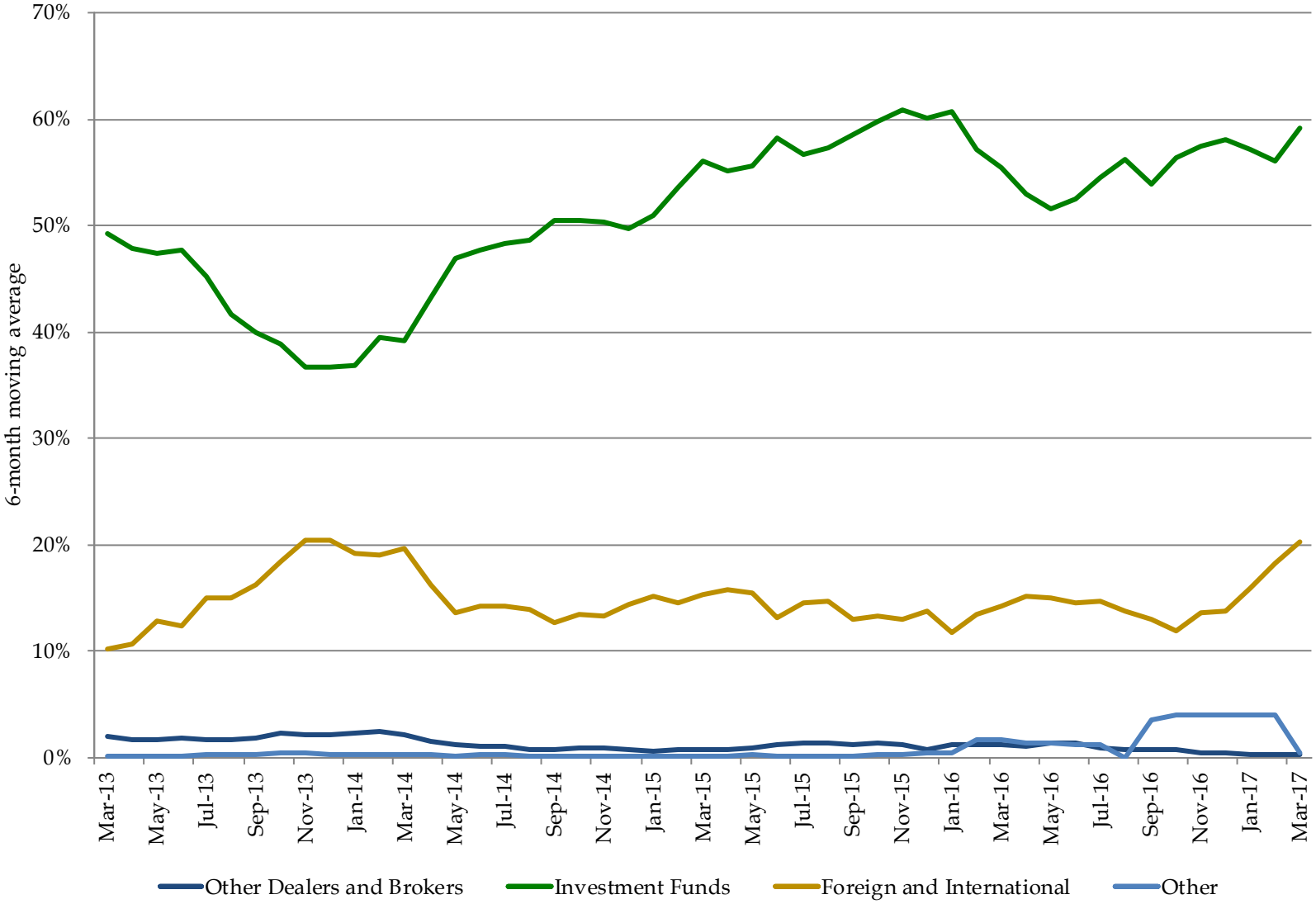
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

Percent Awarded in 7-, 10-, 30-Year Nominal Security Auctions by Investor Class (6-Month Moving Average)



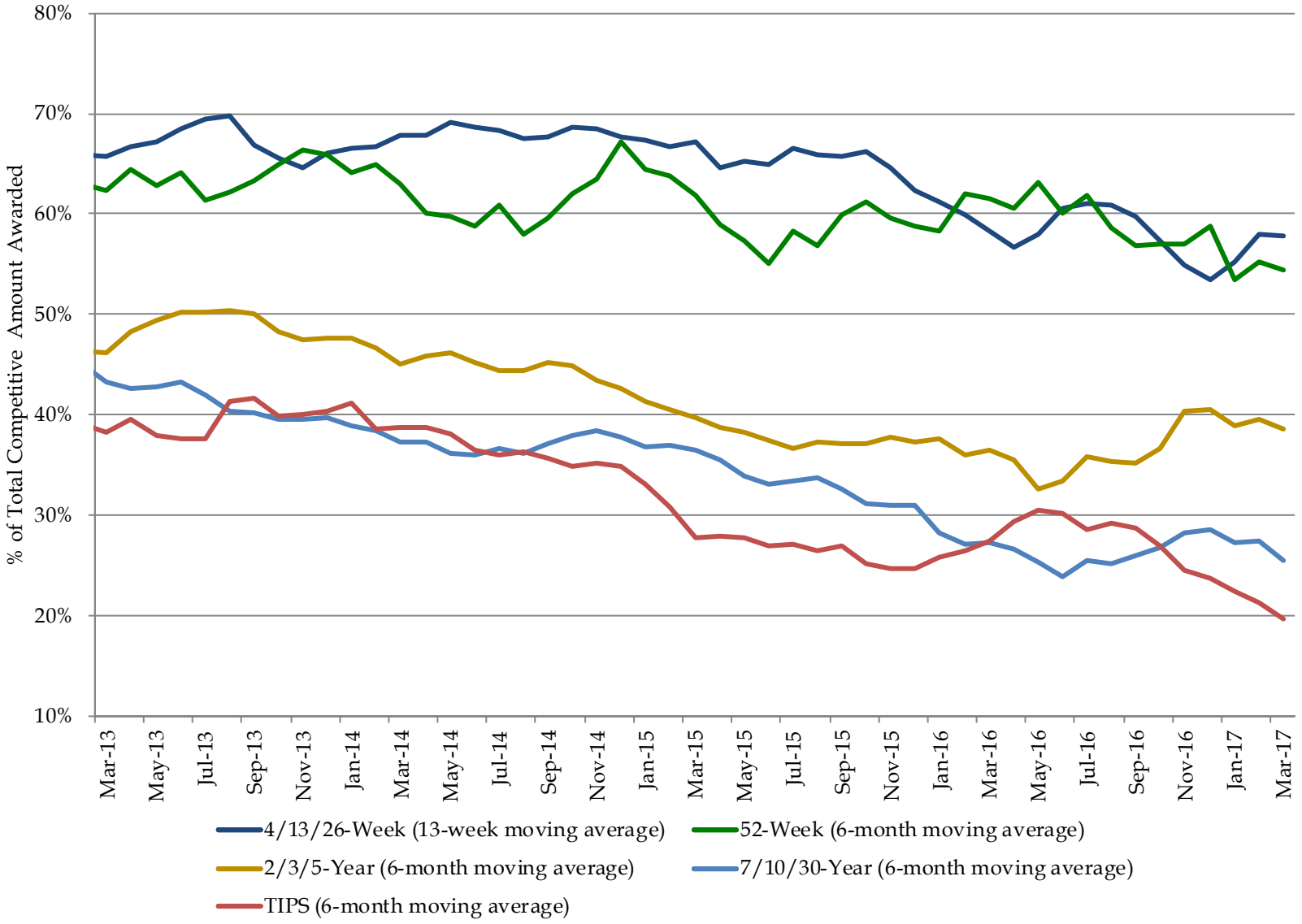
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

Percent Awarded in TIPS Auctions by Investor Class (6-Month Moving Average)



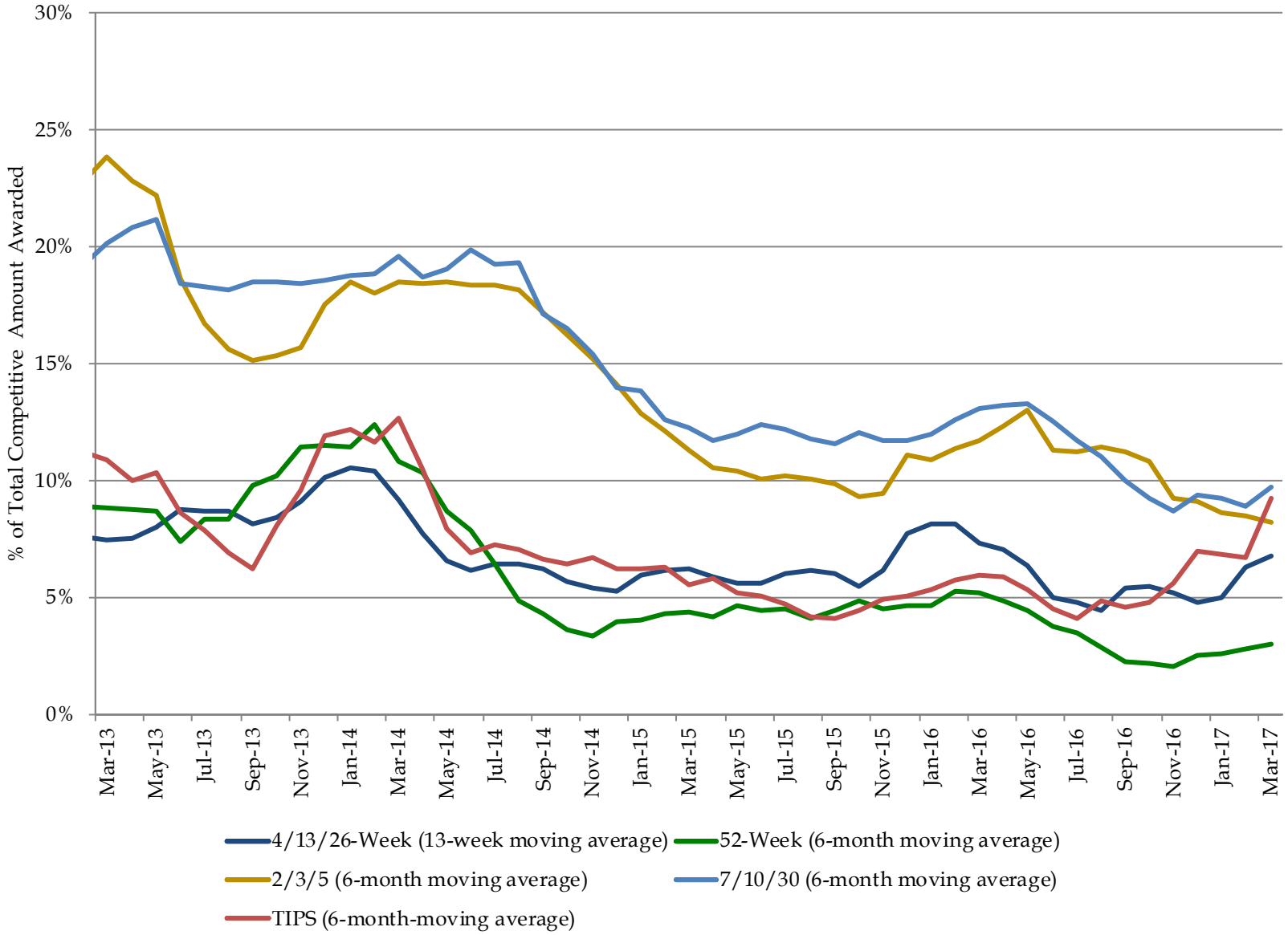
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

Primary Dealer Awards at Auction



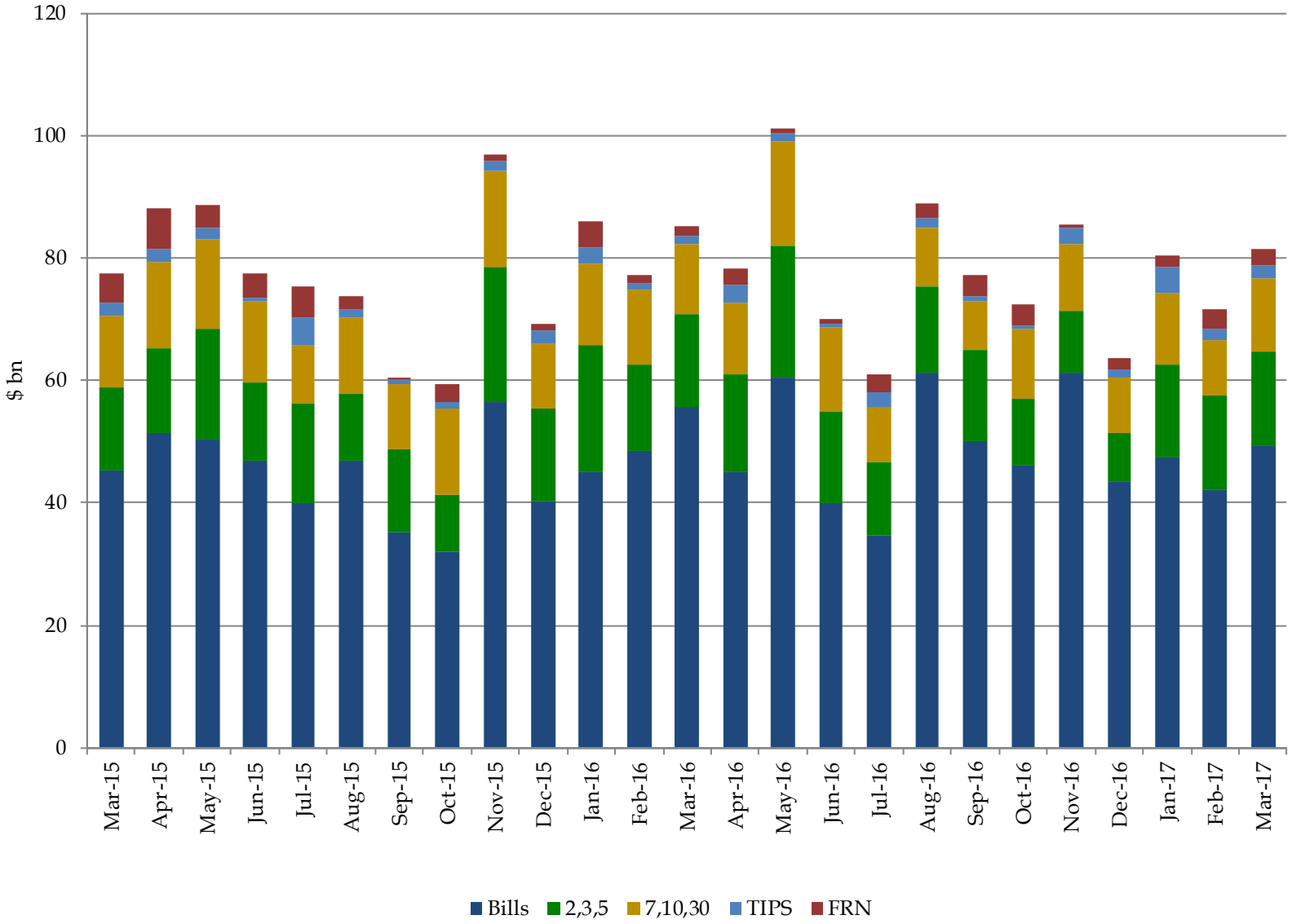
Excludes SOMA add-ons.

Direct Bidder Awards at Auction



Excludes SOMA add-ons.

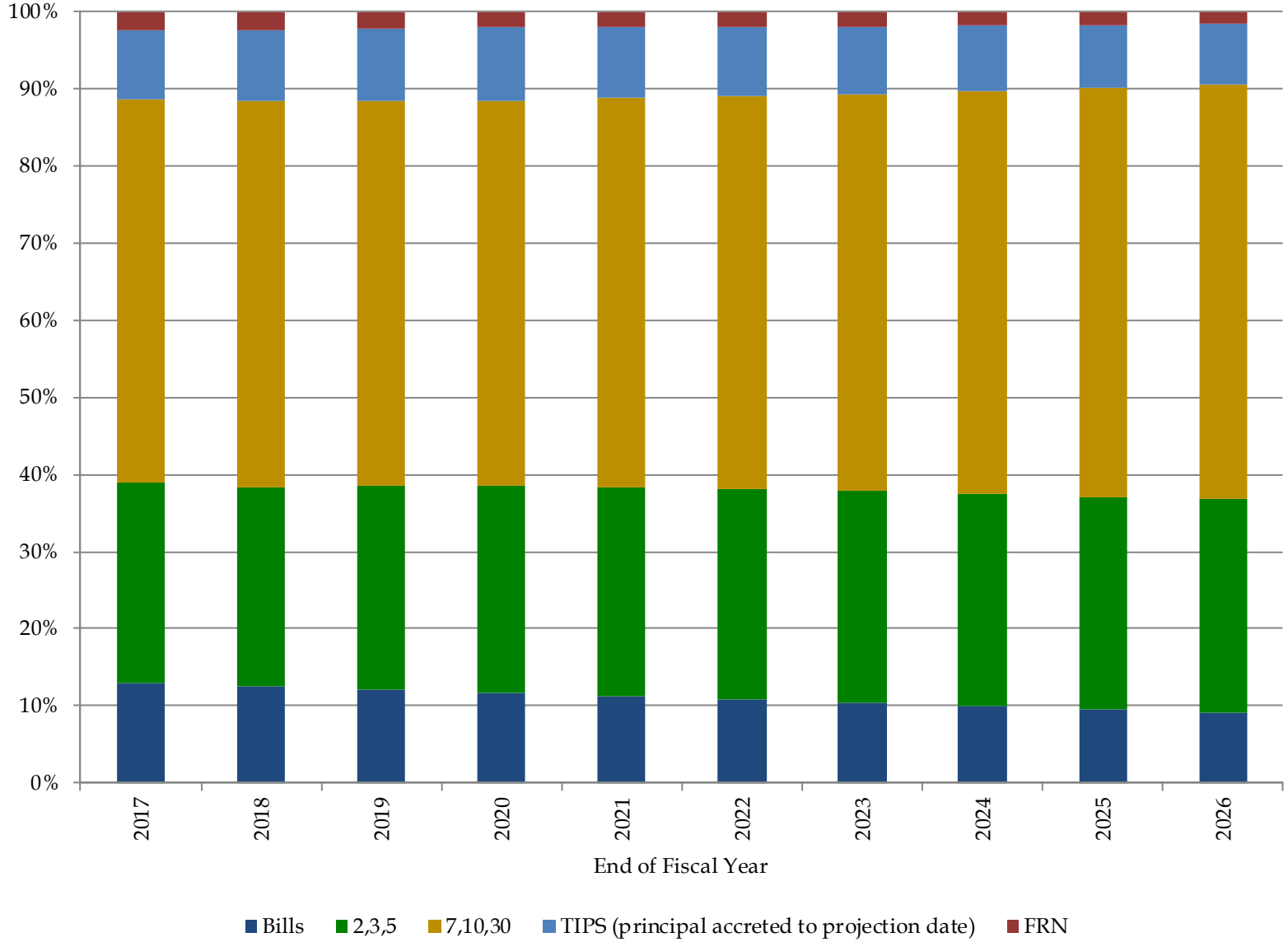
Total Foreign Awards of Treasuries at Auction, $ billions



Foreign includes both private sector and official institutions.

Appendix

Projected Portfolio Composition by Issuance Type



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 following page for details.

Recent and Projected 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)	FRN
2009	28.5	36.2	27.4	63.6	7.9	0.0
2010	21.1	40.1	31.8	71.9	7.0	0.0
2011	15.4	41.4	35.9	77.3	7.3	0.0
2012	15.0	38.4	39.0	77.4	7.5	0.0
2013	13.2	35.8	43.0	78.7	8.1	0.0
2014	11.5	33.0	46.0	79.0	8.5	1.0
2015	10.6	29.4	49.0	78.3	8.8	2.2
2016	12.1	27.0	49.6	76.6	8.9	2.4
2017	13.0	26.0	49.6	75.6	9.0	2.4
2018	12.5	25.9	49.9	75.8	9.3	2.4
2019	12.1	26.5	49.8	76.3	9.5	2.2
2020	11.7	26.9	50.0	76.9	9.4	2.1
2021	11.2	27.1	50.4	77.5	9.2	2.0
2022	10.8	27.3	51.0	78.3	9.0	1.9
2023	10.4	27.5	51.5	79.0	8.8	1.9
2024	10.0	27.4	52.2	79.6	8.6	1.8
2025	9.6	27.5	53.0	80.6	8.1	1.7
2026	9.2	27.6	53.8	81.4	7.8	1.7

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.

Bills										
Issue	Settle Date	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($bn)	SOMA Add Ons ($bn)	10-Year Equivalent ($bn)*
4-Week	1/5/2017	0.475	3.25	44.5	61.6	7.1	31.3	0.4	0.0	0.4
4-Week	1/12/2017	0.500	3.46	44.6	73.8	8.0	18.3	0.3	0.0	0.4
4-Week	1/19/2017	0.520	3.54	44.6	57.3	1.8	40.9	0.3	0.0	0.4
4-Week	1/26/2017	0.480	3.36	44.6	54.5	10.4	35.1	0.3	0.0	0.4
4-Week	2/2/2017	0.490	3.45	44.5	60.1	8.4	31.6	0.4	0.0	0.4
4-Week	2/9/2017	0.530	3.46	44.6	55.2	6.6	38.2	0.3	0.0	0.4
4-Week	2/16/2017	0.515	3.41	44.6	64.0	10.7	25.3	0.3	0.0	0.4
4-Week	2/23/2017	0.480	3.60	34.6	64.4	11.2	24.4	0.3	0.0	0.3
4-Week	3/2/2017	0.400	3.96	17.5	65.3	14.9	19.8	0.4	0.0	0.2
4-Week	3/9/2017	0.570	3.81	14.6	56.9	2.5	40.6	0.3	0.0	0.1
4-Week	3/16/2017	0.770	3.40	54.6	51.8	7.2	40.9	0.3	0.0	0.5
4-Week	3/23/2017	0.745	3.17	54.5	55.2	10.9	33.8	0.4	0.0	0.5
4-Week	3/30/2017	0.745	3.21	54.5	52.9	9.6	37.5	0.4	0.0	0.5
13-Week	1/5/2017	0.530	3.70	33.5	45.1	11.1	43.8	0.4	0.0	1.0
13-Week	1/12/2017	0.510	3.64	33.5	68.2	4.7	27.1	0.4	0.0	1.0
13-Week	1/19/2017	0.530	3.22	33.5	71.6	4.0	24.4	0.4	0.0	1.0
13-Week	1/26/2017	0.505	3.67	33.5	53.9	9.5	36.6	0.4	0.0	1.0
13-Week	2/2/2017	0.515	3.51	33.4	52.8	6.8	40.4	0.4	0.0	1.0
13-Week	2/9/2017	0.530	3.30	33.4	73.8	8.4	17.9	0.4	0.0	1.0
13-Week	2/16/2017	0.540	3.33	33.3	62.7	9.5	27.8	0.5	0.0	1.0
13-Week	2/23/2017	0.535	3.33	32.6	60.7	9.0	30.3	0.4	0.0	1.0
13-Week	3/2/2017	0.515	3.35	33.3	60.3	10.1	29.7	0.4	0.0	0.9
13-Week	3/9/2017	0.745	3.22	29.5	54.3	4.4	41.2	0.4	0.0	0.8
13-Week	3/16/2017	0.780	3.51	35.3	46.0	7.0	47.1	0.5	0.0	1.0
13-Week	3/23/2017	0.760	3.08	38.3	62.8	10.0	27.2	0.5	0.0	1.1
13-Week	3/30/2017	0.780	3.19	37.5	56.3	7.6	36.2	0.5	0.0	1.1
26-Week	1/5/2017	0.630	3.62	27.5	52.3	3.7	44.0	0.4	0.0	1.6
26-Week	1/12/2017	0.590	3.74	27.4	55.6	2.3	42.1	0.4	0.0	1.6
26-Week	1/19/2017	0.605	3.35	27.3	62.0	2.7	35.2	0.5	0.0	1.6
26-Week	1/26/2017	0.600	3.69	26.6	50.0	3.2	46.8	0.4	0.0	1.6
26-Week	2/2/2017	0.625	3.47	27.4	56.2	2.3	41.5	0.3	0.0	1.6
26-Week	2/9/2017	0.620	3.64	27.2	38.6	2.0	59.4	0.4	0.0	1.6
26-Week	2/16/2017	0.645	3.25	27.2	55.8	1.9	42.3	0.5	0.0	1.6
26-Week	2/23/2017	0.670	3.25	26.6	54.7	1.4	43.8	0.4	0.0	1.6
26-Week	3/2/2017	0.670	3.11	27.4	68.6	5.7	25.7	0.4	0.0	1.6
26-Week	3/9/2017	0.835	3.72	23.3	48.1	1.7	50.2	0.4	0.0	1.3
26-Week	3/16/2017	0.910	3.13	29.3	50.0	0.7	49.3	0.4	0.0	1.7
26-Week	3/23/2017	0.890	3.10	32.3	58.7	3.7	37.6	0.4	0.0	1.8
26-Week	3/30/2017	0.905	3.23	31.5	53.4	2.7	44.0	0.5	0.0	1.8
52-Week	1/5/2017	0.870	3.39	19.8	47.9	1.9	50.2	0.2	0.0	2.2
52-Week	2/2/2017	0.810	3.48	19.8	46.2	4.3	49.5	0.2	0.0	2.3
52-Week	3/2/2017	0.850	3.14	19.8	60.0	3.0	37.0	0.2	0.0	2.2
52-Week	3/30/2017	1.025	3.17	18.8	49.9	3.2	46.9	0.2	0.0	2.3
CMB	2/9/2017	0.525	3.48	50.0	56.4	5.3	38.4	0.0	0.0	0.5
CMB	3/9/2017	0.515	3.68	20.0	62.2	4.0	33.8	0.0	0.0	0.0
CMB	3/14/2017	0.770	3.02	33.0	75.7	3.5	20.8	0.0	0.0	0.4
CMB	3/16/2017	0.780	3.31	35.0	56.8	3.6	39.6	0.0	0.0	0.4

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

Nominal Coupons										
Issue	Settle Date	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($bn)	SOMA Add Ons ($bn)	10-Year Equivalent ($bn)*
2-Year	1/31/2017	1.210	2.68	25.8	41.9	9.3	48.8	0.2	1.6	6.2
2-Year	2/28/2017	1.230	2.82	25.8	30.1	20.1	49.8	0.2	3.6	6.6
2-Year	3/31/2017	1.261	2.73	25.7	35.7	10.8	53.6	0.2	3.1	6.5
3-Year	1/17/2017	1.472	2.97	23.9	38.8	6.6	54.6	0.1	1.3	8.4
3-Year	2/15/2017	1.423	2.78	23.9	34.7	8.1	57.2	0.1	2.8	9.0
3-Year	3/15/2017	1.630	2.74	23.8	42.2	8.4	49.4	0.1	0.0	7.9
5-Year	1/31/2017	1.988	2.38	34.0	32.1	4.6	63.3	0.0	2.2	19.6
5-Year	2/28/2017	1.937	2.29	33.9	33.3	8.4	58.2	0.1	4.7	20.8
5-Year	3/31/2017	1.950	2.37	33.9	26.4	4.8	68.9	0.1	4.1	20.6
7-Year	1/31/2017	2.335	2.45	28.0	20.7	6.6	72.8	0.0	1.8	21.8
7-Year	2/28/2017	2.197	2.49	28.0	24.8	11.4	63.8	0.0	3.9	23.3
7-Year	3/31/2017	2.215	2.56	28.0	20.5	8.4	71.1	0.0	3.4	23.1
10-Year	1/17/2017	2.342	2.58	20.0	20.7	8.7	70.5	0.0	1.1	21.1
10-Year	2/15/2017	3.005	2.25	15.0	28.9	4.9	66.2	0.0	1.7	37.6
10-Year	3/15/2017	3.170	2.34	12.0	25.8	13.1	61.1	0.0	0.0	26.4
30-Year	1/31/2017	0.436	2.45	12.9	15.9	7.0	77.1	0.1	0.8	15.3
30-Year	3/31/2017	0.466	2.23	11.0	20.4	15.6	64.1	0.0	1.3	13.5
30-Year	2/28/2017	0.923	2.25	7.0	23.6	6.6	69.8	0.0	1.0	23.6
2-Year FRN	1/31/2017	0.140	3.16	15.0	73.1	1.5	25.4	0.0	1.0	0.0
2-Year FRN	2/24/2017	0.133	3.08	13.0	50.9	0.4	48.7	0.0	0.0	0.0
2-Year FRN	3/31/2017	0.109	3.43	13.0	58.8	0.8	40.4	0.0	1.6	0.0

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 ($bn)	10-Year Equivalent ($bn)*
10-Year TIPS	1/31/2017	0.436	2.45	12.9	15.9	7.0	77.1	0.1	0.8	15.3
10-Year TIPS	3/31/2017	0.466	2.23	11.0	20.4	15.6	64.1	0.0	1.3	13.5
30-Year TIPS	2/28/2017	0.923	2.25	7.0	23.6	6.6	69.8	0.0	1.0	23.6

*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.

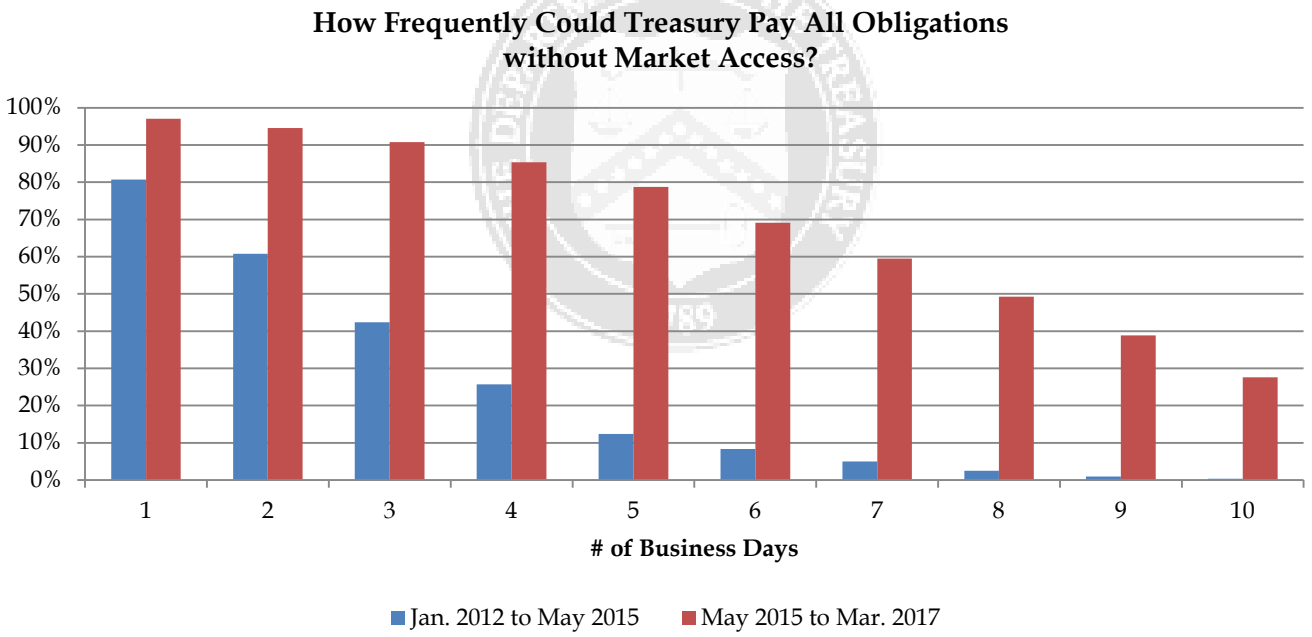
Office of Debt Management

Review of Treasury Cash Balance Policy

May 2017

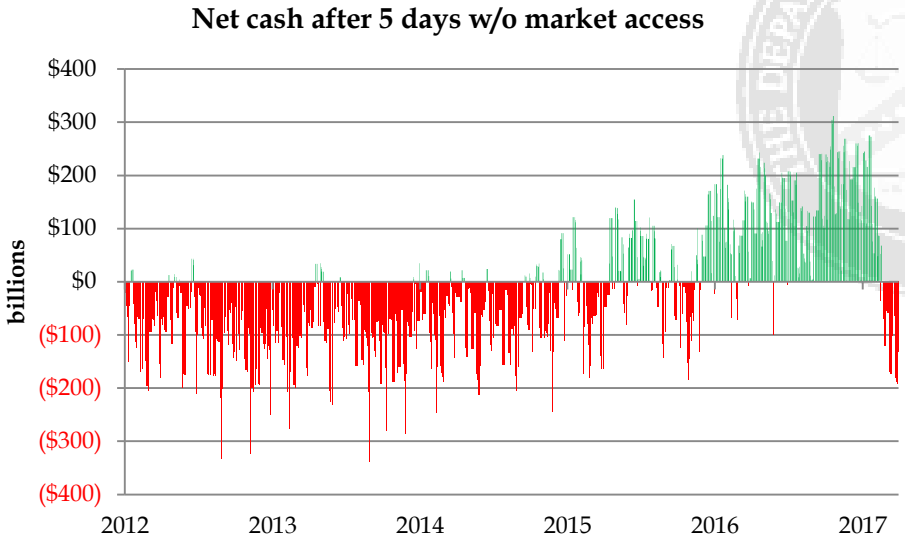
Current Level of Coverage

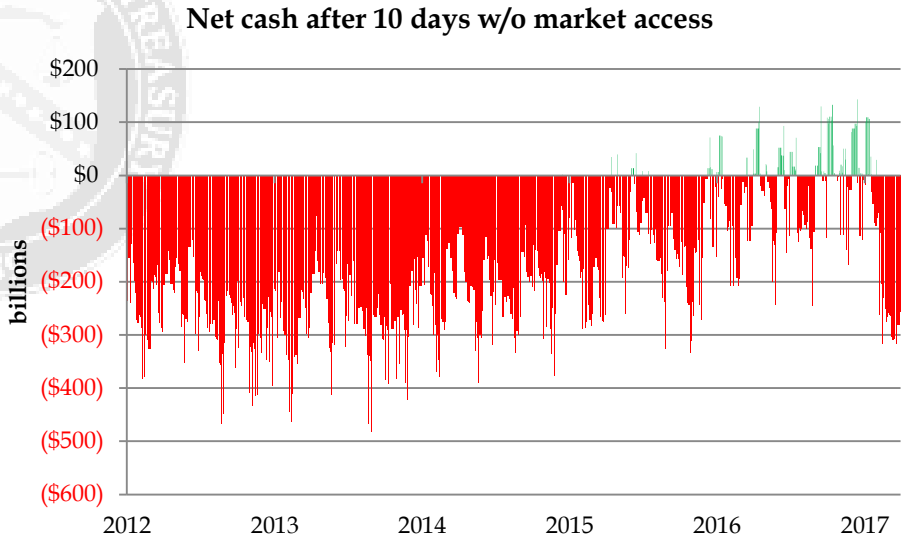
- Since May 2015, Treasury has maintained sufficient liquidity to withstand a loss of market access for an average of approximately 7 days:
  - Treasury would have been protected against losing market access for 5 days approximately 79 percent of the time and for 10 days roughly 28 percent of the time.
    - The debt limit impasse during the fall of 2015 is the predominant reason for Treasury missing its 5-day liquidity target 21 percent of the time.



Cash Shortfall from Loss of Market Access

- If Treasury lost market access for more than a short period of time, the U.S. government could face a substantial cash shortfall:
  - Since May 2015, on average, Treasury would have a cash surplus of $86 billion if market access had been lost for 5 days.
    - However, if market access had been lost for 10 days, this cash surplus would become a *shortfall* averaging $73 billion over the same timeframe.



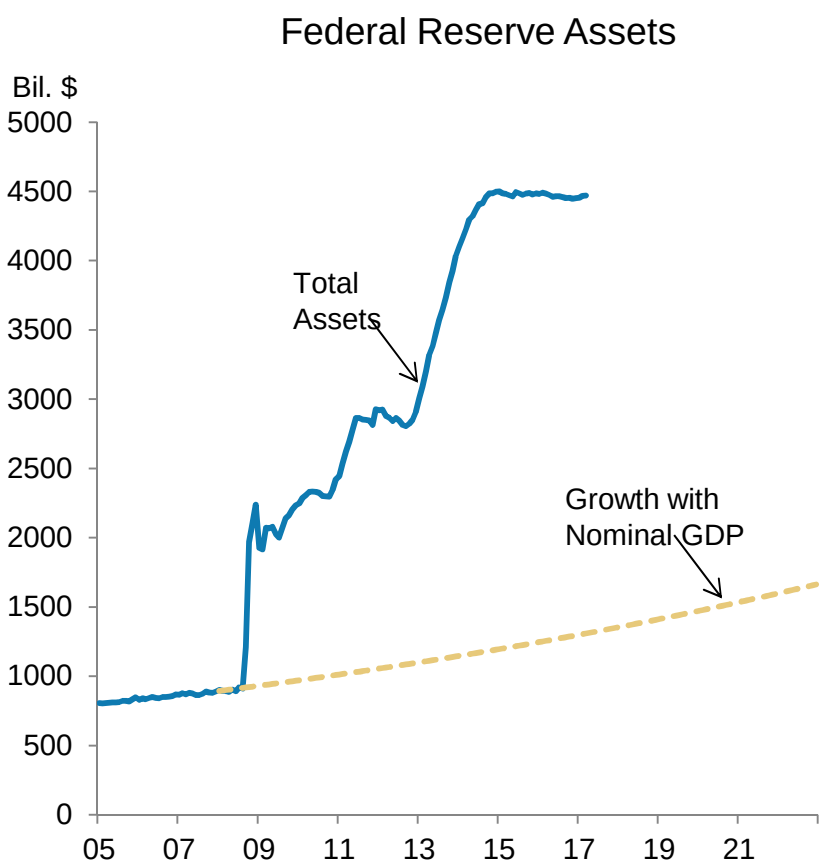


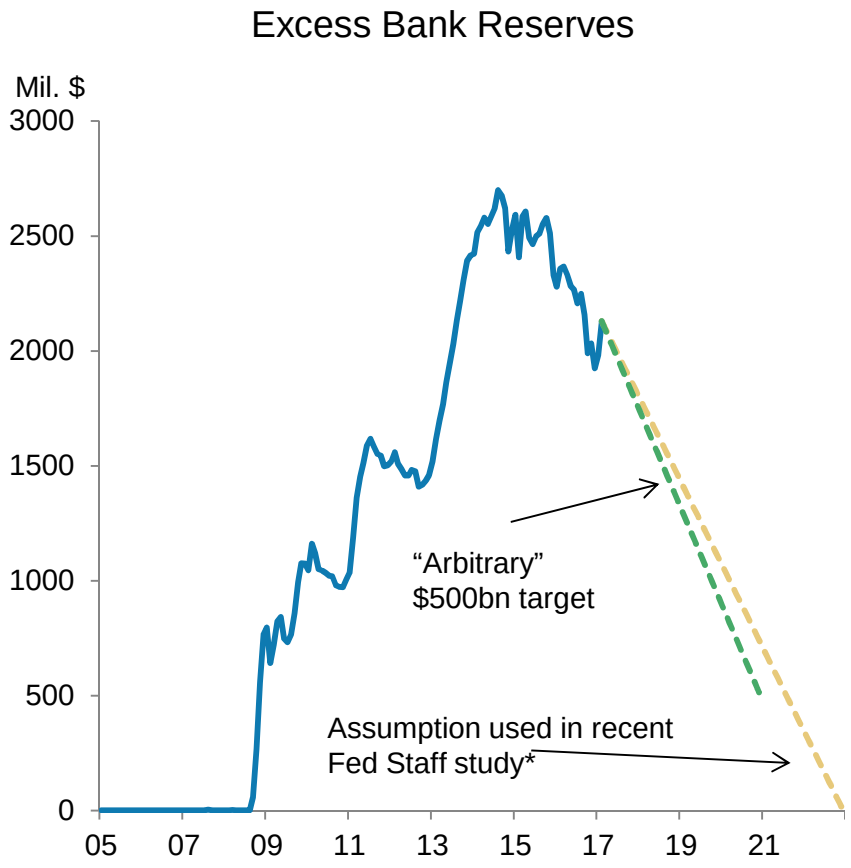
Treasury Borrowing Advisory Committee Presentation

May 2017

Charge: Consistent with the discussion at February 2017 TBAC meeting, in the event that the Federal Reserve normalizes the SOMA portfolio and begins to redeem its Treasury holdings, Treasury would like the Committee's views on funding these redemptions. Please comment on the potential timing and pace of the normalization process as well as any pricing impacts on fixed income markets.

Fed Balance Sheet: What is "Normal"?



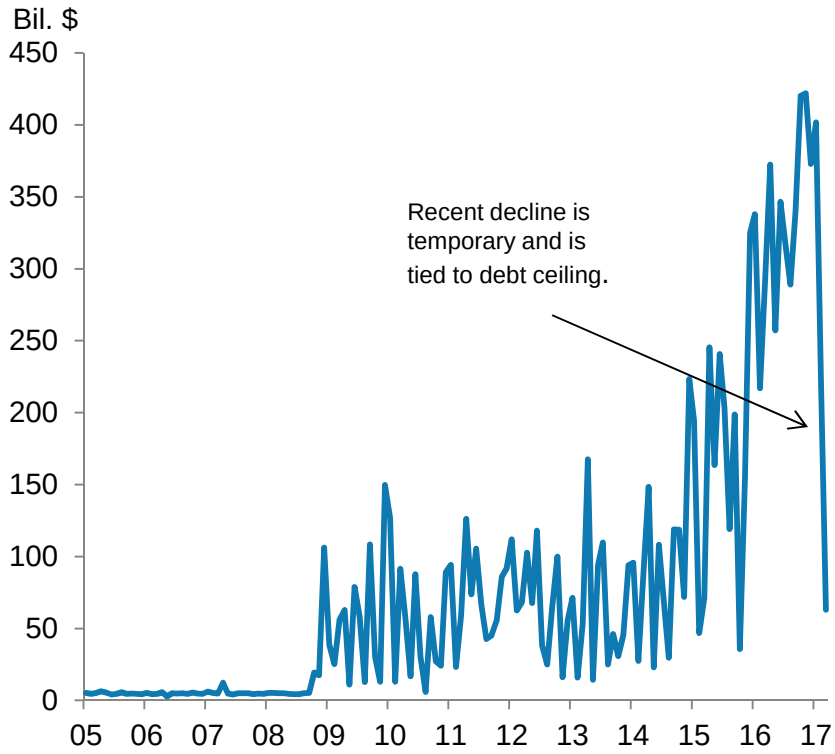


The amount of MBS and Treasuries that the Fed will need to roll off in order to achieve a "normal" balance sheet will be determined, in large part, by their target for excess bank reserves.

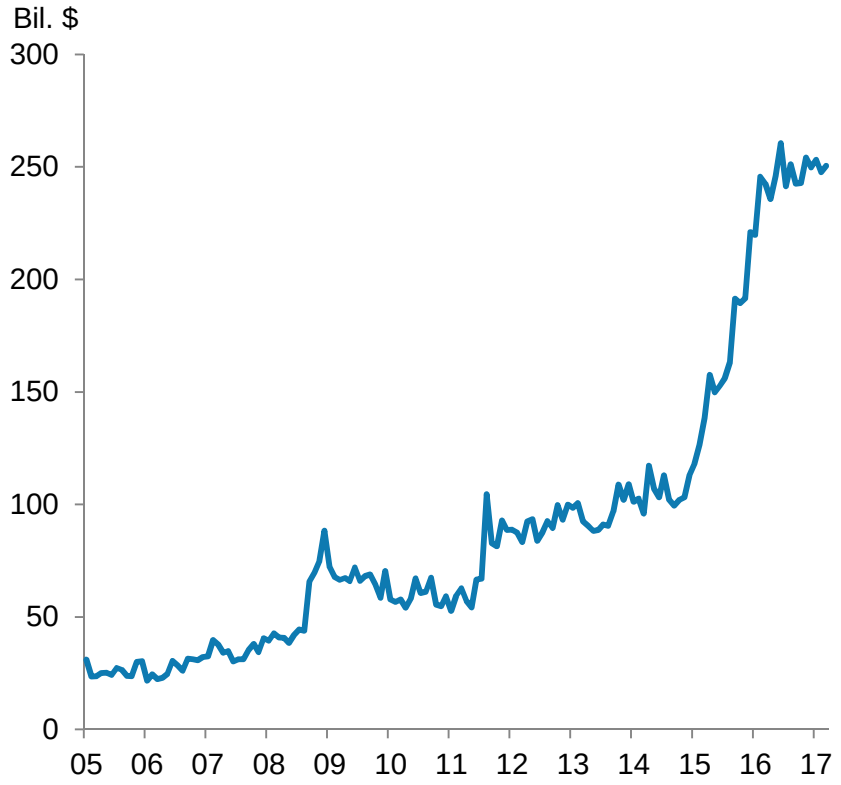
Source: Federal Reserve H.4.1
* See Ferris, Kim and Schlusche, "Confidence Interval Projections of the Federal Reserve Balance Sheet and Income", January 2017

Fed Balance Sheet: What is "Normal"?

US Treasury Deposits With the Fed



Foreign Official RRPs



Excess reserves – rather than the overall amount of Fed assets – should be the main determinant of what is "normal" largely because some important items on the Fed's balance sheet are at much different levels today than pre-crisis.

Source: Federal Reserve H.4.1

Excess Reserves Under Alternative Balance Sheet Normalization Scenarios

Excess Reserves: MBS Run-off Only (Bil. $)			
	Maintain Current Yields	+ 50bp	+ 100bp
2017	1759	1759	1759
2018	1488	1521	1538
2019	1251	1306	1337
2020	1025	1096	1136
2021	816	897	945
2022	624	709	762
2023	439	526	581

Excess Reserves: Treasury & MBS Run-off (Bil. $)			
	Maintain Current Yields	+ 50bp	+ 100bp
2017	1759	1759	1759
2018	1063	1095	1113
2019	434	489	519
2020	n.a.	35	75
2021	n.a.	n.a.	n.a.
2022	n.a.	n.a.	n.a.
2023	n.a.	n.a.	n.a.

The scenario on the left estimates MBS prepayments and the associated level of excess reserves at yearend, using MBS run-off starting at the beginning of 2018, assuming 10-yr Treasury yields remain near current levels, rise 50 bp over the balance of 2017 (and hold at that level) or rise 100 bp over the balance of 2017 (and hold at that level). The scenario on the right assumes run-off of both MBS (using the same three yield assumptions) and Treasuries starting at the beginning of 2018. Observations labeled n.a. reflect negative values.

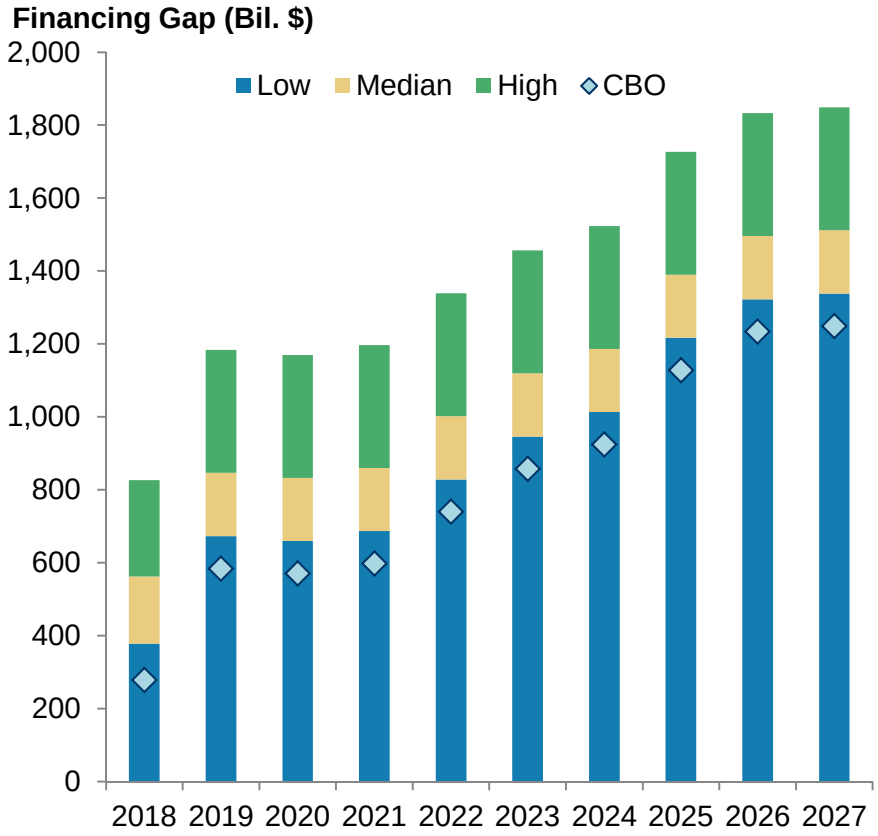
Note: assumptions used for other Fed balance items are identical to those used by Ferris, Kim and Schlusche, "Confidence Interval Projections of the Federal Reserve Balance Sheet and Income", January 2017
Source: Author's calculations

Assumptions Used to Generate Financing Gap Estimates

- Budget Deficit (4 alternatives): CBO baseline and Treasury Primary Dealer Survey (median, high, low). Change in Primary Dealer forecast set equal to change in CBO baseline after 2019.
- Fed rollovers cease at the beginning of 2018 and resume in mid-2020.
- Cash balance target equals $400 bil at end of 2017 and grows in line with nominal GDP thereafter.
- Nonmarketable borrowing and other means of finance hold steady over the forecast horizon (in line with the most recently published OMB budget estimates).
- Hold gross coupon (including TIPS and FRNs) sizes at current levels and set net bill issuance to zero after FY 2017.
- Financing Gap = Budget Deficit - Net Marketable Coupon Issuance + Change in Cash Balance - Net Nonmarketable Issuance - Other Means of Finance

Estimating the Treasury's Financing Gap

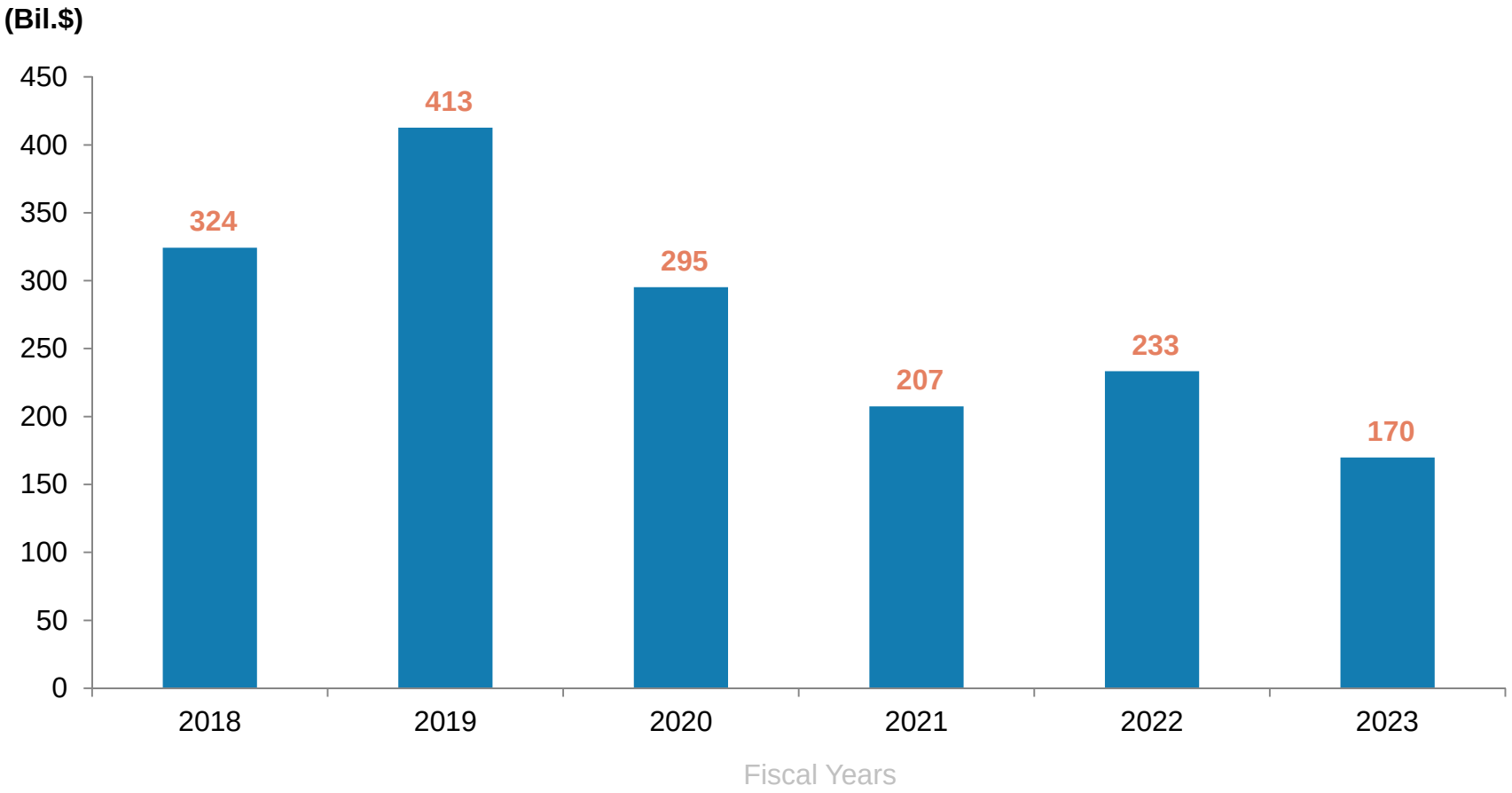
Fiscal Deficit (Bil. $)				
	CBO Baseline	Primary Dealer Survey		
		Low	Median	High
2017	-559	-525	-661	-1,010
2018	-487	-587	-771	-1,035
2019	-601	-690	-863	-1,200
2020	-684	n.a.	n.a.	n.a.
2021	-797	n.a.	n.a.	n.a.
2022	-959	n.a.	n.a.	n.a.
2023	-1,000	n.a.	n.a.	n.a.
2024	-1,027	n.a.	n.a.	n.a.
2025	-1,165	n.a.	n.a.	n.a.
2026	-1,297	n.a.	n.a.	n.a.
2027	-1,408	n.a.	n.a.	n.a.



In the current environment, the Treasury financing gap can be thought of as having three components: 1) amount attributable to baseline budget deficit, 2) amount attributable to deviation from baseline budget deficit (i.e., expansionary fiscal policy), and 3) amount attributable to Fed redemptions.

Source: Congressional Budget Office, New York Fed, Author's calculations

Maturing Fed Holdings of Treasury Coupons (after December 2017)



In the financing scenarios that follow, we assume the Fed ceases all rollovers at the beginning of 2018 and this continues until the middle of FY 2020 (when they are assumed to have achieved a "normal" balance sheet). If Fed runoffs are extended beyond that point, the financing gap would be correspondingly larger.

Source: Author's calculations based on data published by the NY Fed

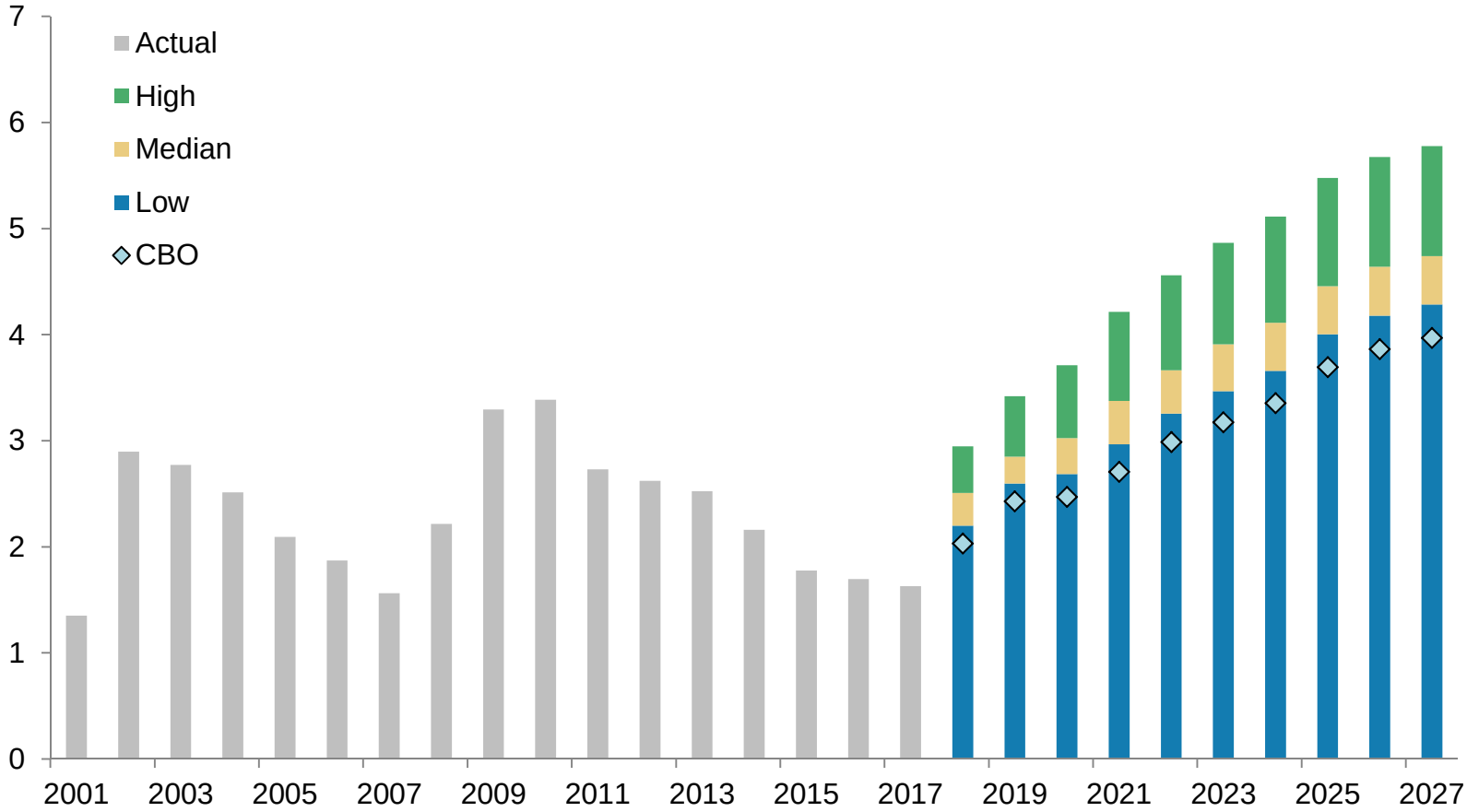
Consider Two Alternative Treasury Financing Scenarios

1) Concentrate extra issuance in the front end (equal proportion of bills, 2's and 3's).

2) Spread extra issuance across all maturities in proportion to current issue sizes holding bill share constant at yearend 2017 value.

Scenario 1: Front End Used to Fill Financing Gap

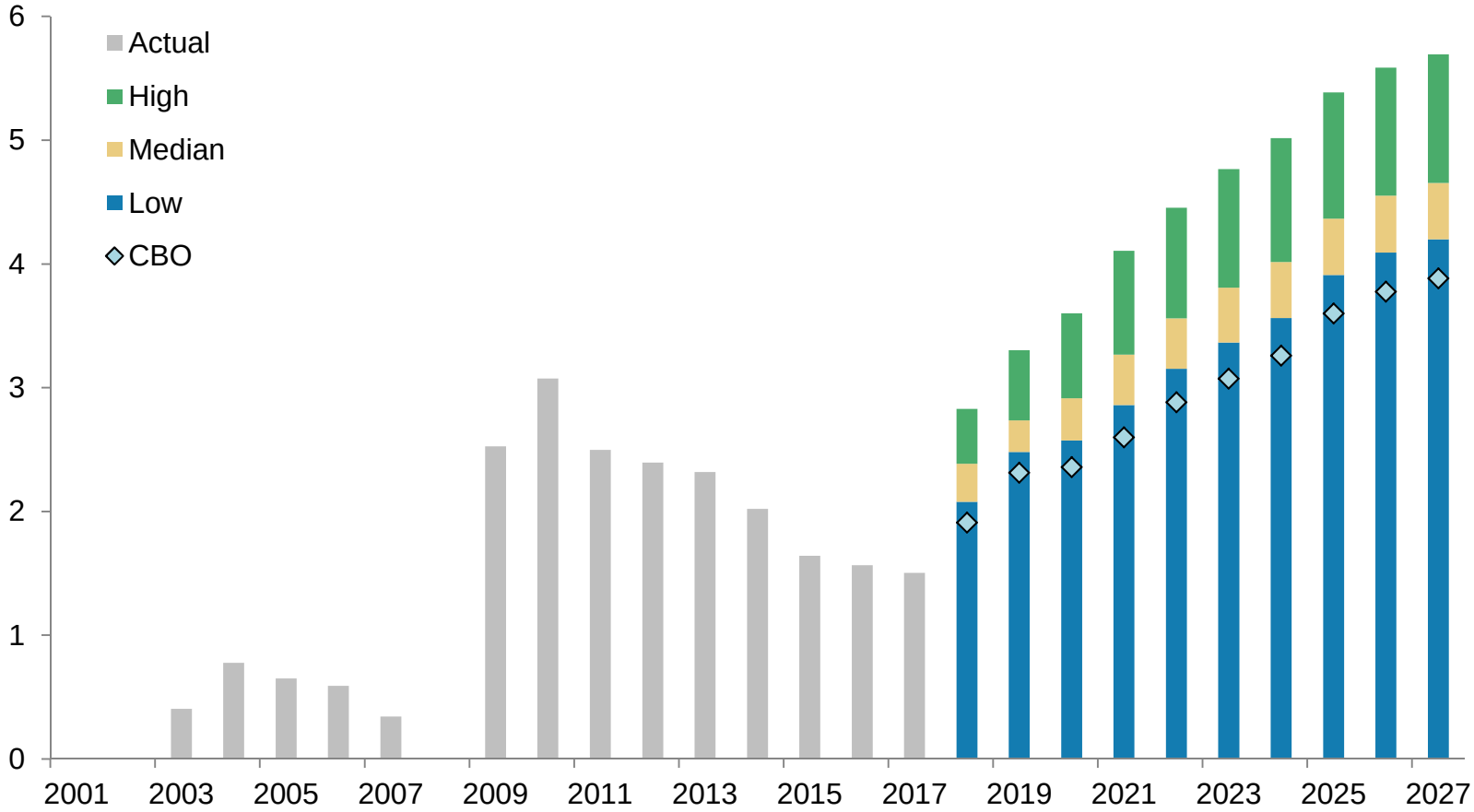
Annual 2 Yr Note Issuance, % of GDP



Source: Author's calculations

Scenario 1: Front End Used to Fill Financing Gap

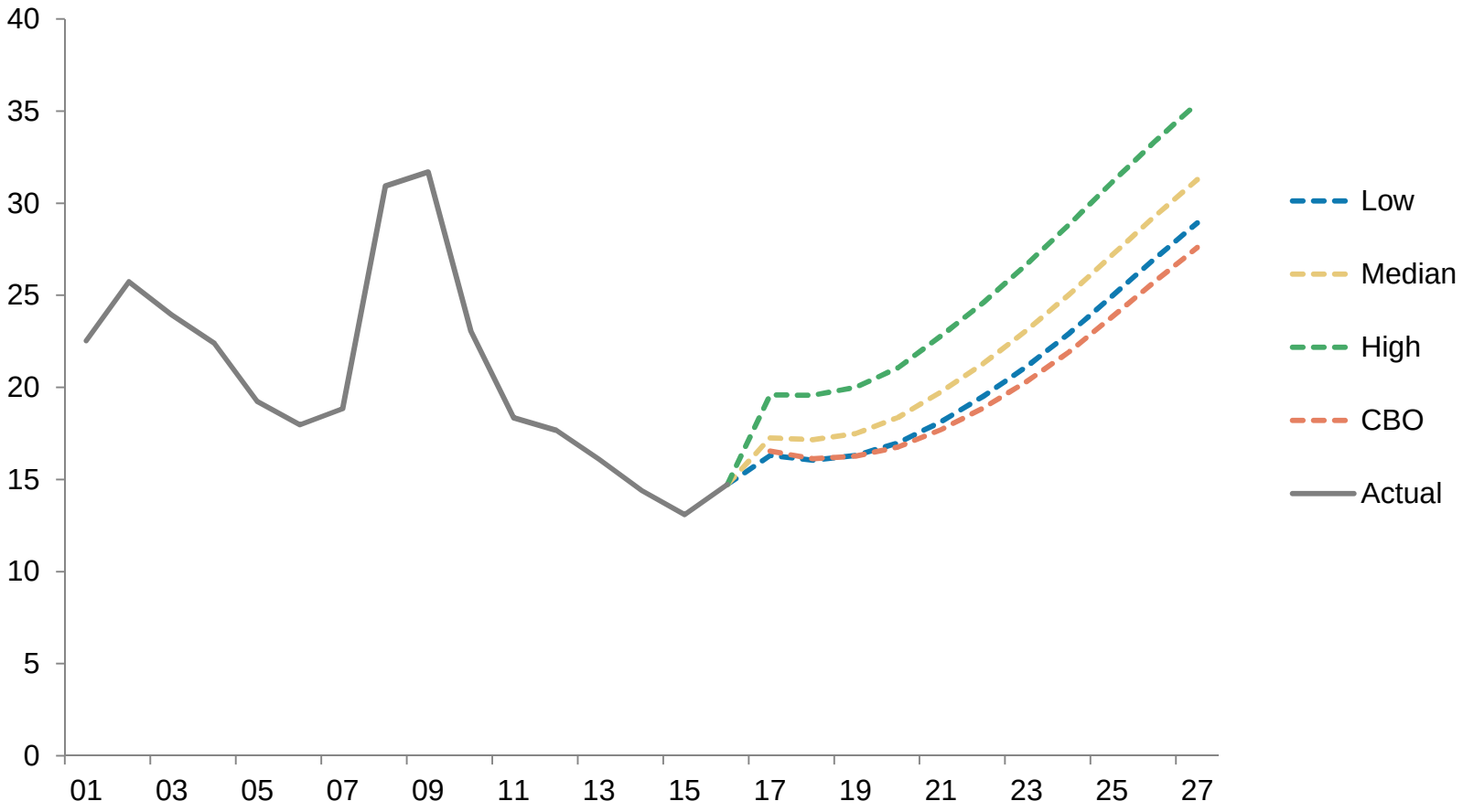
Annual 3 Yr Note Issuance, % of GDP



Source: Author's calculations

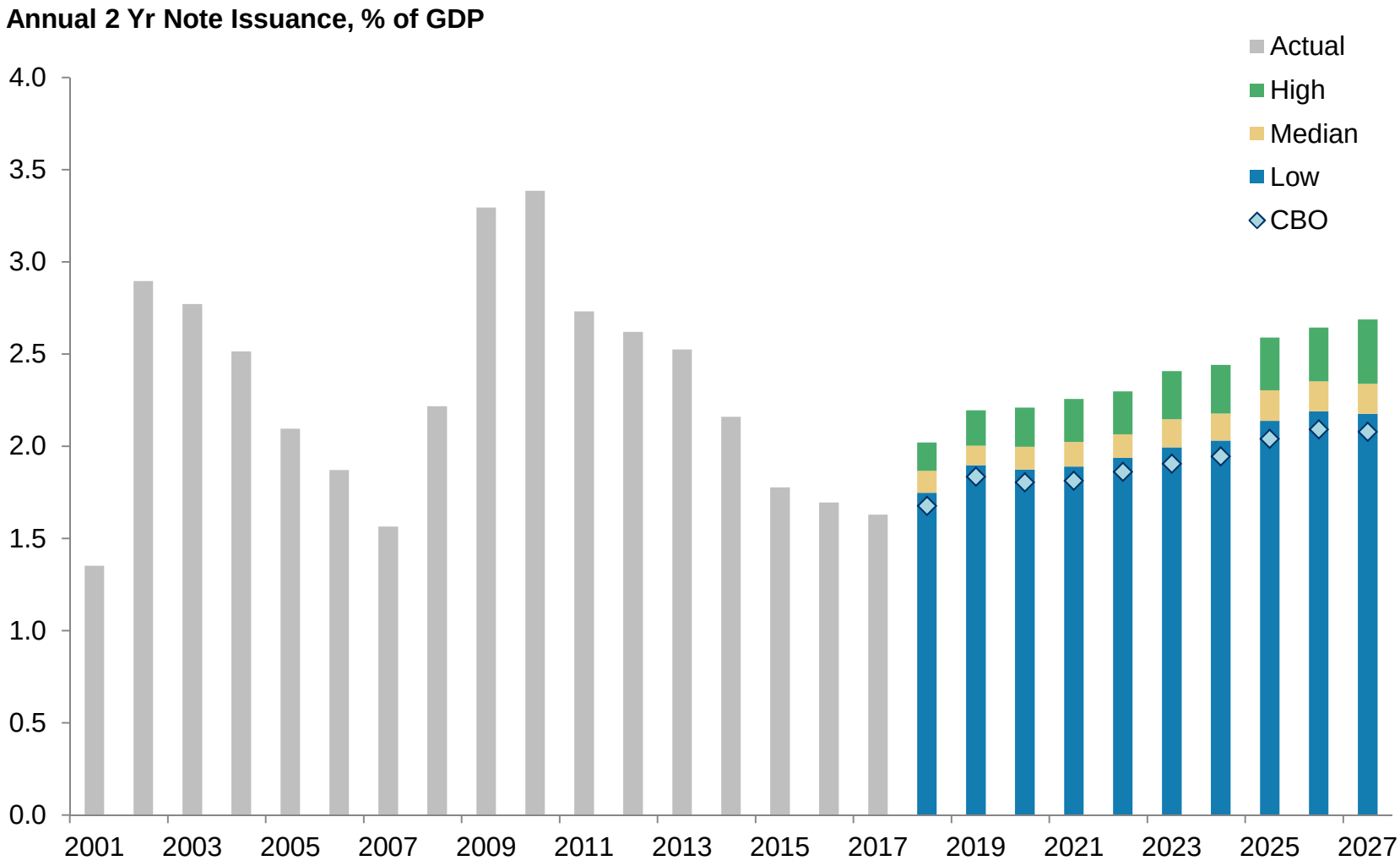
Scenario 1: Front End Used to Fill Financing Gap

Bill Share of Debt Outstanding



Source: Author's calculations

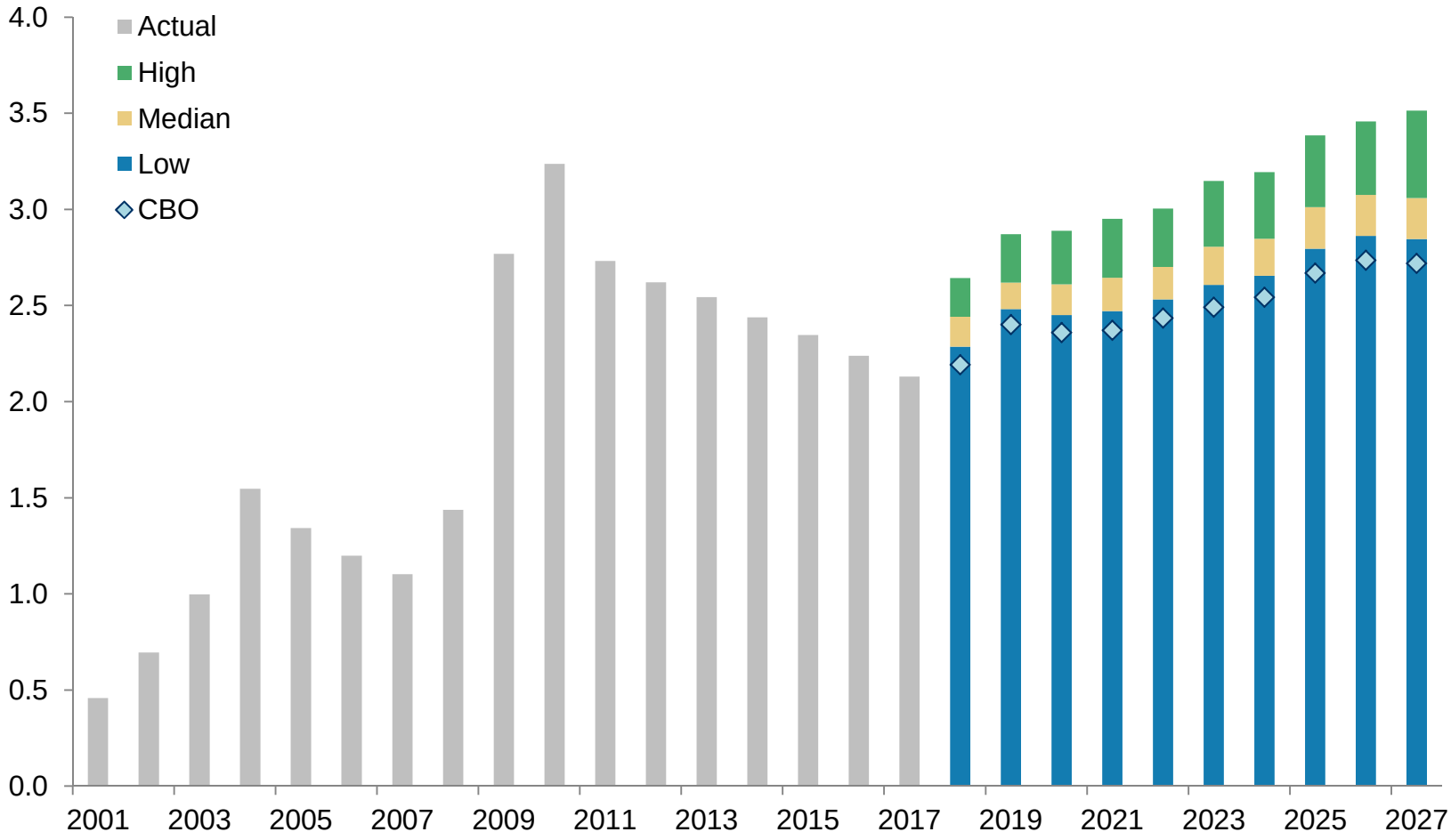
Scenario 2: Financing Gap is Spread Across Curve



Source: Author's calculations

Scenario 2: Financing Gap is Spread Across Curve

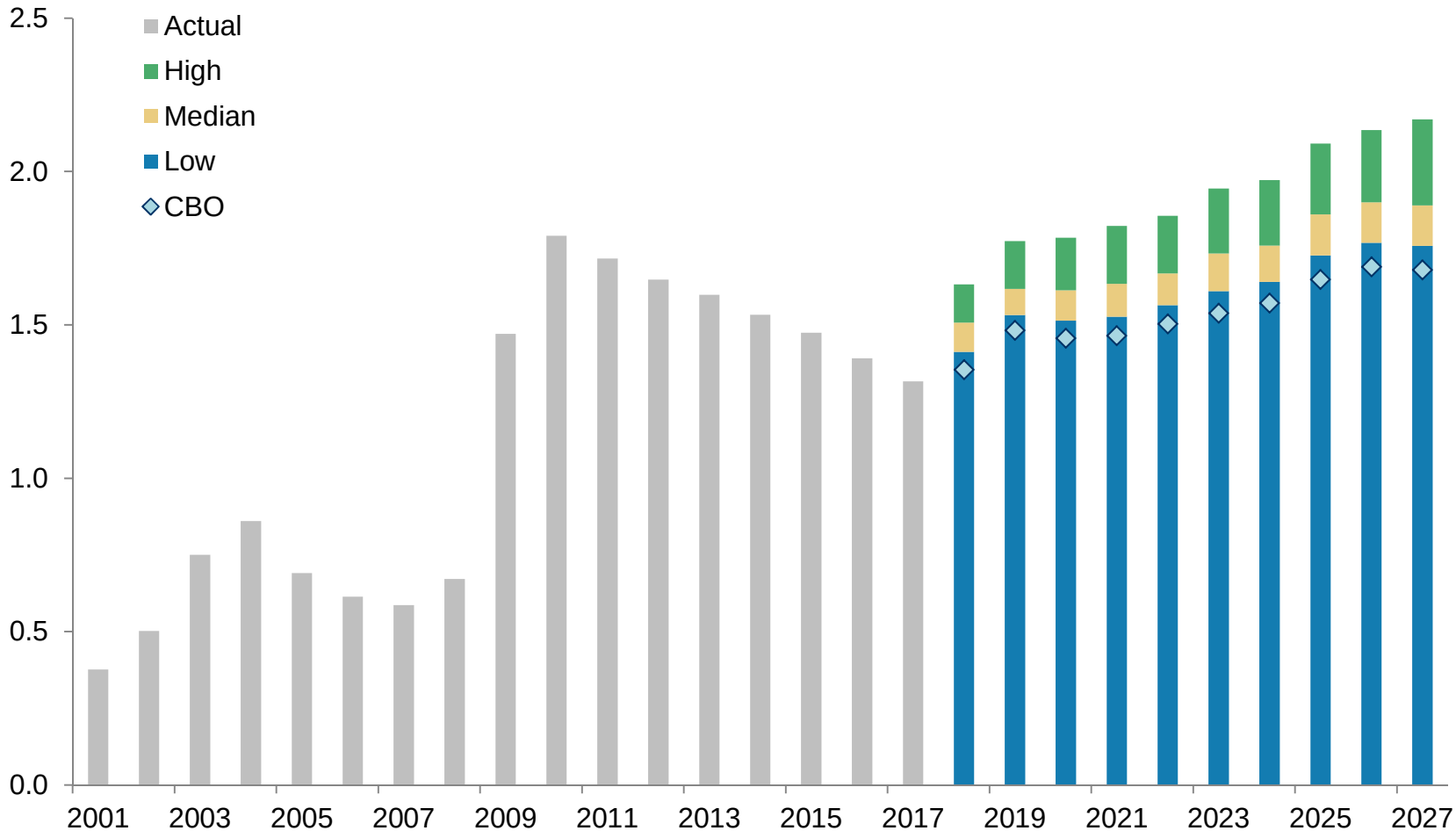
Annual 5 Yr Note Issuance, % of GDP



Source: Author's calculations

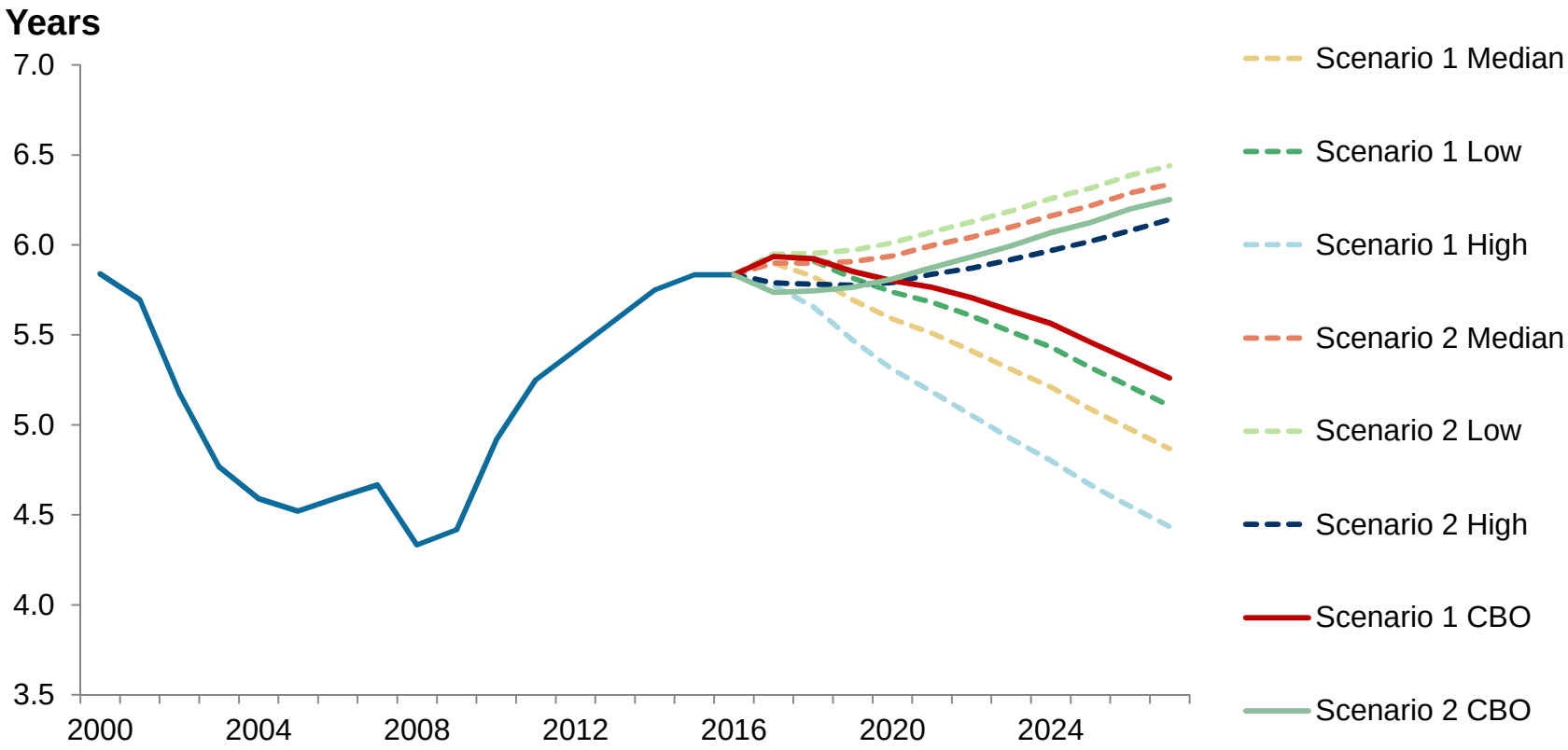
Scenario 2: Financing Gap is Spread Across Curve

Annual 10 Yr Note Issuance, % of GDP



Source: Author's calculations

Weighted Average Maturity of Marketable Treasury Securities Outstanding



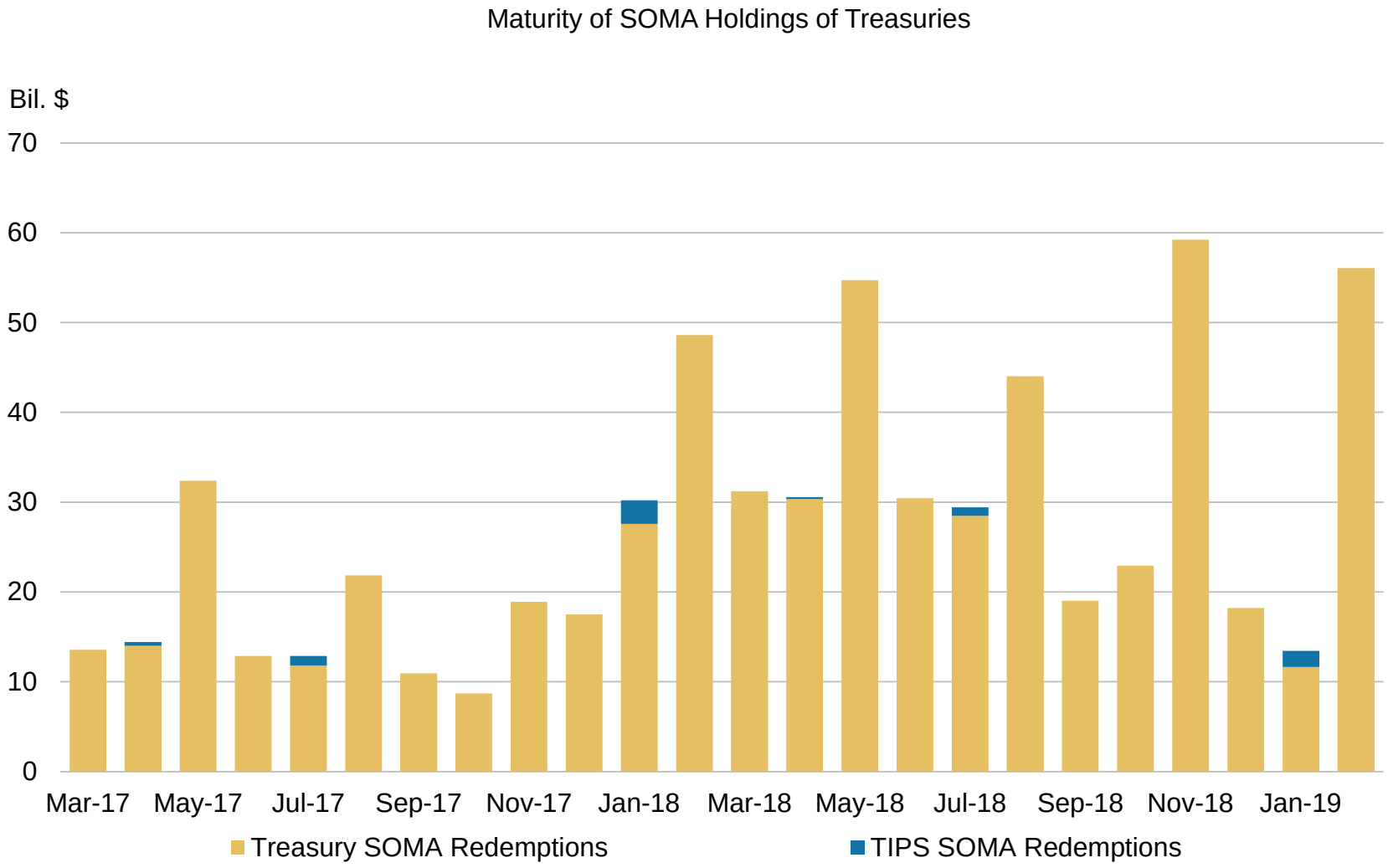
Not surprisingly, WAM declines in the scenarios in which the extras issuance is concentrated in the front end while it rises in the scenarios in which the extra issuance is spread across the curve.

Source: Author's calculations

Takeaways From the Alternative Treasury Financing Scenarios

- The financing gap faced by Treasury in coming years is likely to be too large to address with a heavy concentration of front end issuance. Such a policy would also imply an undesirable decline in WAM.
- Spreading the extra issuance across the curve would result in coupon sizes, in relation to GDP, that are reasonably close to the peak levels seen during the financial crisis for most maturities. A notable exception is the two year sector – where issuance would remain below past peaks even with the most pessimistic budget deficit assumptions.
- Spreading the extra issuance across the curve would maintain a gradual increase in WAM.

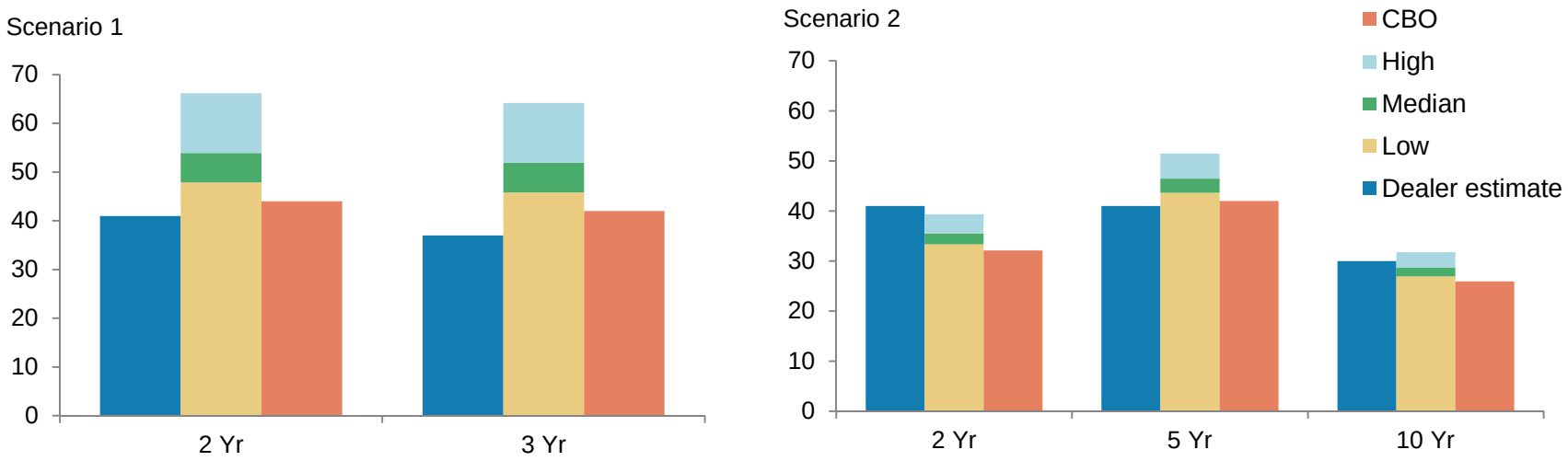
Lumpiness in Maturity Profile of SOMA Holdings Could Create Debt Management Challenges



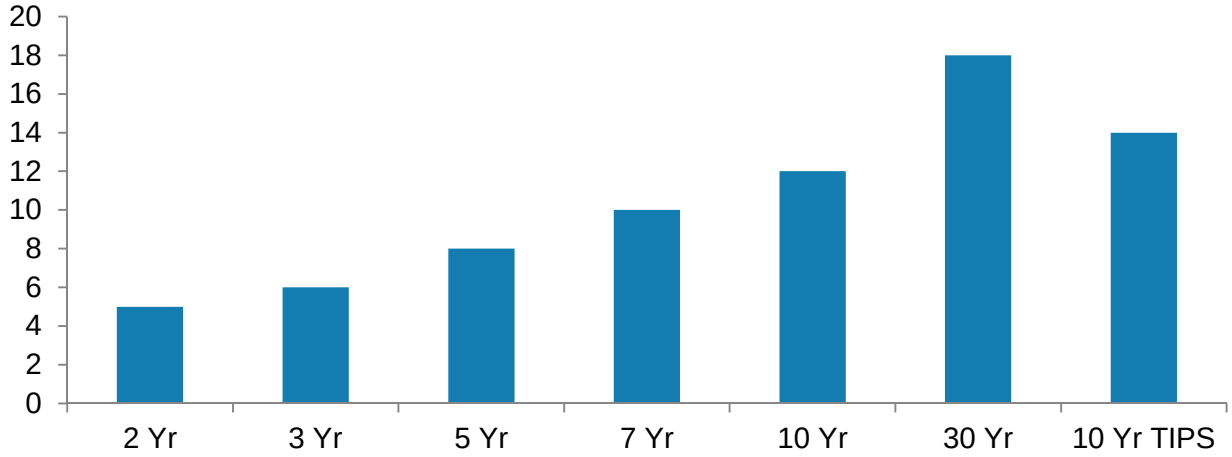
Source: Federal Reserve

Can Market Impact Be Gauged Using the Primary Dealer Auction Size Survey?

Monthly Issuance in 2020 (Bil. $)

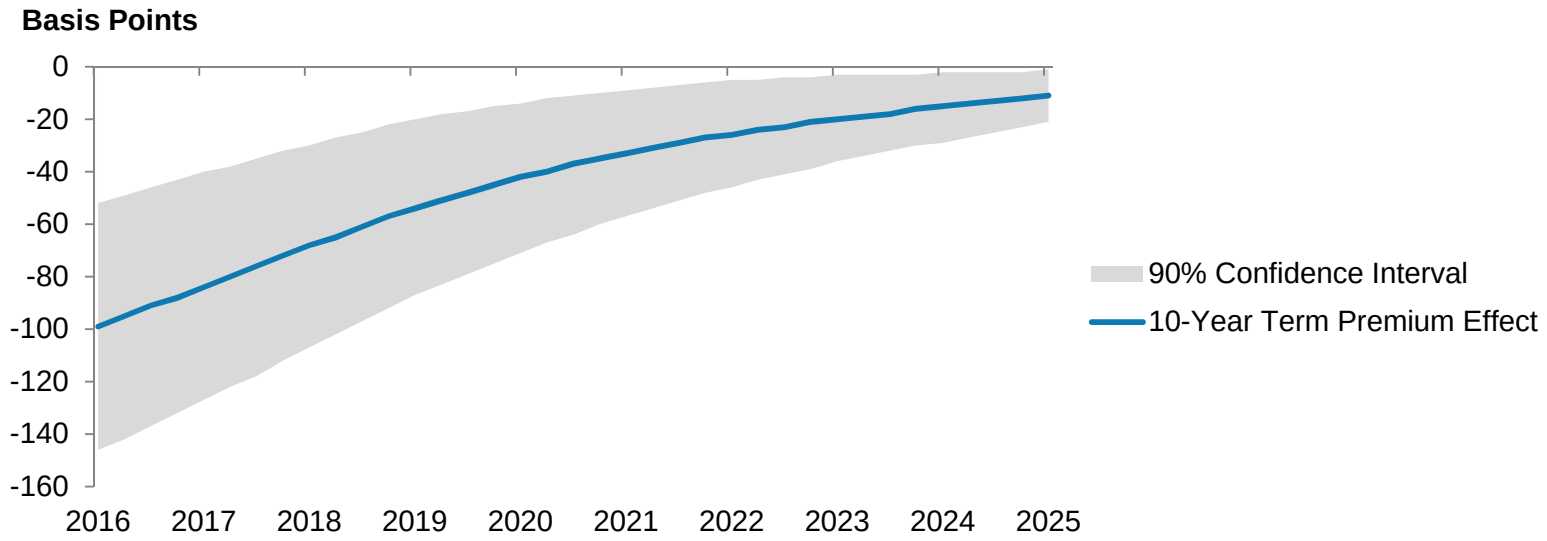


Change in Auction Stop Out Rate (bp) at end of 1 year given $4bn monthly change in auction size



Source: US Treasury Primary Dealer Survey

Can Market Impact Be Gauged Using Fed QE Studies?



LSAP Policies	Estimated Decline in 10-Year Treasury Yield at onset of the program (basis points)	Other Studies
LSAP 1	34	91 - (Event Studies); 36 to 82 (Regressions) - Gagnon et al. (2011) 100 - Krishnamurthy and Vissing-Jørgensen (2011) 20 to 30 - (Treasury security purchases only) - D'Amico and King (2013) 35 - (Treasury security purchases only) - D'Amico et al. (2012)
LSAP 2	12	25 - Krishnamurthy and Vissing-Jørgensen (2011) 55 – D'Amico et al. (2012) 21 – Meaning and Zhu (2011) 15 – Swanson (2011)
MEP	28	22 - Hamilton and Wu (2012) 17 – Meaning and Zhu (2012)
LSAP 3	31	60 - Engen, Laubach, and Reifschneider (2015)*

*Constructed with Ihrig et al. (2012) model and updated LSAP3 assumptions: https://www.federalreserve.gov/pubs/feds/2012/201257/201257abs.html
Source: Bonis, Ihrig and Wei,"**The Effect of the Federal Reserve's Securities Holdings on Longer-term Interest Rates", April 20, 2017**

Market Impact of Increased Treasury Supply

- The market impact of Fed redemptions combined with the possibility of a higher budget deficit is difficult to gauge with a high degree of precision.
- The dealer survey may not be sufficiently robust to capture the impact of such large changes in new issue sizes.
- Studies by Fed staffers and others regarding the impact of large scale asset purchases are probably not applicable to a balance sheet unwind and, at best, provide only an upper bound of the potential market impact.
- The likelihood that the Fed will resume secondary market purchases of Treasuries once they have achieved a “normal” balance sheet (sometime in 2020 according to our estimates) could cushion the impact in the interim. It is also worth noting that these purchases will have to account for both the typical growth in Fed liabilities (currency, etc) as well as ongoing MBS redemptions.

Appendix: Scenario 1 (Front End)

Scenario 1: Fill Financing Gap with Equal Share of Bills, 2's and 3's												
							Annual Issuance					
	WAM			Bill Share			2 Yr			3 Yr		
	Low	Median	High	Low	Median	High	Low	Median	High	Low	Median	High
2016 (Actual)	5.2	**5.2**	5.2	14.7	**14.7**	14.7	312	**312**	312	288	**288**	288
2017	5.2	**5.2**	5.1	16.3	**17.3**	19.6	312	**312**	312	288	**288**	288
2018	5.2	**5.1**	5.0	16.0	**17.2**	19.6	438	**499**	587	414	**475**	563
2019	5.2	**5.0**	4.8	16.3	**17.5**	20.0	536	**589**	706	512	**565**	682
2020	5.1	**4.9**	4.7	17.0	**18.4**	21.1	574	**647**	794	550	**623**	770
2021	5.1	**4.9**	4.6	18.1	**19.7**	22.8	658	**748**	934	634	**724**	910
2022	5.0	**4.8**	4.4	19.5	**21.3**	24.6	750	**844**	1050	726	**820**	1026
2023	4.9	**4.7**	4.3	21.1	**23.1**	26.7	830	**936**	1165	806	**912**	1141
2024	4.9	**4.6**	4.2	22.9	**25.0**	28.8	911	**1024**	1273	887	**1000**	1249
2025	4.8	**4.5**	4.1	25.0	**27.2**	31.1	1036	**1154**	1418	1012	**1130**	1394
2026	4.7	**4.4**	4.0	27.0	**29.3**	33.3	1125	**1249**	1528	1101	**1225**	1504
2027	4.6	**4.3**	3.9	28.9	**31.3**	35.4	1199	**1327**	1617	1175	**1303**	1593

	Annual Issuance														
	5 Yr			7 Yr			10 Yr			30 Yr			TIPS		
	Low	Median	High	Low	Median	High	Low	Median	High	Low	Median	High	Low	Median	High
2016 (Actual)	412	**412**	412	340	**340**	340	256	**256**	256	160	**160**	160	139	**139**	139
2017	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2018	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2019	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2020	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2021	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2022	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2023	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2024	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2025	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2026	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2027	408	**408**	408	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131

Source: Author's calculations

Appendix: Scenario 2 (Spread Across Curve)

Scenario 2: Fill Financing Gap with Proportional Increases in All Coupon Sizes (Hold Bill Share Constant)															
							Annual Issuance								
	WAM			Bill Share			2 Yr			3 Yr			5 Yr		
	Low	Median	High	Low	Median	High	Low	Median	High	Low	Median	High	Low	Median	High
2016 (Actual)	5.2	**5.2**	5.2	14.7	**14.7**	14.7	312	**312**	312	288	**288**	288	412	**412**	412
2017	5.2	**5.2**	5.1	16.3	**17.3**	19.6	312	**312**	312	288	**288**	288	408	**408**	408
2018	5.3	**5.2**	5.1	16.3	**17.3**	19.6	348	**372**	403	322	**343**	372	455	**486**	527
2019	5.3	**5.3**	5.1	16.3	**17.3**	19.6	392	**414**	454	362	**382**	419	513	**541**	593
2020	5.4	**5.4**	5.2	16.3	**17.3**	19.6	401	**427**	472	370	**394**	436	524	**558**	618
2021	5.5	**5.4**	5.3	16.3	**17.3**	19.6	419	**448**	500	387	**414**	462	548	**586**	654
2022	5.6	**5.5**	5.3	16.3	**17.3**	19.6	446	**476**	529	412	**439**	488	583	**622**	692
2023	5.7	**5.6**	5.4	16.3	**17.3**	19.6	477	**514**	577	441	**474**	532	624	**672**	754
2024	5.8	**5.7**	5.5	16.3	**17.3**	19.6	506	**542**	608	467	**500**	561	661	**709**	795
2025	5.9	**5.8**	5.6	16.3	**17.3**	19.6	553	**596**	670	511	**550**	619	724	**780**	876
2026	6.0	**5.9**	5.7	16.3	**17.3**	19.6	589	**633**	712	544	**584**	657	770	**828**	931
2027	6.0	**5.9**	5.7	16.3	**17.3**	19.6	609	**655**	752	562	**604**	694	796	**856**	983

	Annual Issuance											
	7 Yr			10 Yr			30 Yr			TIPS		
	Low	Median	High	Low	Median	High	Low	Median	High	Low	Median	High
2016 (Actual)	340	**340**	340	256	**256**	256	160	**160**	160	139	**139**	139
2017	336	**336**	336	252	**252**	252	156	**156**	156	131	**131**	131
2018	375	**401**	434	281	**300**	325	174	**186**	201	146	**156**	169
2019	422	**446**	488	317	**334**	366	196	**207**	227	165	**174**	190
2020	431	**460**	509	324	**345**	381	200	**213**	236	168	**179**	198
2021	451	**483**	539	338	**362**	404	209	**224**	250	176	**188**	210
2022	480	**512**	570	360	**384**	427	223	**238**	265	187	**200**	222
2023	514	**553**	621	386	**415**	466	239	**257**	288	200	**216**	242
2024	544	**584**	655	408	**438**	491	253	**271**	304	212	**228**	255
2025	596	**642**	722	447	**482**	541	277	**298**	335	232	**250**	281
2026	634	**682**	766	476	**511**	575	295	**317**	356	247	**266**	299
2027	656	**705**	810	492	**529**	607	304	**327**	376	256	**275**	316

Source: Author's calculations

Estimated Demand for Potential Ultra-Long Treasury Issuance

TBAC Charge

Treasury would like the Committee to comment on the demand for ultra-long debt (e.g. 50-year and/or 100-year maturities)?

What factors would Treasury need to consider when structuring ultra-long issuance (e.g. settlement date, issuance frequency, issuance sizes), who would be the end user of such issuance, and what is the anticipated level of demand from this constituency both at present and over the coming years?

If Treasury were to issue an ultra-long security to meet this projected market demand, at what price relative to its current 30-year bond offering could Treasury reasonably expect the ultra-long to price?

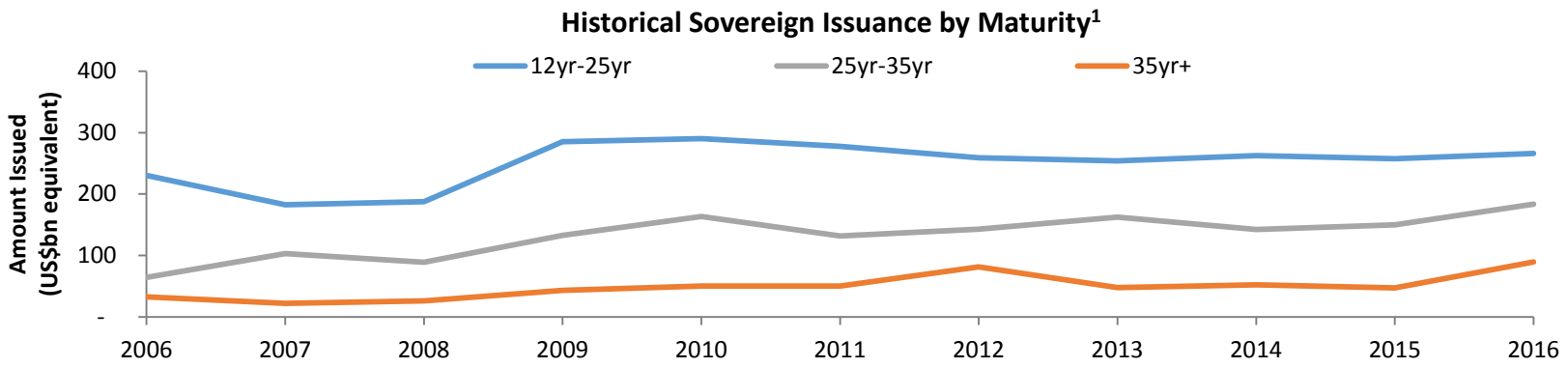
Outline

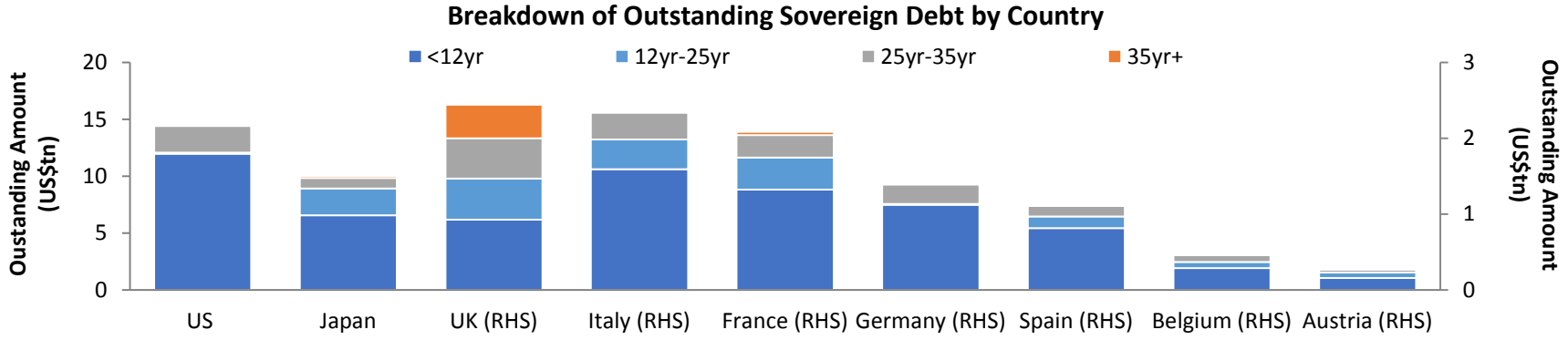
- Experience with Ultra-Long Instruments
- Potential Demand for Ultra-Long debt:
  - Foreign Buyers
  - Corporate Defined Benefit Pension Plans
  - Life Insurance and Annuity Companies
- Estimated Pricing
  - International Comparisons
  - Theoretical models
- Implications for US Debt Structure
- Issuance Mechanics
- Recommendations

Experience with Ultra-Long Instruments

Ultra-long Sovereign Issuance Is Relatively Small But Has Been Growing

- Ultra-long issuance represents a small portion of overall issuance for sovereigns
- Issuance is sporadic and generally responds to investor appetite at relatively short notice, i.e. *ir*regular and *un*predictable
- The UK is a unique case, where pension regulation creates its own demand





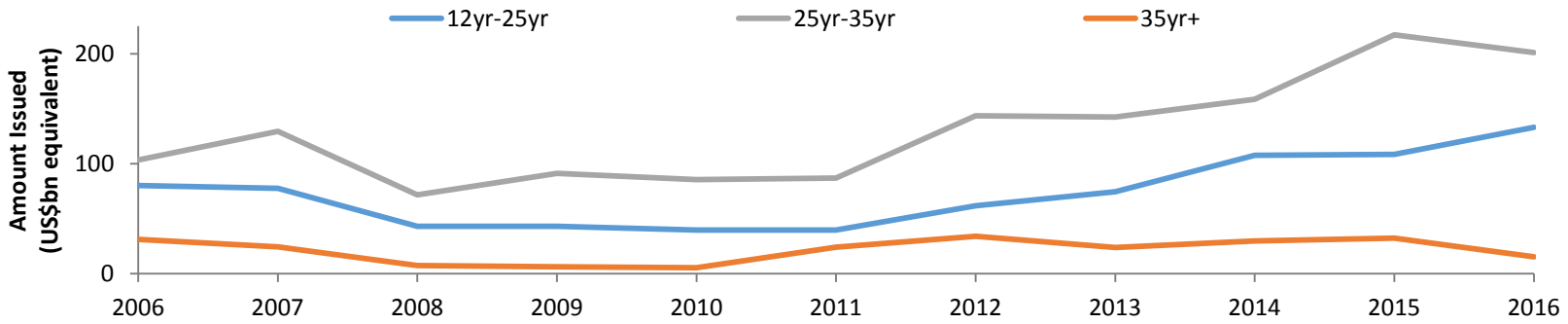
Source: Dealogic

[1] *Dataset comprised of European sovereigns including UK and Japan*

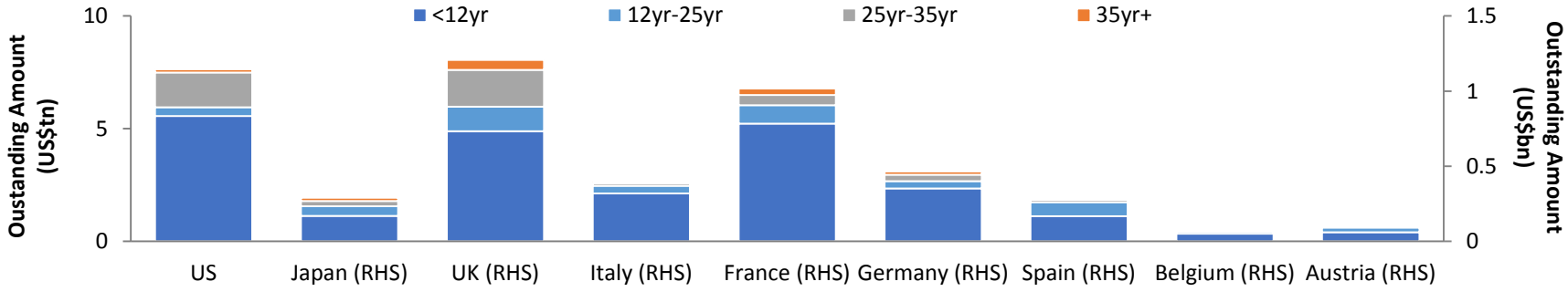
Ultra-long Corporate Issuance Is Limited

- Ultra-long issuance represents an even smaller portion of overall issuance in the corporate (ex-financial) space
- Issuance is sporadic and opportunistic. Corporate issuers do not follow specific long-dated issuance plans: their issuance is rather driven by investor demand and opportunistic considerations

Historical Corporate Issuance by Maturity[1]



Breakdown of Outstanding Corporate Debt by Country



Source: Bloomberg

[1] Dataset comprised of non-government issuance

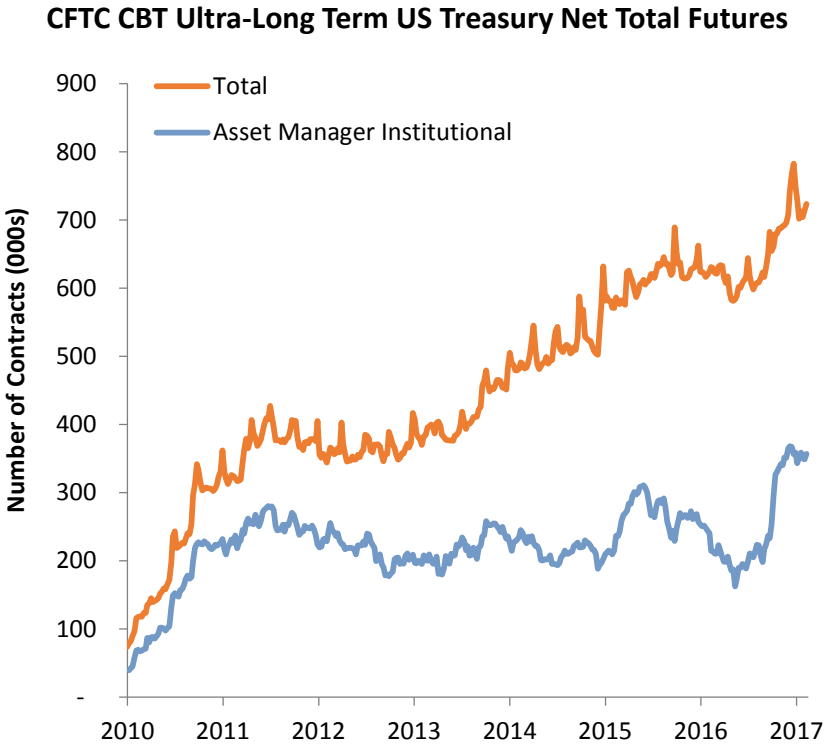
Long Duration Derivative Usage Has Been Limited

- There has been modest demand for synthetic long duration via derivatives – only $30bn notional net long asset managers' position in the Ultra futures contract
- Pension plans are limited users of derivatives (futures and swaps)
- Trading in swaps longer than 30yrs is quite limited as compared to shorter maturities; 4% the volume of 30yrs and 1% the volume in 10yrs

		USD Swap Notional Traded in 2016*		
Maturity Year		Spot Swaps	Fwd Swaps	Total
2026	10y	2,551.0	761.9	3,313.0
2031	15y	164.9	75.9	240.8
2036	20y	179.6	105.1	284.7
2041	25y	68.7	31.4	100.1
2046	30y	616.4	160.3	776.7
2051	35y	6.2	16.5	22.7
2056	40y	4.4	4.0	8.3
2066	50y	0.9	1.2	2.2

Note: Only reflects trades reported to the SDR (trades where at least one of the counterparties is a US person). Notional reported is subject to a cap. Excludes unwinds, amendments and aged swaps. Spot starting swaps defined as swaps where the effective date is within 7 calendar days of trade date.

Source: Bloomberg SDR



Source: CFTC

UK Is the Largest Issuer of Ultras, Driven by Pension Regulation

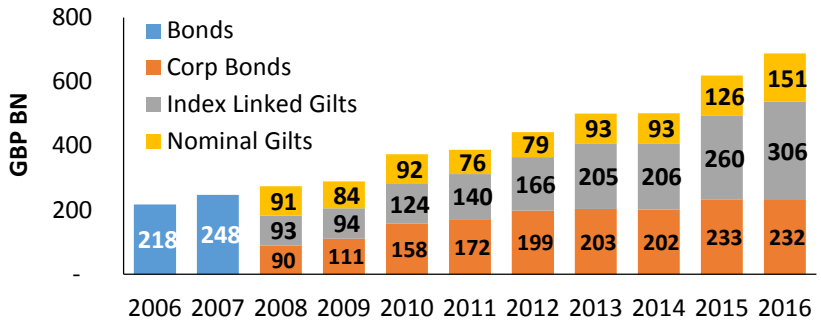
- UK DB pension plans are required to increase benefits in line with inflation. This creates a much longer duration in projected liabilities and creates demand for inflation hedging instruments
- There is less focus on the accounting valuation basis (high quality corporates) because pension governance is not controlled by the corporate sponsor
- The Technical Provisions basis (Gilts/swap curve + fixed spread) is the most important liability valuation basis – this creates greater utilization of sovereign instruments for liability hedging
- Much of the UK's ultra issuance is in Linkers (TIPs) rather than nominals

Differences Between UK and US Corporate Defined Benefit Pension Plans

	UK	US
Typical liability duration	20[1]	12
Inflation indexation	Mandatory inflation indexation of benefits	No inflation increases required
Liability valuation basis used for investment strategy	Technical Provisions - Gilt / Swap curve plus fixed spread	US GAAP - High Quality Corporate Yield
Pension insurance program premiums	Higher premium for higher levels of asset liability mismatch	Based on # participants and level of underfunding, cap on total premium payable
Funding rules	The Pensions Regulator requires all pension plans to implement a deficit recovery plan with plan sponsor	Funding relief is currently in place, allowing plan sponsors to delay making deficit repair contributions

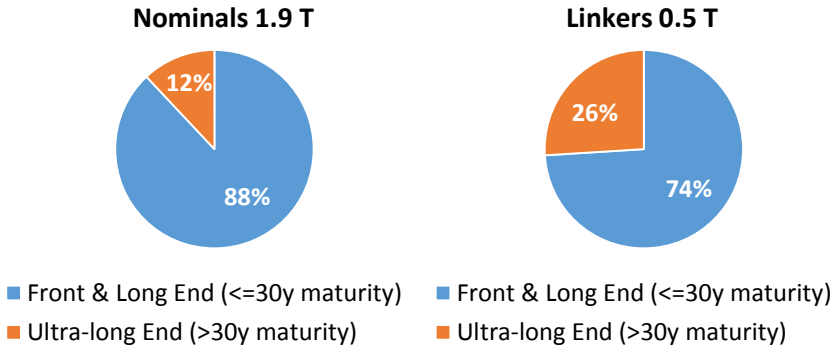
[1] *PPF Purple Book*

UK Corporate DB Pension Plan Fixed Income Holdings



Source: PPF Purple Book (prior to 2008 sector breakdown was not provided)

UK Current market composition



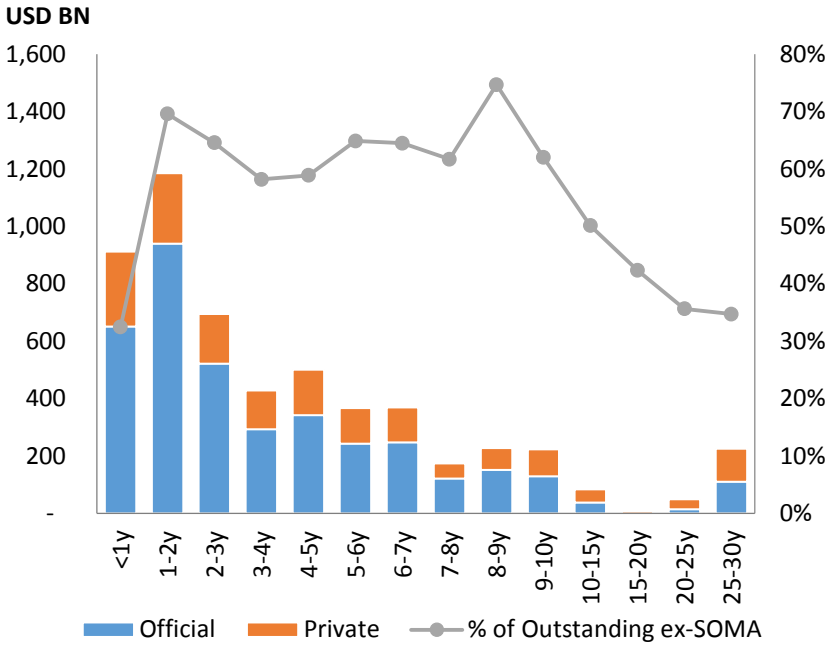
Source: Bloomberg as at 3/31/2016.

Potential Demand for Ultra-Long Debt

Foreign Demand for Ultra-Long Likely to be Relatively Small

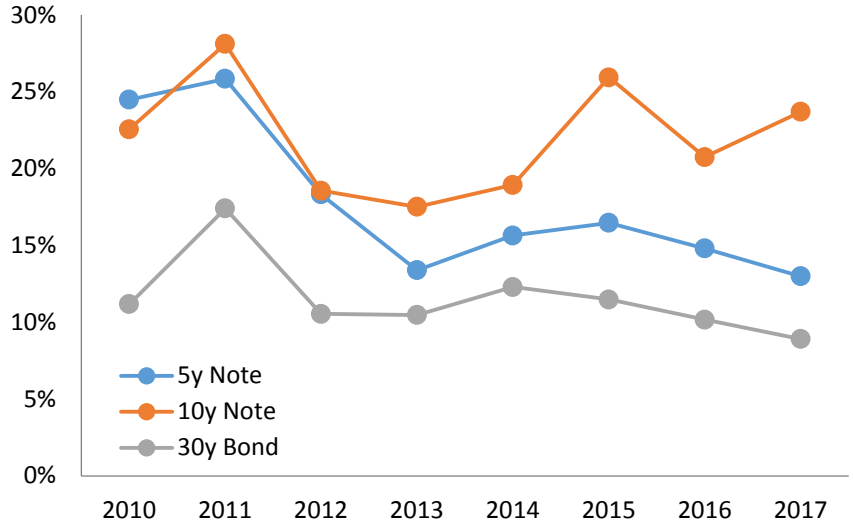
- Foreign investor demand is concentrated in the intermediate part of the curve
- Long-end Treasuries (25-30y) represent only ~4.1% of foreign Treasury holdings (~$225bn)
  - Foreign holdings still represent ~35% of Treasuries outstanding in the sector
- The allotment to foreign & international investors at the 30y bond auction averaged 11.8% since 2010 (vs. 18.2% for 5y notes and 21.8% for 10y notes)

Foreign Holdings of Treasuries



Source: US Treasury (Foreign Portfolio Holdings of US Securities and Monthly Statement of the Public Debt), NY Fed (SOMA Holdings), as of 30-June-2015

Foreign Allotment at Treasury Auctions



Source: TreasuryDirect

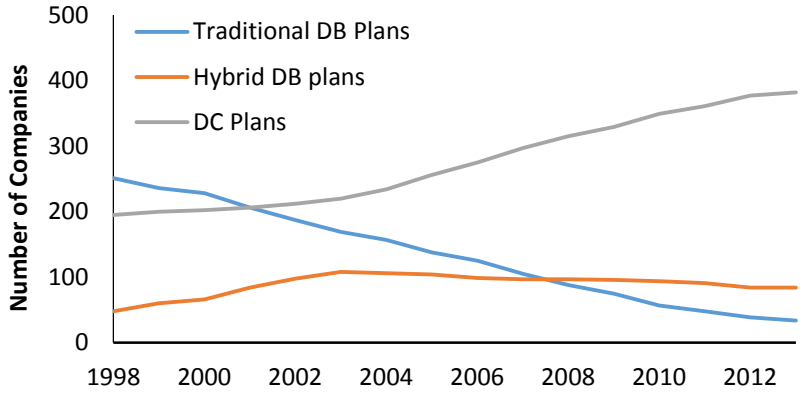
Potential US Corporate Defined Benefit Pension Plan Demand is Uncertain

- US Corporate DB pension liabilities are estimated at $3.6tr
- They are ~81% funded (assets of $2.95tr[1]), and 44% allocated to fixed income[2]
- If pension plans were to fully fund and fully match, they would require an additional $2.3tr in mostly long duration fixed income
- Pension plans have been increasing fixed income allocations by, on average, ~1% per annum between 2007 and 2016. **A 1% increase in fixed income allocation creates ~$30bn additional annual demand**
- Over the long run, the DB pension plans are shrinking, reducing the forward potential demand for long Treasuries

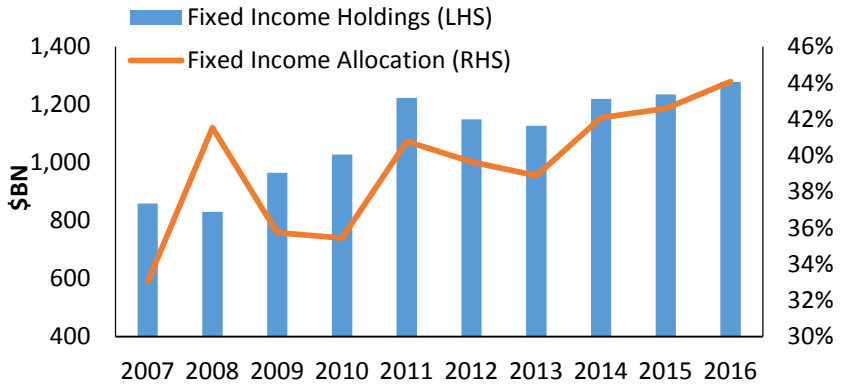
	Largest 100 US Corporate Defined Benefit Plans[2]	Extrapolating to US Corporate DB Universe
Value of Assets	$1.40tr	$2.95tr[1]
Value of Liabilities	$1.72tr	$3.63tr
Funded Status	81.2%	81.2%
% Allocation to Fixed Income	44%	$1.3tr

Difference of $2.3tr

Type of Pension Plan Offered to New Employee Fortune 500 Companies



US Corporate DB Pension Plan Fixed Income Holdings



Source: Willis Towers Watson Retirement in Transition
[1]Investment Company Institute 'The US Retirement Market' data as at 13/31/2016

Source: Milliman 2017 Corporate Pension Funding Study (12/31/2016)
[2]Milliman 2017 Corporate Pension Funding Study

Potential US Corporate Defined Benefit Pension Plan Demand is Uncertain II

- The typical US corporate DB pension plan has liability duration of ~12 years, but only ~10-15% of projected benefits beyond 35 years
- US plans are currently ~81% funded with 44% allocated to all fixed income assets
- For many US plans, this creates a need to **maximize duration within fixed income holdings**, rather than liability cash flow defeasance
- Since PPA 2006 and FASB 158 (2006), pension plans have been steadily increasing the duration of their fixed income
- We observe significant allocations to Long Government Credit and Long Corporate strategies with modest allocations to dedicated Long Treasury and Long STRIPS strategies

Factors which could influence fixed income allocations of corporate pension plans

- Improvement in funded status driven by market moves (higher yields, higher equities)
- Convergence of US GAAP pension accounting towards IFRS pension accounting would encourage higher fixed income allocations
- The PBGC continues to increase the variable rate premium on unfunded amounts up to 4.2% in 2019. This creates an incentive to make additional contributions
- Anticipated corporate tax reform could cause an acceleration in pension contributions to maximize the value of the tax deduction

Cash flow Defeasance of Typical US Corporate DB Plan[1]

Maturity	% MV	Duration Contribution	% Par Bond Defeasance
0-2 year	9.9%	0.1	5.0%
2-7 year	24.3%	1.0	11.1%
7-15 year	31.7%	3.3	23.5%
15-25 year	22.5%	4.2	28.9%
25-35 year	8.7%	2.5	19.4%
35-45 year	2.4%	0.9	8.7%
45+ years	0.6%	0.3	3.5%
Total	100%	12.2	100%

~29% around 20 years

~12% beyond 35 years

Source: Committee participant

Long Duration Strategies	MV $	% MV	Duration
Long Government Credit	248bn	38%	15
Long Corporate / Credit	215bn	33%	13
Extended Duration (STRIPS)	121bn	19%	27
Long Duration Treasury	34bn	5%	17
Long Duration Custom	31bn	5%	10-16
Total	649bn	100%	

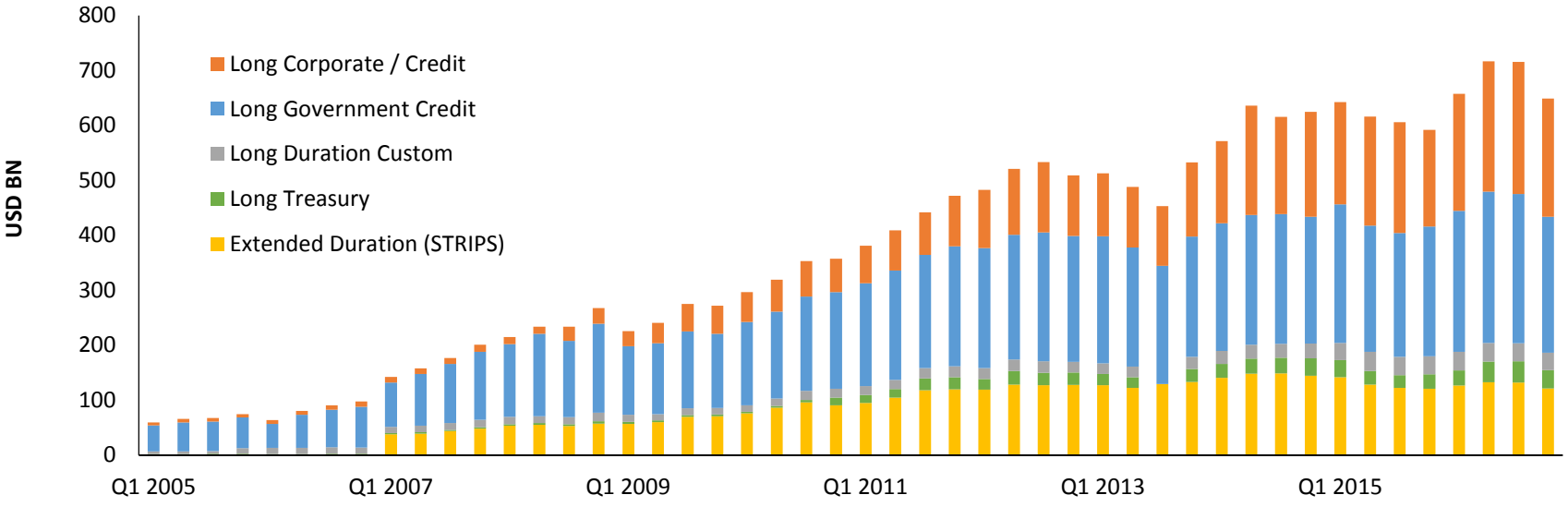
Source: eVestment as at 12/31/2016

[1] *Normalized average of pension cash flows with durations between 6–18 years, mean = 12 years, standard deviation = 2 years*

Potential US Corporate Defined Benefit Pension Plan Demand is Uncertain III

- Barclays Bloomberg Long Government Credit is the most prevalent long duration benchmark among corporate DB plans
- All Treasuries issued with a maturity greater than 10 years experience ongoing demand as a result of being included in this benchmark. Currently the index is ~40% Treasuries
- Long Government Credit managers often overweight shorter maturity credit sectors and extend duration with derivatives
- The Treasury allocation is typically split between 30 year par bonds for liquidity and 30 year STRIPS to maximize duration
- Long duration issuance could reduce manager reliance on extending duration with interest rate derivatives

AUM Growth in Long Duration Fixed Income Strategies



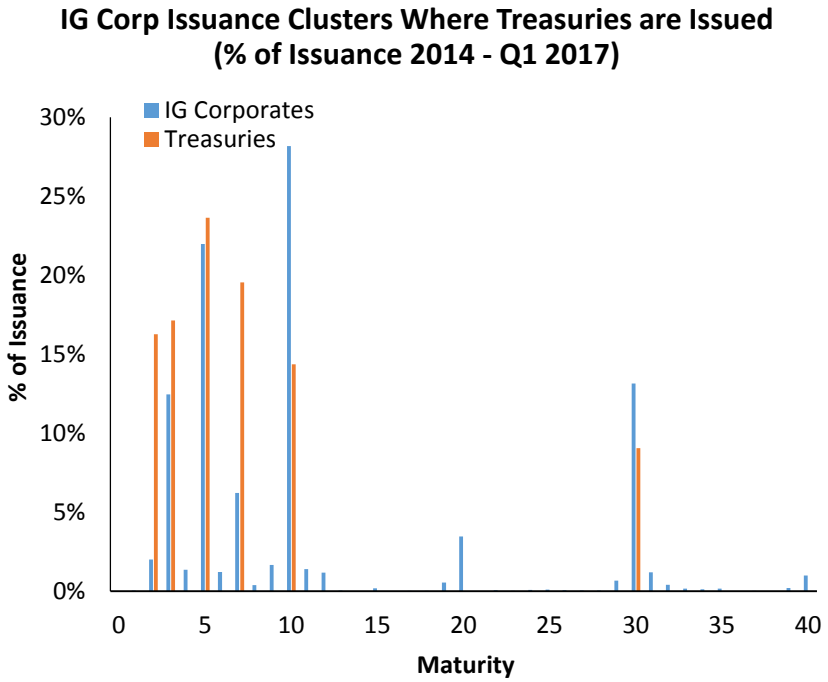
Source: eVestment

Life and Annuity Insurance Companies Have a Preference for Spread Sectors over Treasuries

- Life and Annuity companies hold the majority of their fixed income portfolios in corporate credit and other spread sectors in order to exceed their liability cost of funds. US Government holdings are only ~4% of holdings based on NAIC data.
- This focus on net investment spread and the ability to add duration through strips and interest rate derivatives (which utilize less investable cash) would limit the demand of insurers for 40 and 50y coupon Treasury bonds
- Given their preference for cash flow matching and spread product, insurers would have more demand for 20yr investment grade issues. However, 20y corporate issuance is held back by the lack of a 20y benchmark Treasury

NAIC Life Industry Asset Holdings (YE 2015)		
Asset Class	Book Carry Value (Millions)	%
Public Fixed Income	2,743,933	72%
Corporate Bonds	1,680,974	44%
Munis	176,753	5%
Agency RMBS	183,925	5%
ABS & Other Structured	215,876	6%
US Government	151,576	4%
Private-Label CMBS	125,822	3%
Private-Lavel RMBS	87,011	2%
Foreign Government	77,318	2%
Agency CMBS	25,256	1%
Hybrids	19,423	1%
Other Asset Classes	1,045,530	28%
Total Assets (Book Carrying Value)	3,789,463	100%

Source: NAIC

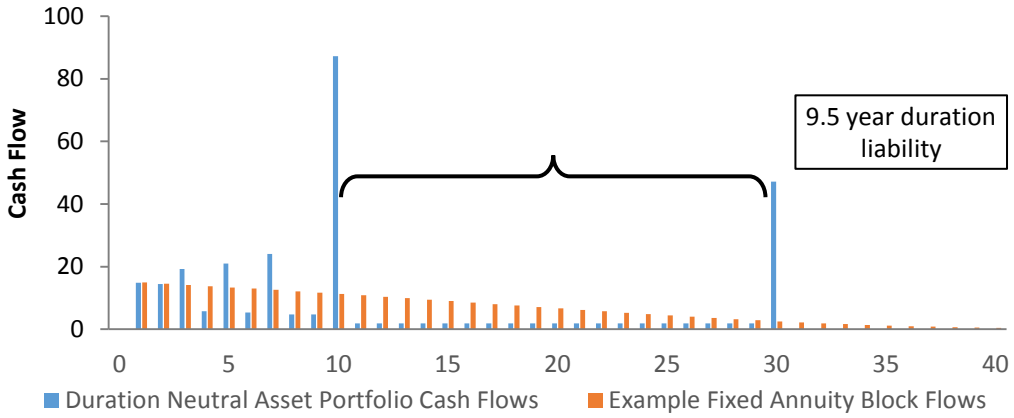


Source: Bloomberg

20 Year Treasury Issuance Would Facilitate Improved Cash Flow Matching by Insurers

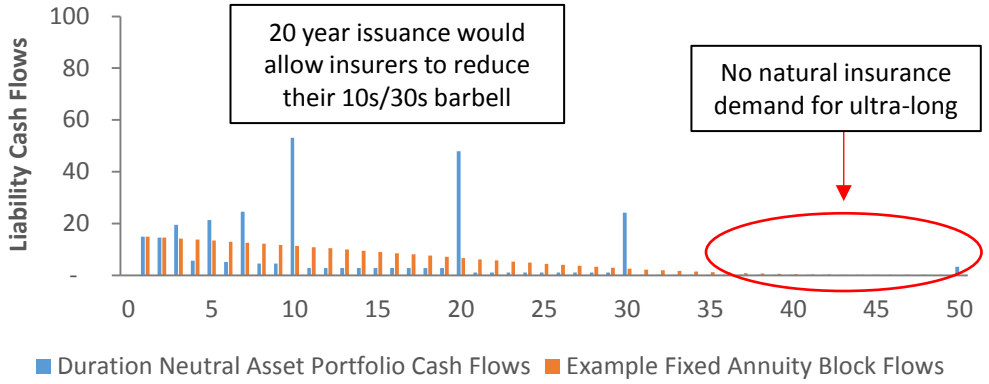
- Regulatory testing and accounting considerations push life and annuity companies to adopt a cash flow matching approach where spread product is available.
- The gap in the 20 year part of the curve creates cash flow matching issues for insurers
- Life and annuity products are driven by retirement needs, leading to fixed liability flows in the 15 – 25 years sectors.
- 20yr Treasury issuance would provide a reference bond for corporate issuers who could issue to meet insurance demand.
- We would expect significant demand from life and annuity insurers at the 20 year part of the curve for investment grade corporate debt given their desire to match life contingent liability flows.

Difficult to Cash Flow Match Liabilities With Only 10yr/30yr Issuance



Source: Committee participant

20 Year Issuance Improves Cash Flow Match

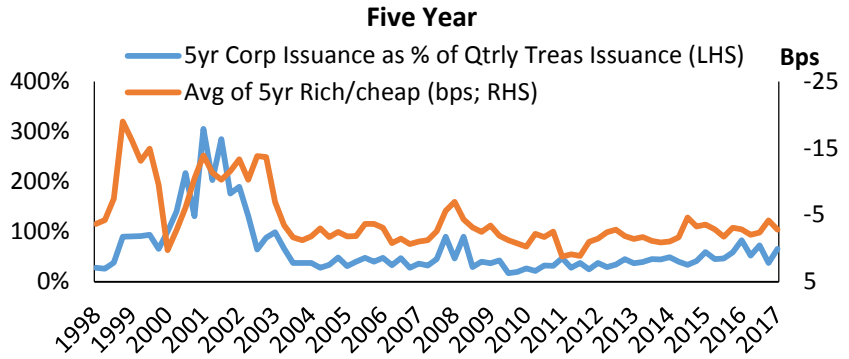


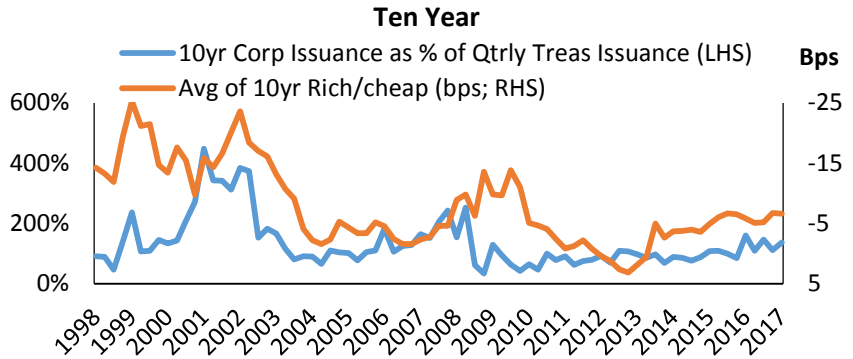
Source: Committee participant

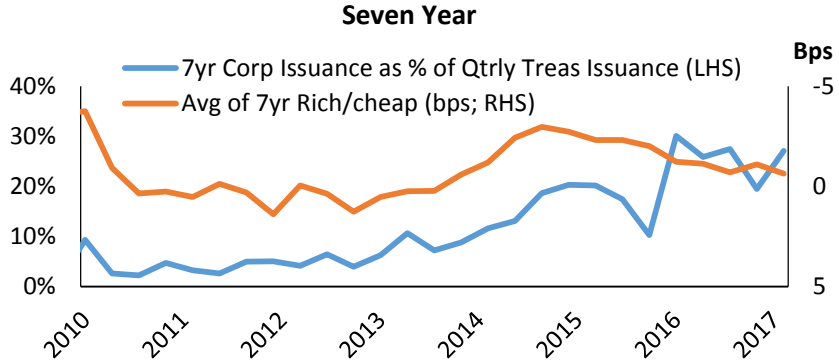
Treasury Issuance Benefits from Private Sector Issuance at Same Maturities

- Corporate issuers prefer to price off of liquid benchmark issues
- Ultimately enhances Treasury on-the-run liquidity premia
- A mutually beneficial relationship exists between corporate issuance and on-the-run Treasuries – both parties benefit
- Large sophisticated issuers including AT&T, Bank of America, Johnson & Johnson, and Verizon have recently issued in 20 years to meet investor demand. This type of issuance could lead to an on-the-run premium for newly issued 20 year Treasuries

Quarterly Corporate Issuance (as % of Treasury Issuance) Compared to Liquidity Premia[1]





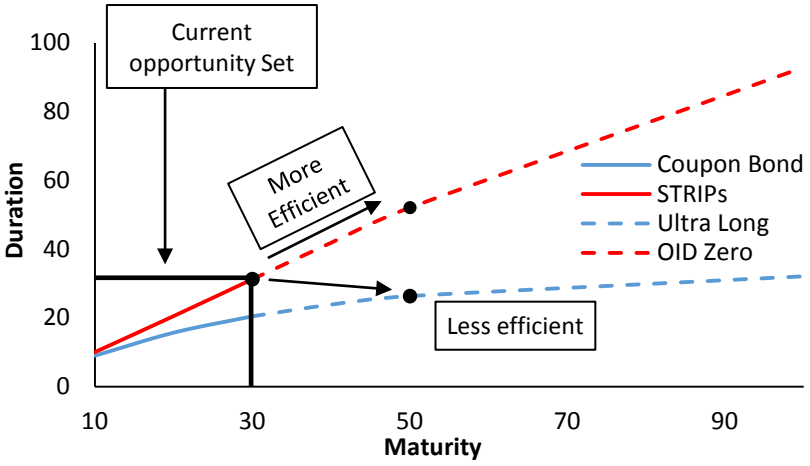


1. Richness of on-the-run Treasury versus fourth old.
Source: Committee participant's models.

Cash Constrained Investors Likely to Have Demand for Ultra-Long Zeros

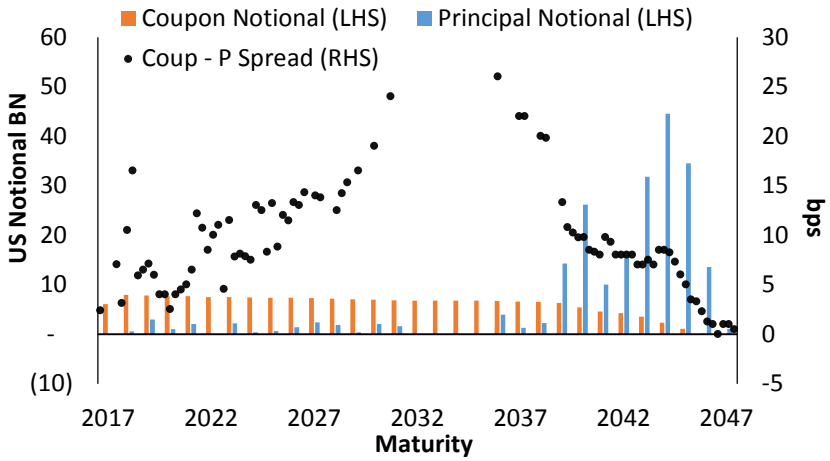
- Pension plans are typically cash constrained due to underfunding and need to hedge liability duration without reducing allocations to growth assets
- Insurers prefer to maximize allocation to spread products to meet net interest margin objectives
- This leads both pensions and insurers to seek to minimize the amount of cash utilized to achieve the desired duration and curve exposure
- An ultra-long duration, zero coupon Treasury would provide pensions and insurers a security to maximize duration per unit of portfolio market value
- Currently, this demand is expressed in appetite for long duration interest rate derivatives and 25yr+ principal STRIPS. Balance sheet constraints impede dealers in pricing STRIPS, as they must warehouse the resulting coupon STRIPS. A 50 year par bond could be inefficient for dealers to STRIP
- Taxable investors would need to pay taxes on accruals despite lack of cash flow
- Other considerations regarding fungibility and ability to reopen outstanding issues would need to be clarified

Zero Coupon Bonds are Capital Efficient for Cash Constrained Investors



Source: Committee participant

STRIPS Outstanding and Coupon-Principal Yield Spread

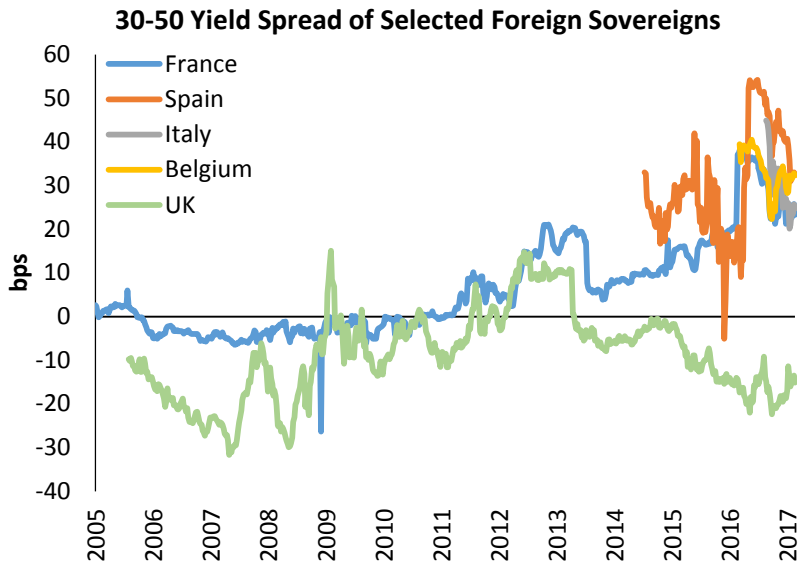


Source: Citi STRIPS Index data as at 3/31/2017

Estimated Pricing

Pricing in Ultra-Long Issuance Reflects Differences in Institutional Demand and Regulation

- Several European sovereigns have recently brought 50y issues to market, and those securities trade significantly cheap to 30y debt
  - France, Spain and Italy all have much smaller pension markets than the US and UK
  - France 50s traded below or around flat before 2011, but subsequently have traded wider
  - ECB bond buying has been limited to maturities less than 30 years, likely contributing to recent widening in the 30-50 spread
- The longer duration liabilities and unique regulation of UK pension plans create strong demand for long duration sovereign issuance
  - UK DB pensions are much larger relative to the outstanding GBP issuance than the US DB pensions are to USD issuance
  - UK 50s have typically traded through 30s



Source: Bloomberg

	UK[1]	US[1]	Italy[2]	France[2]	Spain[2]
Total Corp and Sov Issuance Outstanding Maturity > 10 years ($BN)	1,134	2,501	444	517	224
Pension Plan Assets ($BN)	1,896	2,946	153	146	39
Pension Assets as % of Total Issuance > 10 years	167%	118%	34%	28%	17%
% Fixed Income Allocation	51%	44%			
Pension Fixed Income Assets as a % of Total Outstanding Issuance > 10 years	85%	52%			

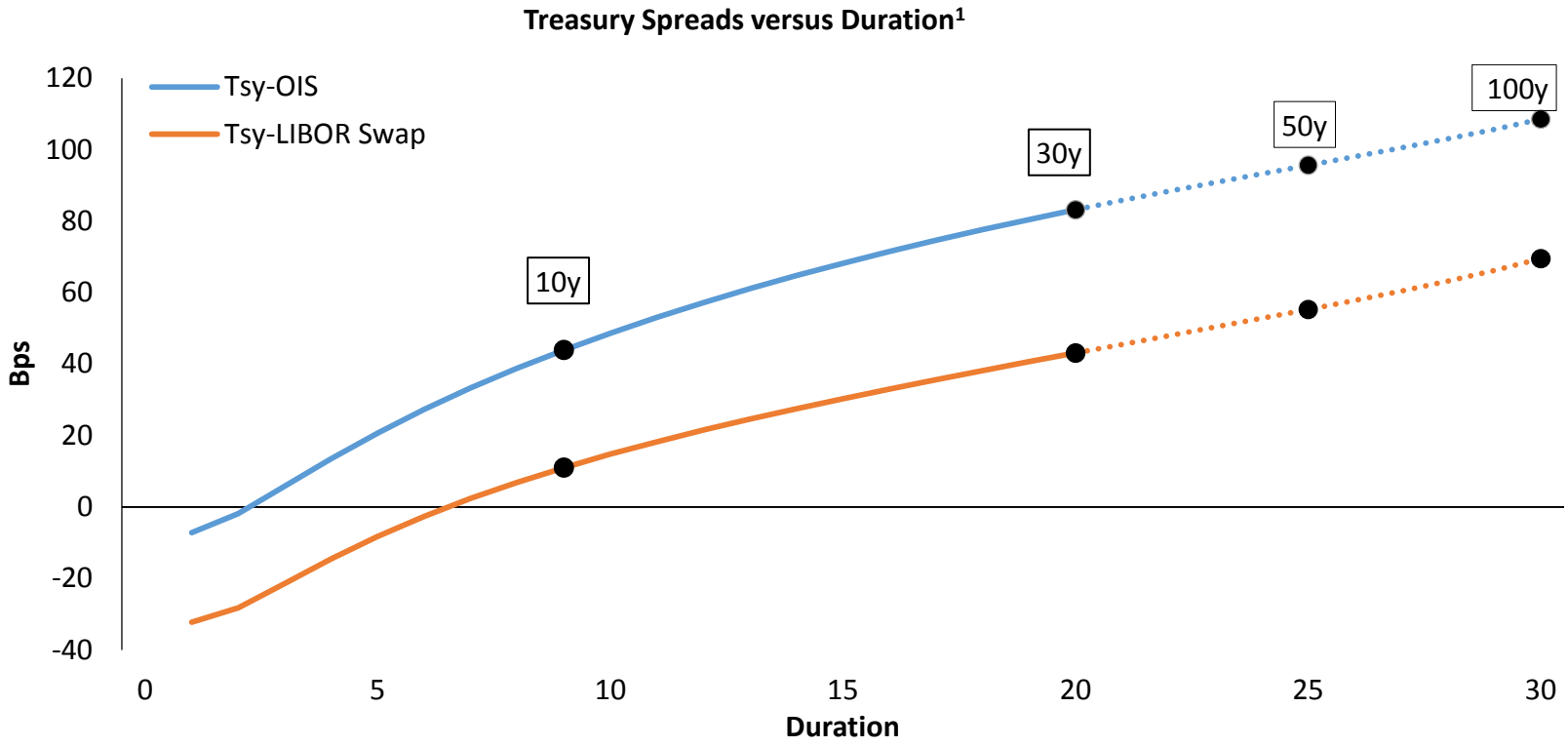
Sources: Investment Company Institute Retirement Assets 2017, Willis Towers Watson 2017 Global Pension Asset Study, Bloomberg, PPF Purple Book. UK data as at 3/31/2016, all other data as at 12/31/2016

[1] Includes only corporate defined benefit pension plans

[2] Includes both defined benefit and defined contribution plans

Longer-term Treasuries Trade Cheap to Interest Rate Swaps

- Treasury spreads to OIS and Libor swaps increase approximately linearly with duration.
- This suggests that issuance/borrowing costs are a function of the WAM or duration of overall Treasury borrowing rather than the mix of maturities issued



Source: Committee participant model

[1] Represents the spread of a Treasury bond minus the yield of the fixed leg of a corresponding maturity OIS and LIBOR Swap plotted against the Treasury bond duration

Theoretical Pricing: Term Structure Model Identifies Fair Value for Ultra-Longs

- A fitted model of the US term structure values a 50 year coupon bond at a 7 bps higher yield than the 30 year and values a 100 year coupon bond at a 3 bps higher yield than the 30 year
  - Longer yields are pulled down by the value of convexity. This convexity effect is assumed to lower the expected funding cost to the Treasury, although this reduced cost would only be fully realized under par accounting with no buybacks
- The fitted curve is a hypothetical exercise, and in practice other factors (such as degree of specific institutional demand) are likely to affect the yields on these bonds relative to the fitted yield.
- We would initially expect Treasury to initially issue at a higher yield than the fitted value.

US Treasury

	Coupon Bond				Zero			
Maturity	Fitted Yield	Market Yield Deviation[1]	Dur	Conv	Fitted Yield	Market Yield Deviation[1]	Dur	Conv
10	2.30%	-6	9.0	0.9	2.34%	-7	10.1	1.1
20	2.75%	-9	15.7	3.0	2.85%	-18	20.6	4.3
30	2.91%	-3	20.5	5.4	3.05%	-7	31.3	9.7
40	2.97%		23.9	7.9	3.12%		41.9	17.3
50	2.98%		26.4	10.2	3.12%		52.1	26.8
100	2.94%		32.1	18.3	2.88%		92.9	91.2

UK

	Coupon Bond			
Maturity	Fitted Yield	Market Yield Deviation[1]	Dur	Conv
10	1.10%	-6	9.6	1.0
20	1.53%	14	17.7	3.5
30	1.65%	-1	24.3	6.9
40	1.67%	-14	29.7	10.8
50	1.66%	-15	34.3	15.1
100	1.47%		50.6	37.8

US Swap

	Coupon Bond				Zero			
Maturity	Fitted Yield	Market Yield Deviation[1]	Dur	Conv	Fitted Yield		Dur	Conv
10	2.19%	1	9.0	0.9	2.22%		10.0	1.0
20	2.44%	1	16.0	3.0	2.49%		20.2	4.1
30	2.48%	0	21.3	5.7	2.53%		30.3	9.2
40	2.46%	0	25.5	8.6	2.48%		39.8	16.1
50	2.41%	3	28.8	11.6	2.39%		48.6	24.3
100	2.15%		39.4	25.3	1.89%		80.7	73.3

France

	Coupon Bond			
Maturity	Fitted Yield	Market Yield Deviation[1]	Dur	Conv
10	0.90%	5	9.8	1.0
20	1.68%	-5	17.8	3.5
30	1.95%	1	23.9	6.8
40	2.05%	5	28.6	10.3
50	2.08%	0	32.3	13.9
100	2.04%		42.6	29.3

Source: Committee participant model as of April 13, 2017

[1] *On the runs for US, Principal STRIPS for zeros, closest bond maturity for all other countries*
Model used for fitted Treasury yield is a proprietary stochastic term structure model which fits fair value for bonds and bond volatility

Implications for US Debt Structure

Modeling the Effects on US Debt Structure

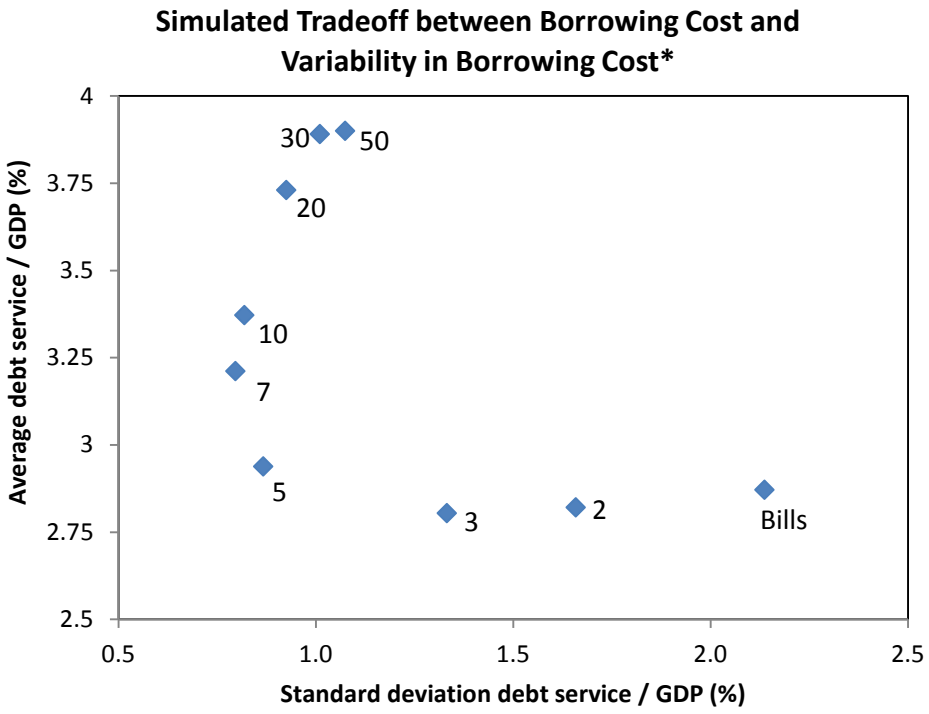
- We use a small macroeconomic model to assess the costs and benefits of long-term debt issuance
  - Continuation of preliminary model work highlighted at previous TBAC meeting
  - Model is intended to capture the uncertainty in both financing needs and borrowing rates across the yield curve
  - Results are dependent on the assumed structure of the model

- Model results do not point to meaningful benefits of long-term debt issuance
  - The reduction in the variation in debt funding costs from extending to very long maturities is limited
  - If the term premium increases with duration, moving to very long maturities would raise the expected funding cost to the Treasury

- There could be other reasons for issuing longer maturity points that are not captured by the model
  - Expansion of overall borrowing capacity if limitations exist on expanding current coupon sizes (not incorporated into the model)
  - Other sources of longer-term uncertainty
  - Desire to match long-term assets (however, funding is fungible and in most cases should be optimized for uncertainty about borrowing needs and interest rates, as captured by the model)

Issuing Ultra-Long Debt Might Not Reduce Funding Cost Uncertainty

- Using the model, we consider the effects of concentrating issuance in single maturity points to assess the trade-offs involved
- Extending issuance from bills to intermediate maturities produces a meaningful reduction in the variability of funding costs
- However, extending further to very long maturities does not reduce funding cost variability over a 20 year window
- Moreover, the expected funding cost rises notably as issuance is extended to long maturities
- Results highlight that WAM is not an adequate measure of funding cost risk



*Based on simulations in which Treasury issues debt only at the single maturity point indicated (with no limits imposed). Results are based on the debt service cost realized in 20 years.

Issuance Mechanics

Treasury's Regular and Predictable Issuance Pattern Delivers Lowest Cost Over Time

Treasury Financing

- Our Debt Management Objectives
  - **Regular and predictable**
  - **Least expected cost over time**

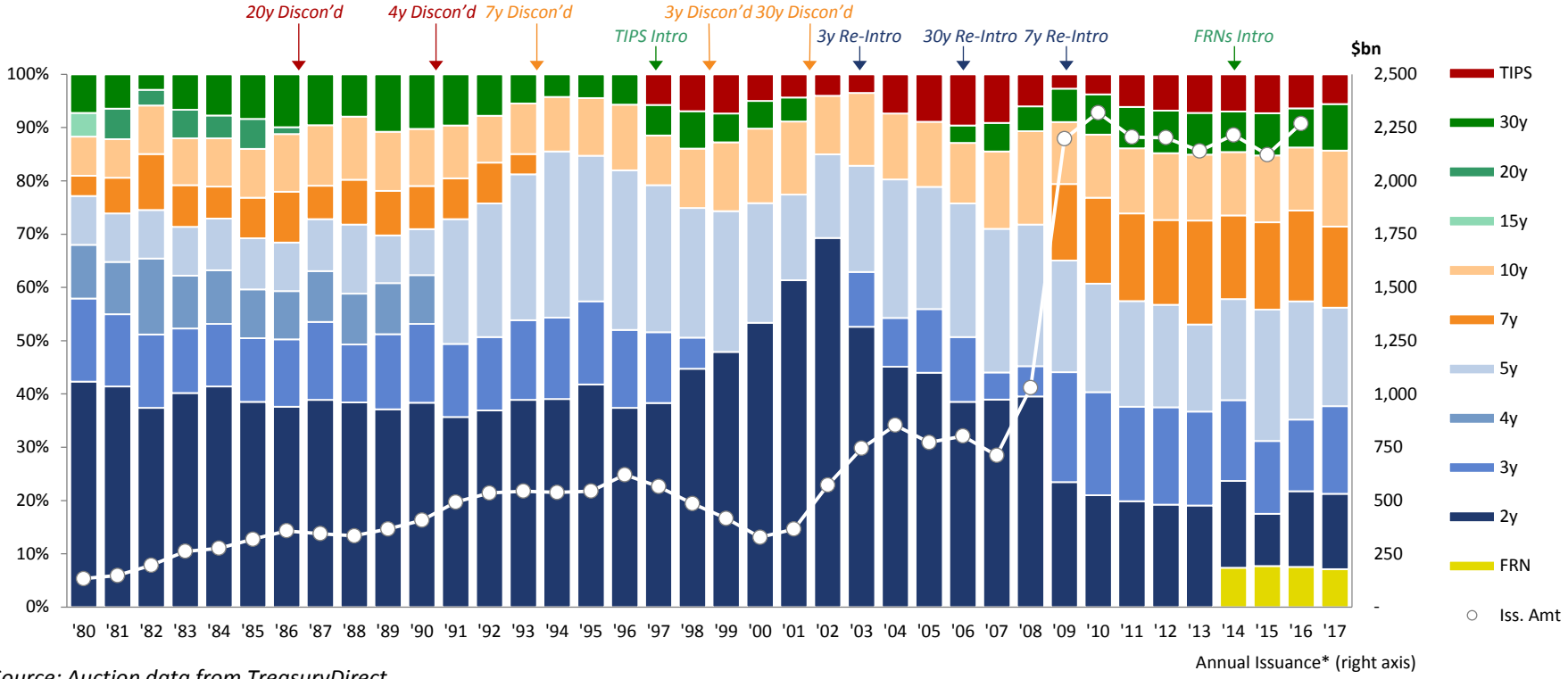
  } Most widely acknowledged
  - Managing interest rate risk
  - Supporting market functioning and liquidity
  - Maintaining a broad investor base
- Constraints
  - Uncertainty – (Sources: legislative commitments, macro-economic forecast errors, technical modeling factors all create uncertainty in deficit forecasts)
  - Size - Treasury is too large to behave opportunistically in the credit markets
- Policy Outcomes
  - Treasury is a regular and predictable market participant, not a market timer
  - Treasury doesn't react to current rate levels or short-term fluctuations in demand
  - Treasury needs flexibility to respond to uncertainty -- to rapidly raise cash or pay down debt – shorter maturities provide more flexibility
  - Treasury seeks continuous improvement in the auction process
  - Treasury strives for transparency and consults often with market participants

5

Source: https://www.treasury.gov/about/organizational-structure/offices/Pages/-Debt-Management.aspx

Treasury Issuance Pattern Changes Have Historically Been Limited

- Since 1980, the Treasury has made minimal changes to its issuance patterns:
  - Introduced 2 new products (TIPS and FRNs)
  - Permanently canceled 2 products (4y and 20y)
  - Canceled and subsequently re-introduced 3 products (3y, 7y and 30y)
- The Treasury commands an issuance premium due to its regular and predictable issuance pattern
- Regular and predictable means issuance happens in all interest rate environments



Source: Auction data from TreasuryDirect
** Gross issuance excluding bills*

Market Participants' Do Not Expect Meaningful Ultra-Long Supply

Previous market survey in regards to ultra-long issuance highlighted that participants[1]

- Expect a low probability that an ultra-long bond is issued (average near 10%, highest 25%)
- Expect any ultra-long issue to come in the next 18 months
- Expect any ultra-long bond would be issued in sizes ranging from $5 – $20 USD billon/quarter
- See no need for reduction in supply elsewhere on the curve

Recent Research from dealers is mixed to negative[2]

- Very few expect ultra-long issuance
- All questioned whether demand would be significant enough or sustainable to meet Treasury's regular and predictable issuance pattern
- Most expected any ultra-long issuance to trade cheap to theoretical value
- Some suggested 20y would be a more viable alternative

[1] Committee participant survey
[2] Harris, Alexandra. "RESEARCH ROUNDUP: Dealers Wary on Ultra-Long UST Issuance" *Bloomberg* 25 April 2017

Borrowers with Large Funding Programs Are Generally Less Opportunistic in their Approach to the Market

Country	2017 Issuance[1]	Non Benchmark Issuance	Syndicated Issuance[2]	Auction Announcements	Foreign Currency debt/ Use derivative hedges?	Long End Auctions	Ultra Long Issuance[3]
Japan	1,361	✗	None	Quarterly	✗ / ✓	15, 20, 30, 40yr	Regular 40yr auctions established in 2007
France	206	✗	7%	Annually, specifics one week prior	✗ / ✗	Reopenings Only	50yr: €6bn in 2005, €5bn in 2010, €3bn in 2016 A new 50yr transaction every few years with taps via auction afterwards
Germany	172	✗	~1%	Annually	✓ / ✓	30yr	None
Italy	~150	✓	18%	Annually, specifics one week prior	✓ / ✓	Reopenings Only	€5bn 50yr in 2016 tapped in 2017 Private placements since 2006
UK	148	✗	15%	Annually, specifics quarterly	✓ / ✓	20, 30yr, Reopenings	Programmatic since 2009
Spain	132	✓	22%	Annually, specifics one week prior	✓ / ✓	Reopenings Only	€1bn 50yr in 2014, €3bn 50yr in 2016 Reopened bonds via auction
Belgium	42	✓	41%	Annually, specifics one week prior	✓ / ✓	Reopenings Only	€3bn 50yr in 2016, €3bn 40yr in 2017 Private placements since 2010
Austria	21.5	✓	48%	Annually, specifics one week prior	✓ / ✓	Reopenings Only	€2bn 50yr in 2012 (tapped 3 times) €2bn 70yr in 2016

[1] Billion USD equivalents
[2] As a percentage of overall issuance
[3] 40 year maturity or longer

Many European Sovereigns Issue Ultras via Syndication, Though this Would be a Significant Departure from Current Treasury Practice

Syndication		Auction
• Pricing managed by issuer and syndicate banks to meet investor demand and subscription level • Pricing can be adjusted to meet a desired size of issuance in the context of the order book	**Pricing**	• Pricing uncertainty will be subject to auction process and volatility at the moment of issuance • When issued trading should help provide some transparency, but a first issuance of 50yrs could experience heightened volatility and a meaningful tail
• In the Euro-government market, syndications tend to offer issuers a larger liquidity event than auctions. • This is driven to some extent by the fact that syndications will offer a bigger discount to investors (as mentioned above)	**Size**	• Dealers participating in European government bond auctions have an obligation to bid or buy a minimum size (similar to US primary dealers. This will give the issuer an idea of a minimum total size but on occasion European auctions are smaller than expected or retained by the issuer
• Places bonds directly with end users, limiting the amount on dealer balance sheets, and dealer's ability to make short offerings • The syndication process can generate an "oversubscribed book" where investors get allocated fewer bonds than they wanted. This typically generates demand in the secondary market	**Performance**	• Post auction performance can be more variable depending on the percentage of direct bids, the bid/cover ratio and the positioning of the dealers heading out of the auction

Recommendations

Recommendations

- Treasury's regular and predictable issuance policy is designed to fund the government at the lowest cost over time. This should remain the central consideration when assessing new instruments or additional maturities.
- We do not currently see evidence of notably strong or sustainable demand for ultra-longs in the US market.
- However, issuing more longer-term debt could be warranted if Treasury wanted to raise its overall borrowing capacity.
- Under that objective, we recommend considering points between 10 and 30 year benchmarks, such as a return of the 20 year bond, in addition to increased issuance in 10 and 30 years
  - A reintroduction of the 20 year will have the broadest demand, highest certainty of initial pricing, and quickest market acceptance
  - Fills a hole in the curve and offers best certainty of establishing another maturity
  - Expect significant demand from insurers and annuity providers for 20 year corporates which will benefit Treasury issuance cost
- Issuing an ultra-long security should be studied further
  - Although issuing a zero coupon security requires detailed analysis on tax, accounting and systems implications, there may be meaningful demand for 50 year zero coupon bonds. This ultra-long security is the most likely to trade near theoretical value
  - In the future, a 40 or 50 year par bond may warrant further study and may make sense if demand increases or expected pricing relative to theoretical valuation improves
- We would not recommend issuing 100 year par bonds at this time
  - There are limited pension or insurance cash flows which stretch far beyond 50 years
  - An existing 30 year STRIP already provides a similar duration exposure to a 100 year par bond
  - We would expect a 100 year issue to price significantly cheap to fair value