Treasury Presentation to TBAC

Office of Debt Management

Fiscal Year 2019 Q4 Report

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Section I:
Executive Summary

Highlights of Treasury's November 2019 Quarterly Refunding Presentation to the Treasury Borrowing Advisory Committee (TBAC)

Receipts and Outlays

- In FY 2019, receipts were $133 billion (4%) higher than the comparable period last year. Total receipts were 16.3% of GDP, compared to 16.4% of GDP for the same period last year. Customs duties rose $30 billion (70%), largely resulting from new tariffs. Withheld income and FICA taxes were up $78 billion (3%), driven by growth in wages and employment. Gross excise taxes were $6 billion (7%) higher. Non-withheld income and SECA taxes were up $10 billion (1%). Individual refunds were $24 billion (9%) lower. Gross corporate taxes were $14 billion (5%) higher. Partially offsetting the increases, Federal Reserve earnings were $18 billion (25%) lower due to the Federal Reserve paying higher short-term interest rates to depository institutions.

- In FY 2019, total outlays were $291 billion (7%) higher than last year. Social Security Administration outlays were $58 billion (6%) higher due to increases in enrollment and in the average benefit including the cost-of-living adjustment of 2.8%. Defense expenditures were up $50 billion (8%) due to increased spending for military personnel, operations, maintenance, and procurement. Health and Human Services spending was $64 billion (6%) higher due to increased Medicare and Medicaid expenditures. Treasury outlays were $60 billion (10%) higher primarily due to increased interest cost of $51 billion (10%) on the public debt. Education expenditures were up $41 billion (64%) due to differences in subsidy re-estimates. Housing & Urban Development outlays were down $25 billion (47%) due to differences in subsidy re-estimates.

Projected Net Marketable Borrowing (FY 2020)

- Treasury's Office of Fiscal Projections (OFP) currently forecasts a net privately-held marketable borrowing need of $352 billion for Q1 FY 2020, with an end-of-December cash balance of $410 billion. For Q2 FY 2020, OFP forecasts a net privately-held marketable borrowing need of $389 billion assuming end-of-March cash balance of $400 billion. Privately-held net marketable borrowing excludes rollovers (auction "add-ons") of Treasury securities held in the Federal Reserve's System Open Market Account (SOMA), but includes financing from the private sector required due to SOMA redemptions, when applicable. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when they mature would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA "add-on" amount.

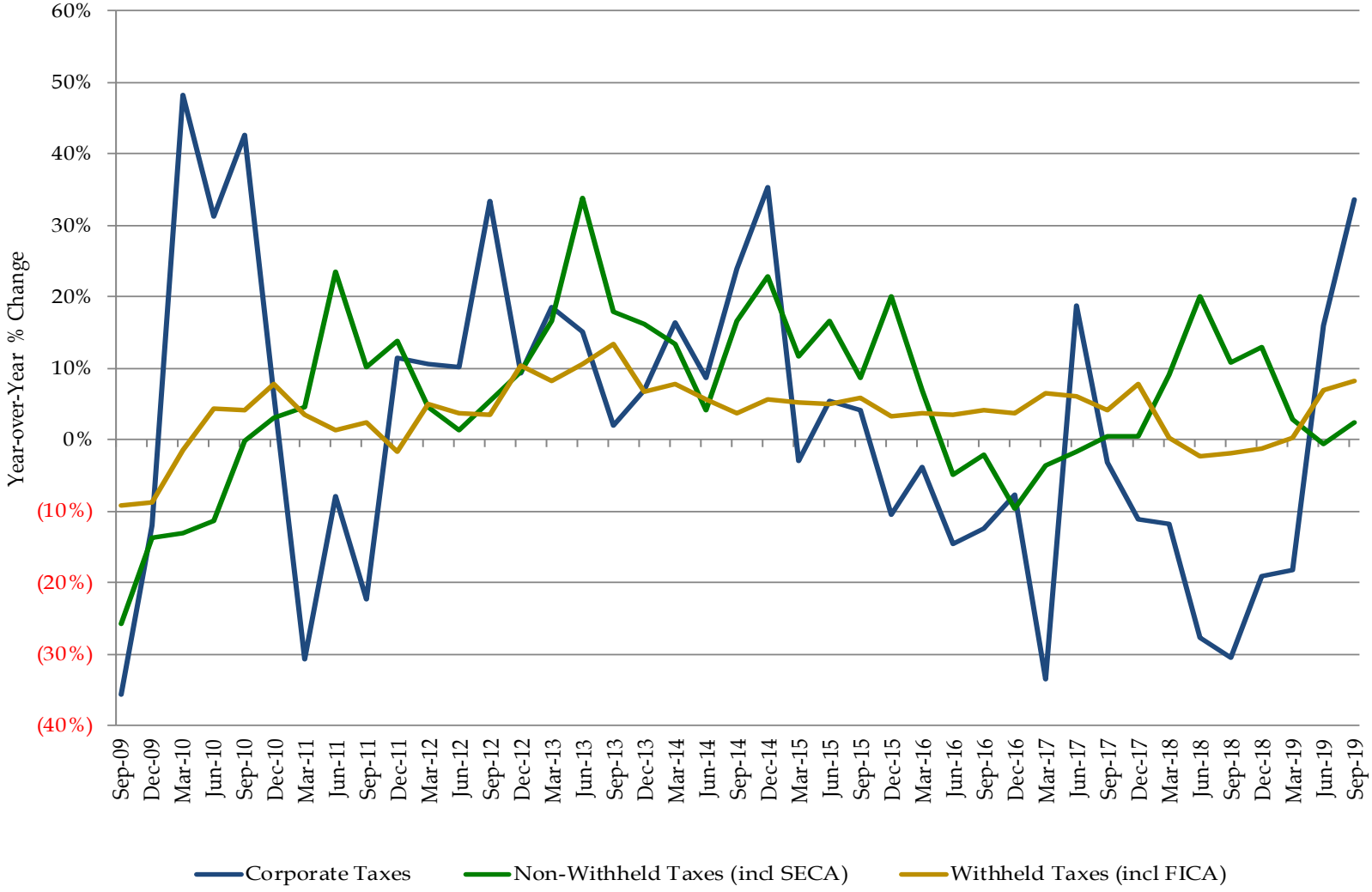
Demand for Treasury Securities

- Bid-to-cover ratios for all securities were largely stable over the last quarter.

- Foreign demand remained steady.

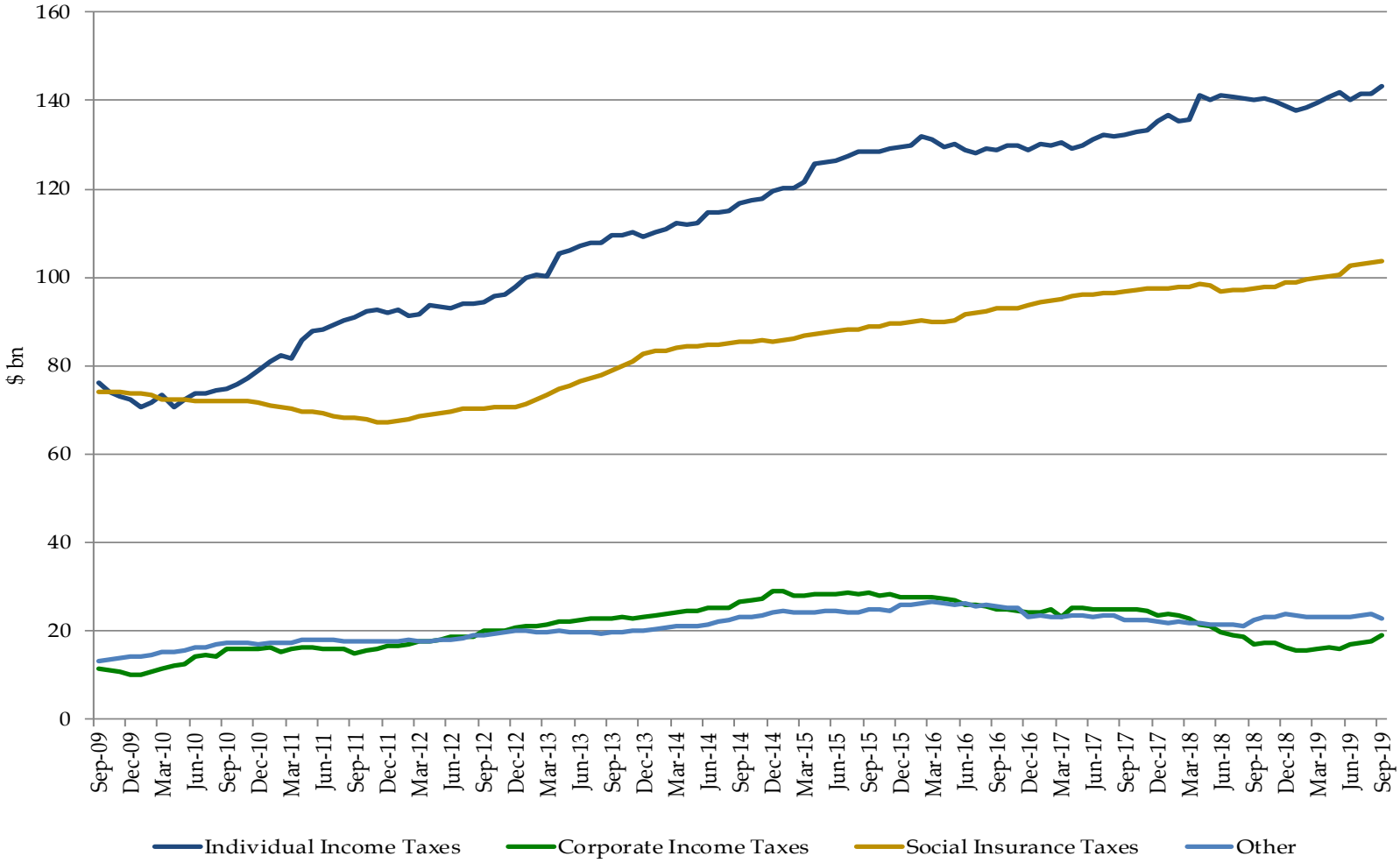
Section II: Fiscal

Quarterly Tax Receipts



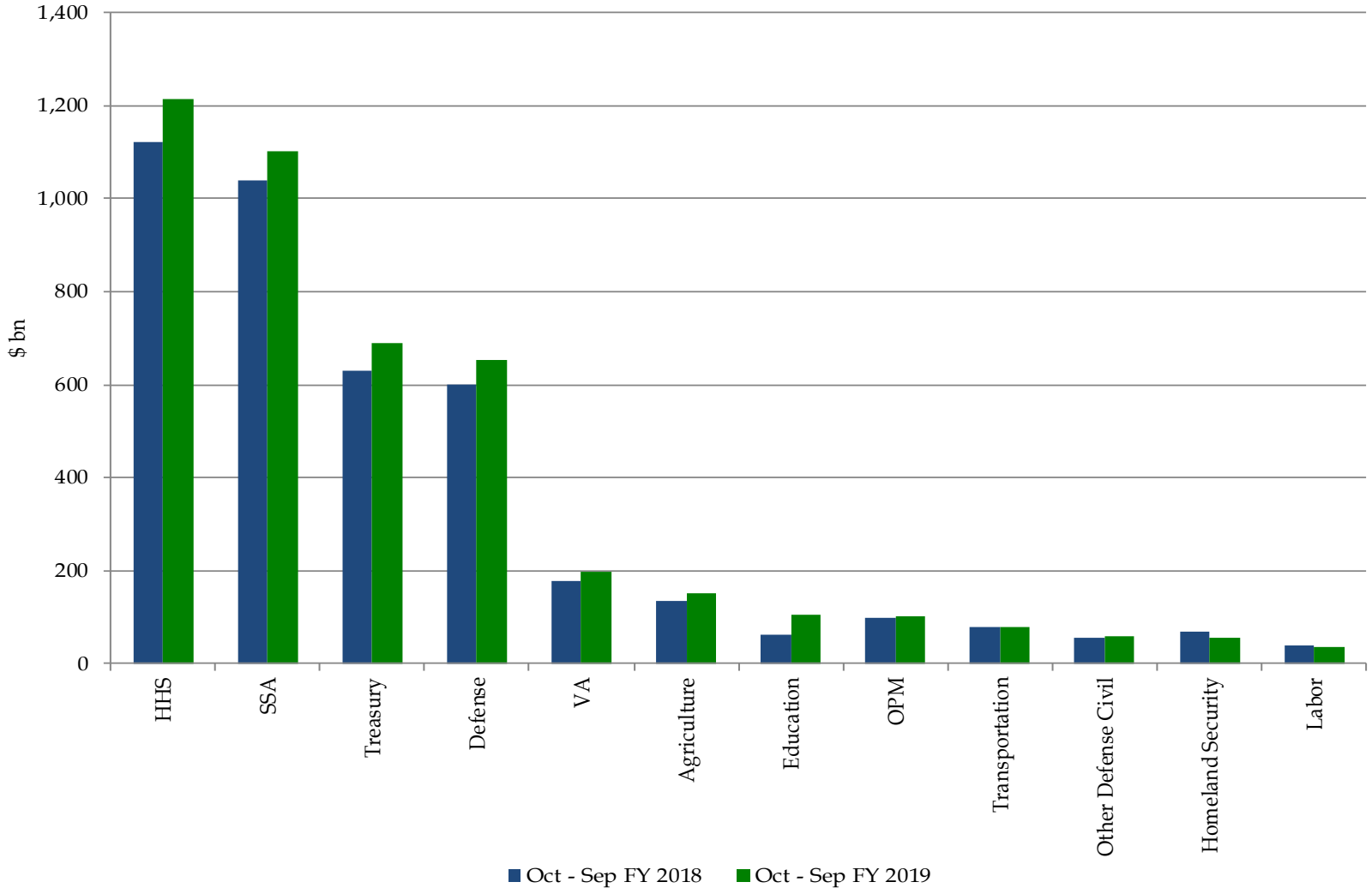
Source: United States Department of the Treasury

Monthly Receipt Levels
(12-Month Moving Average)



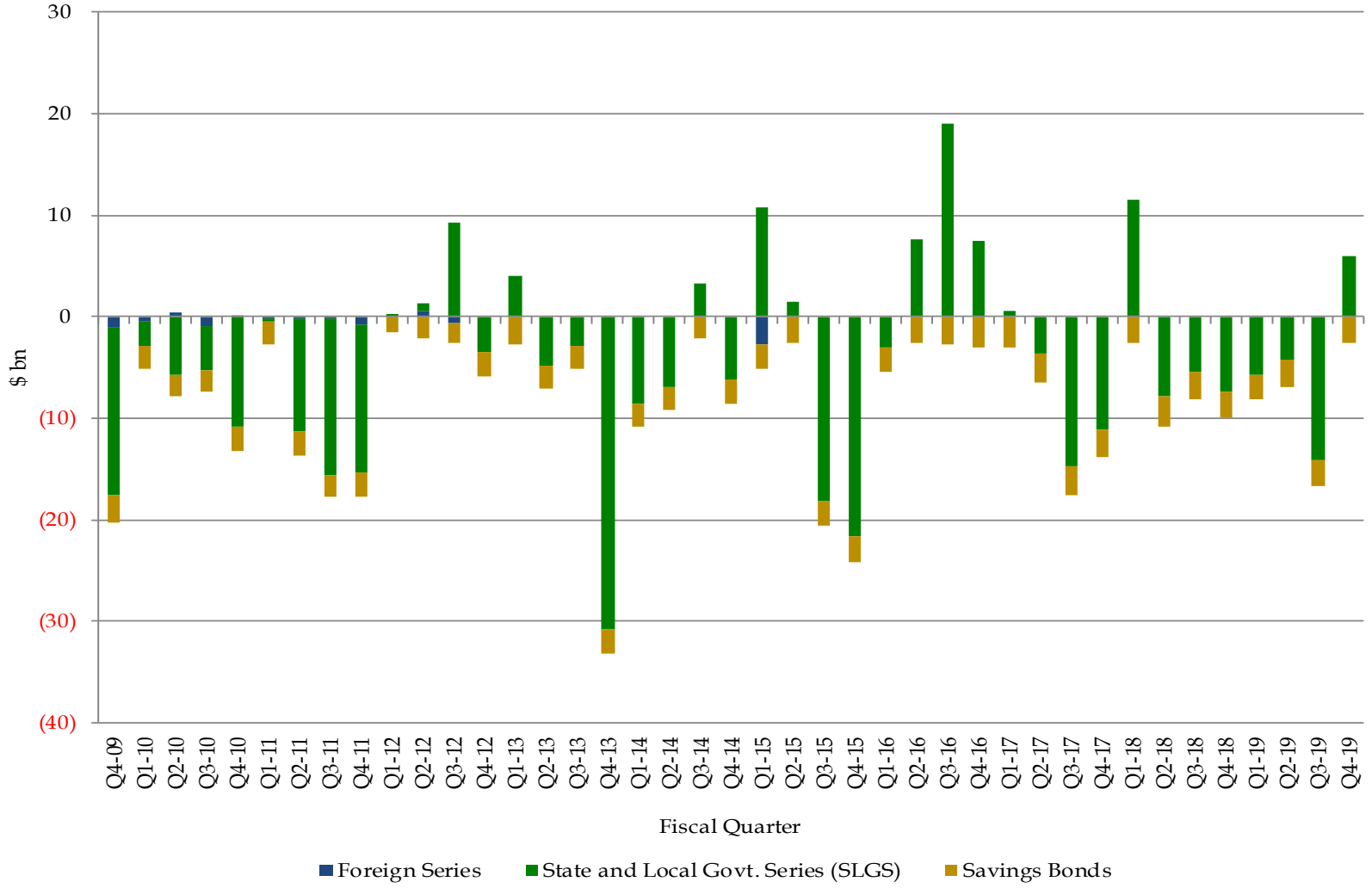
Individual Income Taxes include withheld and non-withheld. Social Insurance Taxes include FICA, SECA, RRTA, UTF deposits, FUTA and RUIA. Other includes excise taxes, estate and gift taxes, customs duties and miscellaneous receipts.
Source: United States Department of the Treasury

Largest Outlays



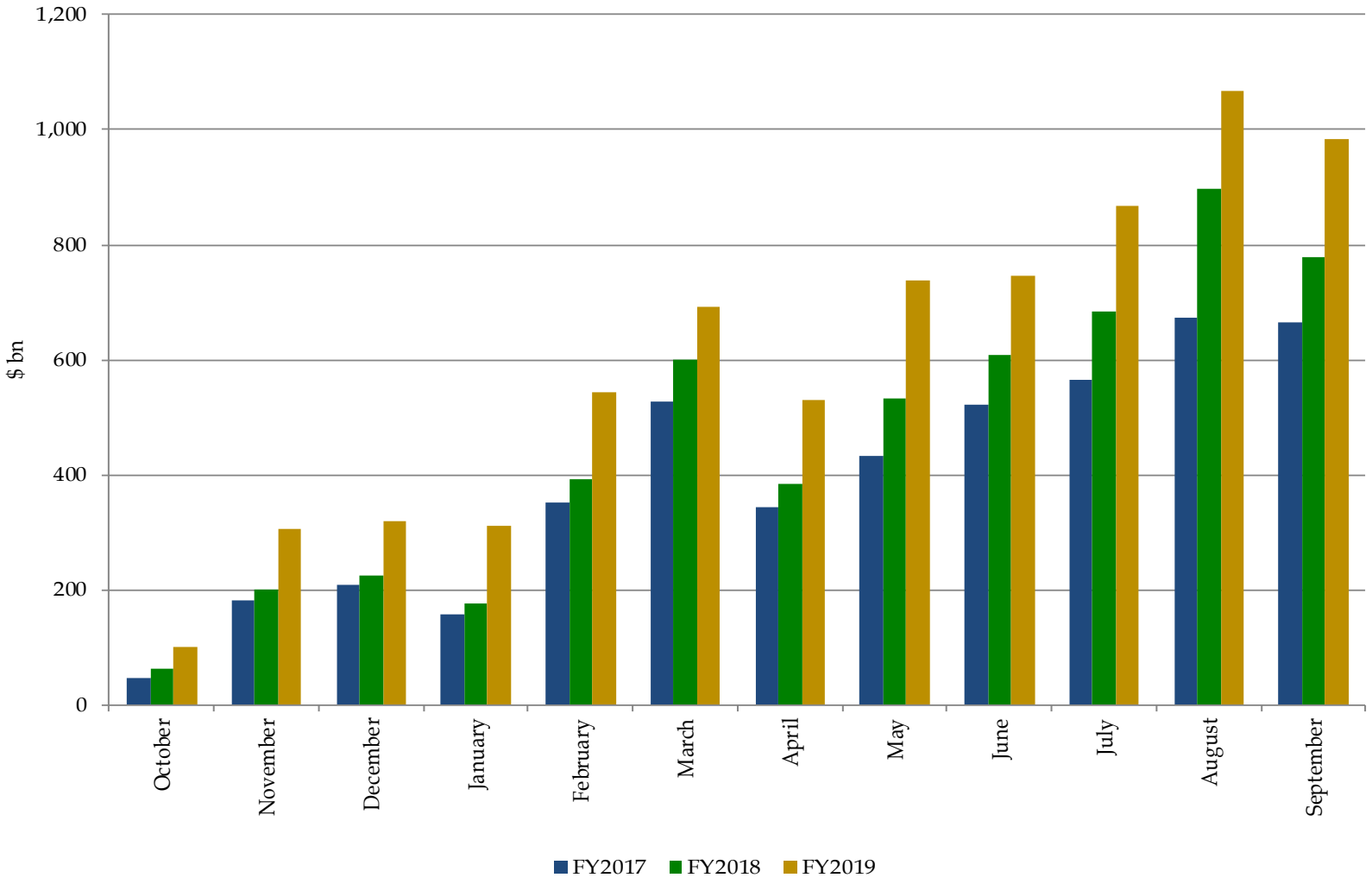
Source: United States Department of the Treasury

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 2020-2022 Deficits and Net Marketable Borrowing Estimates, in $ billions

	Primary Dealers[1]	CBO[2]	OMB[3]	CBO[4]
FY 2020 Deficit Estimate	1,044	1,008	1,045	966
FY 2021 Deficit Estimate	1,083	1,034	1,015	921
FY 2022 Deficit Estimate	1,161	1,159	967	1,073
FY 2020 Deficit Range	925-1,210			
FY 2021 Deficit Range	1,000-1,290			
FY 2022 Deficit Range	1,025-1,300			
FY 2020 Net Marketable Borrowing Range	700-1,412			
FY 2021 Net Marketable Borrowing Range	790-1,300			
FY 2022 Net Marketable Borrowing Range	925-1,360			
FY 2020 Net Marketable Borrowing Estimate	1,093	1,070	1,112	1,030
FY 2021 Net Marketable Borrowing Estimate	1,108	1,086	1,082	978
FY 2022 Net Marketable Borrowing Estimate	1,200	1,201	1,030	1,121
Estimates as of:	Oct-19	Aug-19	Jul-19	May-19

[1]Estimates represent the medians from the primary dealer survey in October 2019.

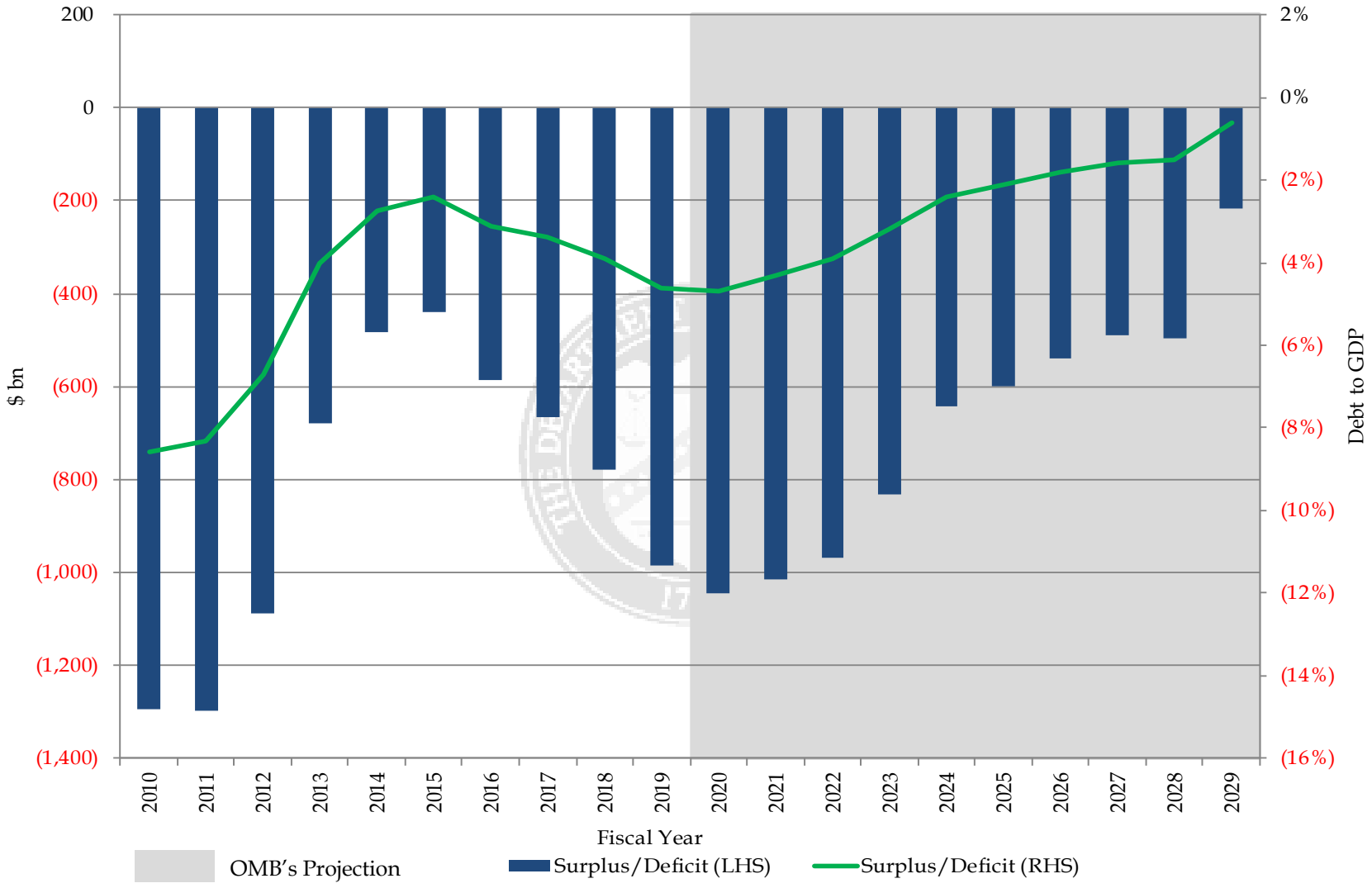
[2]Table 3 of CBO's "Updated Budget Projections: 2019 to 2029," Aug 2019 (current law).

[3]Table S-11 of OMB's "A Budget for a Better America, Fiscal Year 2020, Mid-Session Review," July 2019.

[4]Table 2 of CBO's "An Analysis of the President's 2020 Budget," May 2019.

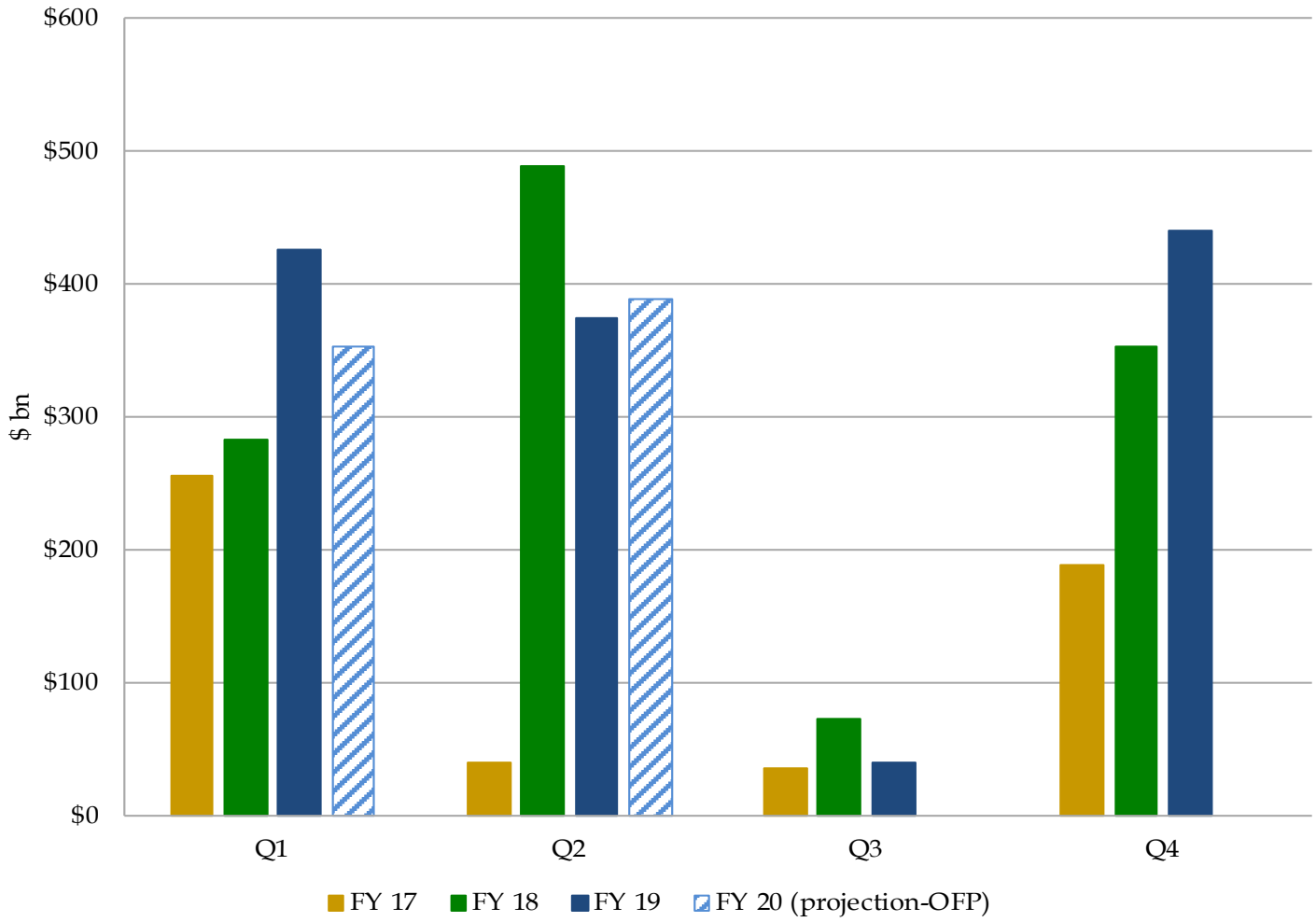
SOMA redemptions and privately-held net marketable borrowing details were removed because the Federal Open Market Committee (FOMC) concluded the reduction of aggregate securities holdings in the System Open Market Account (SOMA) at the end of July 2019. [https://www.newyorkfed.org/markets/opolicy/operating_policy_190731]

Budget Surplus/Deficit



Projections are from OMB's Table S-11 of "A Budget for a Better America, Fiscal Year 2020, Mid-Session Review," July 2019.

Privately-Held Net Marketable Borrowing Outlook



Note: Privately-held net marketable borrowing excludes rollovers (auction "add-ons") of Treasury securities held in the Federal Reserve's System Open Market Account (SOMA), but includes financing from the private sector required due to SOMA redemptions, when applicable. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when they mature would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA "add-on" amount.

Section III: Financing

Assumptions for Financing Section (pages 16 to 21)

- Portfolio and SOMA holdings as of 09/30/2019.
- Estimates assume announced issuance sizes and patterns remain constant for nominal coupons, TIPS, and FRNs given changes made at the August 2019 refunding, while using privately-held bills outstanding of ~$2.37 trillion.
- The principal on the TIPS securities was accreted to each projection date based on market ZCIS levels as of 09/30/2019.
- No attempt was made to account for future financing needs.

Sources of Privately-Held Financing in FY19 Q4*

July - September 2019	
Net Bill Issuance	126
Net Coupon Issuance	314
Subtotal: Net Marketable Borrowing	440
Ending Cash Balance	382
Beginning Cash Balance	264
Subtotal: Change in Cash Balance	119
Net Implied Funding for FY19 Q4**	321

Security	July - September 2019 Bill Issuance			Fiscal Year-to-Date Bill Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
4-Week	585	540	45	2,400	2,375	25
8-Week	490	455	35	1,695	1,380	315
13-Week	531	504	27	2,169	2,283	(114)
26-Week	513	498	15	1,977	2,106	(129)
52-Week	82	78	4	342	302	40
CMBs	35	35	0	158	158	0
Bill Subtotal	2,236	2,110	126	8,741	8,604	137

Security	July - September 2019 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	56	41	15	223	164	59
2-Year	160	104	56	514	312	202
3-Year	114	72	42	453	288	165
5-Year	164	139	25	527	396	131
7-Year	128	60	68	414	257	157
10-Year	75	28	47	299	111	188
30-Year	51	6	45	203	15	188
5-Year TIPS	0	0	0	46	54	(8)
10-Year TIPS	26	18	8	72	33	39
30-Year TIPS	7	0	7	20	0	20
Coupon Subtotal	781	467	314	2,771	1,628	1,143

Total	3,017	2,577	440	11,512	10,232	1,280

*Privately-held net marketable borrowing excludes rollovers (auction "add-ons") of Treasury securities held in the Federal Reserve's System Open Market Account (SOMA), but includes financing from the private sector required due to SOMA redemptions, when applicable. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when they mature would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA "add-on" amount.
**An end-of-September 2019 cash balance of $382 billion versus a beginning-of-July 2019 cash balance of $264 billion. By keeping the cash balance constant, Treasury arrives at the net implied funding number.

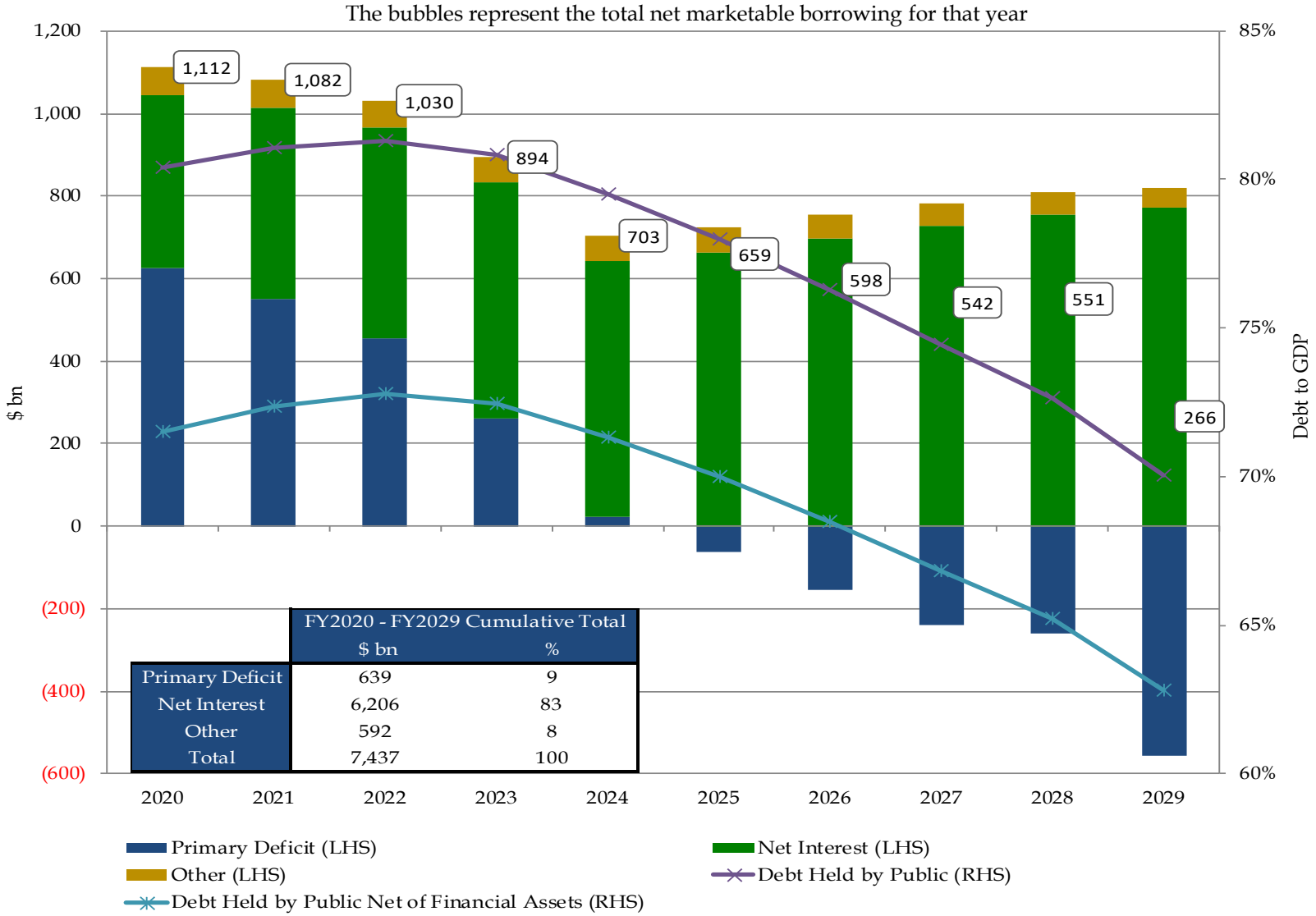
Sources of Privately-Held Financing in FY20 Q1*

October - December 2019	
Assuming Constant Coupon Issuance Sizes**	
Treasury Announced Net Marketable Borrowing***	352
Net Coupon Issuance	289
Implied Change in Bills	63

Security	October - December 2019 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	56	41	15	56	41	15
2-Year	120	51	68	120	51	68
3-Year	114	72	42	114	72	42
5-Year	123	131	(8)	123	131	(8)
7-Year	96	58	38	96	58	38
10-Year	75	37	38	75	37	38
30-Year	51	0	51	51	0	51
5-Year TIPS	32	0	32	32	0	32
10-Year TIPS	12	0	12	12	0	12
30-Year TIPS	0	0	0	0	0	0
Coupon Subtotal	679	390	289	679	390	289

*Privately-held net marketable borrowing excludes rollovers (auction "add-ons") of Treasury securities held in the Federal Reserve's System Open Market Account (SOMA), but includes financing from the private sector required due to SOMA redemptions, when applicable. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when they mature would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA "add-on" amount.
**Keeping announced issuance sizes and patterns constant for nominal coupons, TIPS, and FRNs based on changes made at the August 2019 refunding.
***Assumes an end-of-December 2019 cash balance of $410 billion versus a beginning-of-October 2019 cash balance of $**382** 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

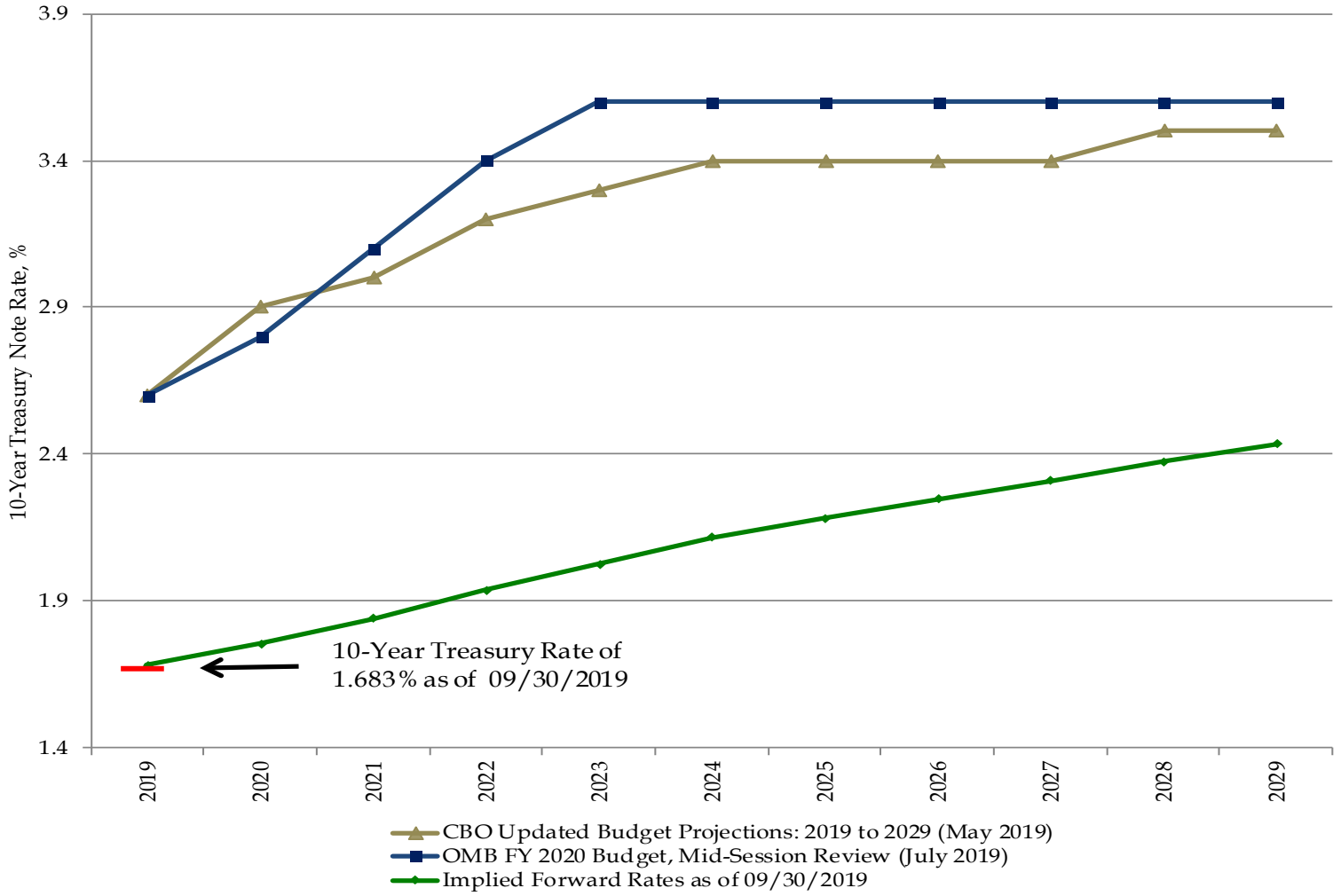
OMB's Projection of Borrowing from the Public



	FY2020 - FY2029 Cumulative Total	
	$ bn	%
Primary Deficit	639	9
Net Interest	6,206	83
Other	592	8
Total	7,437	100

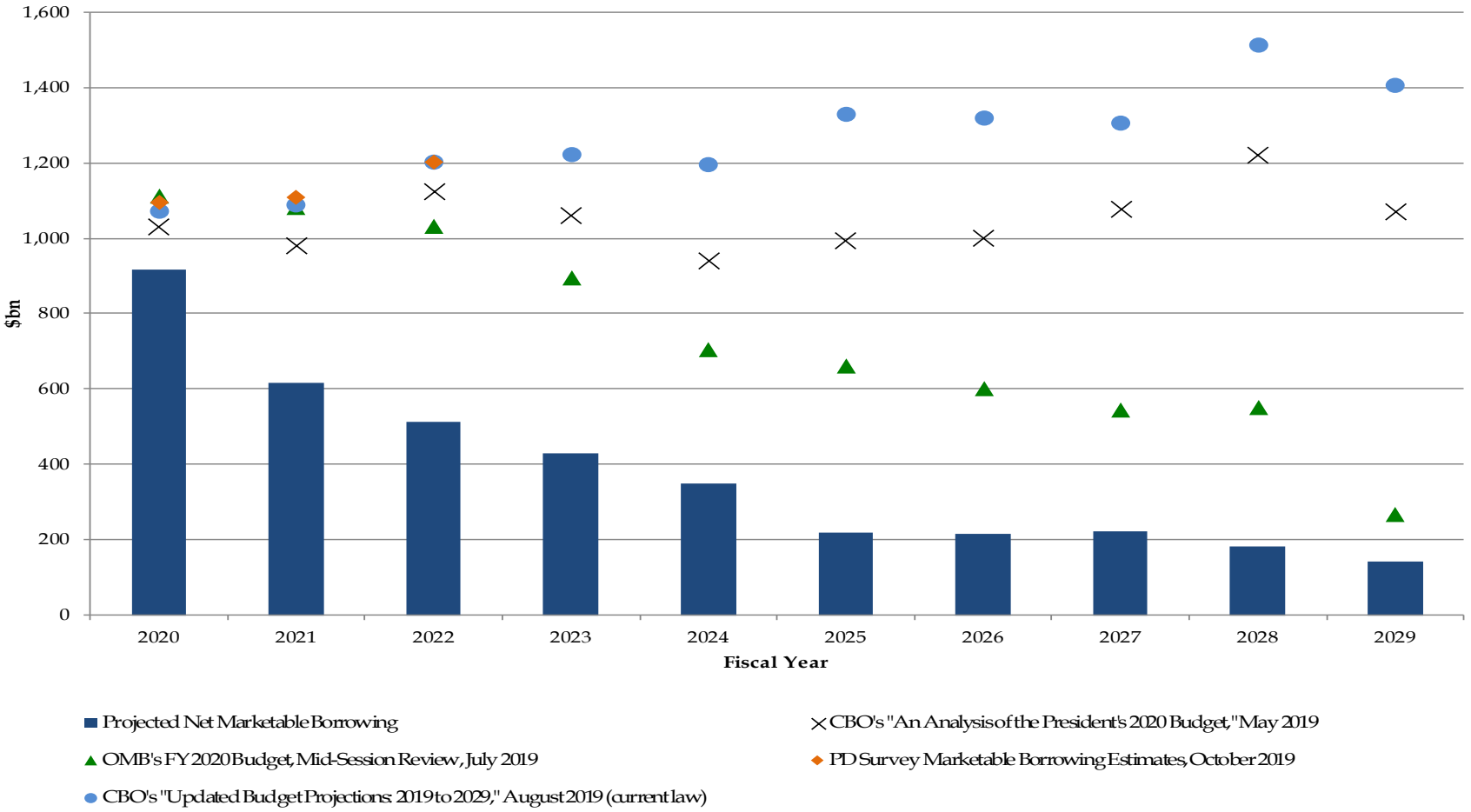
OMB's projections of the change in debt held by the public (borrowing) are from Table S-11 of "A Budget for a Better America, Fiscal Year 2020 Mid-Session Review," July 2019. "Other" represents borrowing from the public to provide direct and guaranteed loans.

Interest Rate Assumptions: 10-Year Treasury Note



OMB's economic assumption of the 10-Year Treasury note rates are from Table 3 of OMB's "A Budget for a Better America, Fiscal Year 2020, Mid-Session Review" July 2019. CBO's economic assumption of the 10-Year Treasury note rates are from Table 3 of CBO's "Updated Budget Projections: 2019 to 2029," May 2019. The forward rates are the implied 10-Year Treasury note rates on September 30, 2019.

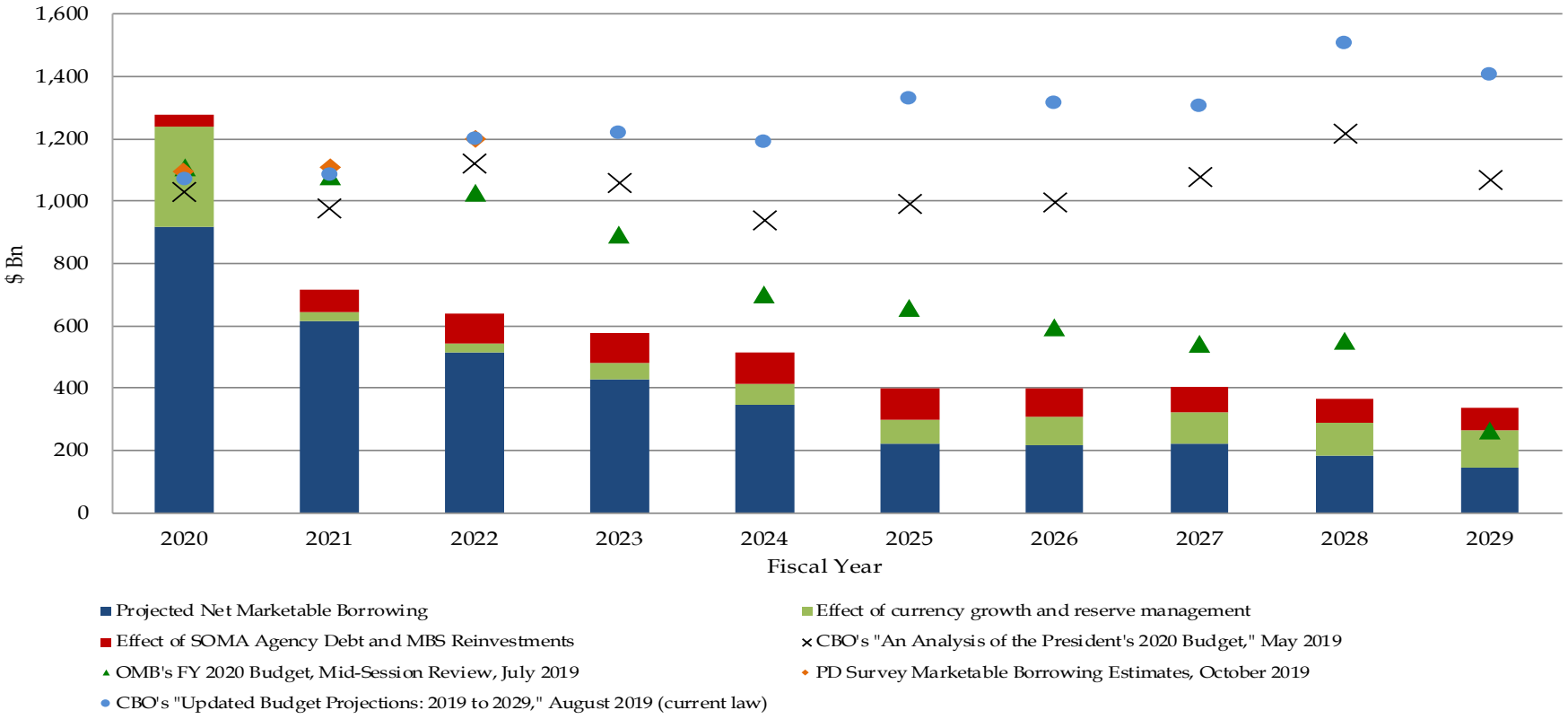
Projected Net Marketable Borrowing
Assuming Future Private Issuance Remains Constant*



Treasury's latest primary dealer survey estimates can be found on page 11. OMB's projections of the change in debt held by the public are from Table S-11 of "A Budget for a Better America, Fiscal Year 2020, Mid-Session Review," July 2019. CBO's current law budget projections of the change in debt held by the public are from Table 3 of "Updated Budget Projections: 2019 to 2029," Aug 2019. CBO's budget projections of the change in debt held by the public are from Table 2 of "An Analysis of the President's 2020 Budget," May 2019. See table in the appendix section for details.

* Projections reflect only SOMA rollovers at auction of principal payments of Treasury securities. No adjustments are made for open-market outright purchases and subsequent rollovers.

Estimate of the Effect of SOMA Purchases* on Projected Net Borrowing
Assuming Future Private Issuance Remains Constant



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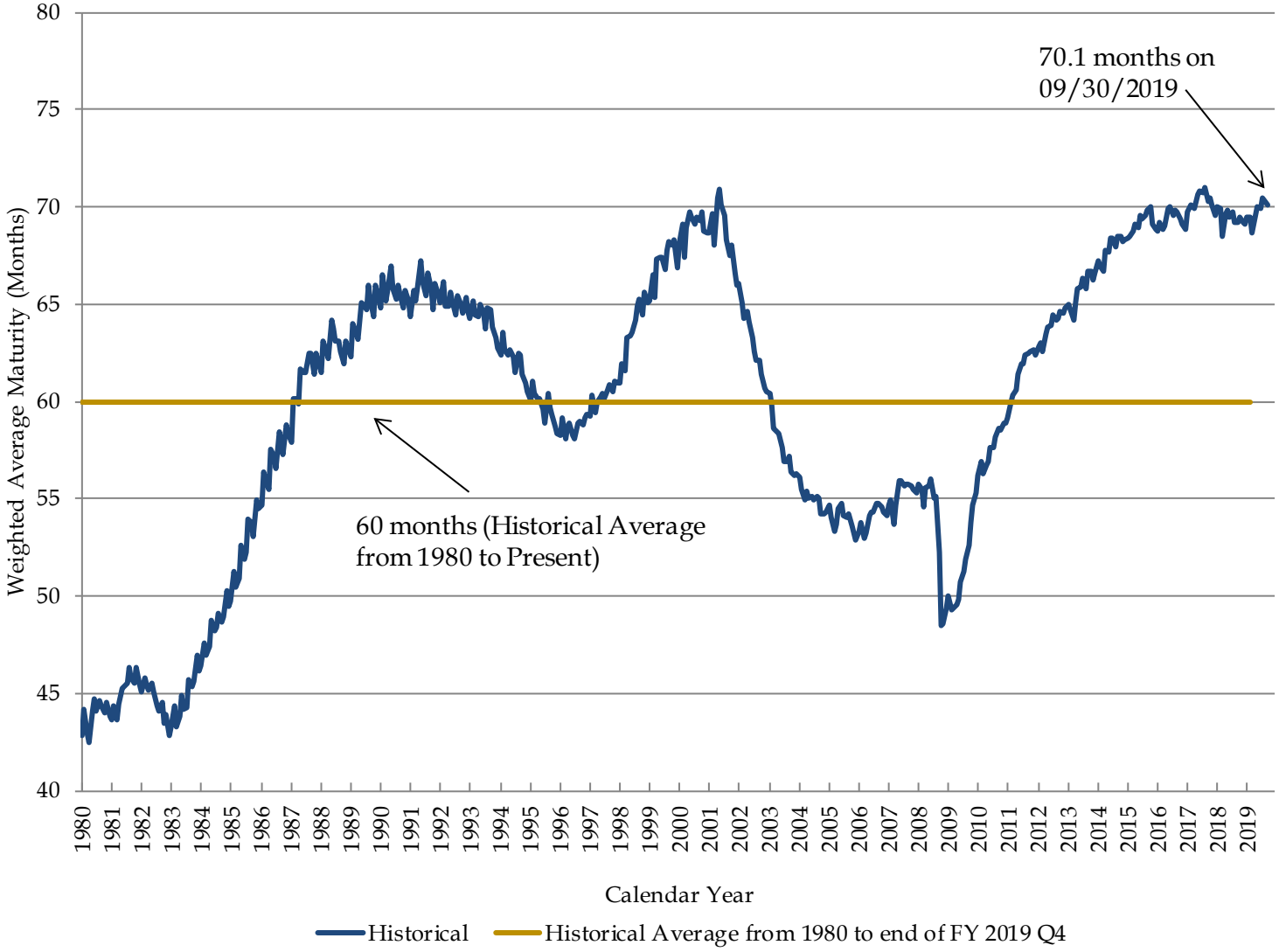
* Projections reflect SOMA rollovers at auction of principal payments of Treasury securities and SOMA's reserve management purchases of Treasury bills at an initial pace of approximately $60 billion per month, starting from mid-October and at least into the second quarter of 2020 [1]. The principal payments from agency debt and agency MBS up to a maximum amount of $20 billion per month will be reinvested in Treasury securities through secondary market purchases that roughly match the maturity composition of Treasury securities outstanding [2]. The currency portion of the Fed's balance sheet is assumed to grow at the historical annual rate and assumed to be offset by Treasury securities purchases in the same manner consistent with the MBS principal payments. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when they mature would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA "add-on" amount.

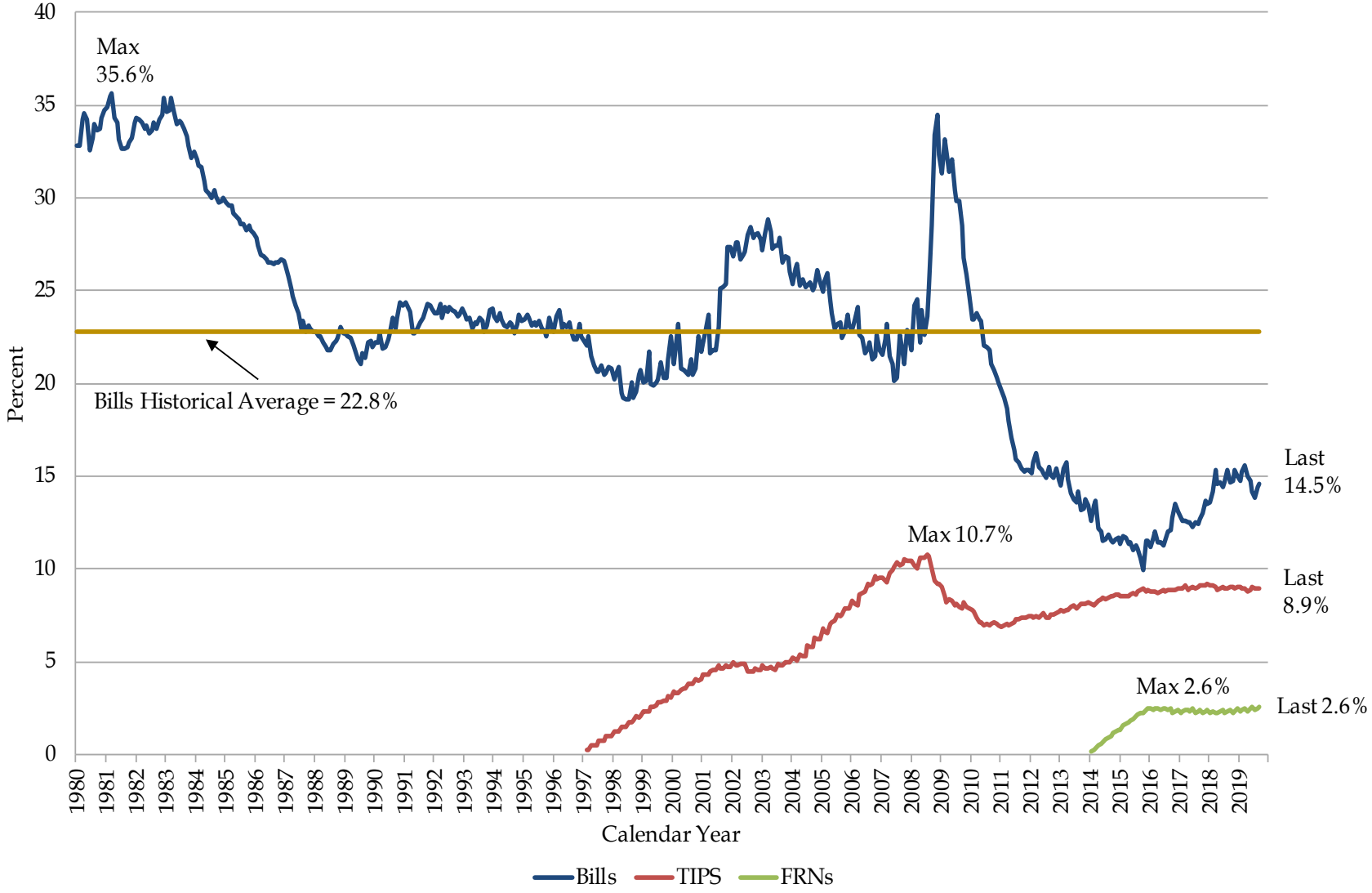
[1] https://www.newyorkfed.org/markets/opolicy/operating_policy_191011
[2] https://www.newyorkfed.org/markets/opolicy/operating_policy_190731

Section IV:
Portfolio Metrics

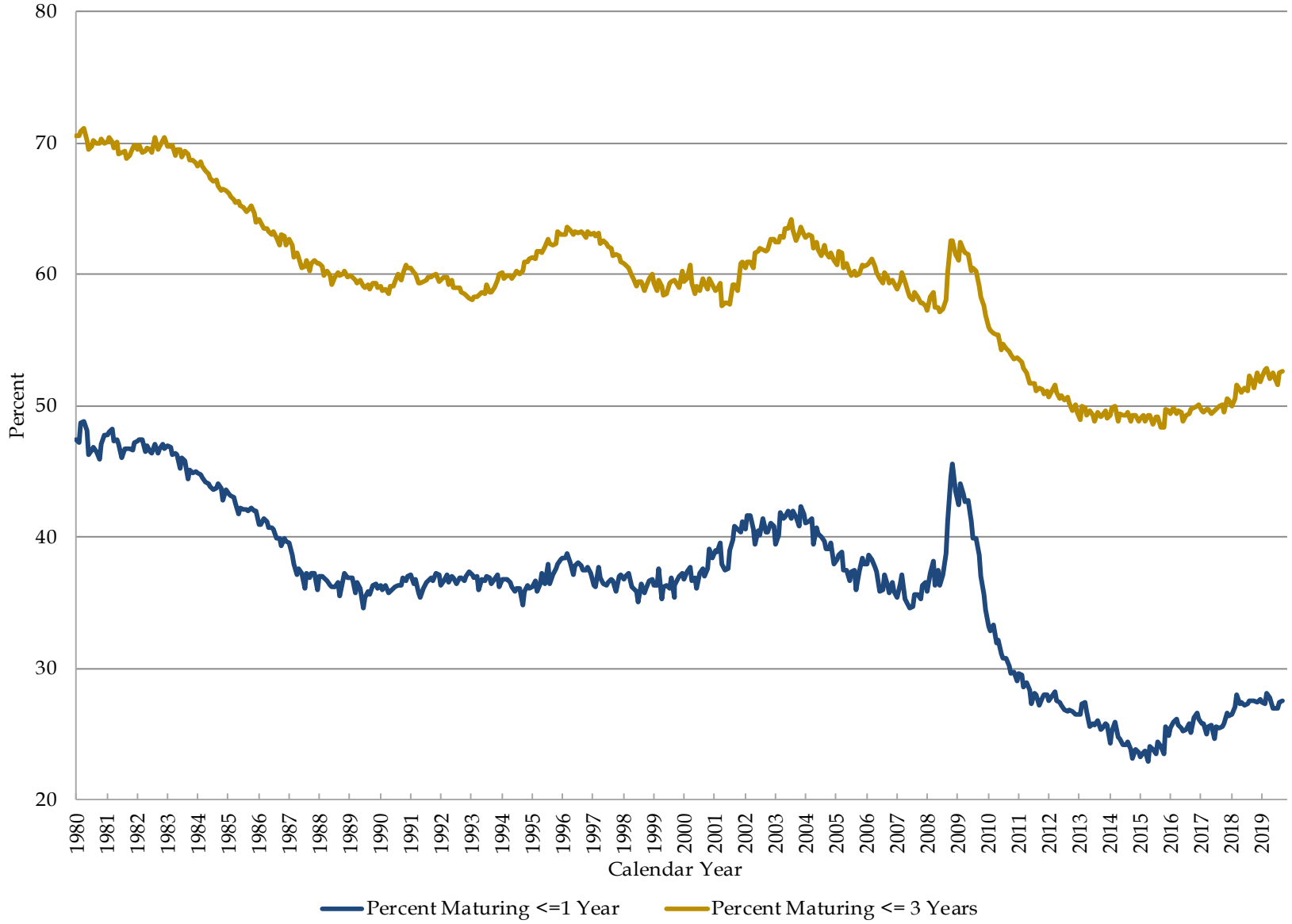
Historical Weighted Average Maturity of Marketable Debt Outstanding



Bills, TIPS & FRNs Outstanding as a Percent of Marketable Debt Outstanding



Treasury Maturity Profile History



End of Fiscal Year & Most Recent Quarter Maturity Profile, $ billions

Date	(0,1]	(1,2]	(2,3]	(3,5]	(5,7]	(7,10]	(10,30]	Total	(0,5]
Sep-12	2,951	1,373	1,104	1,811	1,214	1,108	1,181	10,742	7,239
Sep-13	2,939	1,523	1,242	1,965	1,454	1,136	1,331	11,590	7,669
Sep-14	2,935	1,739	1,319	2,207	1,440	1,113	1,528	12,281	8,199
Sep-15	3,097	1,775	1,335	2,382	1,478	1,121	1,654	12,841	8,589
Sep-16	3,423	1,828	1,538	2,406	1,501	1,151	1,800	13,648	9,195
Sep-17	3,631	2,027	1,504	2,433	1,466	1,180	1,946	14,188	9,596
Sep-18	4,299	2,076	1,603	2,472	1,531	1,209	2,077	15,268	10,450
Sep-19	4,492	2,333	1,766	2,571	1,612	1,312	2,253	16,338	11,162

End of Fiscal Year & Most Recent Quarter Maturity Profile, percent

Date	(0,1]	(1,2]	(2,3]	(3,5]	(5,7]	(7,10]	(10,30]	(0,3]	(0,5]
Sep-12	27.5	12.8	10.3	16.9	11.3	10.3	11.0	50.5	67.4
Sep-13	25.4	13.1	10.7	17.0	12.5	9.8	11.5	49.2	66.2
Sep-14	23.9	14.2	10.7	18.0	11.7	9.1	12.4	48.8	66.8
Sep-15	24.1	13.8	10.4	18.5	11.5	8.7	12.9	48.3	66.9
Sep-16	25.1	13.4	11.3	17.6	11.0	8.4	13.2	49.7	67.4
Sep-17	25.6	14.3	10.6	17.1	10.3	8.3	13.7	50.5	67.6
Sep-18	28.2	13.6	10.5	16.2	10.0	7.9	13.6	52.3	68.4
Sep-19	27.5	14.3	10.8	15.7	9.9	8.0	13.8	52.6	68.3

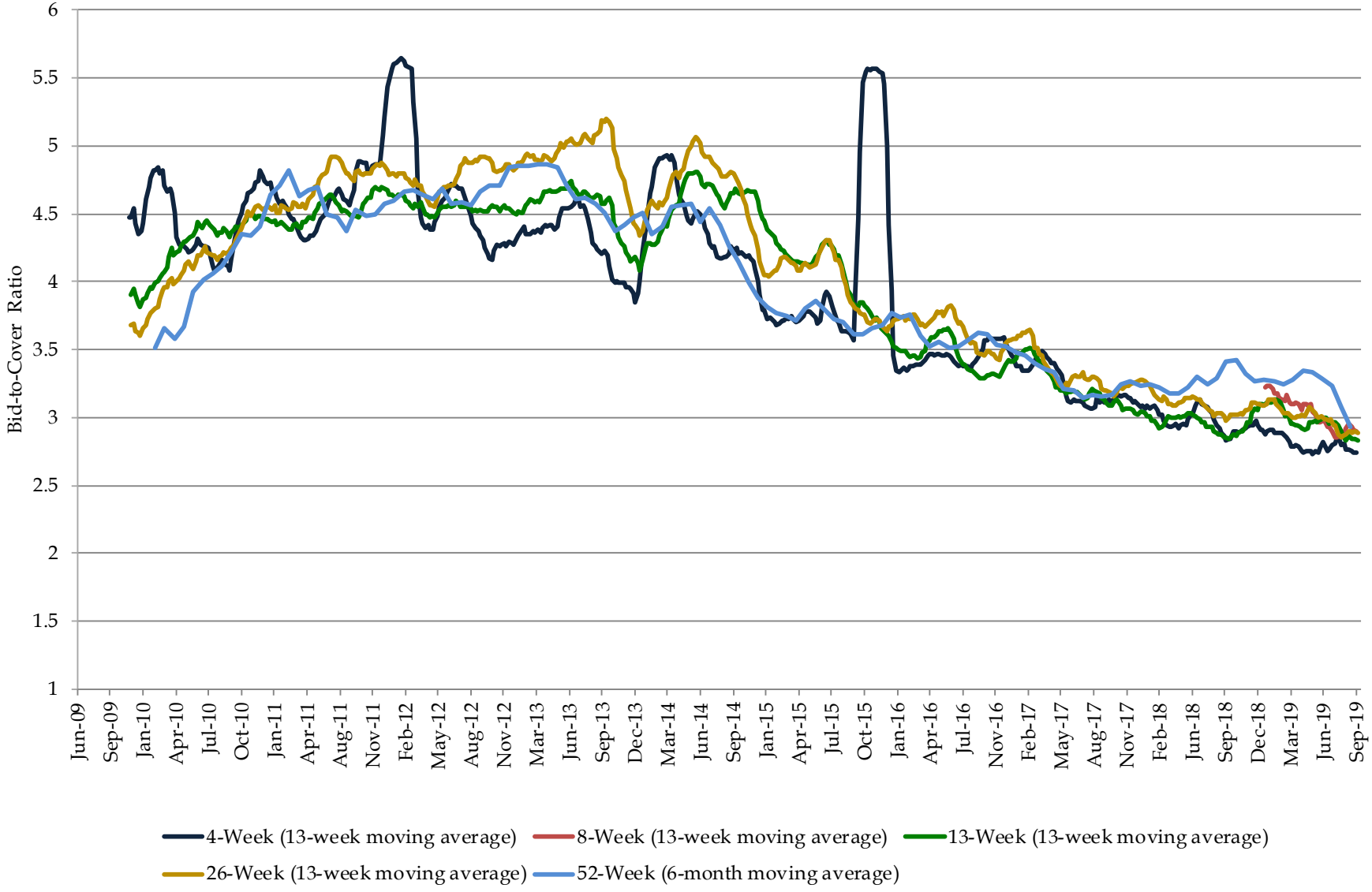
Section V: Demand

Summary Statistics for Fiscal Year 2019 Q4 Auctions

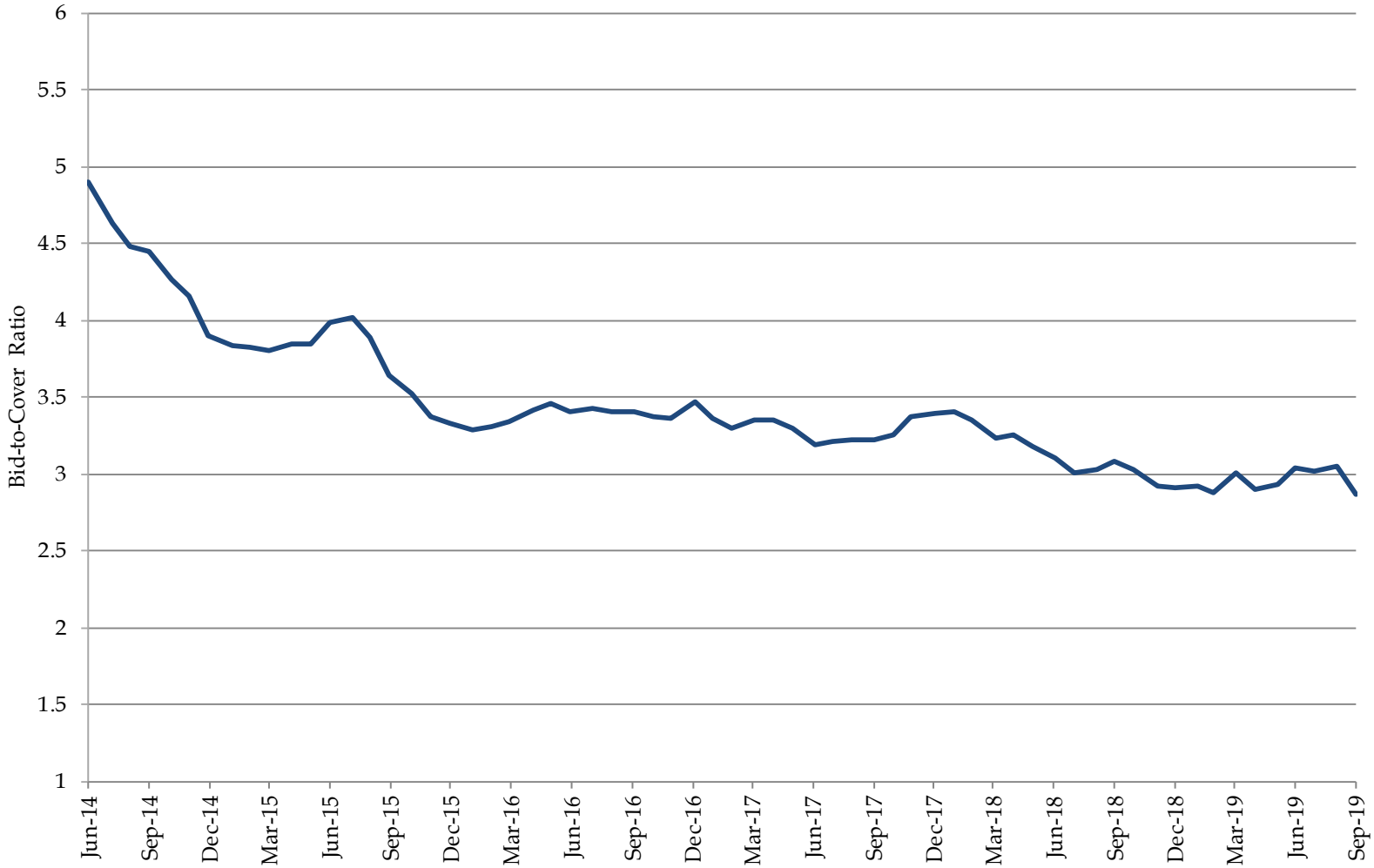
Security Type	Term	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards ($bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards ($bn)	SOMA "Add-Ons" ($bn)	10-Year Equivalent ($bn)**
Bill	4-Week	2.043	2.7	569.3	57.1	4.1	38.9	20.7	0.0	5.0
Bill	8-Week	2.018	2.9	491.1	50.9	2.8	46.3	3.9	0.0	8.4
Bill	13-Week	1.985	2.8	559.8	50.1	3.4	46.4	16.3	0.0	15.8
Bill	26-Week	1.912	2.9	540.6	48.7	2.9	48.4	14.4	0.0	30.5
Bill	52-Week	1.816	2.8	80.7	57.3	3.0	39.7	1.3	0.0	9.1
Bill	CMB	2.110	2.6	35.0	70.7	1.1	28.2	0.0	0.0	0.5
Coupon	2-Year	1.651	2.6	119.3	30.4	20.4	49.2	0.7	10.9	28.5
Coupon	3-Year	1.664	2.4	113.8	34.9	17.9	47.1	0.2	25.1	46.0
Coupon	5-Year	1.596	2.4	122.9	27.2	15.5	57.3	0.1	11.2	71.6
Coupon	7-Year	1.696	2.3	96.0	26.3	15.5	58.3	0.0	8.8	76.8
Coupon	10-Year	1.818	2.4	75.0	27.4	13.1	59.5	0.0	17.8	95.3
Coupon	30-Year	2.412	2.2	51.0	28.4	14.1	57.5	0.0	12.5	153.3
TIPS	10-Year	0.232	2.3	26.0	17.2	17.5	65.3	0.0	1.8	30.5
TIPS	30-Year	0.501	2.7	7.0	10.6	7.7	81.6	0.0	0.0	19.7
FRN	2-Year	0.248	2.8	56.0	48.5	0.6	50.9	0.0	0.8	0.0
Total Bills		1.985	2.8	2,276.5	52.2	3.3	44.5	56.5	0.1	69.3
Total Coupons		1.738	2.4	577.9	29.4	16.6	54.1	1.1	86.4	471.6
Total TIPS		0.289	2.4	33.0	15.8	15.5	68.7	0.0	1.8	50.2
Total FRN		0.248	2.8	56.0	48.5	0.6	50.9	0.0	0.8	0.0

*Weighted averages of Competitive Awards. FRNs are reported on discount margin basis.
**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.

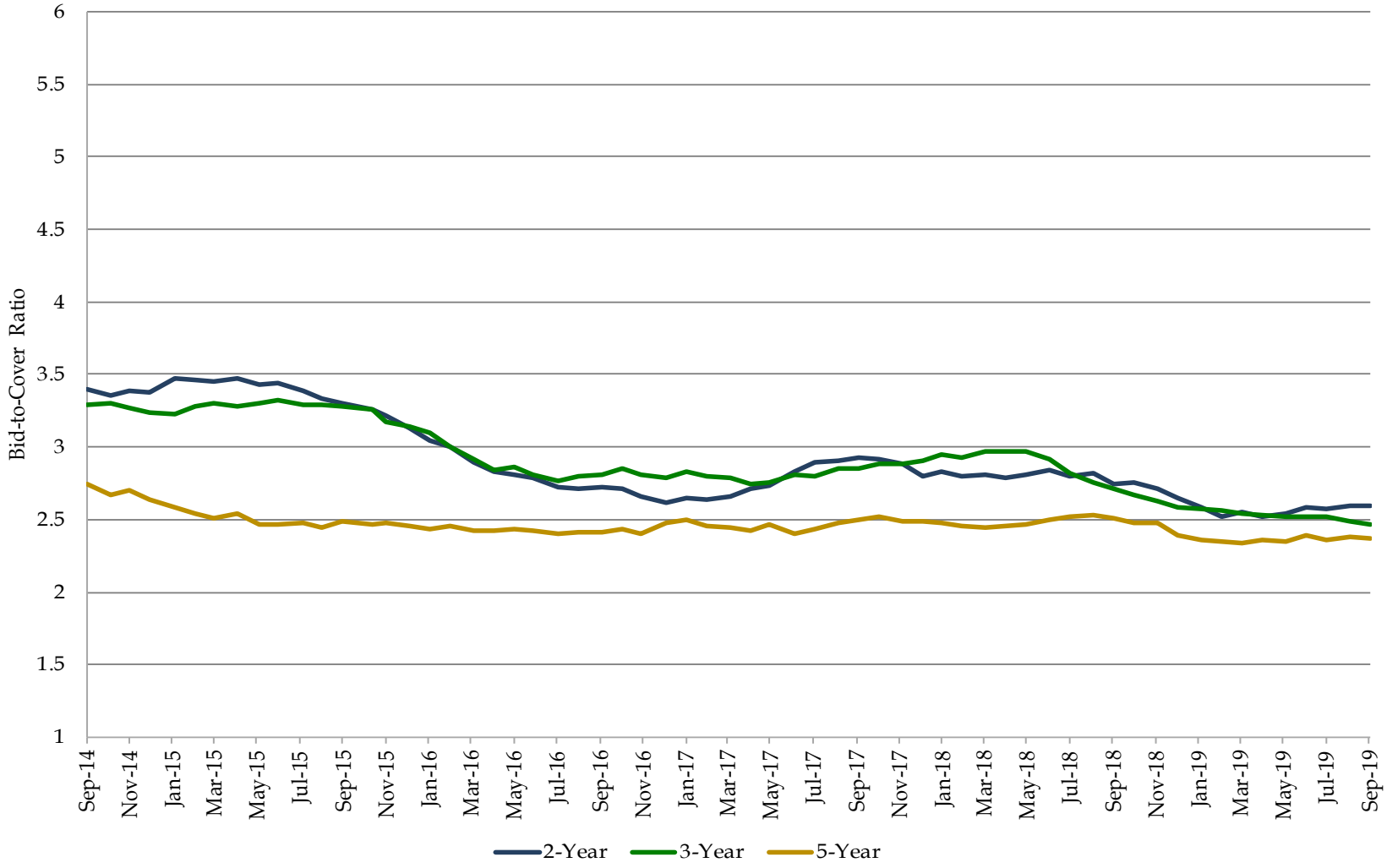
Bid-to-Cover Ratios for Treasury Bills



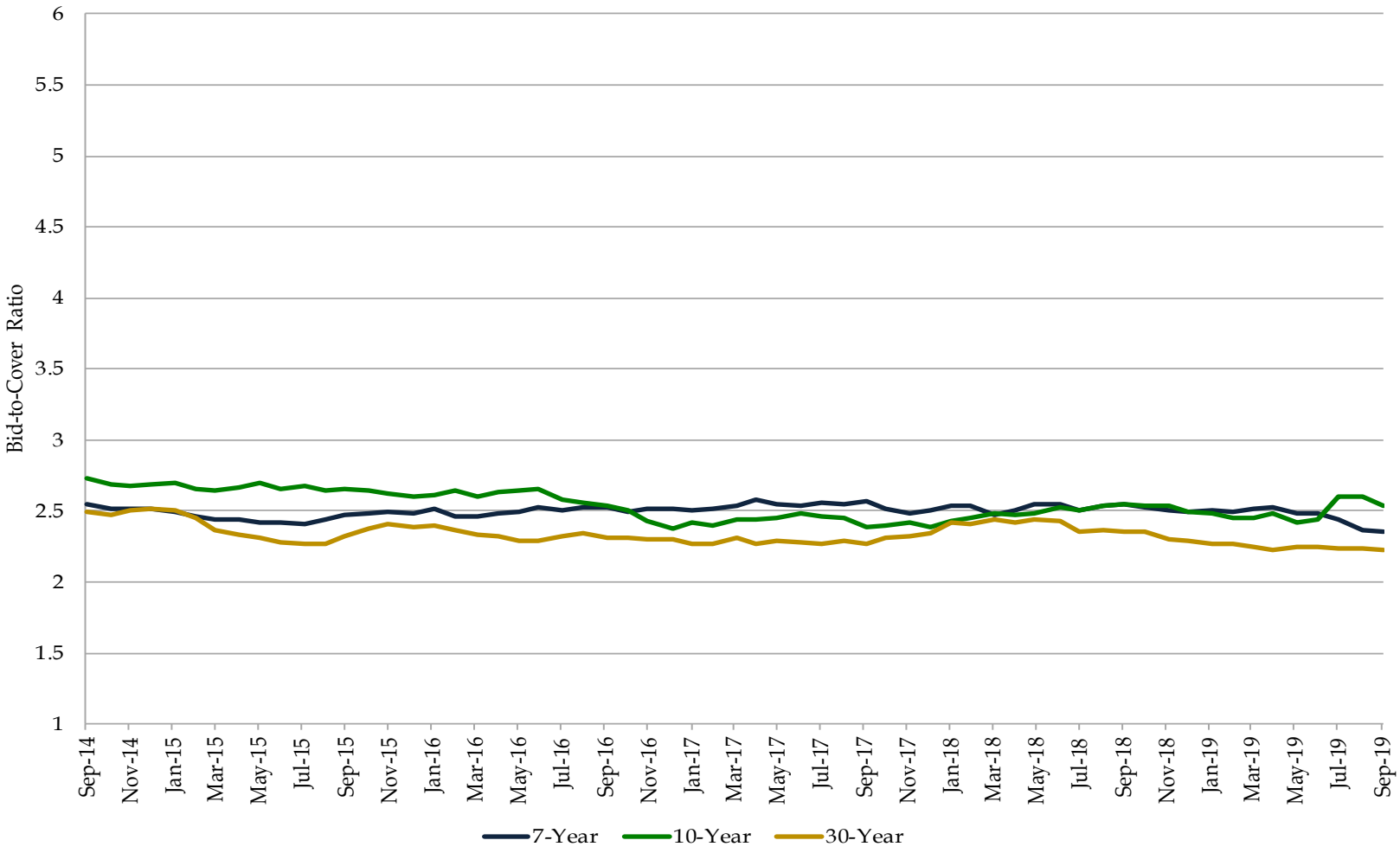
Bid-to-Cover Ratios for FRNs
(6-Month Moving Average)



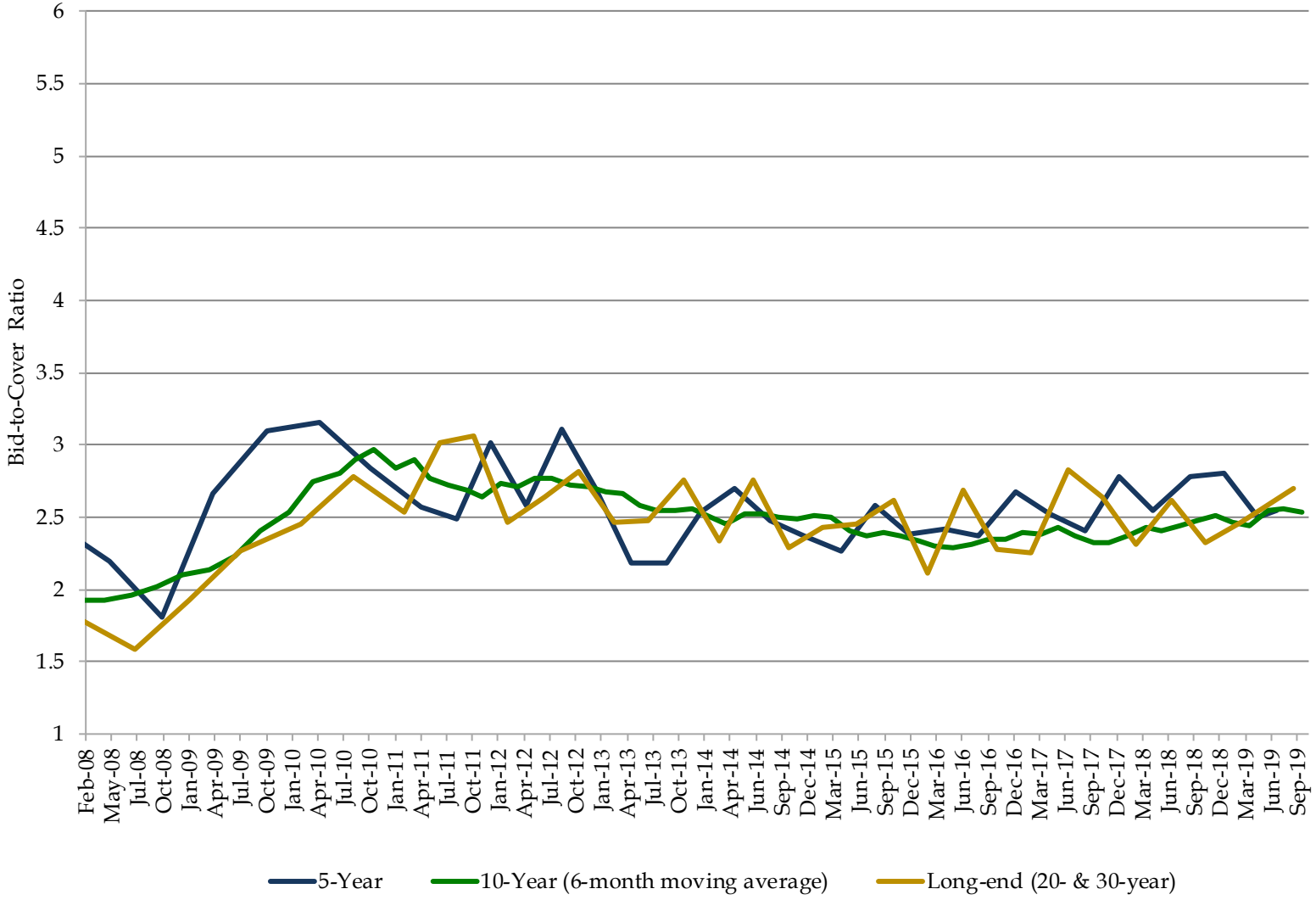
Bid-to-Cover Ratios for 2-, 3-, and 5-Year Nominal Securities (6-Month Moving Average)



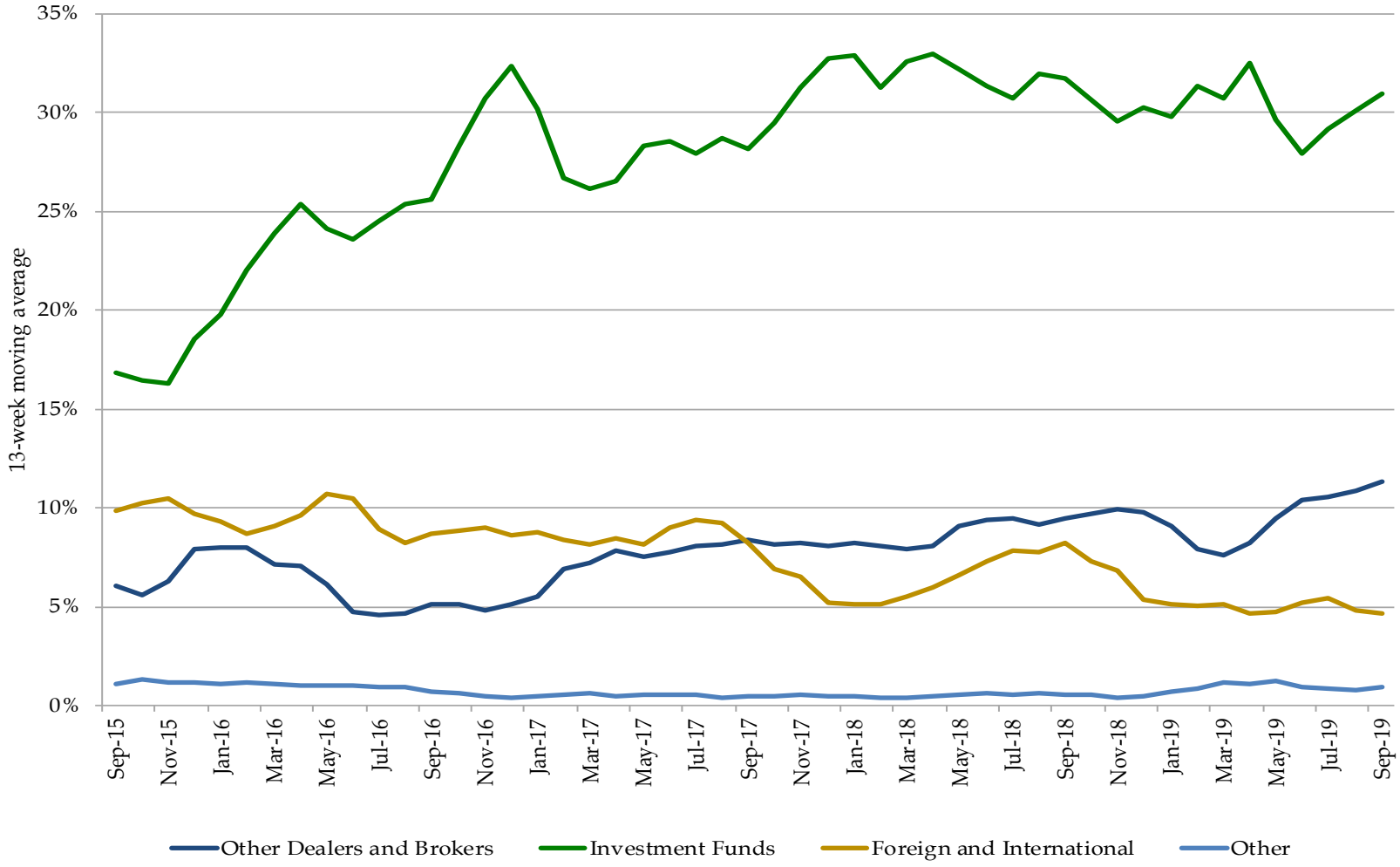
Bid-to-Cover Ratios for 7-, 10-, and 30-Year Nominal Securities (6-Month Moving Average)



Bid-to-Cover Ratios for TIPS

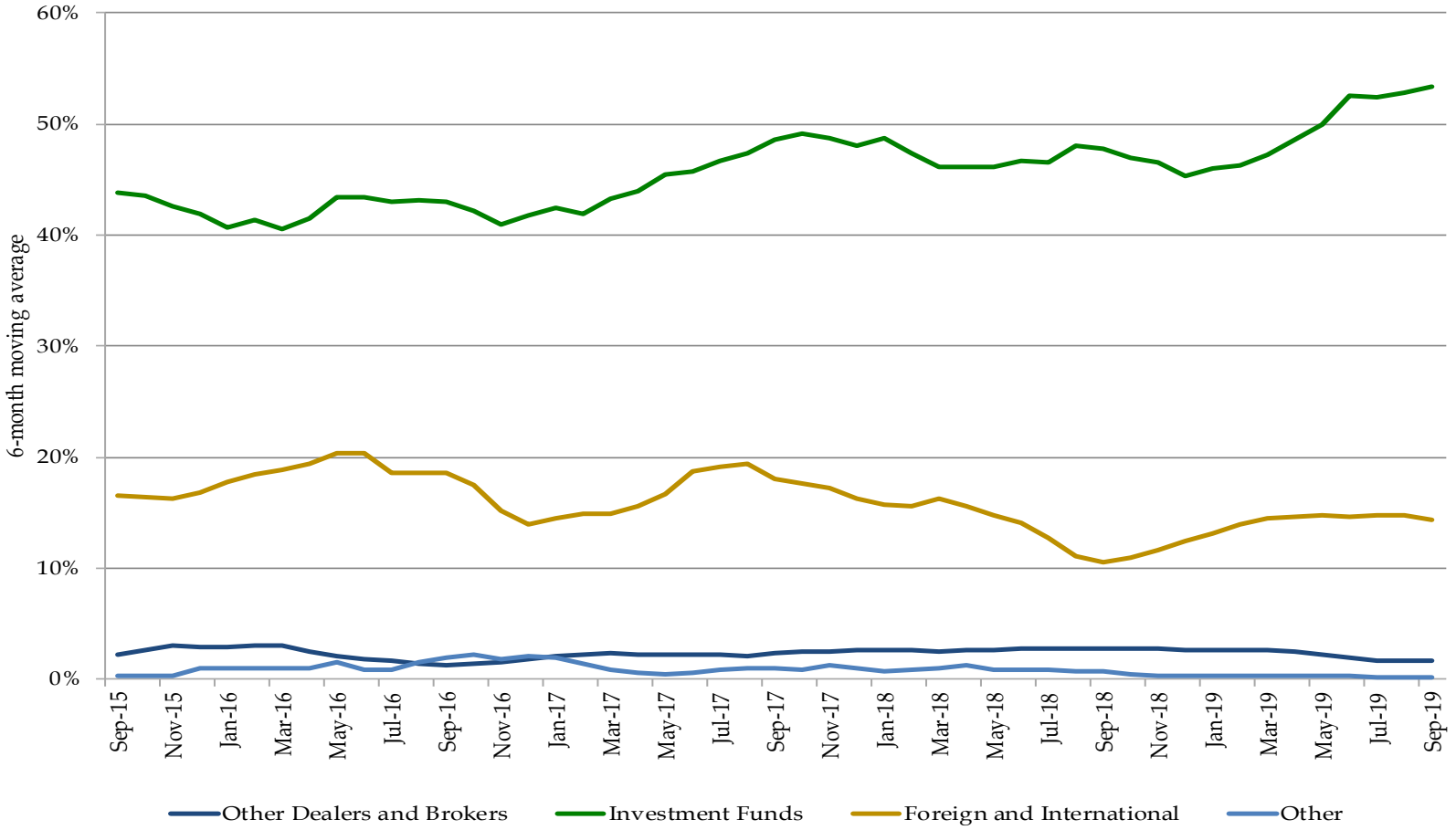


Percent Awarded in Bill Auctions by Investor Class (13-Week Moving Average)



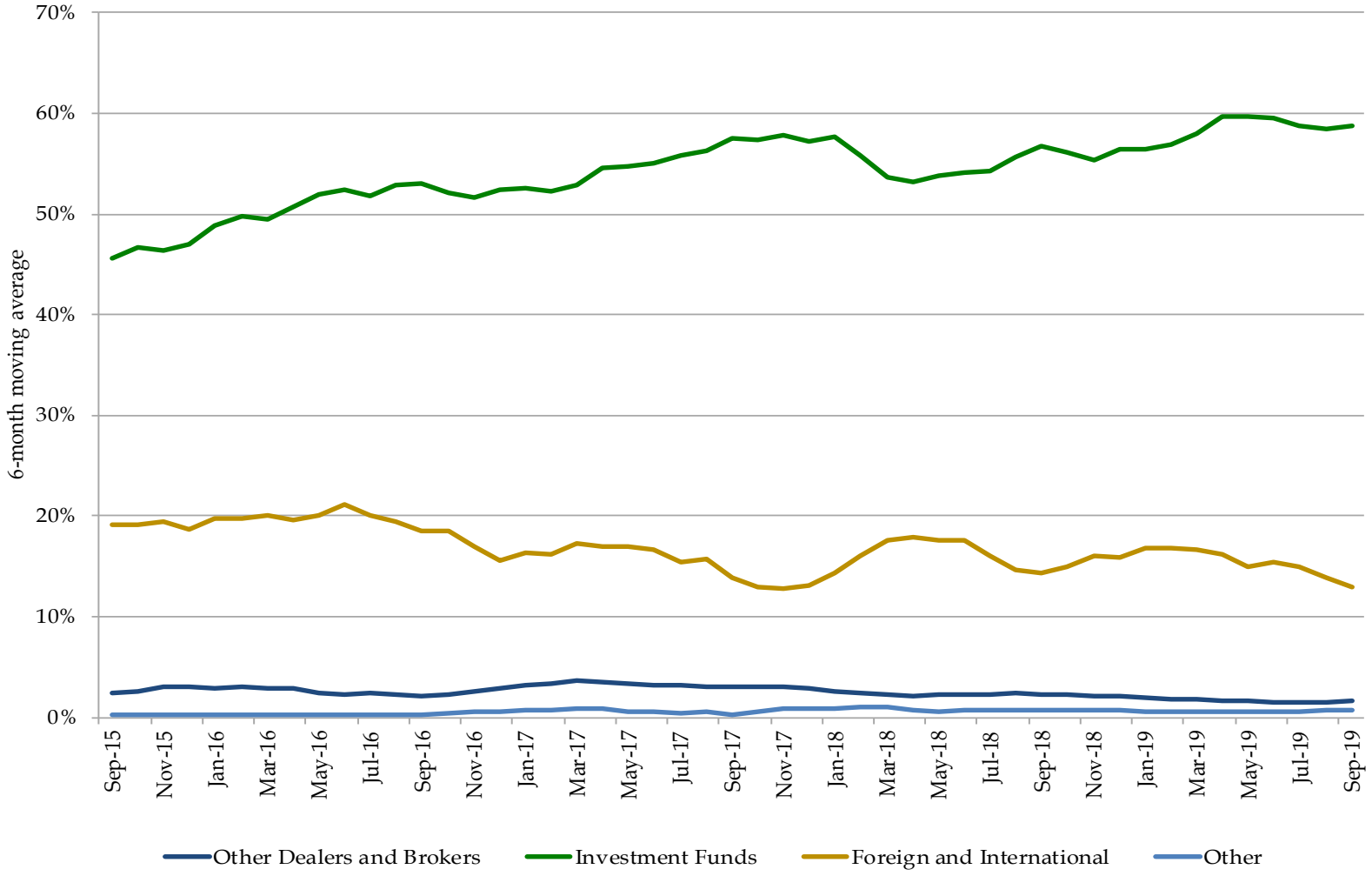
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



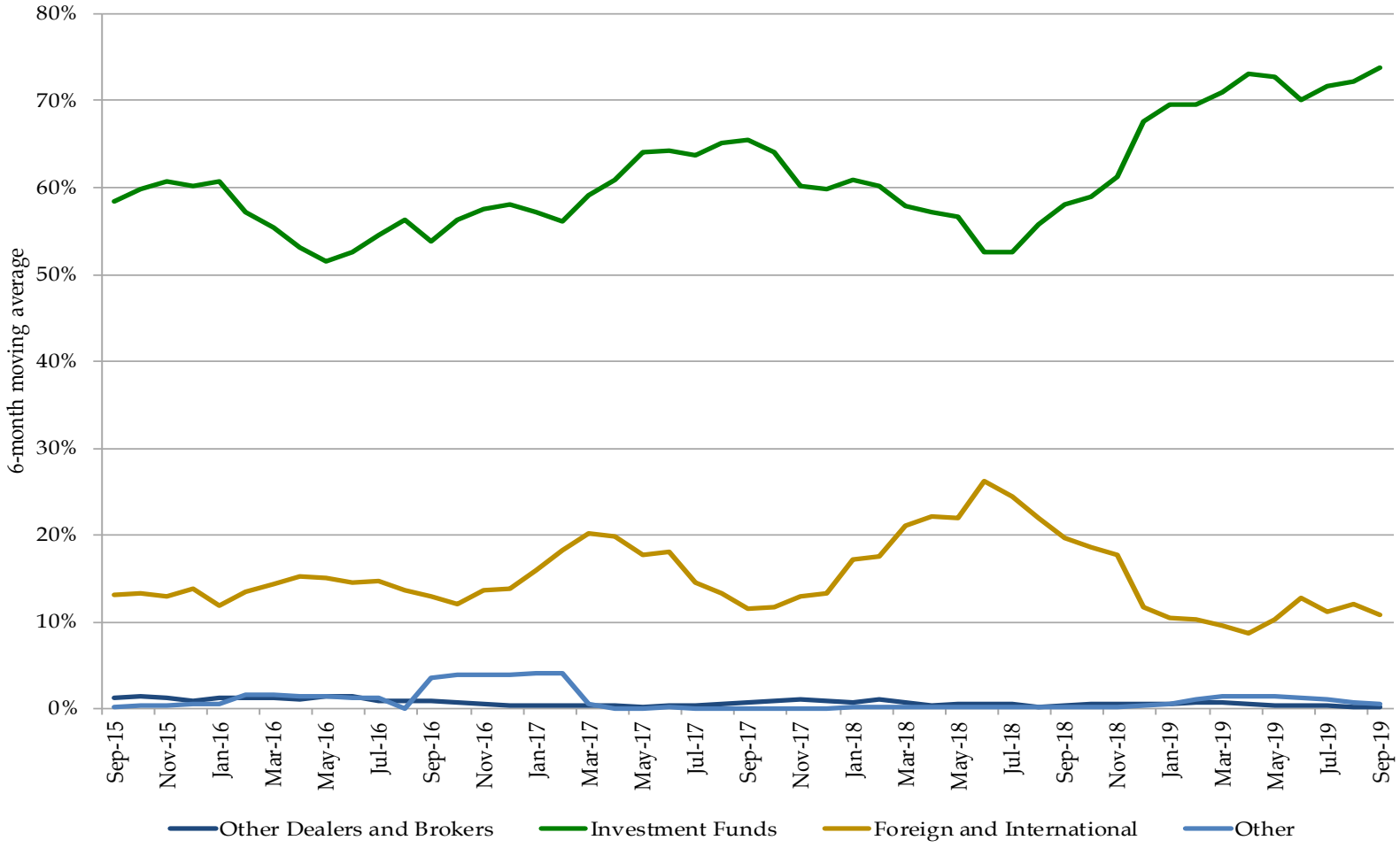
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



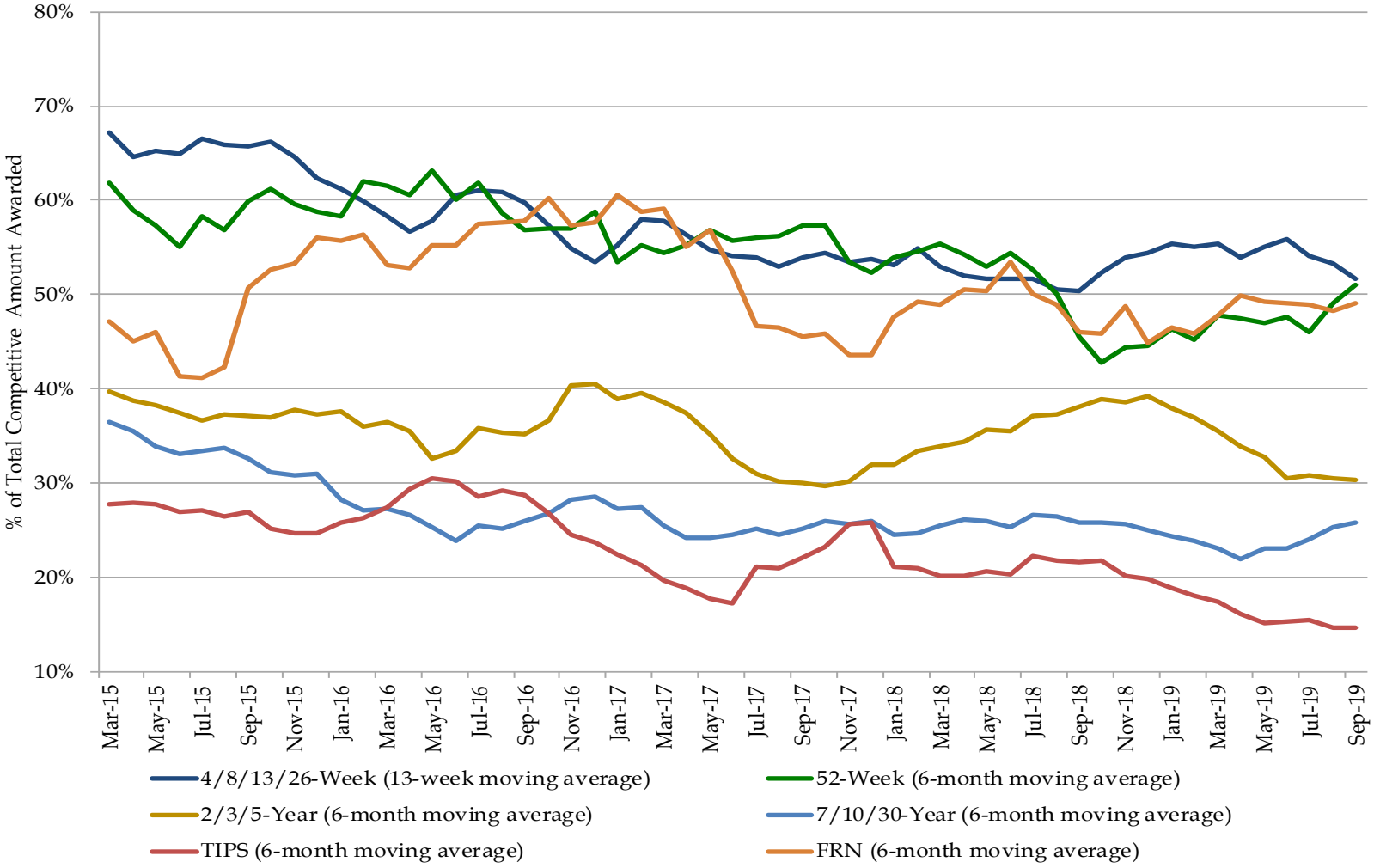
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



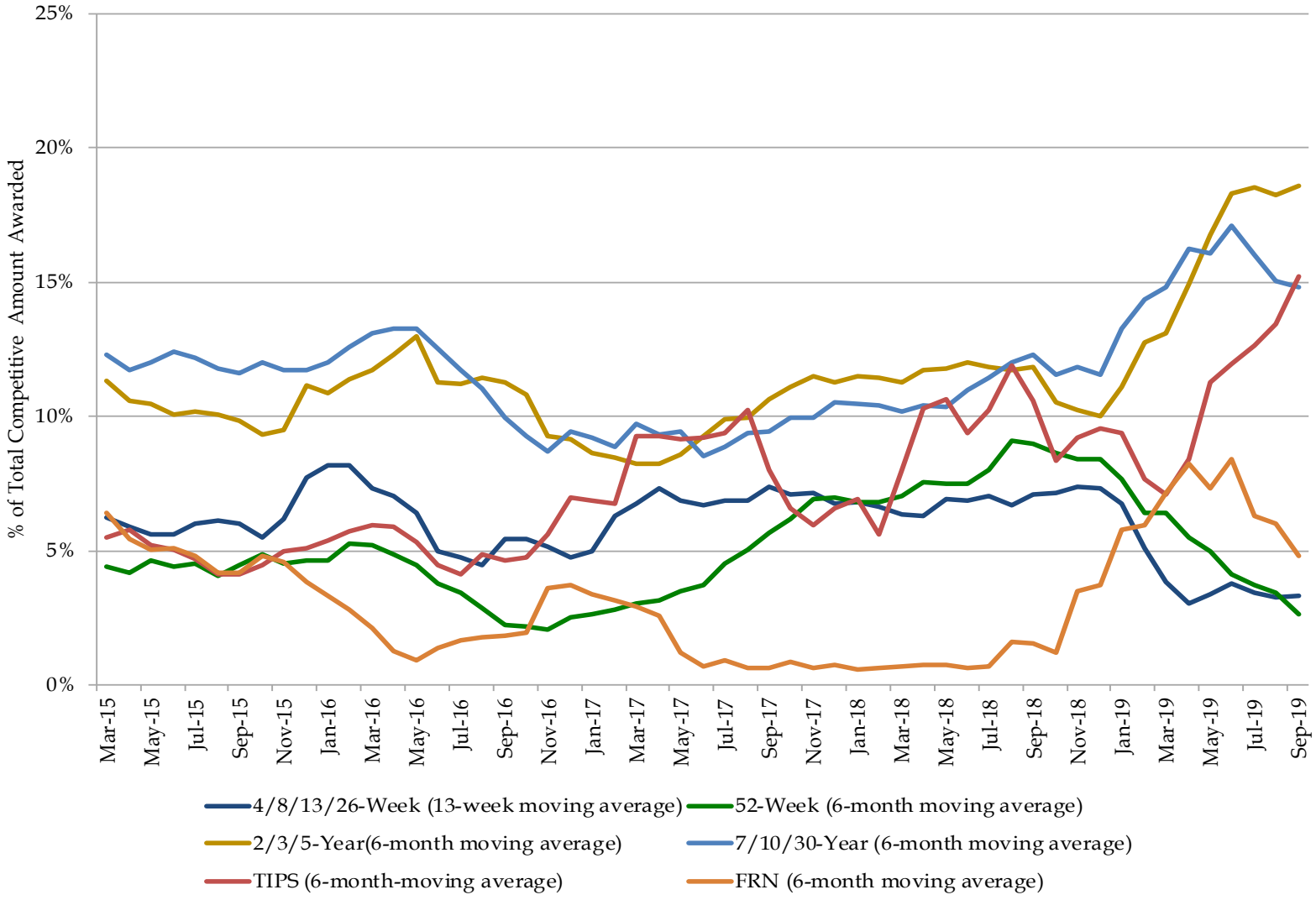
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

Primary Dealer Awards at Auction



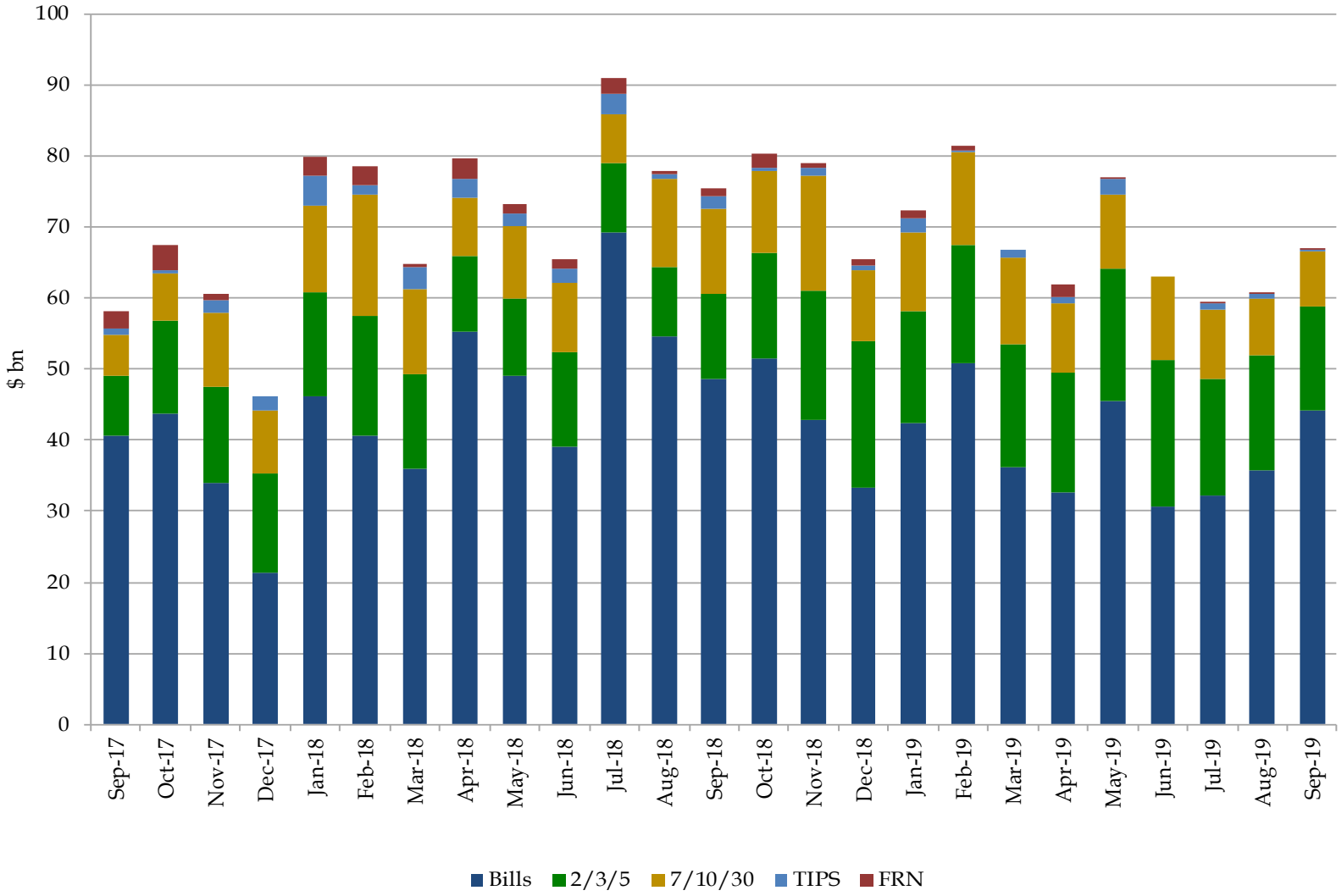
Competitive Amount Awarded excludes SOMA add-ons.

Direct Bidder Awards at Auction



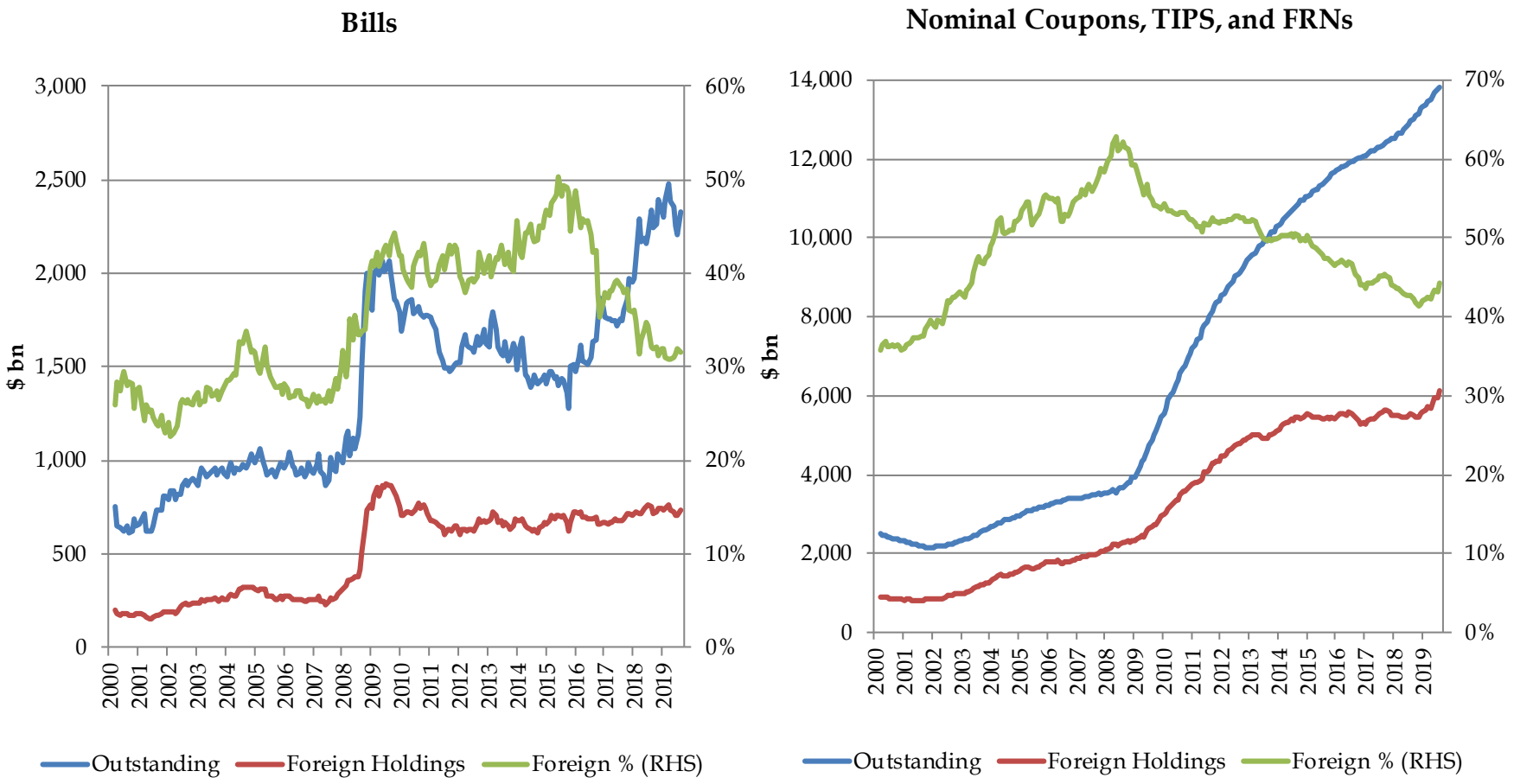
Competitive Amount Awarded excludes SOMA add-ons.

Total Foreign Awards of Treasuries at Auction, $ billions



Foreign includes both private sector and official institutions.

Total Foreign Holdings



Source: Treasury International Capital (TIC) System.
For more information on foreign participation data, including more details about the TIC data shown here, please refer to Treasury Presentation to TBAC "Brief Overview of Key Data Sources on Foreign Participation in the U.S. Treasury Securities Market" at the Treasury February 2019 Refunding.

Appendix

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 2020 Mid-Session Review	CBO's "An Analysis of the President's 2020 Budget "	Primary Dealer Survey
2015	(53)	(282)	641	88	164	558			
2016	289	(82)	477	64	47	795			
2017	155	9	292	55	9	519			
2018	438	209	316	51	26	1,040			
2019	137	533	266	53	55	1,045			
2020	0	464	367	51	35	917	1,112	1,030	1,093
2021	0	320	271	26	0	617	1,082	978	1,108
2022	0	116	379	17	(0)	512	1,030	1,121	1,200
2023	0	143	263	19	5	430	894	1,060	
2024	0	74	245	31	(1)	349	703	940	
2025	0	(48)	316	(48)	(0)	220	659	993	
2026	0	(40)	294	(36)	(3)	215	598	997	
2027	0	4	243	(23)	(2)	221	542	1,077	
2028	0	(16)	248	(52)	3	183	551	1,219	
2029	0	(5)	204	(56)	0	143	266	1,068	

Projections reflect only SOMA rollovers at auction of principal payments of Treasury securities. No adjustments are made for open-market outright purchases and subsequent rollovers.

Treasury's latest primary dealer survey estimates can be found on page 11. OMB's projections of the change in debt held by the public are from Table S-11 of "A Budget for a Better America, Fiscal Year 2020, Mid-Session Review," July 2019. CBO's baseline budget projections of the change in debt held by the public are from Table 2 of CBO's "An Analysis of the President's 2020 Budget," May 2019.

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	7/9/2019	2.210	2.47	38.6	62.9	4.7	32.4	1.4	0.0	0.3
4-Week	7/16/2019	2.135	3.04	33.3	42.7	3.5	53.8	1.7	0.0	0.3
4-Week	7/23/2019	2.090	2.93	33.5	53.9	3.3	42.8	1.5	0.0	0.3
4-Week	7/30/2019	2.110	2.91	33.4	47.3	3.3	49.3	1.6	0.0	0.3
4-Week	8/6/2019	2.080	3.18	33.5	51.3	4.5	44.1	1.5	0.0	0.3
4-Week	8/13/2019	2.065	2.64	48.3	56.1	3.7	40.1	1.7	0.0	0.4
4-Week	8/20/2019	2.040	2.47	53.6	63.2	4.3	32.5	1.4	0.0	0.4
4-Week	8/27/2019	2.060	2.59	53.5	56.3	4.5	39.2	1.5	0.0	0.5
4-Week	9/3/2019	2.060	2.53	53.3	66.2	4.1	29.7	1.7	0.0	0.5
4-Week	9/10/2019	2.025	2.69	53.3	54.8	4.7	40.5	1.7	0.0	0.5
4-Week	9/17/2019	1.940	2.81	48.4	55.8	4.1	40.0	1.6	0.0	0.4
4-Week	9/24/2019	1.950	2.66	43.3	63.5	3.2	33.3	1.7	0.0	0.4
4-Week	10/1/2019	1.880	2.70	43.4	58.3	4.3	37.4	1.6	0.0	0.4
8-Week	7/9/2019	2.155	2.76	34.8	40.3	3.3	56.4	0.2	0.0	0.6
8-Week	7/16/2019	2.130	2.99	34.8	40.0	3.1	56.9	0.2	0.0	0.6
8-Week	7/23/2019	2.120	2.45	34.6	61.0	3.3	35.7	0.4	0.0	0.6
8-Week	7/30/2019	2.140	2.77	34.6	52.7	2.5	44.8	0.4	0.0	0.6
8-Week	8/6/2019	2.100	2.67	34.6	74.1	4.2	21.7	0.4	0.0	0.6
8-Week	8/13/2019	2.050	3.24	39.6	51.6	3.3	45.1	0.4	0.0	0.7
8-Week	8/20/2019	1.950	3.05	39.6	42.5	1.6	55.9	0.4	0.0	0.7
8-Week	8/27/2019	1.985	2.86	39.8	47.8	2.0	50.2	0.2	0.0	0.7
8-Week	9/3/2019	1.990	3.18	39.7	46.0	3.0	51.1	0.3	0.0	0.7
8-Week	9/10/2019	1.960	3.18	39.8	39.3	3.7	57.0	0.2	0.0	0.7
8-Week	9/17/2019	1.920	2.87	39.7	51.8	2.5	45.7	0.3	0.0	0.7
8-Week	9/24/2019	1.950	2.59	39.7	67.6	2.5	29.9	0.3	0.0	0.7
8-Week	10/1/2019	1.860	3.09	39.7	48.5	2.3	49.1	0.3	0.0	0.7

*Weighted averages of competitive awards.
**Approximated using prices at settlement and includes both competitive and non-competitive awards.

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)**
13-Week	7/5/2019	2.145	2.66	35.0	46.6	3.3	50.1	1.0	0.0	1.0
13-Week	7/11/2019	2.210	2.59	34.9	55.4	1.9	42.8	1.1	0.0	1.0
13-Week	7/18/2019	2.115	2.88	34.7	54.8	3.5	41.8	1.3	0.0	1.0
13-Week	7/25/2019	2.040	2.96	34.7	42.7	3.8	53.5	1.3	0.0	1.0
13-Week	8/1/2019	2.070	3.02	34.7	41.3	3.0	55.7	1.3	0.0	1.0
13-Week	8/8/2019	1.990	2.88	37.8	41.1	3.8	55.2	1.2	0.0	1.1
13-Week	8/15/2019	1.960	2.99	40.8	49.9	3.1	47.0	1.2	0.0	1.2
13-Week	8/22/2019	1.900	2.51	44.0	74.1	4.3	21.6	1.0	0.0	1.2
13-Week	8/29/2019	1.950	2.74	43.8	51.7	2.1	46.2	1.2	0.0	1.2
13-Week	9/5/2019	1.930	2.95	43.8	44.1	3.3	52.6	1.2	0.0	1.2
13-Week	9/12/2019	1.920	3.05	43.8	44.7	3.1	52.1	1.2	0.0	1.2
13-Week	9/19/2019	1.945	2.68	43.8	51.1	4.2	44.7	1.2	0.0	1.2
13-Week	9/26/2019	1.905	3.04	43.7	42.0	5.7	52.3	1.3	0.0	1.2
13-Week	10/3/2019	1.840	2.49	44.1	58.5	2.9	38.5	0.9	0.0	1.2
26-Week	7/5/2019	2.040	2.91	35.0	46.7	1.9	51.3	1.0	0.0	2.0
26-Week	7/11/2019	2.075	2.95	35.0	44.9	2.3	52.8	1.0	0.0	2.0
26-Week	7/18/2019	2.010	3.22	34.8	42.8	2.1	55.1	1.2	0.0	2.0
26-Week	7/25/2019	2.010	2.69	34.9	70.8	1.1	28.1	1.1	0.0	2.0
26-Week	8/1/2019	2.035	3.04	34.9	45.9	1.7	52.4	1.1	0.0	2.0
26-Week	8/15/2019	1.890	3.06	40.8	45.9	2.3	51.8	1.2	0.0	2.4
26-Week	8/22/2019	1.840	2.86	40.9	47.3	2.2	50.5	1.1	0.0	2.2
26-Week	8/29/2019	1.840	3.05	41.0	36.2	1.0	62.8	1.0	0.0	2.2
26-Week	9/5/2019	1.825	3.10	41.1	40.2	10.1	49.7	0.9	0.0	2.3
26-Week	9/12/2019	1.825	2.98	41.2	43.8	1.7	54.5	0.8	0.0	2.3
26-Week	9/19/2019	1.870	2.74	41.0	47.2	2.2	50.7	1.0	0.0	2.3
26-Week	9/26/2019	1.860	2.77	41.0	50.1	7.4	42.5	1.0	0.0	2.3
26-Week	10/3/2019	1.795	2.83	41.0	42.3	1.9	55.8	1.0	0.0	2.3
52-Week	7/18/2019	1.915	2.87	25.5	48.0	3.1	48.9	0.5	0.0	2.9
52-Week	8/15/2019	1.800	2.66	27.6	63.1	3.4	33.4	0.4	0.0	3.2
52-Week	9/12/2019	1.740	2.81	27.6	60.1	2.4	37.5	0.4	0.0	3.0
CMB	8/2/2019	2.110	2.58	35.0	70.7	1.1	28.2	0.0	0.0	0.5

*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	7/31/2019	1.825	2.50	39.7	31.6	24.9	43.5	0.3	1.6	9.4
2-Year	9/3/2019	1.516	2.60	39.7	32.5	20.4	47.1	0.3	5.2	9.6
2-Year	9/30/2019	1.612	2.64	39.9	27.1	15.9	57.0	0.1	4.2	9.5
3-Year	7/15/2019	1.857	2.39	38.0	33.6	17.9	48.5	0.0	0.3	12.8
3-Year	8/15/2019	1.562	2.41	38.0	34.0	19.3	46.7	0.0	24.8	21.1
3-Year	9/16/2019	1.573	2.42	37.9	37.2	16.6	46.2	0.1	0.0	12.2
5-Year	7/31/2019	1.824	2.26	40.9	32.9	13.7	53.4	0.1	1.6	23.4
5-Year	9/3/2019	1.365	2.48	41.0	21.6	18.7	59.7	0.0	5.3	24.3
5-Year	9/30/2019	1.600	2.32	41.0	27.0	14.2	58.8	0.0	4.3	23.9
7-Year	7/31/2019	1.967	2.27	32.0	24.8	15.8	59.4	0.0	1.3	25.0
7-Year	9/3/2019	1.489	2.16	32.0	33.8	16.1	50.2	0.0	4.2	26.2
7-Year	9/30/2019	1.633	2.49	32.0	20.2	14.6	65.2	0.0	3.3	25.7
10-Year	7/15/2019	2.064	2.41	24.0	26.4	12.9	60.8	0.0	0.2	24.2
10-Year	8/15/2019	1.670	2.20	27.0	30.7	13.6	55.7	0.0	17.6	47.2
10-Year	9/16/2019	1.739	2.46	24.0	24.7	12.7	62.6	0.0	0.0	24.0
30-Year	7/15/2019	2.644	2.13	16.0	33.2	16.8	50.0	0.0	0.1	37.2
30-Year	8/15/2019	2.335	2.24	19.0	26.1	12.5	61.3	0.0	12.4	78.2
30-Year	9/16/2019	2.270	2.22	16.0	26.4	13.3	60.3	0.0	0.0	38.0
2-Year FRN	7/31/2019	0.220	2.73	20.0	51.1	0.1	48.7	0.0	0.8	0.0
2-Year FRN	8/30/2019	0.238	2.92	18.0	43.6	0.1	56.3	0.0	0.0	0.0
2-Year FRN	9/27/2019	0.290	2.66	18.0	50.5	1.6	47.9	0.0	0.0	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	7/31/2019	0.282	2.28	14.0	17.1	18.6	64.3	0.0	0.6	16.4
10-Year TIPS	9/30/2019	0.174	2.41	12.0	17.3	16.3	66.4	0.0	1.2	14.1
30-Year TIPS	8/30/2019	0.501	2.70	7.0	10.6	7.7	81.6	0.0	0.0	19.7

*Weighted averages of competitive awards. FRNs are reported on discount margin basis.
**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.

Effect of SOMA Purchases on Net Privately-Held Marketable Borrowing

- Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when they mature would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA "add-on" amount:

- As illustrated below, if SOMA had purchased $5 billion of 9/19 maturing T-bills and then reinvested the proceeds, Treasury could have reduced privately-held *gross* issuance by an equivalent amount and still have achieved the same net privately-held marketable borrowing figure. Alternatively, Treasury could have maintained privately-held gross issuance and net cash raised would have increased by $5 billion.

Actual

Security	July - September 2019 Treasury Issuance		
	Private	SOMA	Total
Gross	3,017	95	3,112
Maturing	2,577	125	2,702
Net	440	(30)	410

Scenario 1: Treasury Reduces Privately-Held Gross Issuance

Security	July - September 2019 Treasury Issuance		
	Private	SOMA	Total
Gross	3,012	100	3,112
Maturing	2,572	130	2,702
Net	440	(30)	410

Scenario 2: Treasury Maintains Privately-Held Gross Issuance

Security	July - September 2019 Treasury Issuance		
	Private	SOMA	Total
Gross	3,017	100	3,117
Maturing	2,572	130	2,702
Net	445	(30)	415

- A reminder: when SOMA redeems (rather than reinvests) its maturing Treasury securities, privately-held net marketable borrowing needs increase (all else being equal) as Treasury must finance those redemptions via private market participants.

Sample Auction Calendar for End-of-December 2019 *

Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
16	17	18	19	20
			Announce end-of-month coupon supply	
23	24	25	26	27
11:30am: 3- & 6-Month Bills 1:00pm: 2-Year Note	10:00am: 2-Year FRN 11:30am: 5-Year Note	Christmas	11:30am: 1- & 2-Month Bills 1:00pm: 7-Year Note	
30	31			
11:30am: 3- & 6-Month Bills 1:00pm: 1-Year Bill				

* This sample calendar is pre-decisional and for discussion purposes only.

20-Year Bond Issuance

October 2019

TBAC Charge

Over the past several years, TBAC and market participants have proposed that Treasury consider issuing a 20-year nominal coupon bond. Treasury would like the Committee to comment on the current expected demand and pricing for a 20-year Treasury bond. Additionally, how should Treasury consider incorporating such a security into its issuance calendar?

Outline

1. **Approach**

2. **Demand and Market Considerations**
   - Foreign demand
   - Pension funds, Insurance companies
   - Corporates
   - Futures relative value

3. **Expected Valuation and Pricing**
   - Historical context
   - Fair value expected pricing
   - 20-year experience outside the U.S.

4. **Optimal Product Structure**

5. **Conclusions and Recommendations**

Approach

Approach to Analyzing 20-Year Bond Issuance

Treasury's Debt Management Objective:

"To fund the deficit and refinance maturing debt at the least expected cost to taxpayers over time"

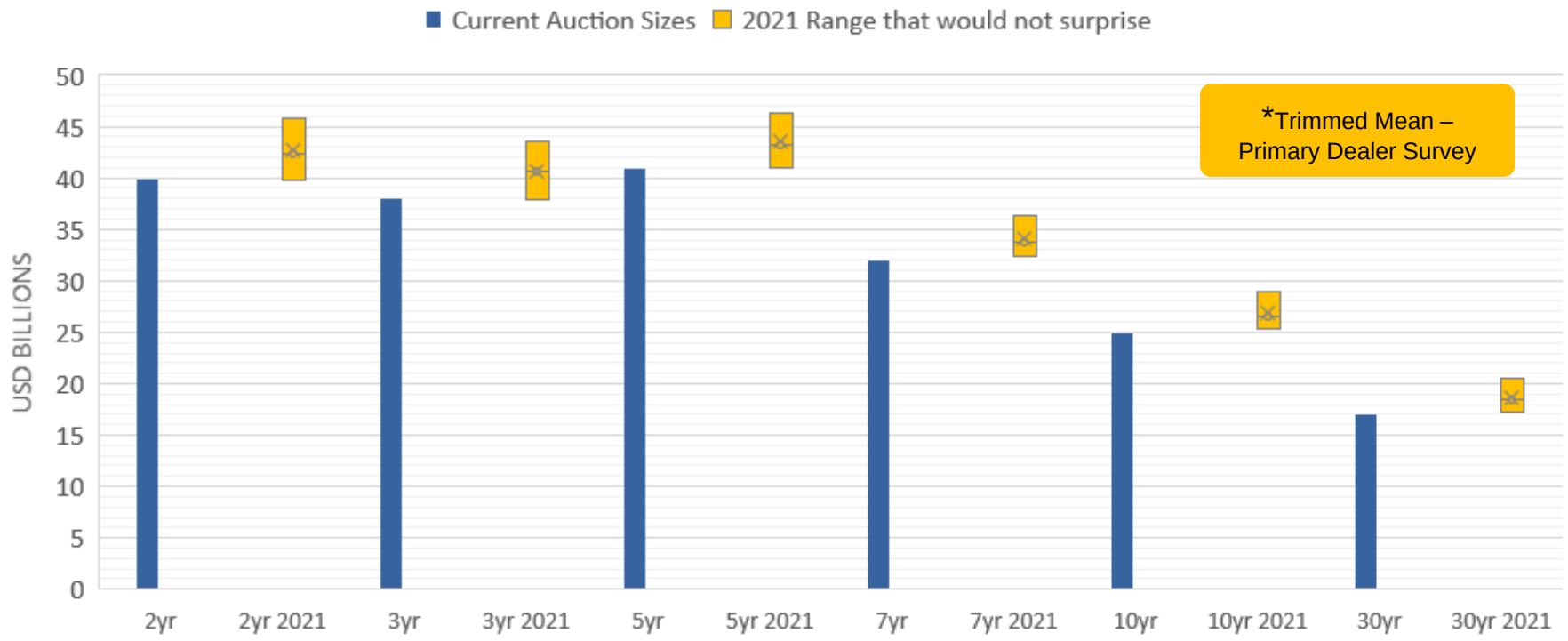
Framework Employed to Analyze 20-Year Bond Issuance:

- We define "expected cost to taxpayers" through valuation versus a fair value curve that takes into account short rate expectations, term premium and value of convexity
- While yield is presented throughout the presentation for comparison purposes, the recommendations are based on expected deviation versus a fair value curve
- The analysis evaluates the 20-year versus duration weighted 10s and 30s
- Our assessment incorporates the Treasury's "regular and predictable" long term auction philosophy

Auctions Sizes Approaching High End of Primary Dealer Expectations

- The federal deficit is projected to be approximately 4.5% of GDP in 2019 and, by some estimates, will likely rise further over time
- While current Treasury issuance covers projected near-term funding needs, the expected funding gap for fiscal 2021 is approximately $300-$450 billion
- Trimmed mean Primary Dealer Survey results suggest the current auction sizes are approaching the high end of their expectations, supporting the addition of a new auction point on the yield curve

Primary Dealer Poll of Auction Sizes That Would Not Surprise



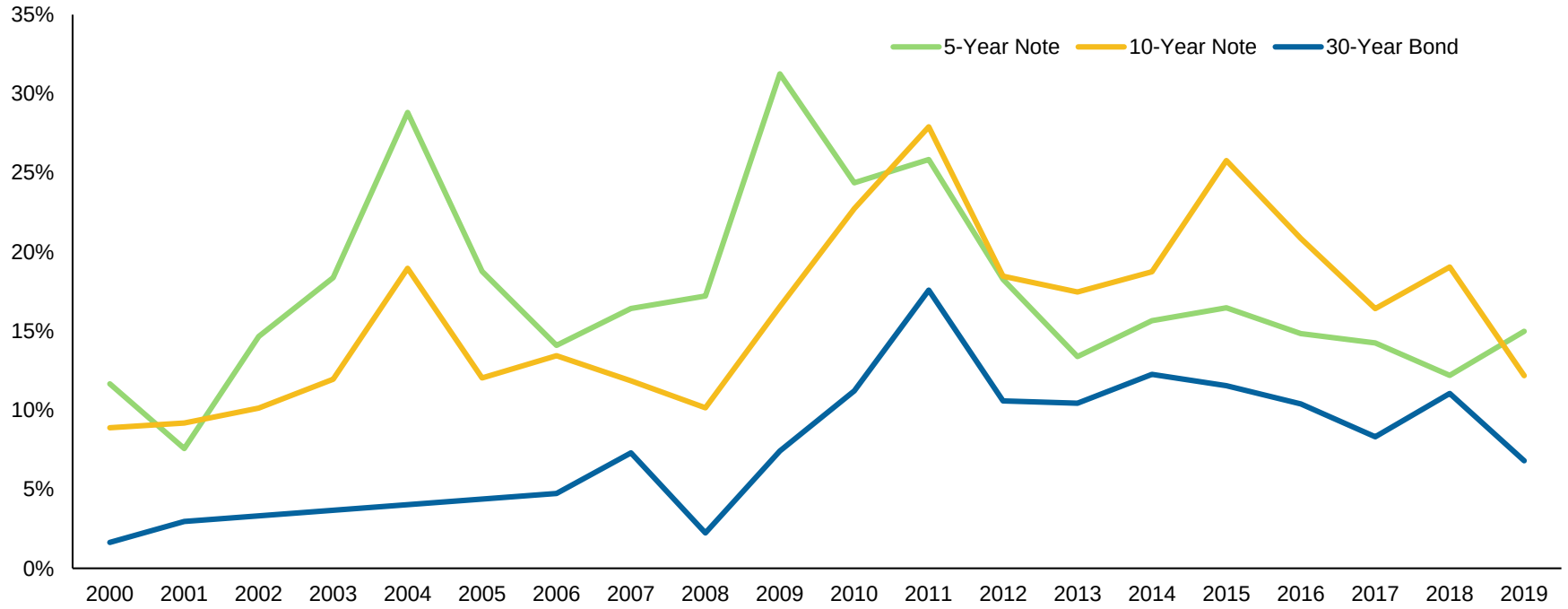
Source: Primary Dealer Survey (April 2019) and Treasury Direct

Demand and Market Considerations

Foreign Demand for 20-Year Treasury Not Likely to be A Major Driver of Auction Demand

- Foreign investor demand is typically concentrated in the intermediate part of the curve and is not expected to be a major driver of 20-year auction demand
- The allotment to foreign and international investors at the 30-year bond auction has averaged 8% since 2000 (vs. 18% for 5-year notes and 16% for 10-year notes since 2000)

Foreign Allotment at Treasury Auctions



Note: The break in 30-year data is due to Treasury's discontinuation of 30-year bonds during this period.

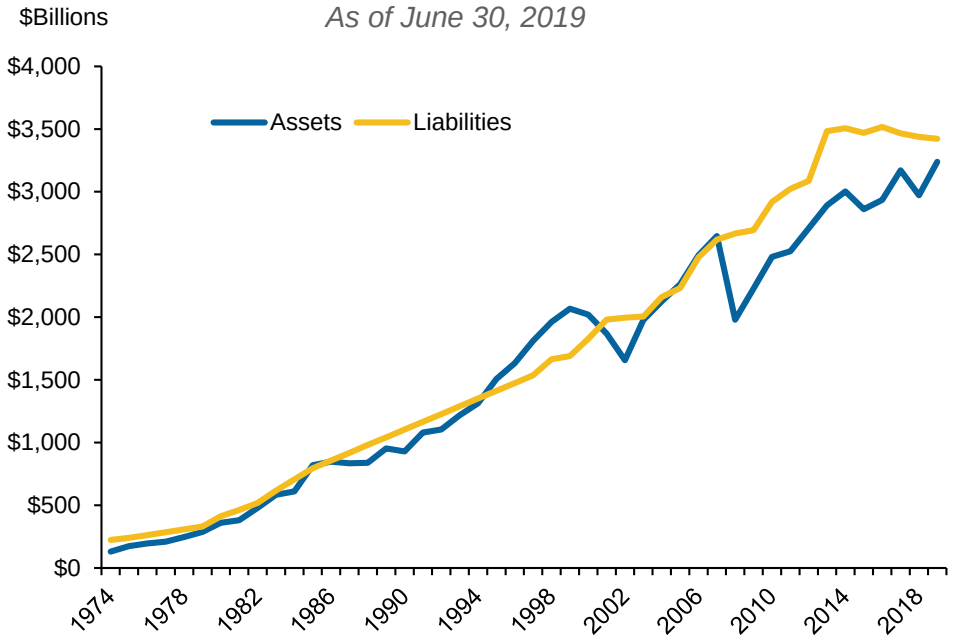
Source: Treasury Direct.

Size of Corporate Defined Benefit Market Has Grown Significantly

- Corporate defined benefit pension legislation, regulation and accounting have also changed to alter demand for fixed income assets
  - PPA 2006, FASB 87 and 158 have all incentivized pension plans to match assets with liabilities and increased their demand for long duration bonds
- We can compare the U.S. experience and demand for long dated issuance with other countries, large defined benefit pension liabilities and 20-year sovereign issuance
  - The size of the U.S. pension liability relative to the long dated issuance is smaller than the UK and Japan
- Corporate defined benefit market is expected to shrink over time, however this may be offset in the future by increasing use of long duration bonds in defined contribution plans

U.S. Corporate—Defined Benefit

As of June 30, 2019



U.S. Corporate & Sovereign Issuance—Defined Benefit

	UK[1]	US[1]	Japan[2]
Total Corp and Sovereign Debt Outstanding Maturity > 10 years ($BN)	1,314	4,338	3,216
Pension Plan Assets ($BN)	1,573	2,972	3,318
Pension Assets as % of Total Corp and Sovereign Debt > 10 years	120%	69%	103%

Sources: PPF Purple Book 2018, Willis Towers Watson Global Pension Asset Study 2019, Milliman Corporate Pension Funding Study 2019, ICI Retirement Assets Study, ICE BAML Indices. UK data as at 3/31/2018. All other data as at 12/31/2018.

[1] Includes only corporate defined benefit pension plans

[2] Includes both defined benefit and defined contribution plans

Corporate Pension Plan Liabilities Could Support Demand for 20-year Bonds

- Corporate pension plan liabilities have significant key rate exposure to the 20-year part of the curve (see table below)
- Corporate pension plans have had preference for fixed income securities with high duration per dollar invested—this is indicated by the richness of interest rate swaps, Treasury futures, and long Treasury Principal STRIPS
- As corporate pension plans mature, they will likely focus more on cashflow and key rate duration matching and would require more 20-year key rate exposure
- Other markets, such as the UK and Japan, also have large corporate DB plans and include 20-year bonds in their suite of sovereign debt issuance

Cashflow Defeasance of Typical U.S. Corporate DB Plan[1]

As of September 30, 2019

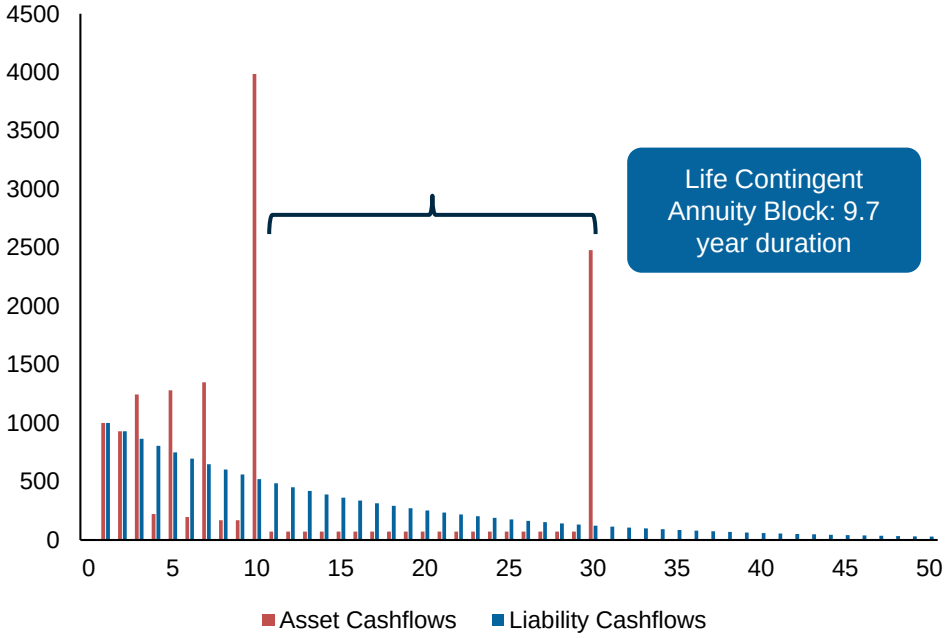
Maturity	% Par Bond Defeasance	Duration Contribution
0-2 year	4.4%	0.1
2-7 year	9.7%	0.9
7-15 year	21.9%	3.2
15-25 year	28.9%	4.4
25-35 year	20.6%	2.7
35-45 year	9.8%	1.1
45+ years	4.6%	0.4
Total	**100%**	**12.7**

Source: Committee participant

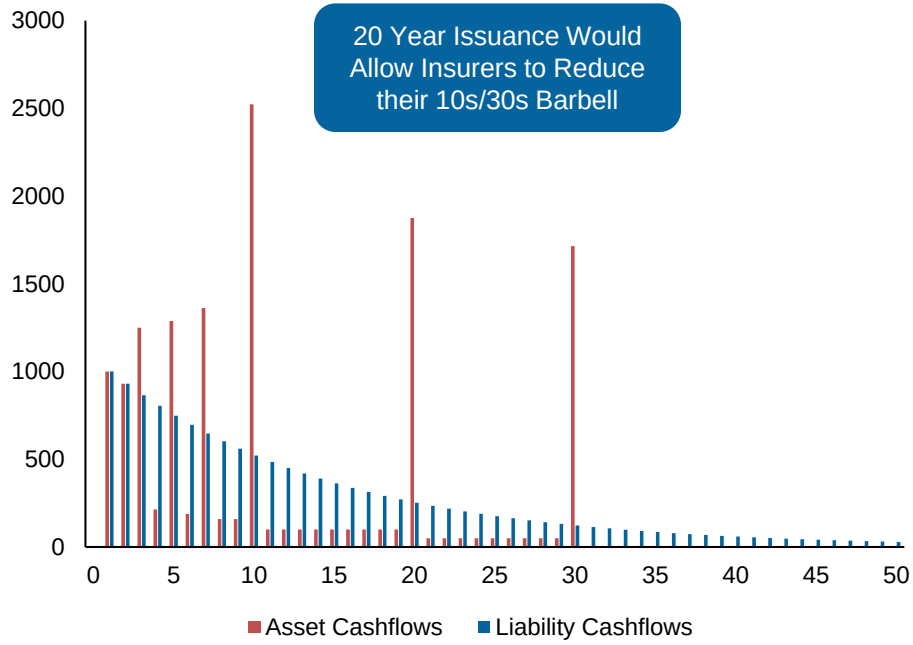
20-Year Treasury Issuance Could Facilitate Improved Cashflow Matching for Insurers

- Regulatory testing and accounting considerations push life and annuity companies to adopt a cashflow 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
- 20-year 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, supporting liquidity of a new 20-year Treasury

Difficult to Cashflow Match Liabilities With Only 10-Year/30-Year Issuance



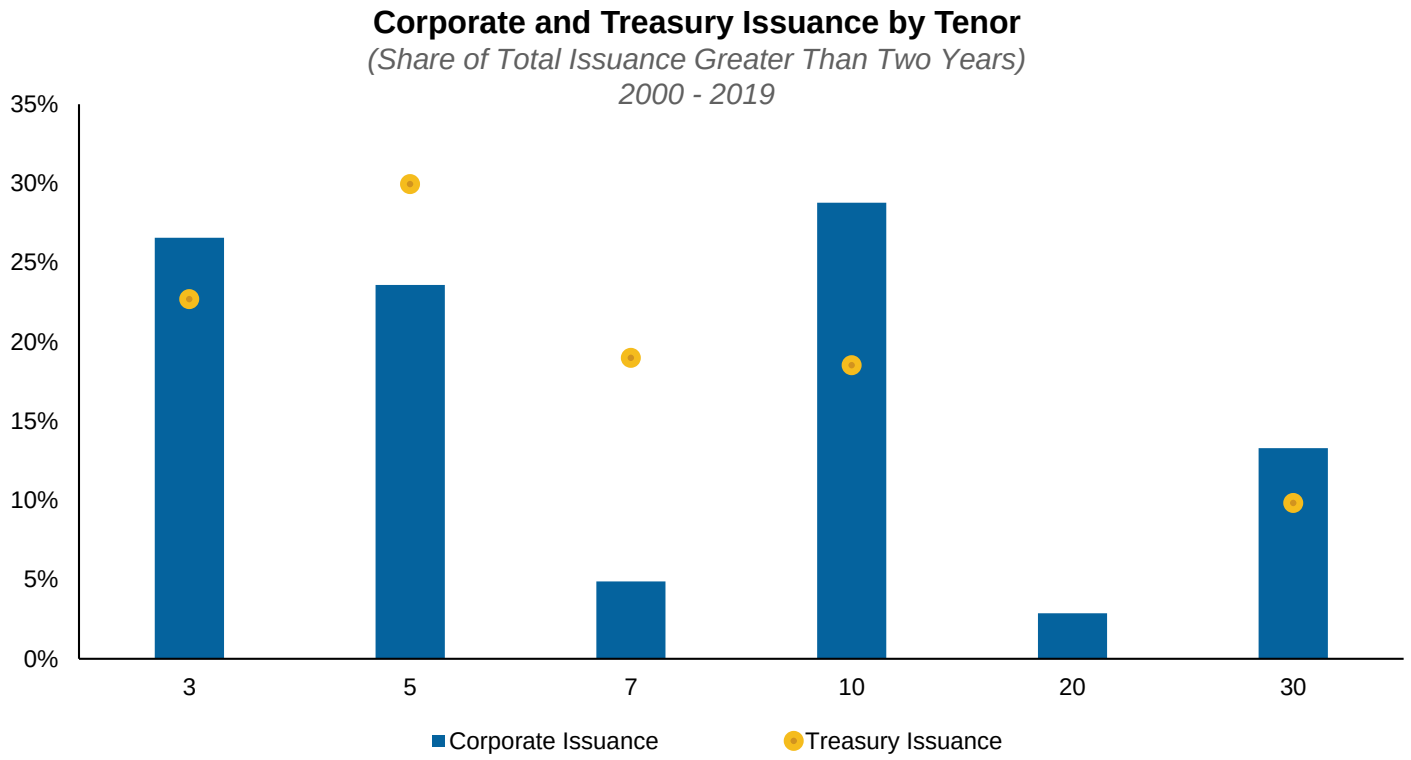
20-Year Issuance Improves Cashflow Match
KRD Matched Portfolio With 20yr Issues



Source: Committee Participant Model

Treasury Could Benefit from Issuing at Additional Maturities That Match Corporate Funding Needs

- Corporates prefer to issue where there is a liquid benchmark Treasury
  - Despite the lack of a 20-year benchmark Treasury, there has still been some corporate issuance
- Availability of liquid benchmark Treasuries provides a basis for hedging interest rate risk and pricing credit risk
  - This creates structural demand for on-the-run Treasuries and contributes to their liquidity premia, which Treasury captures at auction



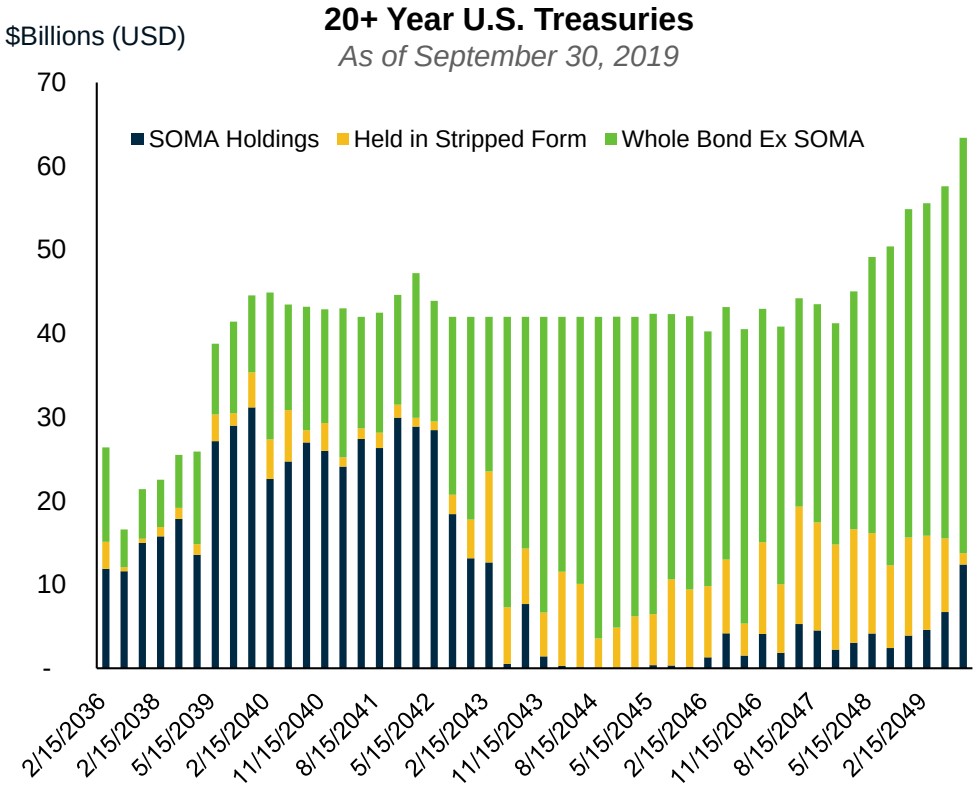
Source: JPMorgan and Haver.

Alternative to U.S. Treasury Futures and STRIPS

- Currently, the Treasury Long Bond (US) futures contract is the dominant hedging instrument in the 20-year sector due to:
  - The lack of a liquid benchmark 20-year bond
  - The less liquid nature of the off-the-run issues in that sector
  - The unfunded nature of a futures contract
- An on-the-run 20-year Treasury would provide an alternative to the US futures contract by:
  - Creating a liquid point for primary dealers to hedge their STRIPS holdings
  - Making Principal STRIPS more available for liability driven investors

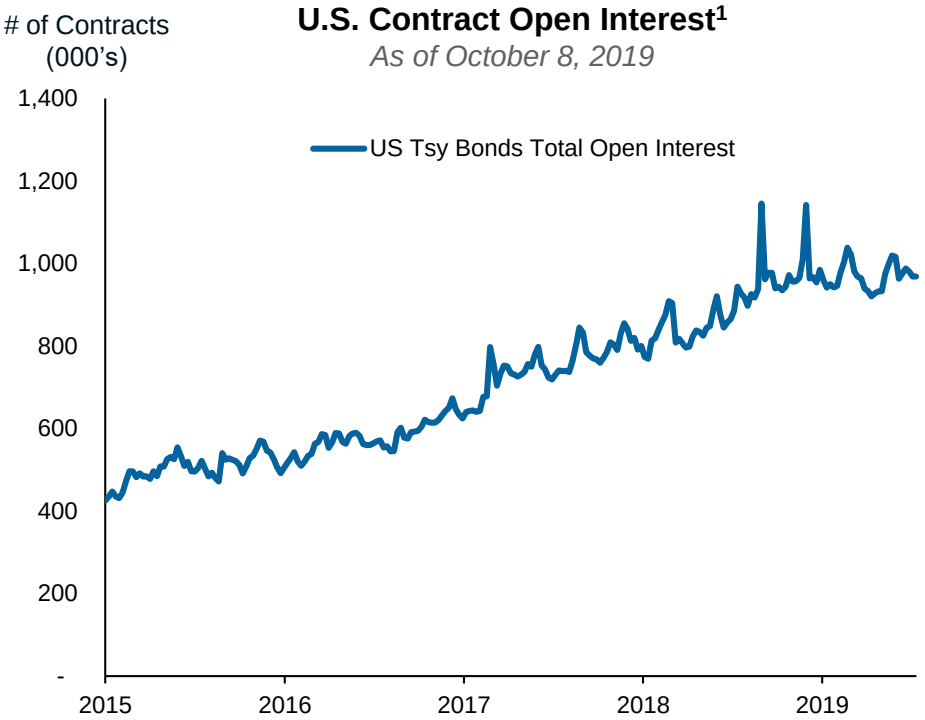
20+ Year U.S. Treasuries

As of September 30, 2019



U.S. Contract Open Interest[1]

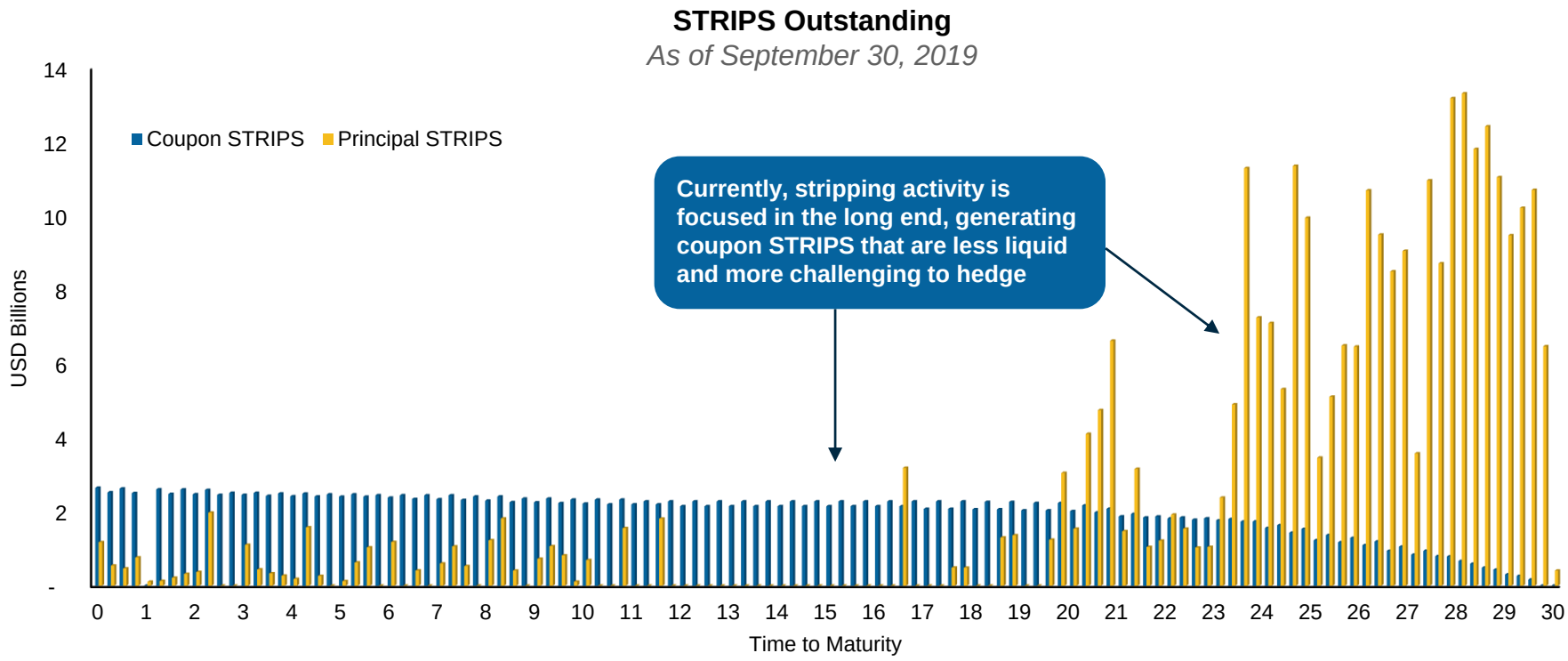
As of October 8, 2019



Source of chart on left: Treasury MSPD, Federal Reserve.
Source of chart on right: CFTC
[1] Reflects open Interest since the roll to 4.5 Feb 36's as CTD

20-Year Treasury Would Support STRIPS Market Liquidity

- Currently, the STRIPS market is primarily focused in longer maturity issues as pensions and other liability driven investors seek to add duration to the portfolios while minimizing cash outlays. This process generates coupon STRIPS held on dealers' balance sheets
- By adding a liquid point in the 20-year sector dealers gain an added tool to hedge STRIPS exposure in the 20-year part of the curve. This, in turn, improves dealers' ability to manage STRIPS risk in their holdings, boosting liquidity in the STRIPS market
- A regular 20-year Treasury issue would be a source for new stripping activity that would likely trade closer to fair value than existing principal STRIPS



Source: Monthly Statement of Public Debt. Treasury Direct.

Expected Valuation and Pricing

Historical Perspective of U.S. 20-Year Issuance

Historical Experience with U.S. Treasury 20-year Bonds

- The U.S. Treasury introduced 20-year bond auctions in January 1981 to replace the 15-year bond, holding quarterly auctions through January 1986, except for a two-quarter pause in 1982
- Debt ceiling constraints on bond issuance at the time led the U.S. Treasury to cancel the 20-year auction twice in 1982 and again in the spring of 1986[1]
- After observing the market's reaction to its cancelation in 1986, the U.S. Treasury opted to discontinue 20-year issuance in favor of larger 10-year and 30-year issuance[2]

Features of the 20-year Bond

- Deliverable against the CBOT's bond futures contract (unlike the 15-year bonds it replaced)[3]
- Reopened at the next quarterly auction only a few times on a sporadic basis[4]
- Eligibility for the STRIPS program was introduced in January 1985[5]

Performance

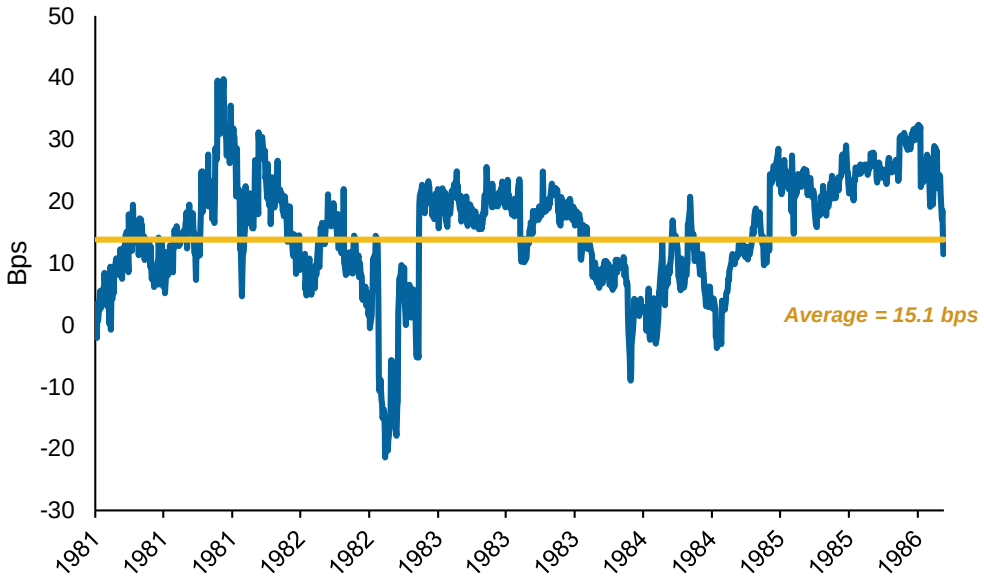
- Auctions of the 20-year bond generally went reasonably well[6], with the bid/cover ratio averaging 2.36; in the last year of its existence, bid/cover ratios averaged 2.71[4]
- There were complaints at the time about a lack of liquidity in the 20-year issue and that the yield on the 20-year bond exceeded 30-year yields over most of the five years it was issued

[1]Legislated limits on the dollar amount of bond issuance exempt from the 4 ¼% interest rate ceiling on issues with maturities > 10 years proved to be a binding constraint on bond issuance during this period of elevated market rates of interest. The ceiling was finally removed in November 1988. [2]U.S. Treasury, "Talking Points for the Financing Press Conference," April 30, 1986. [3]Kenneth D. Garbade, "Treasury Debt Management under the Rubric of Regular and Predictable Issuance: 1983-2012, FRBNY, 2015, p. 48. [4]Treasury Bulletin, various issues. [5]Garbade, p. 33. [6]In fact, Garbade notes "bidding in the first auction was stronger than expected," p. 48.

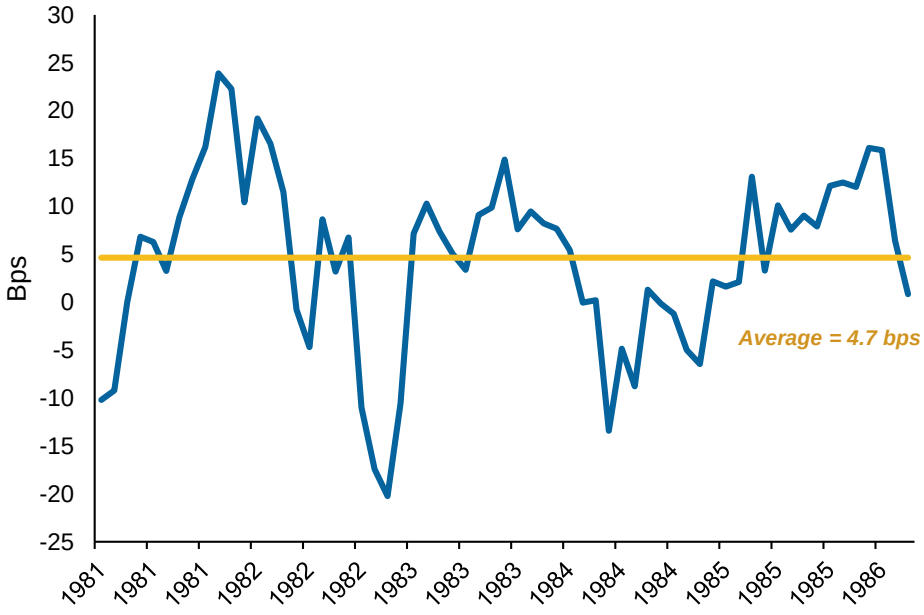
Historical Analysis of 20-Year Bond

- On a nominal yield basis, 20-year yields during the 1981-1986 time frame had a positive yield spread (average: 15.1 bps) to a duration weighted mix of 10s and 30s (left chart)
- Accounting for short rate expectations, term premium and convexity[1], this spread falls to an average of 4.7 bps (right chart)
- The residual spread likely represents illiquidity, due in part to the:
  - Lack of regular and predictable 20-year issuance
  - Lack of 20-year credit issuance (vs. 10s and 30s)

20-Year Yield vs. Duration Weighted 10s & 30s (Market Yield)



20-Year Yield vs. Duration Weighted 10s & 30s (Market Treasury Yield minus Model Yield)[1]

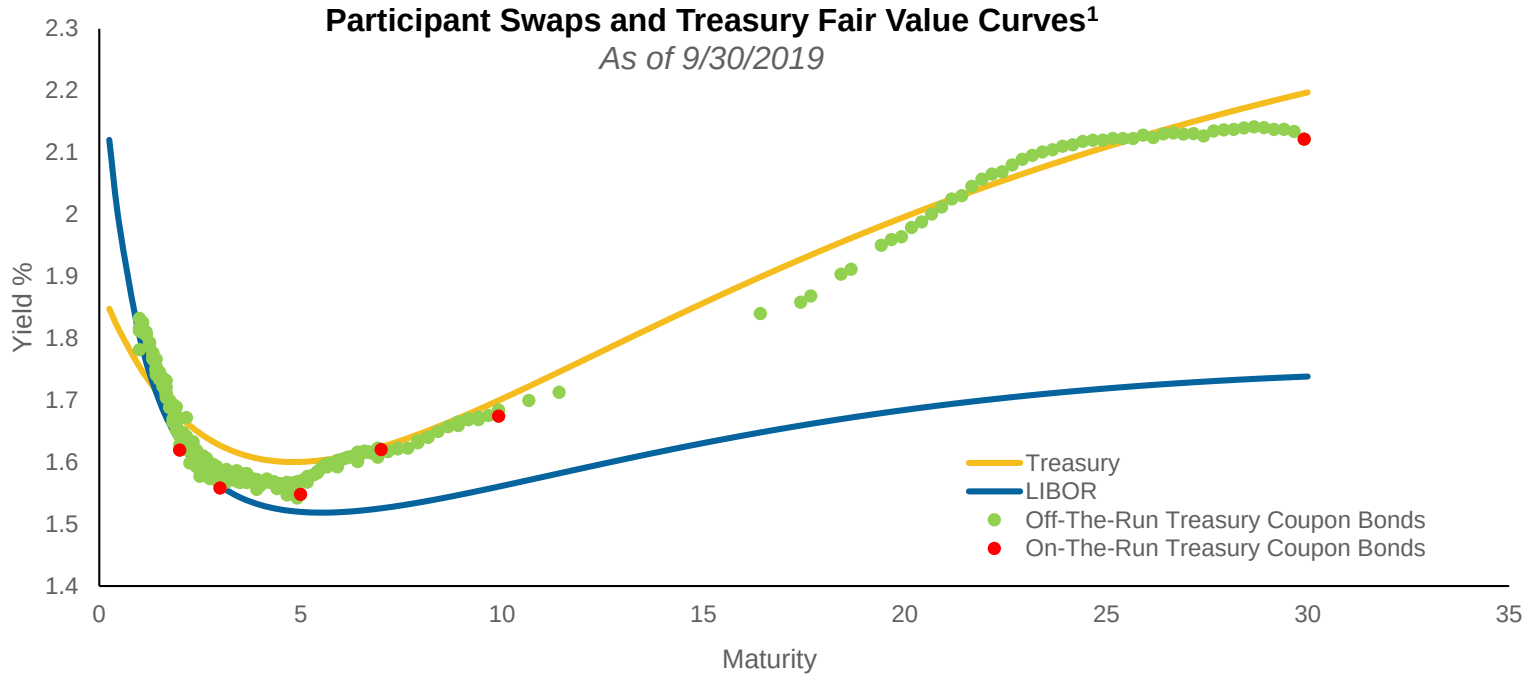


Source: Participant Model and Haver Analytics

[1]Presenting members model used for fitted Treasury yield is a proprietary stochastic term structure model which fits fair value for bonds and bond volatility

Swap and Treasury Curve Fair Value Analysis

- Treasury's objective of regular and predictable issuance and funding at least expected cost over time can be approached as a duration neutral decision between:
  - Increasing the size of existing 10-year and 30-year auctions
  - Introducing a new 20-year Treasury issuance
- We evaluate expected pricing of 20-year versus 10-years and 30-years from three perspectives:
  - Duration neutral yield butterfly (the yield difference between a 20 year bond and duration weighted 10s & 30s)
  - Fair value spread of 20s vs 10s & 30s (market Treasury yield minus model yield)
  - LIBOR Swap spread differentials (market Treasury yield minus Swap yield)
- Liquid on-the-run benchmark issues typically trade with a liquidity premium which Treasury captures at auction



Source: Participant Model and Haver Analytics

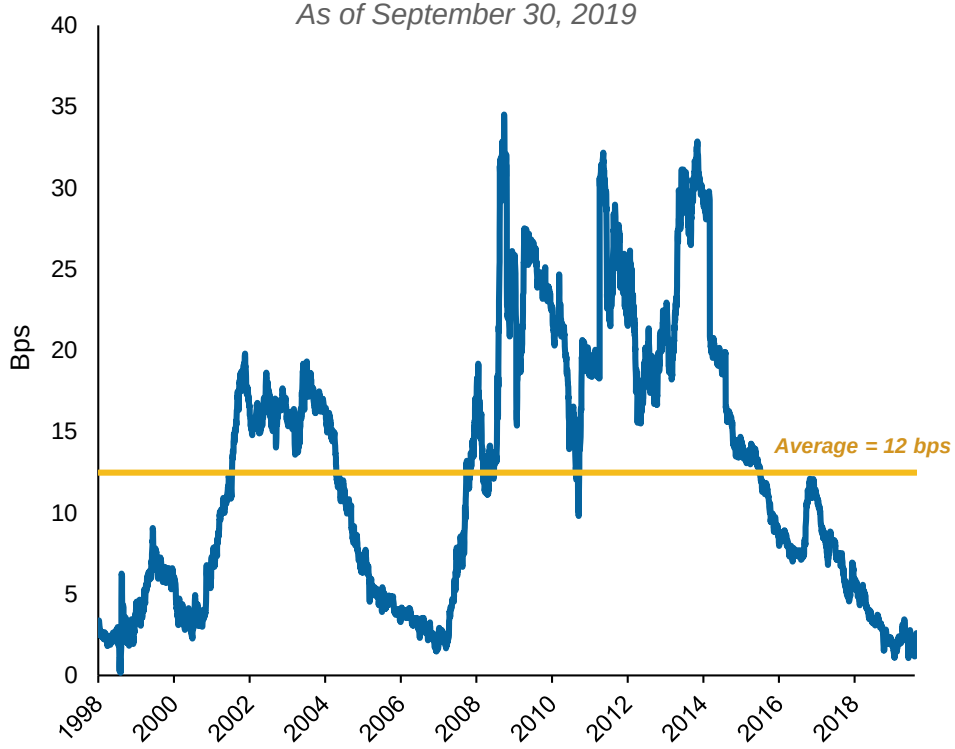
[1]Presenting members model used for fitted Treasury yield is a proprietary stochastic term structure model which fits fair value for bonds and bond volatility

20-Year Treasury Theoretical Fair Value

- 20-year fair value yield will trade above 10s and 30s when market volatility is high and the yield curve is steep (left graph)
- Since 2014 the 20-year maturity has been relatively rich versus the theoretical fair value curve (right graph)
  - The recent richness may be attributable to the scarcity of bonds in the 20 year segment of the curve
  - Over time as existing bonds shorten and begin to fill this maturity gap, this current scarcity premium may dissipate

20-Year Yield vs. Duration Weighted 10s & 30s (Model Yield)

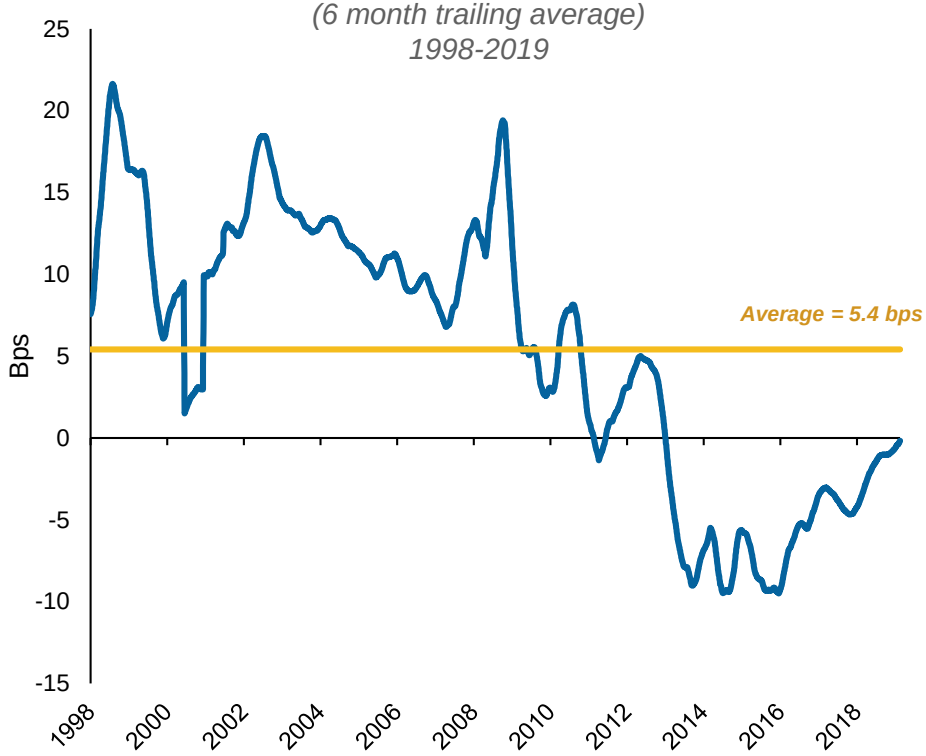
As of September 30, 2019



20-Year Yield vs. Duration Weighted 10s & 30s (Market Treasury Yield minus Model Yield)[1]

(6 month trailing average)

1998-2019



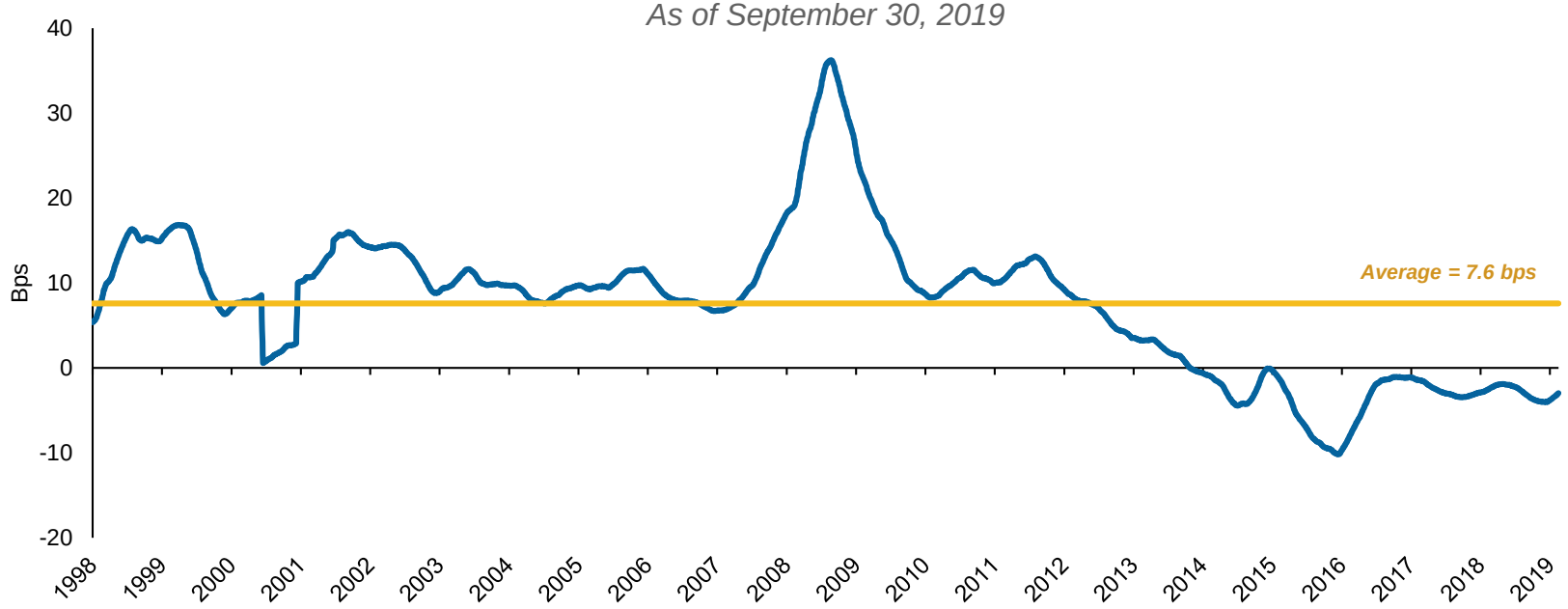
Source: Committee participant model

[1] Duration neutral butterfly of outstanding bonds in 17-23 year versus 7.5-12.5 year and 25+ year maturity ranges

20-Year U.S. Bonds Observed Swap Spread Value

- The Treasury-LIBOR swap spread provides an observable market measure of where a 20-year trades relative to 10-years and 30-years
- Provides a market based measure (rather than model based) perspective of relative pricing of these Treasury sectors
- This spread has averaged 7.6 bps since 1998
- Since 2014, the 20-year sector has traded rich versus 10-year and 30-year sectors

20-Year vs Duration Weighted 10s & 30s
(Market Treasury Yield minus Swap Yield)[1]
(6 month trailing average)
As of September 30, 2019



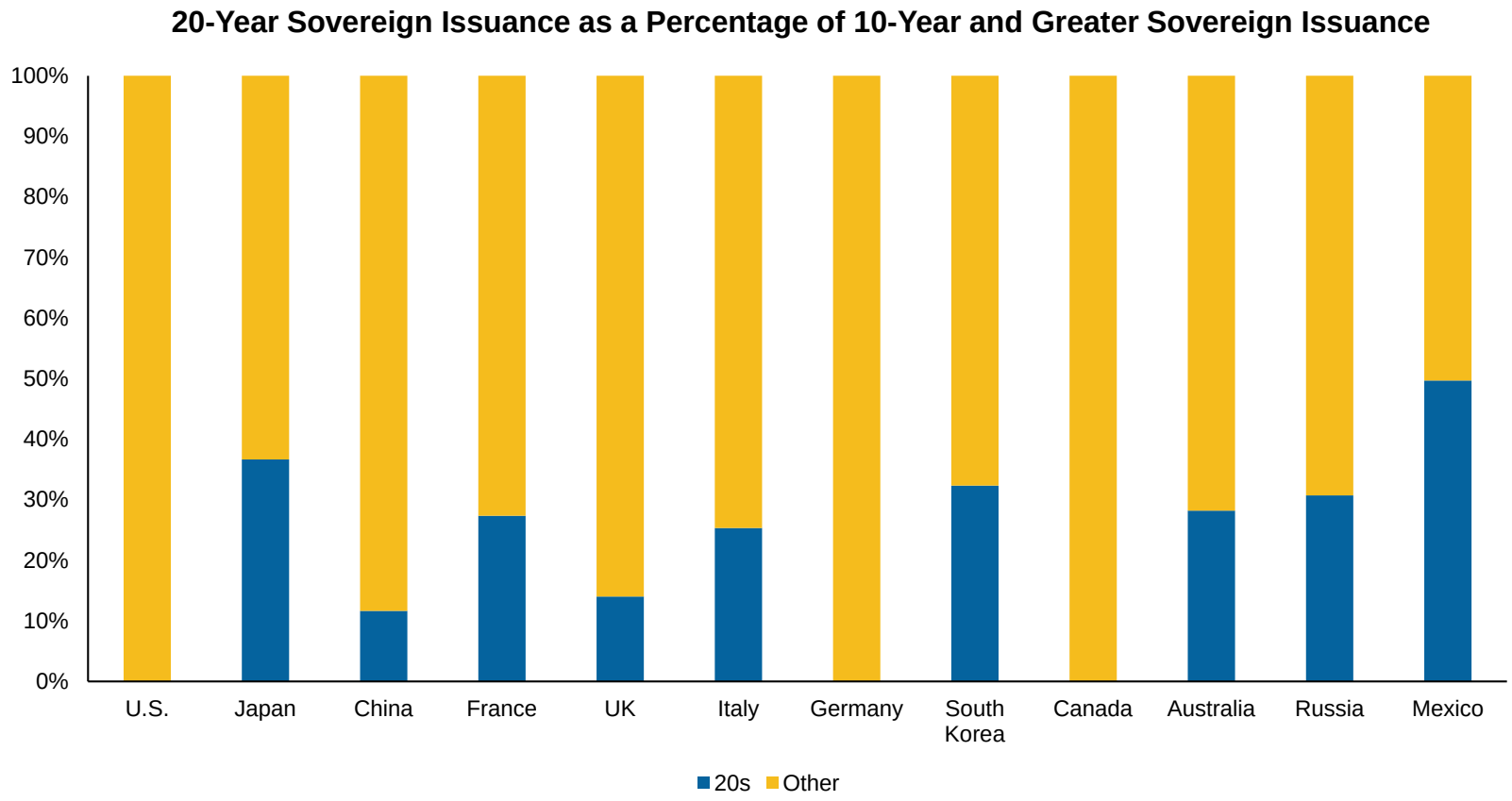
Note:
1. Durations used are calculated from Committee participant's model
2. Treasury spread (see previous for bucketing rules) to the Swap curve is calculated from Committee participant's model
3. Swap curve is calibrated from Committee participant's model with key rate adjustments to market levels

Source: Committee participant model

[1]Represents the spread of Treasury bond minus the yield of the fixed leg of a corresponding maturity LIBOR Swap plotted against the Treasury Bond Duration.

20-Year Is a Common Global Sovereign Maturity

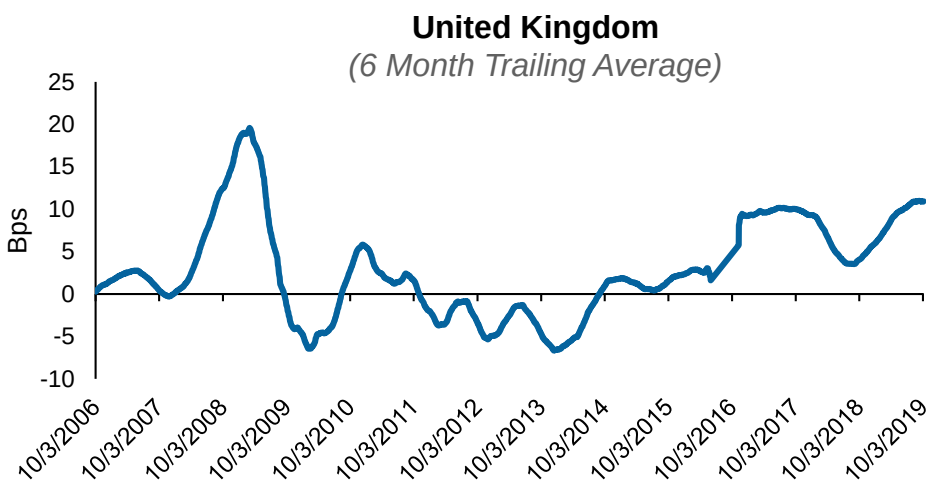
- Global sovereigns generally issue a 20-year as part of long duration debt issuance
- US, Canada, and Germany do not currently include 20-years in their suite of debt issuance

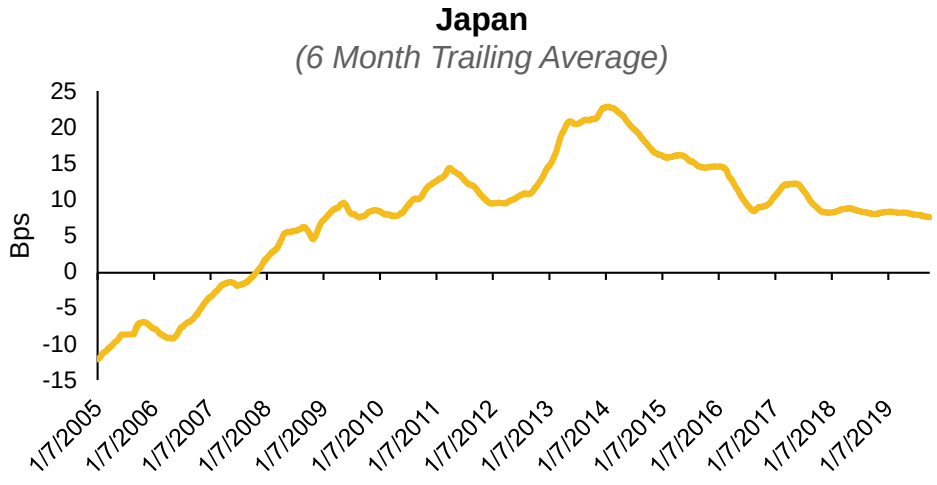


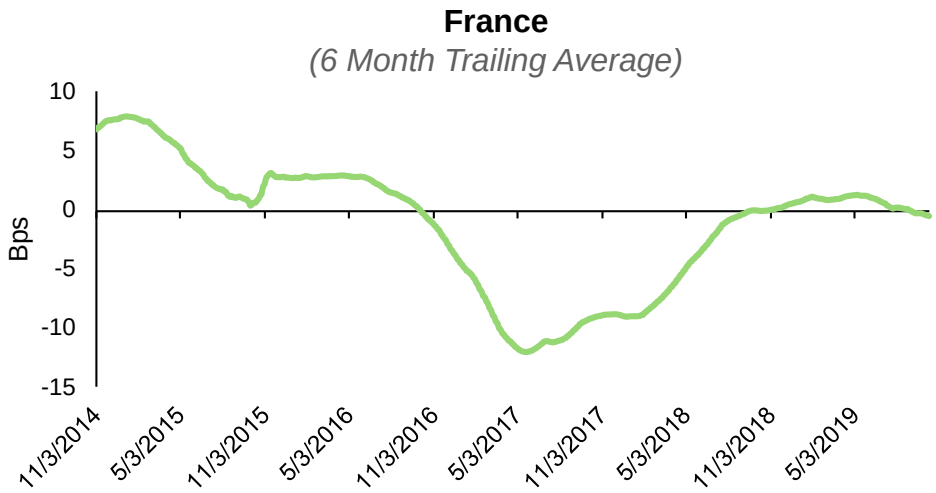
Source: Bloomberg Barclays Global Aggregate Index.

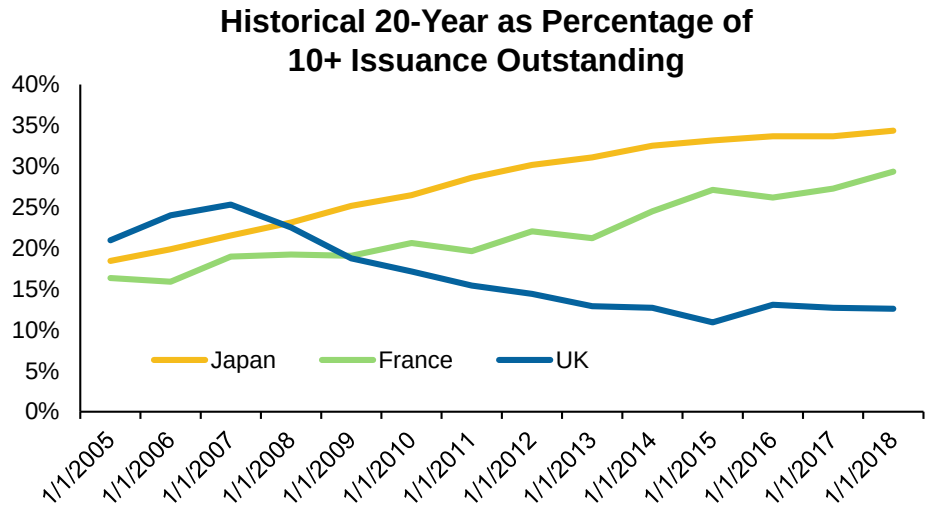
20-Year UK/Japan/France Relative Value to Fair Value Curve

- Valuation of 20-year versus duration weighted 10s and 30s (market Treasury yield minus model yield) in UK, Japan and France show varying results across markets
  - Japan 20-year has generally traded cheap to theoretical fair value
  - No discernable valuation difference in France or the UK









Source: Participant Model and Haver Analytics

Model used for fitted Treasury yield is a proprietary stochastic term structure model which fits fair value for bonds and bond volatility

Optimal Product Structure

Auction Schedule—Recommendation for 20-Year Bonds

- Recommend the 20-year auction follow the existing issuance pattern of 10yrs and 30yrs with a mid-month maturity (i.e. February 15th, May 15th, August 15th, and November 15th)
  - Doing so will ensure that any coupon STRIPS obtained from a 20-year issue will line up with the existing STRIPS market, supporting overall STRIPS liquidity
  - Consistent with other nominal benchmark issuance patterns we recommend quarterly issues with 2 reopenings each to support overall liquidity
- Endorse auctioning 20-years in the latter half of the month with dated and maturity dates aligning with existing 10-years and 30-years
  - Ideally, the 20-year would be auctioned during the same week as the existing TIPS auction
  - Avoids a large amount of coupon Treasury issuance during the existing 3yr/10yr/30yr and 2yr/5yr/7yr auction weeks
  - Results in a 20-year Treasury settling after the 15th of the month, requiring accrued interest at settlement—this convention is already prevalent in TIPS auctions

Generalized Auction Monthly Schedule

Week	Issues Auctioned/Reopened
Week 1	
Week 2	3yr, 10yr, 30-year Auction/Reopenings
Week 3	TIPS and **20-year Auction/Reopenings**
Week 4	2yr FRN, 2yr, 5yr, 7yr Auctions

Auction Schedule—Recommendation for 20-Year Bonds

Benefits

- A new 20-year coupon auction would not compete with existing auctions in the weeks with existing nominal coupon auctions (i.e. 2s/5s/7s and 3s/10s/30s)
- The auction would fit in the same week as the TIPS auction given the single TIPS auction/reopening during that week every month.
- Leverages an existing Treasury product delayed settlement post-auction (i.e. TIPS)

Drawbacks

- Potentially longer when-issued period between the auction and settlement

Conclusions and Recommendations

Conclusions and Recommendations

- In light of large projected U.S. Treasury borrowing needs in the coming years, Treasury should consider adding a 20-year to its current auction schedule
  - Issuance of 20-year bonds would relieve pressure from both 10s and 30s as auction sizes are expected to increase in future years
- The 15-20 year part of the curve currently trades rich to a Treasury fair value curve, hinting at potential unmet demand
- A new 20-year benchmark issuance would fill a large hole in the current auction schedule between 10s and 30s and potentially benefit from becoming a new liquid pricing point for future 20-year corporate issuance
- A new 20-year issue has the potential to tap into pockets of demand from pension and life insurance portfolios
- Initially a new 20-year issuance would likely price fair relative to a Treasury fair value curve
  - While this pricing would be approximately 5 basis points cheaper than a duration weighted 10 & 30 barbell, the 20 year would likely richen over time as the new auction point becomes established
  - Treasury should take a long-term perspective consistent with its “Regular and Predictable” philosophy
- While issuance of a 20-year bond will clearly cannibalize demand for 10s & 30s, it would also absorb supply from 10 & 30 year auctions. Over time, as the 20-year issuance point becomes well established, we believe the net effect has the potential to reduce Treasury borrowing cost.
- Annual size recommendation:
  - Given current annual auction sizes of $300 bn 10 years and $204 bn 30 years, we recommend initial annual size of approximately $140 bn (roughly 22% of Treasury’s 10-year and greater issuance)
    - Initial size should be large enough to ensure liquidity and demonstrate Treasury’s long term commitment to the issue
    - At the same time, the initial size should not be too large until the issue is well established
    - Over time annual 20-year issuance could grow to approximately $250 bn
- Auction details recommendation:
  - 20-year issuance should mature quarterly on the 15th of the month, with auctions occurring in the third week of the month with end of month settlement
  - Proposed initial auction sizes of $13 bn original quarterly issuance with $11 bn monthly re-openings

TBAC Financing Tables (Illustrative Scenarios)

The following slides are **for discussion purposes only** and do not represent TBAC recommendations.

ILLUSTRATIVE US TREASURY FINANCING SCHEDULE FOR 4th QUARTER 2019 (FOR DISCUSSION PURPOSES ONLY) *
BILLIONS OF DOLLARS

	NEW MONEY	Fed Purchases	New Private Bills
Net BILLS Issuance for the quarter	121.64	-157.50	-35.86

ISSUE	SETTLEMENT DATE	OFFERED AMOUNT	CHANGE	MATURING AMOUNT	NEW MONEY
COUPONS					
3-year Note	*10/15*	*38.00*	*0.00*		
10-year Note (r)	*10/15*	*24.00*	*0.00*		
30-year Bond (r)	*10/15*	*16.00*	*0.00*	24.00	54.00
5-year TIPS	*10/31*	*17.00*	*0.00*		
2-year note	*10/31*	*40.00*	*0.00*		
2-year FRN	*10/31*	*20.00*	*0.00*		
5-year note	*10/31*	*41.00*	*0.00*		
7-year note	*10/31*	*32.00*	*0.00*	116.34	33.66
3-year Note	*11/15*	*23.00*	*-15.00*		
10-year Note	*11/15*	*27.00*	*0.00*		
30-year Bond	*11/15*	*19.00*	*0.00*	*60.52*	*8.48*
10-year TIPS (r)	*11/29*	*12.00*	*0.00*		
2-year FRN (r)	*11/29*	*18.00*	*0.00*	*0.00*	*30.00*
2-year note	*12/2*	*25.00*	*-15.00*		
5-year note	*12/2*	*41.00*	*0.00*		
7-year note	*12/2*	*32.00*	*0.00*	*82.44*	*15.56*
3-year Note	*12/16*	*23.00*	*-15.00*		
10-year Note (r)	*12/16*	*24.00*	*0.00*		
30-year Bond (r)	*12/16*	*16.00*	*0.00*	*24.00*	*39.00*
2-year FRN (r)	*12/27*	*18.00*	*0.00*	*0.00*	*18.00*
5-year TIPS (r)	*12/31*	*15.00*	*0.00*		
2-year note	*12/31*	*25.00*	*-15.00*		
5-year note	*12/31*	*41.00*	*0.00*		
7-year note	*12/31*	*32.00*	*0.00*	*81.35*	31.65
		619.00	*-60.00*	388.64	*230.36*

Estimates are italicized. R = Reopening

NET CASH RAISED THIS QUARTER: *352*

** This Financing table is meant to be illustrative based on meeting discussions and does not indicate how Treasury will actually issue debt in the future.*

ILLUSTRATIVE US TREASURY FINANCING SCHEDULE FOR 1ST QUARTER 2020 (FOR DISCUSSION PURPOSES ONLY)*
BILLIONS OF DOLLARS

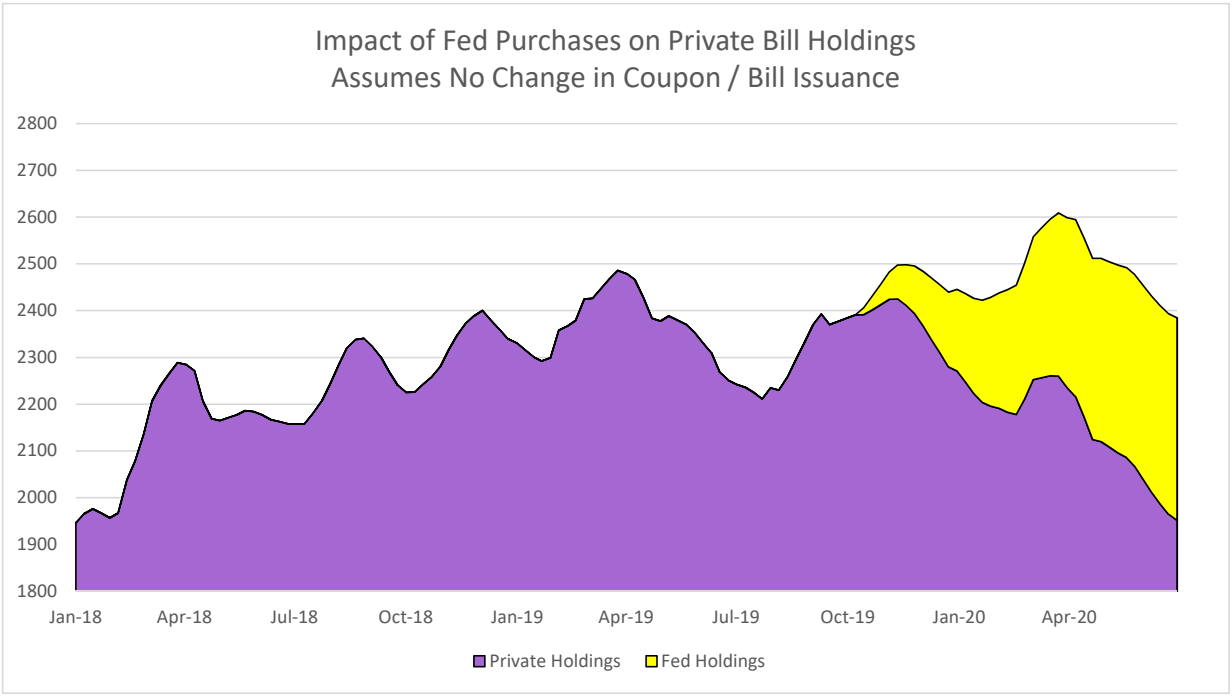
	NEW MONEY	Fed Purchases	New Private Bills
Net BILLS Issuance for the quarter	243.11	-189.00	54.11

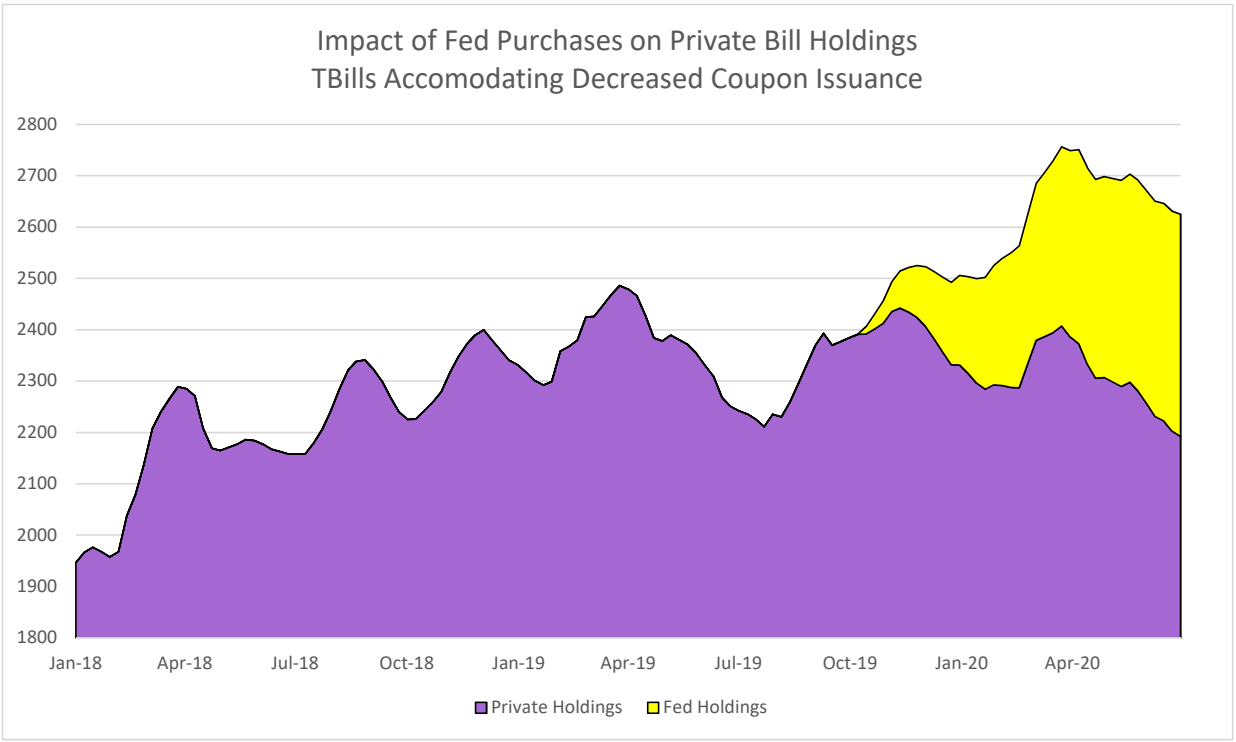
ISSUE	SETTLEMENT DATE	OFFERED AMOUNT	CHANGE	MATURING AMOUNT	NEW MONEY
COUPONS					
3-year Note	*1/15*	*23.00*	*-15.00*		
10-year Note (r)	*1/15*	*24.00*	*0.00*		
30-year Bond (r)	*1/15*	*16.00*	*0.00*	*45.35*	17.65
2-year FRN	*1/31*	*20.00*	*0.00*		
10-year TIPS	*1/31*	*14.00*	*0.00*		
2-year note	*1/31*	*25.00*	*-15.00*		
5-year note	*1/31*	*41.00*	*0.00*		
7-year note	*1/31*	*32.00*	*0.00*	*128.49*	3.51
3-year Note	*2/18*	*23.00*	*-15.00*		
10-year Note	*2/18*	*27.00*	*0.00*		
30-year Bond	*2/18*	*19.00*	*0.00*	*70.69*	*-1.69*
2-year FRN (r)	*2/28*	*18.00*	*0.00*		
30-year TIPS	*2/28*	*8.00*	*0.00*	*0.00*	*26.00*
2-year note	*3/2*	*25.00*	*-15.00*		
5-year note	*3/2*	*41.00*	*0.00*		
7-year note	*3/2*	*32.00*	*0.00*	*82.08*	*15.92*
3-year Note	*3/16*	*23.00*	*-15.00*		
10-year Note (r)	*3/16*	*24.00*	*0.00*		
30-year Bond (r)	*3/16*	*16.00*	*0.00*	*24.00*	*39.00*
2-year FRN (r)	*3/27*	*18.00*	*0.00*	*0.00*	*18.00*
10-year TIPS (r)	*3/31*	*12.00*	*0.00*		
2-year note	*3/31*	*25.00*	*-15.00*		
5-year note	*3/31*	*41.00*	*0.00*		
7-year note	*3/31*	*32.00*	*0.00*	*82.50*	27.50
		579.00	*-90.00*	433.11	*145.89*

Estimates are italicized. R = Reopening

NET CASH RAISED THIS QUARTER: *389*

** This Financing table is meant to be illustrative based on meeting discussions and does not indicate how Treasury will actually issue debt in the future.*


Impact of Fed Purchases on Private Bill Holdings
Assumes No Change in Coupon / Bill Issuance
2800
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
Jan-18
Apr-18
Jul-18
Oct-18
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20
Private Holdings
Fed Holdings


Impact of Fed Purchases on Private Bill Holdings
TBills Accomodating Decreased Coupon Issuance
2800
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
Jan-18
Apr-18
Jul-18
Oct-18
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20
Private Holdings
Fed Holdings