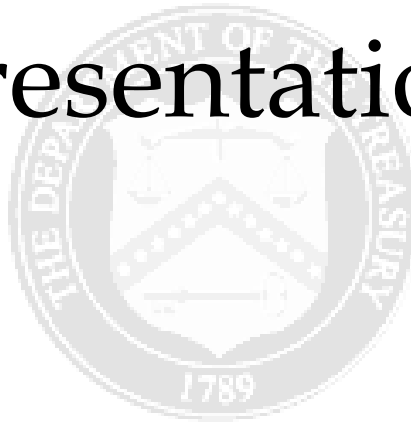


Treasury Presentation to TBAC



Office of Debt Management



Fiscal Year 2021 Q2 Report

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Section I: Executive Summary



Highlights of Treasury's May 2021 Quarterly Refunding Presentation to the Treasury Borrowing Advisory Committee (TBAC)

Receipts and Outlays through Q2 FY2021

- Overall receipts totaled \$1.74 trillion, reflecting an increase of \$102 billion (6%) on a calendar adjusted basis compared to the same period last fiscal year. Corporate taxes were \$25 billion (24%) higher FYTD, as every month except one has seen higher levels than last fiscal year. Corporate refunds were \$5 billion (22%) higher, partially because of CARES Act provisions that expand allowances for net operating losses. Individual refunds were \$27 billion (-18%) lighter due to tax season timing changes and other factors. Adjusted withheld and FICA taxes were up just \$13 billion (1%) due to the economic impact of COVID-19 and the deferral of certain employer taxes through the end of December 2020. Non-withheld and SECA taxes were \$39 billion (21%) higher due primarily to strength in January, when quarterly estimated tax payments were due. Federal Reserve earnings were \$10 billion (33%) higher reflecting lower interest rates that reduce the Fed's interest expenses and higher System Open Market Account (SOMA) holdings. Gross excise taxes were \$8 billion (-18%) lower. Receipts were 15.3% of GDP, unchanged from the same period last fiscal year. The full fiscal year average from 2000 to 2019 was 17.1%.
- Overall outlays were \$3.41 trillion, reflecting an increase of \$1.06 trillion (45%) over the comparable period last fiscal year. Department of Treasury outlays were \$476 billion (124%) higher due to the disbursement of \$487 billion in Economic Impact Payments, \$24 billion in rental assistance and \$12 billion in airline assistance legislated in both the Consolidated Appropriations Act of 2021 and the American Rescue Plan of 2021. These were somewhat offset by \$41 billion lower interest on the public debt. Department of Labor outlays were \$194 billion higher due to increased unemployment costs attributable to the COVID-19 pandemic. Health and Human Services spending was \$99 billion (16%) higher mainly due to the COVID-19 pandemic as well as overall increases to Medicare and Medicaid. Small Business Administration outlays were \$184 billion higher, mainly due to the recognition of subsidy costs for PPP in February and March. Outlays were 30.6% of GDP, compared to 22.4% of GDP for the same period last fiscal year. The full fiscal year average from 2000 to 2019 was 20.8%.

Projected Net Marketable Borrowing (FY2021)

- Treasury's Office of Fiscal Projections (OFP) currently forecasts a net privately-held marketable borrowing need of \$463 billion for Q3 FY2021, with an end-of-June cash balance of \$800 billion. For Q4 FY2021, OFP forecasts a net privately-held marketable borrowing need of \$821 billion assuming end-of-September cash balance of \$750 billion. These borrowing estimates are based upon current law and do not include any assumptions for the impact of additional legislation that may be passed. Treasury is assuming a cash balance of approximately \$450 billion at the expiration of the debt limit suspension on July 31 based on expected outflows under its cash management policies and consistent with its authorities and obligations, including the Bipartisan Budget Act of 2019.

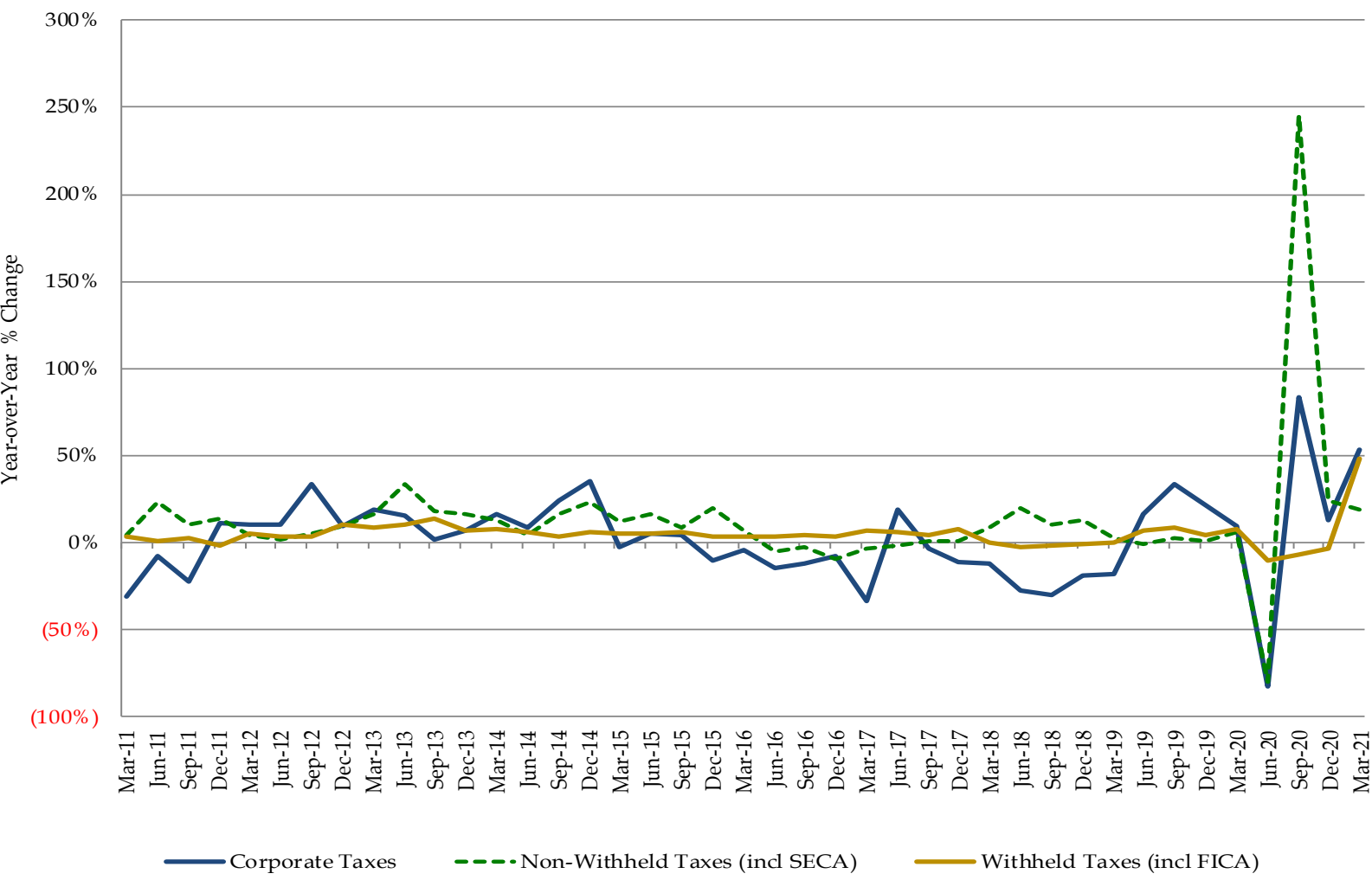
Demand for Treasury Securities

- Bid-to-cover ratios for all securities were within historical ranges over the last quarter.
- Foreign demand remained stable.

Section II: Fiscal

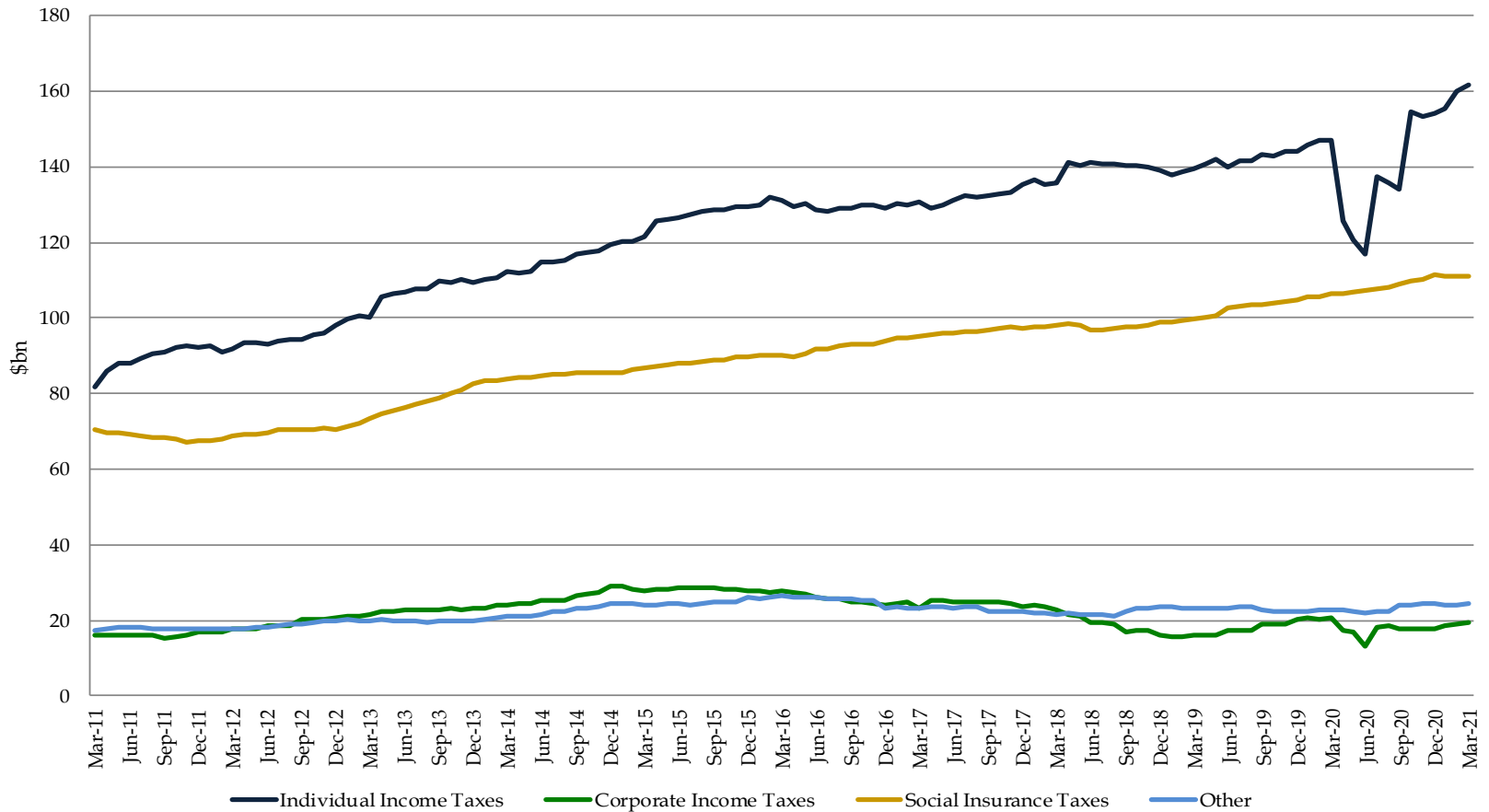


Quarterly Tax Receipts



Quarterly tax receipts for Q4 FY2020 reflect the adjustment of April and June 2020 tax deadlines to July 15th, 2020.
Source: United States Department of the Treasury

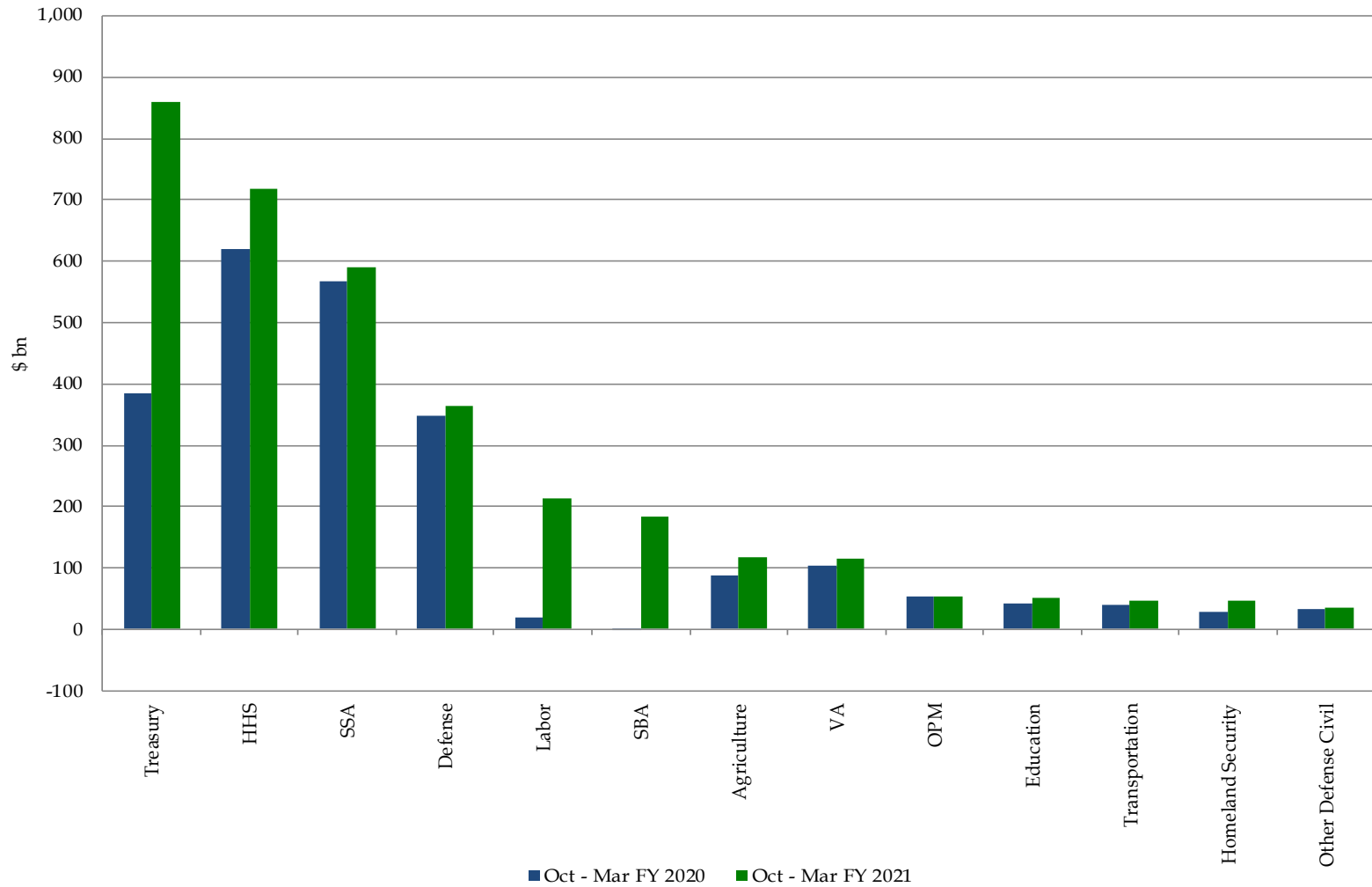
Monthly Receipt Levels (12-Month Moving Average)



Quarterly tax receipts for Q4 FY2020 reflect the adjustment of April and June 2020 tax deadlines to July 15th, 2020. 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.

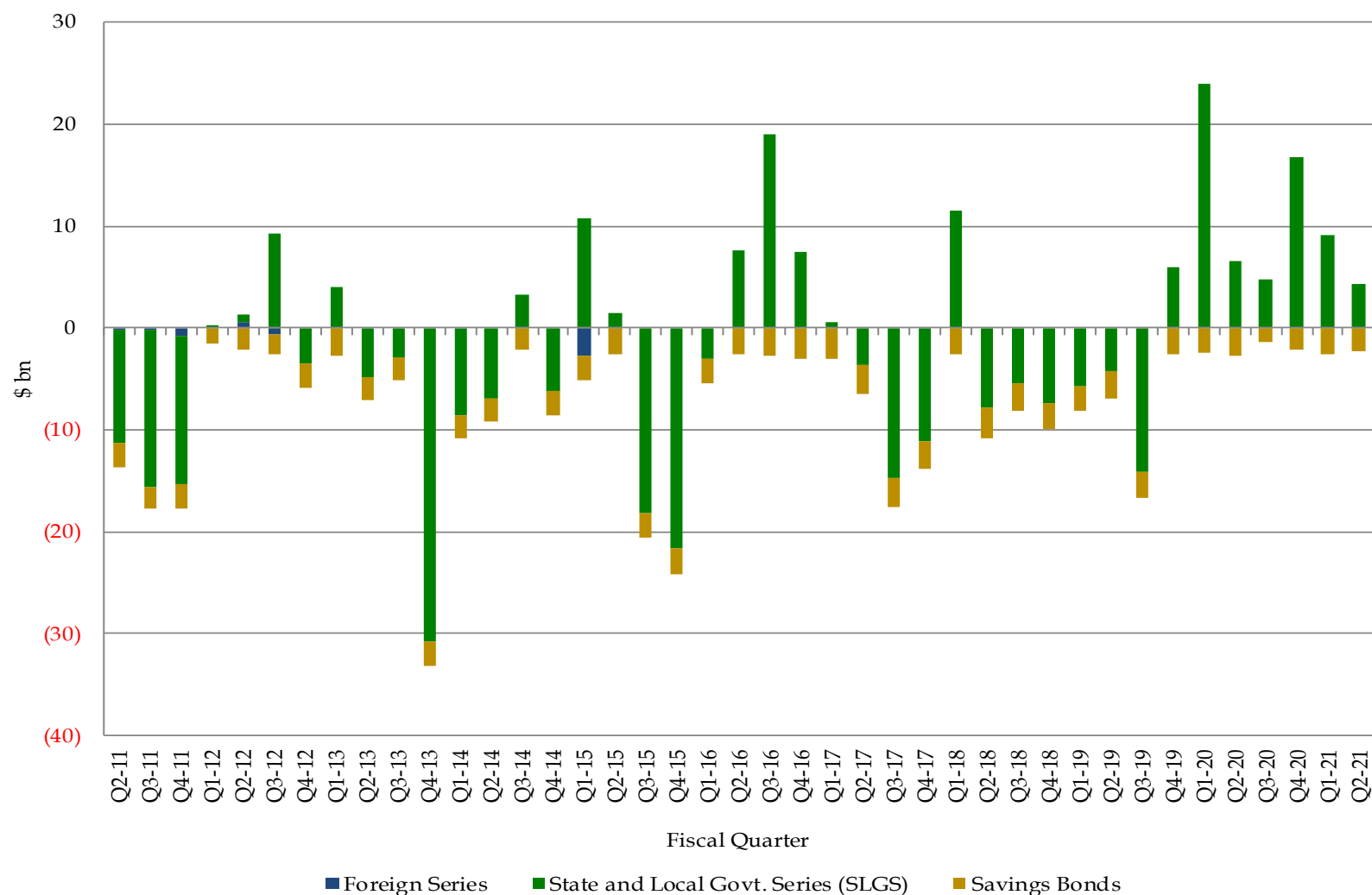
Source: United States Department of the Treasury

Largest Outlays



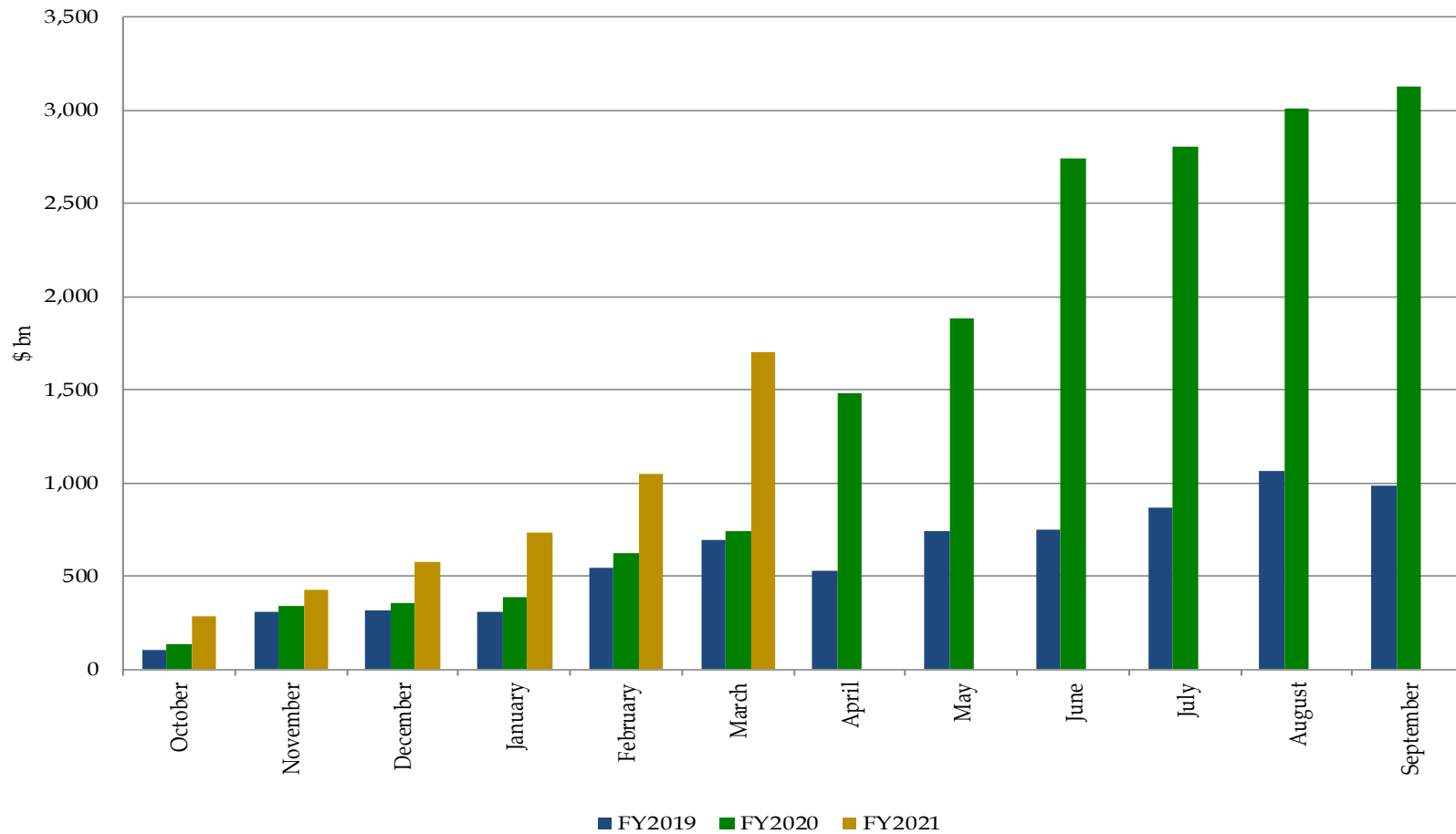
Source: United States Department of the Treasury

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 2021-2023 Deficits and Privately-Held Net Marketable Borrowing Estimates*, in \$ billions

	Primary Dealers ¹	OFPP ²	CBO ³
FY2021 Deficit Estimate	3,347		3,422
FY2022 Deficit Estimate	1,750		1,585
FY2023 Deficit Estimate	1,330		1,077
FY2021 Deficit Estimate Range	3,000-3,700		
FY2022 Deficit Estimate Range	1,100-2,600		
FY2023 Deficit Estimate Range	870-1,700		
FY2021 Privately-Held Net Marketable Borrowing Estimate	2,585	2,282	2,605
FY2022 Privately-Held Net Marketable Borrowing Estimate	1,750		1,610
FY2023 Privately-Held Net Marketable Borrowing Estimate	1,309		1,120
FY2021 Privately-Held Net Marketable Borrowing Range	1,300-3,672		
FY2022 Privately-Held Net Marketable Borrowing Range	875-2,500		
FY2023 Privately-Held Net Marketable Borrowing Range	531-1,700		
Estimates as of:	Apr-21	May-21	Feb-21

¹ Estimates represent the medians from the primary dealer survey in April 2021. The FY2021 net borrowing estimates are normalized with an assumption of end-of-September 2021 cash balance of \$750 billion.

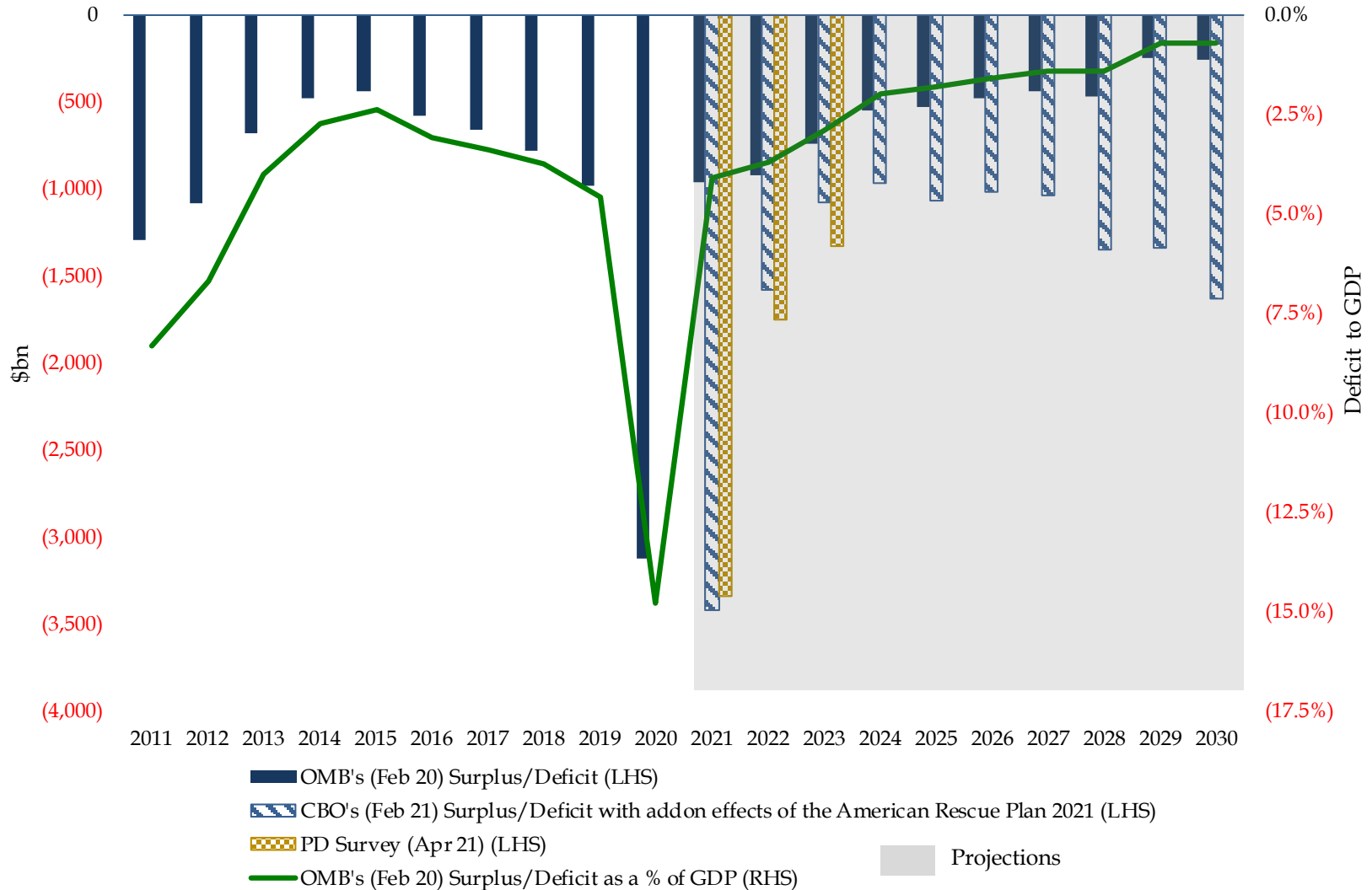
² Treasury's Office of Fiscal Projections (OFP) borrowing estimates announced on May 3, 2021.

³ CBO projections are using estimates are from Table 1 of "The Budget and Economic Outlook: 2021 to 2031," February 2021 and add-ons of the American Rescue Plan Act of 2021.

https://www.cbo.gov/system/files/2021-03/Estimated_Budgetary_Effects_of_HR_1319_as_passed_0.pdf

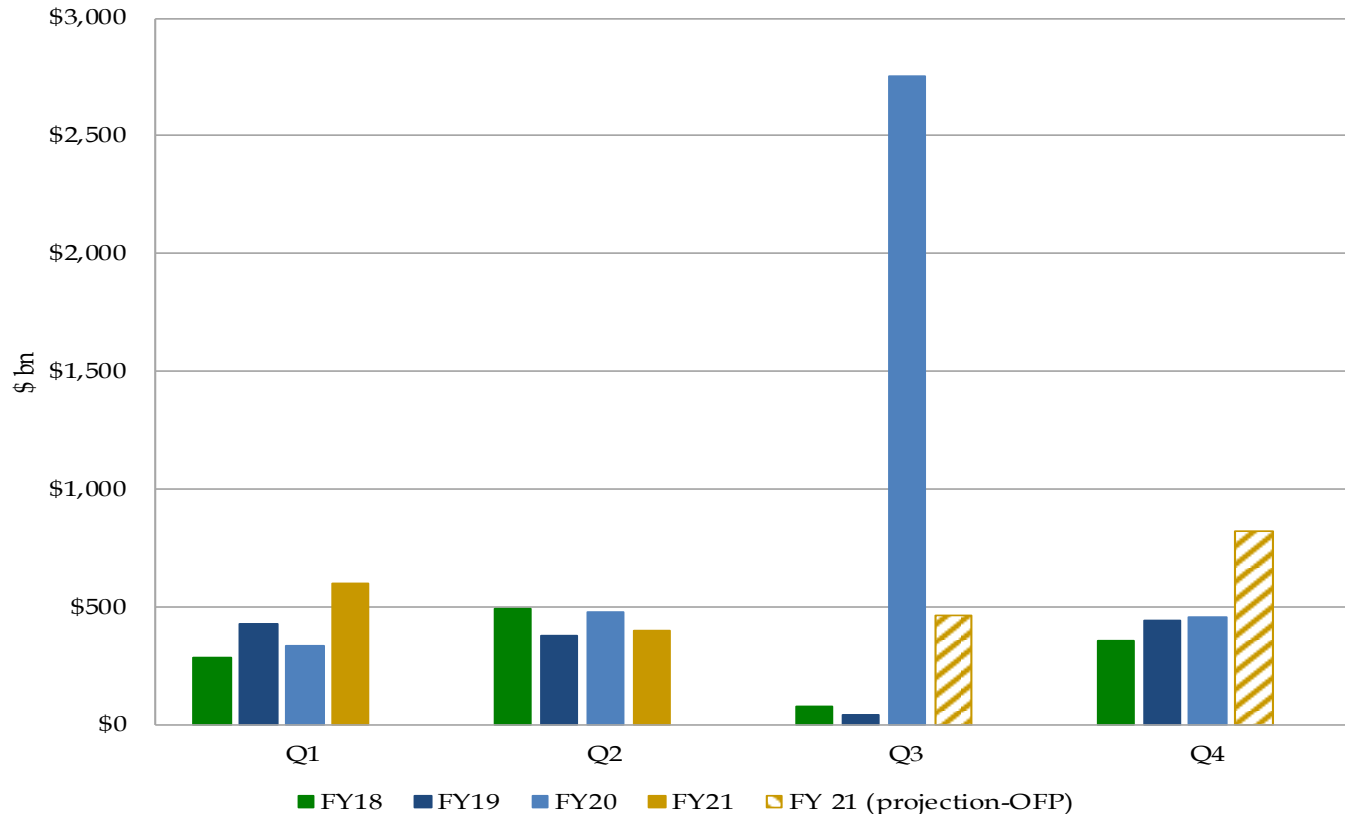
*Privately-held marketable borrowing excludes rollovers (auction "add-ons") of Treasury securities held in the Federal Reserve's System Open Market Account (SOMA) but includes financing required due to SOMA redemptions. Secondary market purchases of Treasury securities by SOMA do not directly change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

Budget Surplus/Deficit*



*OMB's projections are from OMB's Table S-10 of "A Budget for America's Future, Fiscal Year 2021," February 2020. OMB projections reflect pre-CARES Act forecasts and will be updated when new projections become available. CBO's deficit projections are using estimates from CBO's Table 1 of "The Budget and Economic Outlook: 2021 to 2031," February 2021 and add-ons of the American Rescue Plan Act 2021 (https://www.cbo.gov/system/files/2021-03/Estimated_Budgetary_Effects_of_HR_1319_as_passed_0.pdf).

Privately-Held Net Marketable Borrowing Outlook*



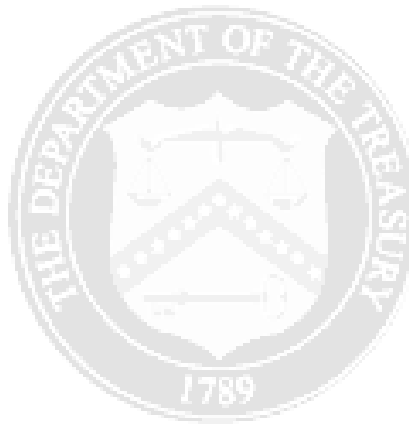
* Privately-held marketable borrowing excludes rollovers (auction “add-ons”) of Treasury securities held in the Federal Reserve’s System Open Market Account (SOMA) but includes financing required due to SOMA redemptions. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when the securities mature and assuming the Fed does not redeem any maturing securities, would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA “add-on” amount. These borrowing estimates are based upon current law and do not include any assumptions for the impact of additional legislation that may be passed.

Section III: Financing



Assumptions for Financing Section (pages 16 to 19)

- Portfolio and SOMA holdings as of 03/31/2021.
- Estimates assume private announced issuance sizes and patterns remain constant for nominal coupons, TIPS, and FRNs given changes made before the May 2021 refunding, while using total bills outstanding of ~\$4.67 trillion.
- The principal on the TIPS securities was accreted to each projection date based on market ZCIS levels as of 03/31/2020.
- No attempt was made to account for future financing needs.



Sources of Privately-Held Financing in FY21 Q2*

January - March 2021	
Net Bill Issuance	(295)
Net Coupon Issuance	696
Subtotal: Net Marketable Borrowing	401
Ending Cash Balance	1,122
Beginning Cash Balance	1,729
Subtotal: Change in Cash Balance	(607)
Net Implied Funding for FY 2021 Q2**	1,007

Security	January - March 2021 Bill Issuance			Fiscal Year-to-Date Bill Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
4-Week	410	390	20	800	780	20
8-Week	465	455	10	920	910	10
13-Week	654	653	1	1,410	1,409	1
26-Week	618	612	6	1,332	1,323	9
52-Week	102	60	42	238	123	115
CMBs						
6-Week	375	360	15	795	780	15
15-Week	175	325	(150)	500	665	(165)
17-Week	370	360	10	790	835	(45)
22-Week	210	390	(180)	600	850	(250)
39-Week	0	70	(70)	0	70	(70)
Other	0	0	0	0	0	0
Bill Subtotal	3,379	3,674	(295)	7,385	7,745	(360)

Security	January - March 2021 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	80	56	24	154	111	43
2-Year	180	49	131	348	135	213
3-Year	174	58	116	336	115	221
5-Year	183	82	101	354	166	188
7-Year	186	84	102	354	145	209
10-Year	117	41	76	231	84	147
20-Year	75	0	75	148	0	148
30-Year	75	3	72	149	3	146
5-Year TIPS	0	0	0	32	0	32
10-Year TIPS	28	38	(10)	40	38	2
30-Year TIPS	9	0	9	9	0	9
Coupon Subtotal	1,107	411	696	2,155	797	1,358

*Privately-held marketable borrowing excludes rollovers (auction “add-ons”) of Treasury securities held in the Federal Reserve’s System Open Market Account (SOMA) but includes financing required due to SOMA redemptions. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when the securities mature and assuming the Fed does not redeem any maturing securities, would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA “add-on” amount.

**By adjusting the change in cash balance, Treasury arrives at the net implied funding number.

Sources of Privately-Held Financing in FY21 Q3*

April - June 2021	
Assuming Constant Coupon Issuance Sizes**	
Treasury Announced Net Marketable Borrowing***	463
Net Coupon Issuance	712
Implied Change in Bills	(249)

Security	April - June 2021 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing^	Net	Gross	Maturing	Net
2-Year FRN	80	56	24	234	167	67
2-Year	180	50	130	528	185	343
3-Year	174	62	112	510	177	333
5-Year	183	79	104	537	245	292
7-Year	186	89	97	540	234	306
10-Year	117	25	92	348	109	239
20-Year	75	0	75	223	0	223
30-Year	75	3	72	224	6	218
5-Year TIPS	33	41	(8)	65	41	24
10-Year TIPS	13	0	13	53	38	15
30-Year TIPS	0	0	0	9	0	9
Coupon Subtotal	1,116	404	712	3,271	1,202	2,069

* Privately-held marketable borrowing excludes rollovers (auction “add-ons”) of Treasury securities held in the Federal Reserve’s System Open Market Account (SOMA) but includes financing required due to SOMA redemptions. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when the securities mature and assuming the Fed does not redeem any maturing securities, would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA “add-on” amount.

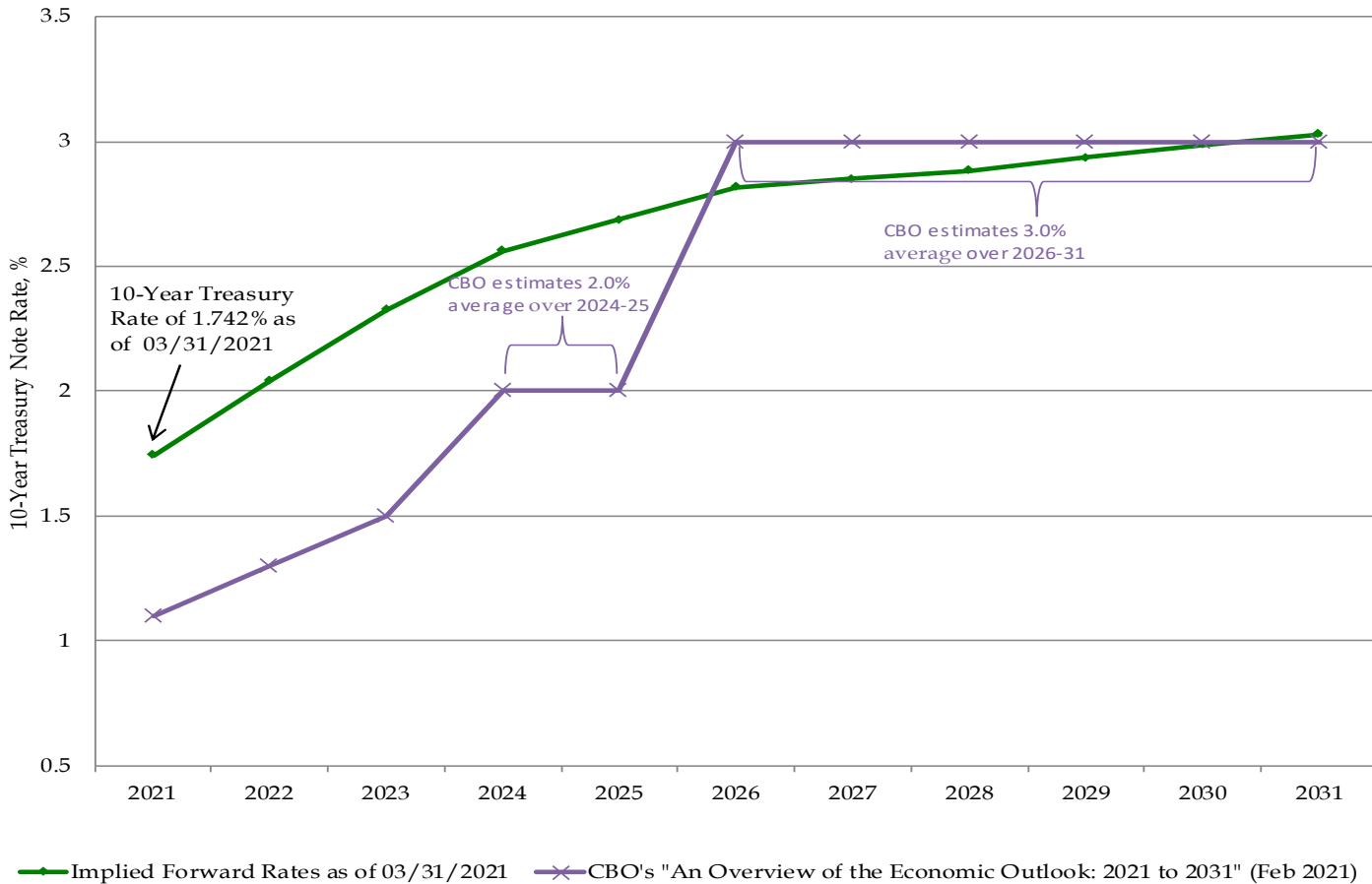
** Keeping announced issuance sizes and patterns constant for nominal coupons, TIPS, and FRNs based on changes made before the February 2021 refunding.

*** Assumes an end-of-June 2021 cash balance of \$800 billion versus a beginning-of-March 2021 cash balance of \$1,122 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>

^ Maturing amounts could change based on future Federal Reserve purchases.

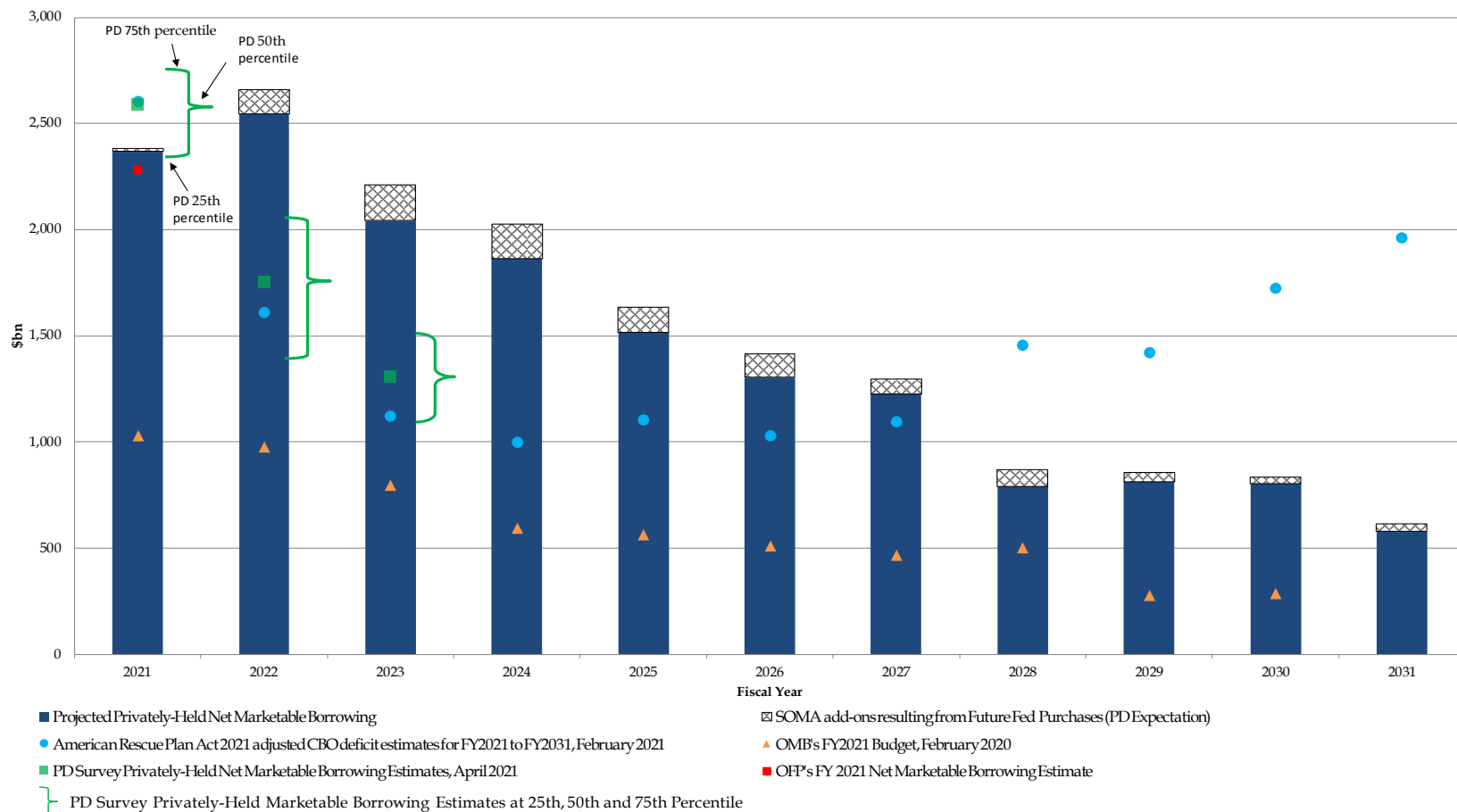
Interest Rate Assumptions: 10-Year Treasury Note*



*CBO's February 2021 economic assumption of the annual average 10-Year Treasury note rates reflect projections for 2021, 2022, 2023, and averages for the periods 2024-25 and 2026-31 (Table 2-1).

Projected Privately-Held Net Marketable Borrowing

Assuming Private Coupon Issuance & Total Bills Outstanding Remain Constant as of 03/31/2021*



Treasury's latest primary dealer survey median estimates can be found on page 11. OMB's borrowing projections are from Table S-10 of "A Budget for America's Future, Fiscal Year 2021," February 2020. CBO's borrowing projections are using estimates from Table 1 of CBO's "The Budget and Economic Outlook: 2021 to 2031," February 2021 and add-ons of the American Rescue Plan Act 2021.

https://www.cbo.gov/system/files/2021-03/Estimated_Budgetary_Effects_of_HR_1319_as_passed_0.pdf

Future Fed purchases are derived from the Fed's March 2021 Primary Dealer Survey median results with maturity bucket weights based on current operations and pro-rata across securities within each maturity bucket.

<https://www.newyorkfed.org/medialibrary/media/markets/survey/2021/mar-2021-spd-results.pdf>

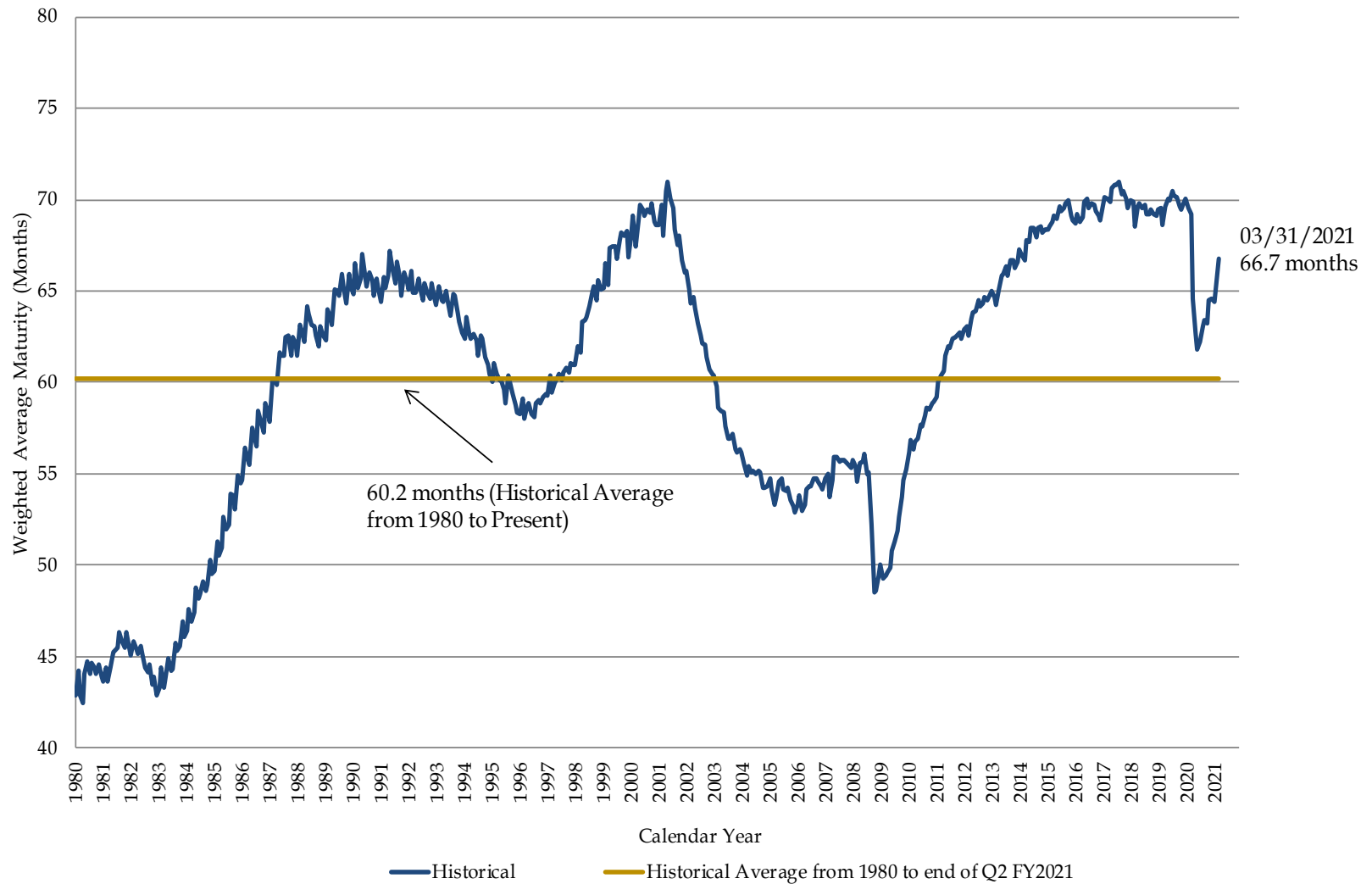
* Privately-held marketable borrowing excludes rollovers (auction "add-ons") of Treasury securities held in the Federal Reserve's System Open Market Account (SOMA) but includes financing required due to SOMA redemptions. No adjustments are made for open-market outright purchases.

OMB projections before April 2020 reflect pre-CARES Act forecasts and will be updated when new projections become available.

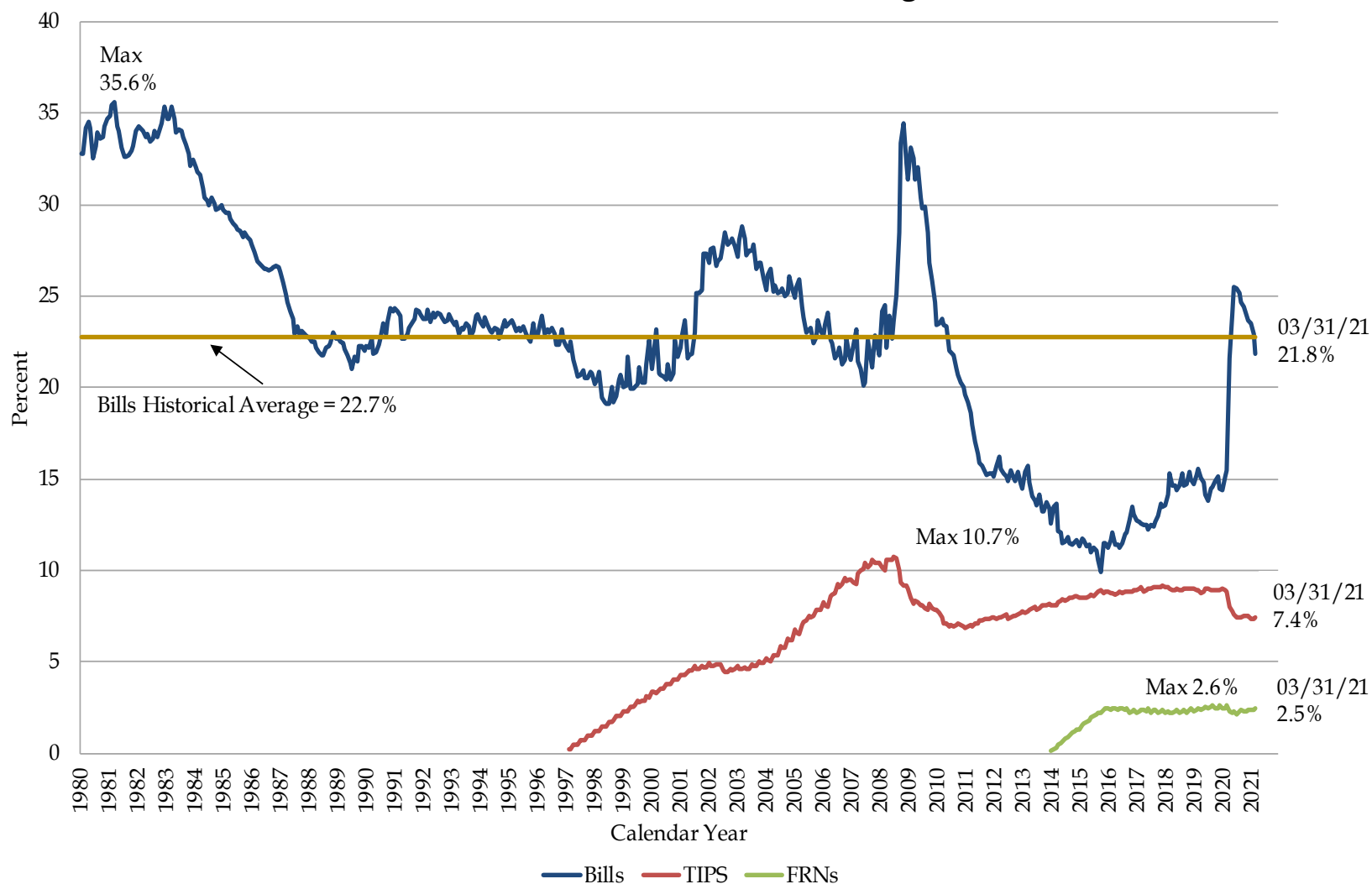
Section IV: Portfolio Metrics



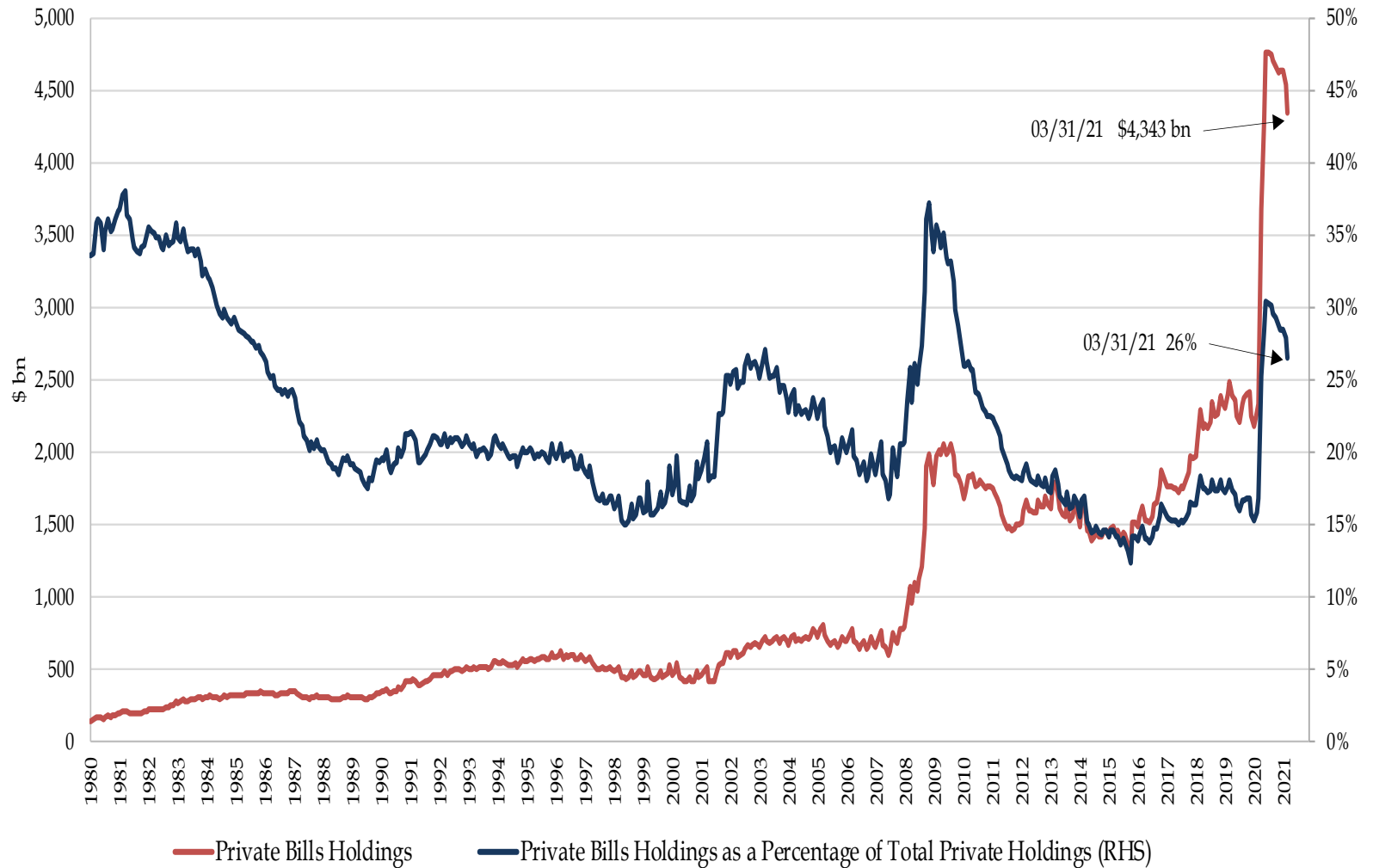
Historical Weighted Average Maturity of Marketable Debt Outstanding



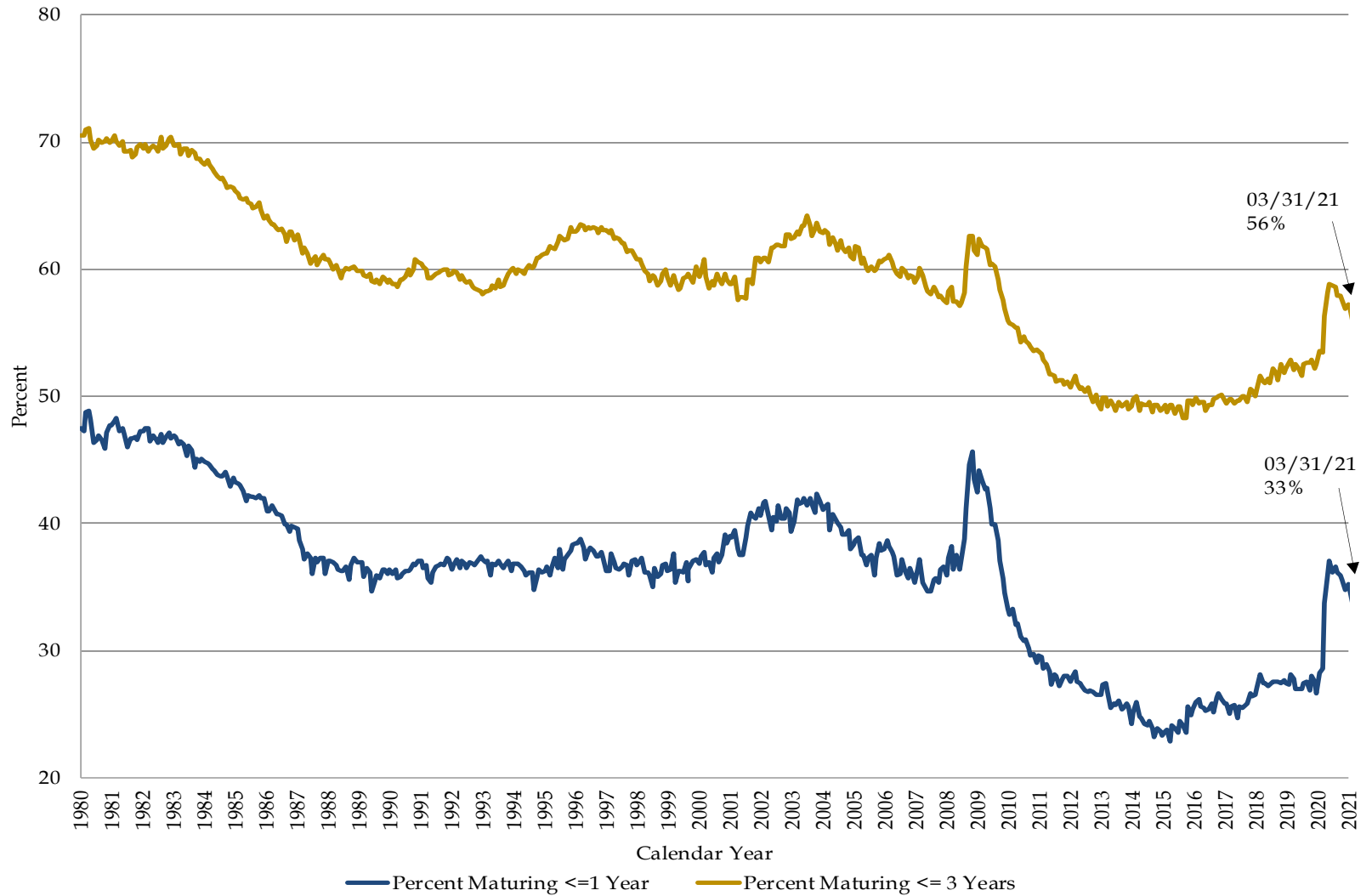
Bills, TIPS & FRNs Outstanding as a Percent of Marketable Debt Outstanding



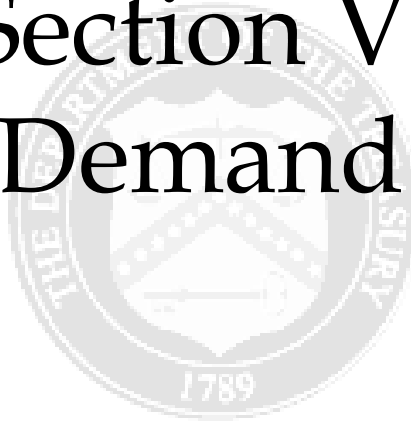
Private Bills Holdings as a Percentage of Total Private Holdings



Treasury Maturity Profile History



Section V: Demand



Summary Statistics for Fiscal Year 2021 Q2 Auctions

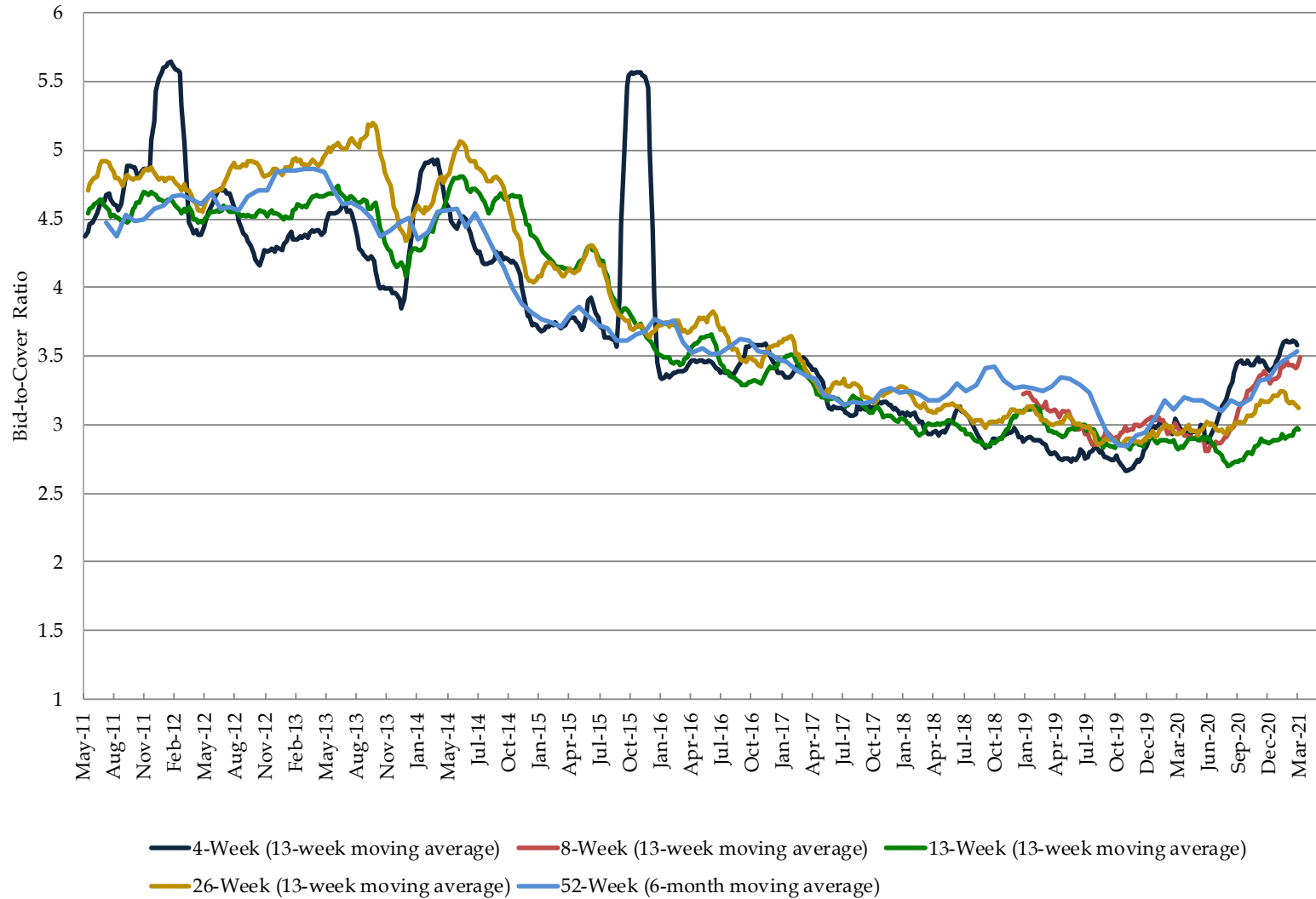
Security Type	Term	Stop Out Rate (%)*	Bid-to-Cover Ratio*	Competitive Awards (\$bn)	% Primary Dealer*	% Direct*	% Indirect*	Non-Competitive Awards (\$bn)	SOMA "Add-Ons" (\$bn)	10-Year Equivalent (\$bn)**
Bill	4-Week	0.038	3.6	362.4	51.1	12.0	36.9	17.61	33.7	3.4
Bill	8-Week	0.045	3.5	421.5	49.0	8.6	42.5	8.51	38.4	7.7
Bill	13-Week	0.051	3.0	695.3	47.4	6.4	46.2	15.76	81.2	21.2
Bill	26-Week	0.064	3.1	659.4	44.1	5.3	50.5	12.59	76.7	40.0
Bill	52-Week	0.077	3.6	101.2	50.7	4.7	44.6	0.78	9.6	11.9
CMB	6-Week	0.043	3.4	414.8	56.0	9.6	34.4	0.21	0.0	5.1
CMB	15-Week	0.073	3.9	150.0	52.6	11.1	36.3	0.02	0.0	4.7
CMB	17-Week	0.056	3.6	404.9	46.0	7.1	46.9	0.12	0.0	14.1
CMB	22-Week	0.077	3.5	180.0	51.7	9.4	38.9	0.01	0.0	8.2
Coupon	2-Year	0.132	2.6	179.3	30.0	15.1	54.9	0.73	31.9	45.2
Coupon	3-Year	0.262	2.5	173.6	32.8	16.3	50.9	0.40	30.5	65.5
Coupon	5-Year	0.632	2.3	182.9	26.4	15.0	58.5	0.11	32.4	113.5
Coupon	7-Year	1.083	2.2	185.9	28.1	18.8	53.1	0.08	32.9	157.9
Coupon	10-Year	1.277	2.4	116.9	21.9	18.2	59.9	0.07	21.0	138.7
Coupon	20-Year	1.954	2.3	75.0	25.6	15.9	58.5	0.01	13.4	157.2
Coupon	30-Year	2.014	2.3	75.0	18.7	18.2	63.1	0.02	13.7	216.9
TIPS	10-Year	-0.798	2.6	27.9	14.5	17.5	68.0	0.07	2.3	32.1
TIPS	30-Year	-0.040	2.3	9.0	17.2	14.6	68.1	0.02	0.0	28.2
FRN	2-Year	0.043	3.0	79.9	39.6	1.3	59.1	0.05	3.8	0.0

Total Bills	0.054	3.4	3,389.5	48.8	7.8	43.4	55.60	239.6	116.3
Total Coupons	0.843	2.4	988.6	27.3	16.7	56.0	1.41	175.9	895.0
Total TIPS	-0.614	2.5	36.9	15.1	16.8	68.0	0.09	2.3	60.2
Total FRN	0.043	3.0	79.9	39.6	1.3	59.1	0.05	3.8	0.0

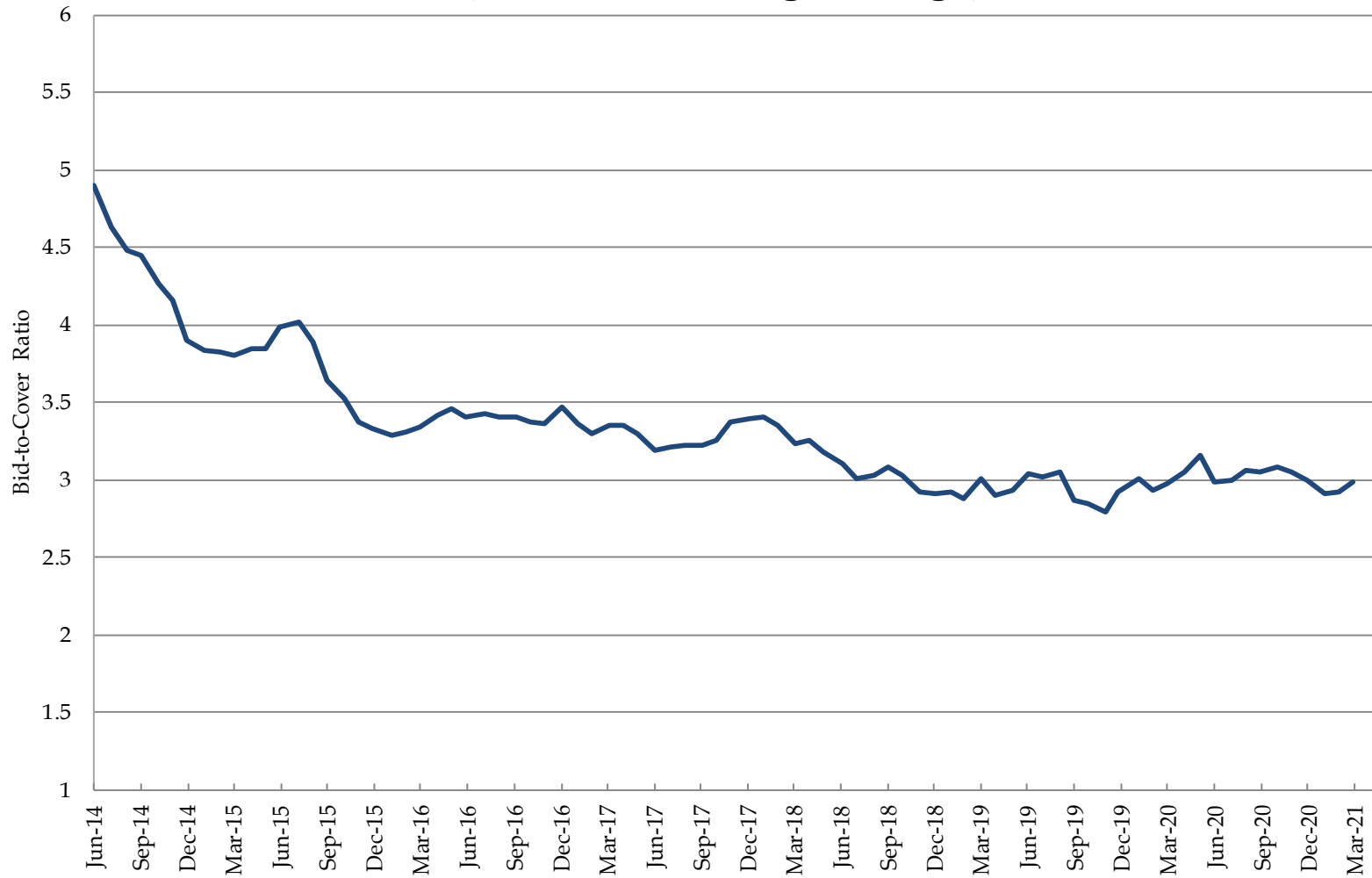
*Weighted averages of Competitive Awards. FRNs are reported on discount margin basis.

**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.

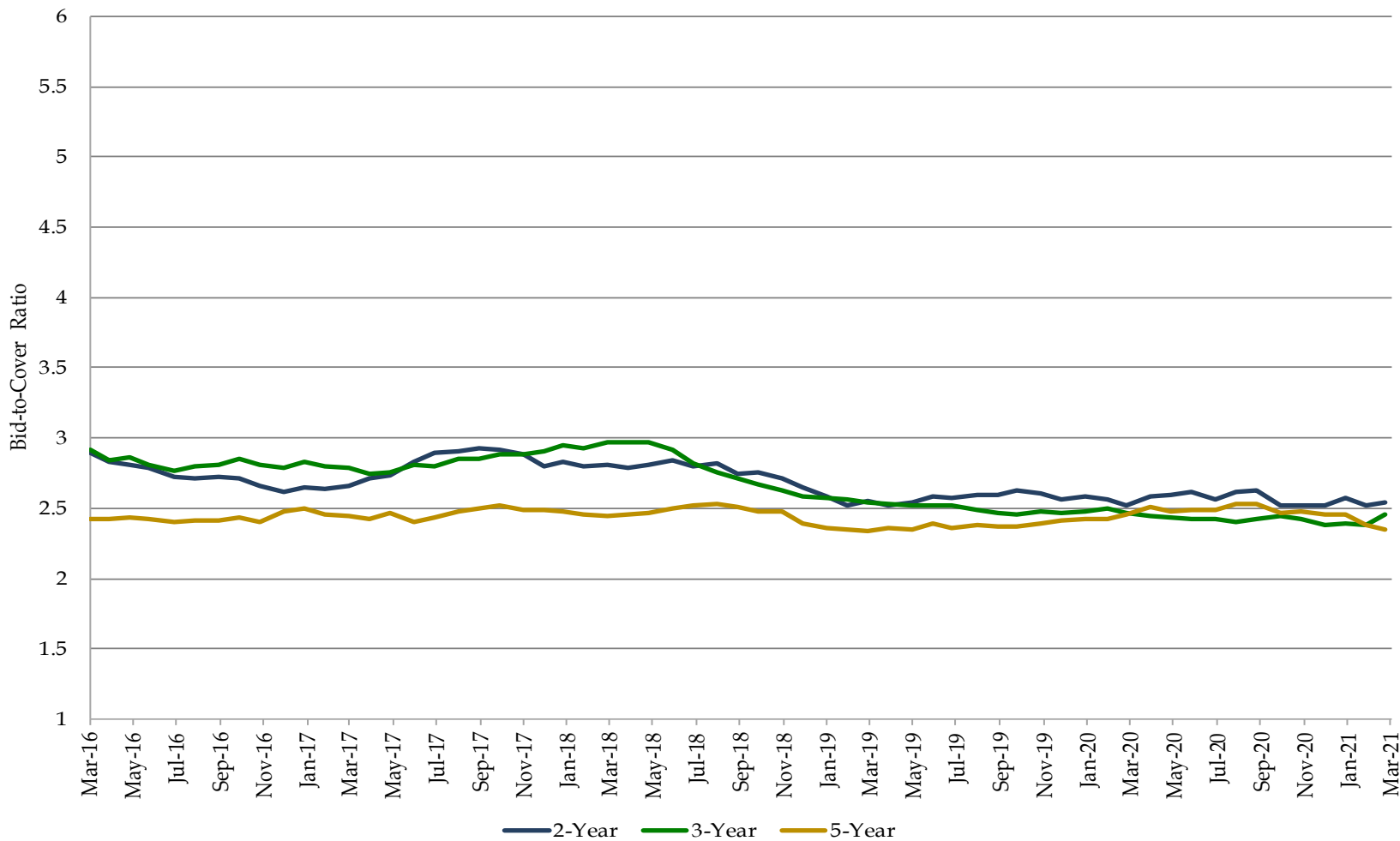
Bid-to-Cover Ratios for Treasury Bills



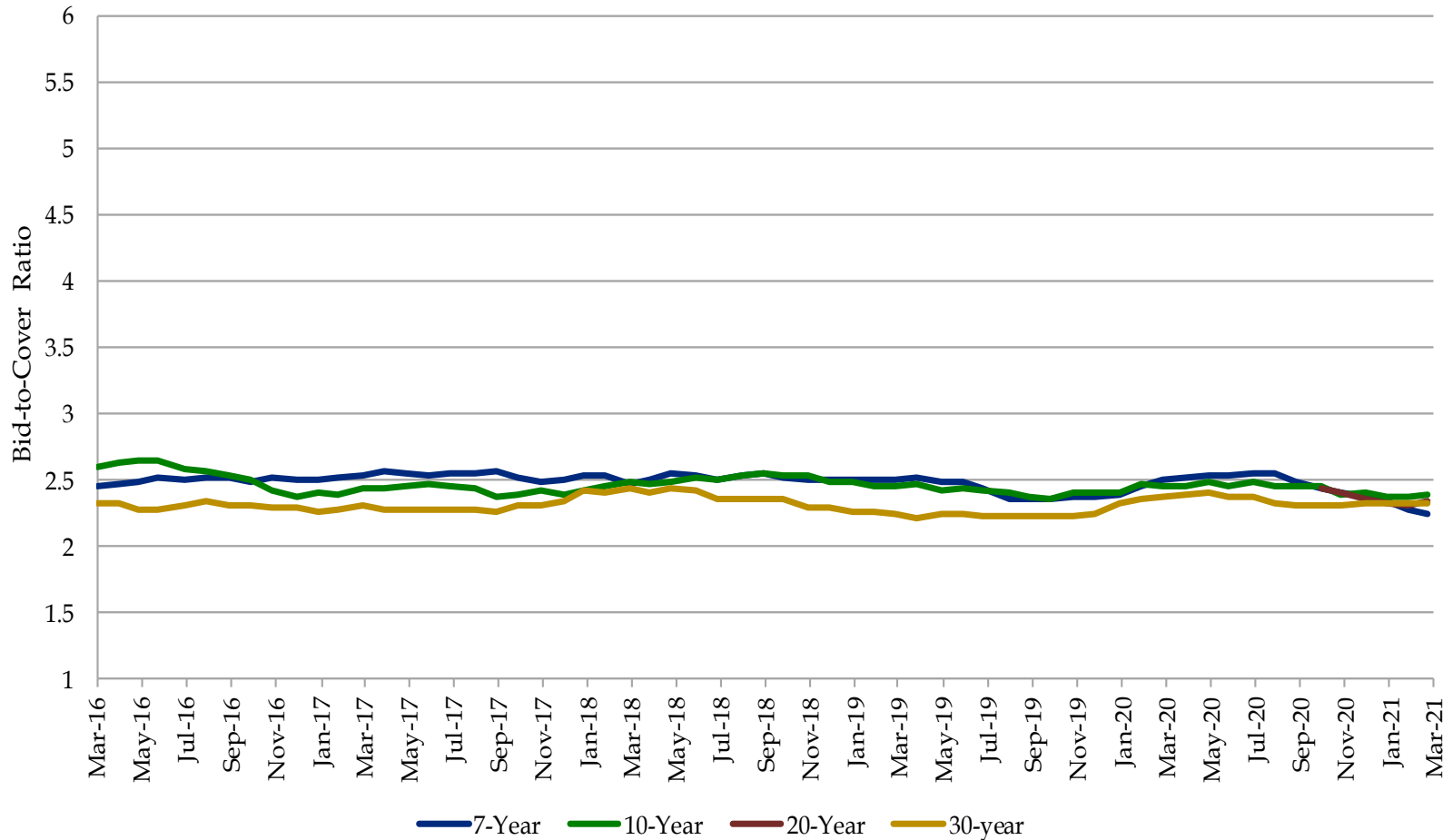
Bid-to-Cover Ratios for FRNs (6-Month Moving Average)



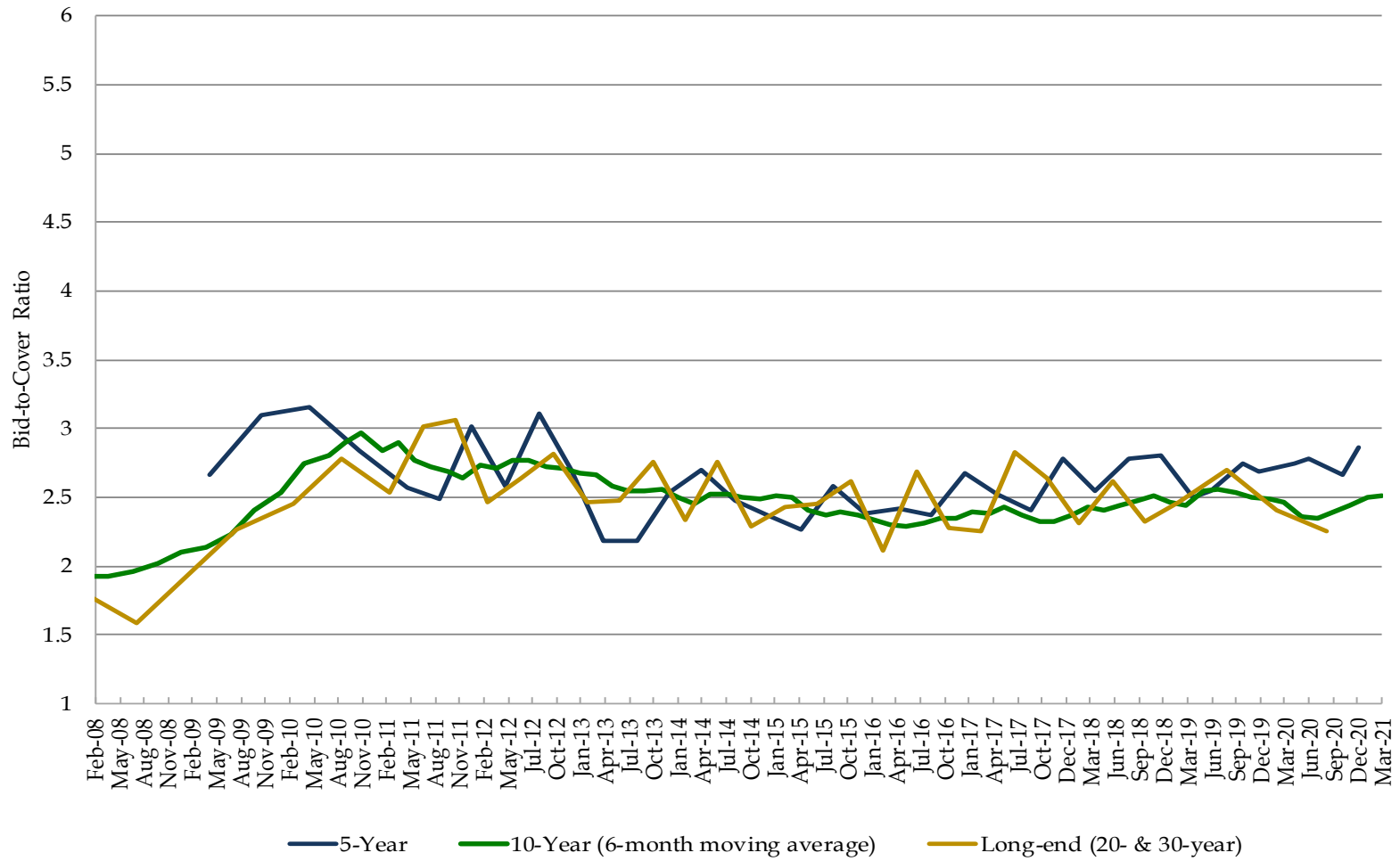
Bid-to-Cover Ratios for 2-, 3-, and 5-Year Nominal Securities (6-Month Moving Average)



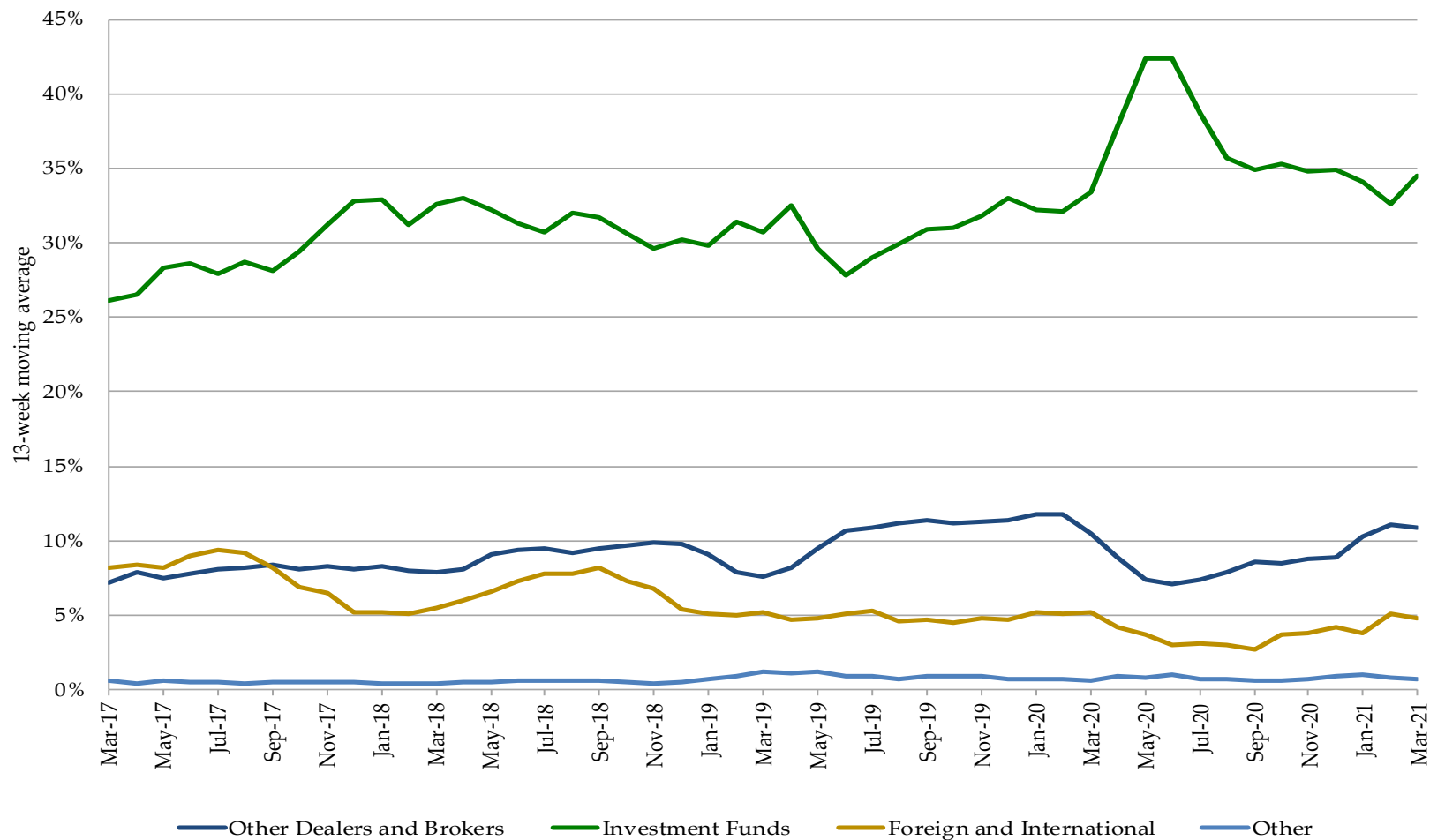
Bid-to-Cover Ratios for 7-, 10-, 20-, and 30-Year Nominal Securities (6-Month Moving Average)



Bid-to-Cover Ratios for TIPS

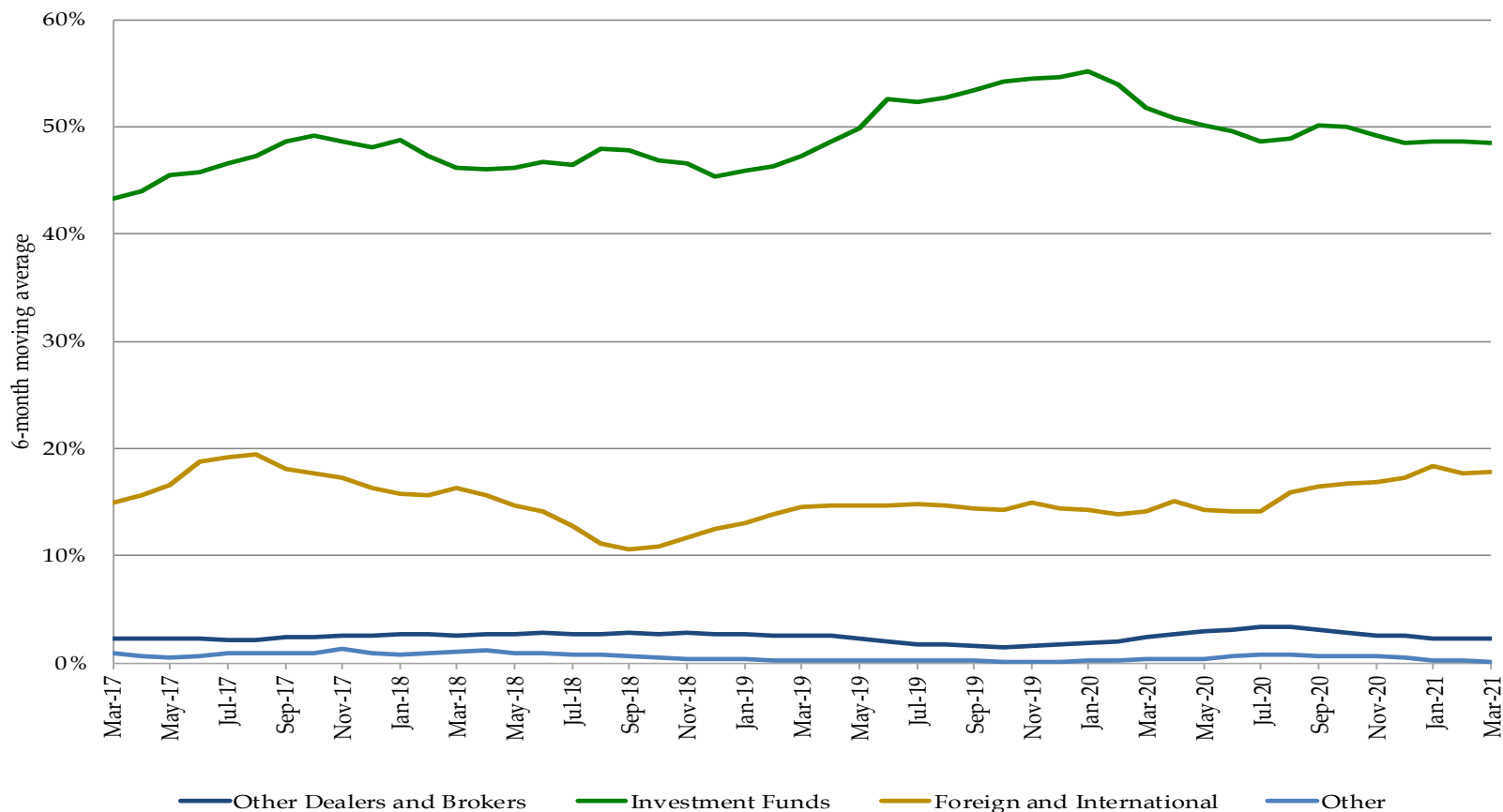


Percent Awarded in Bill Auctions by Investor Class (13-Week Moving Average)



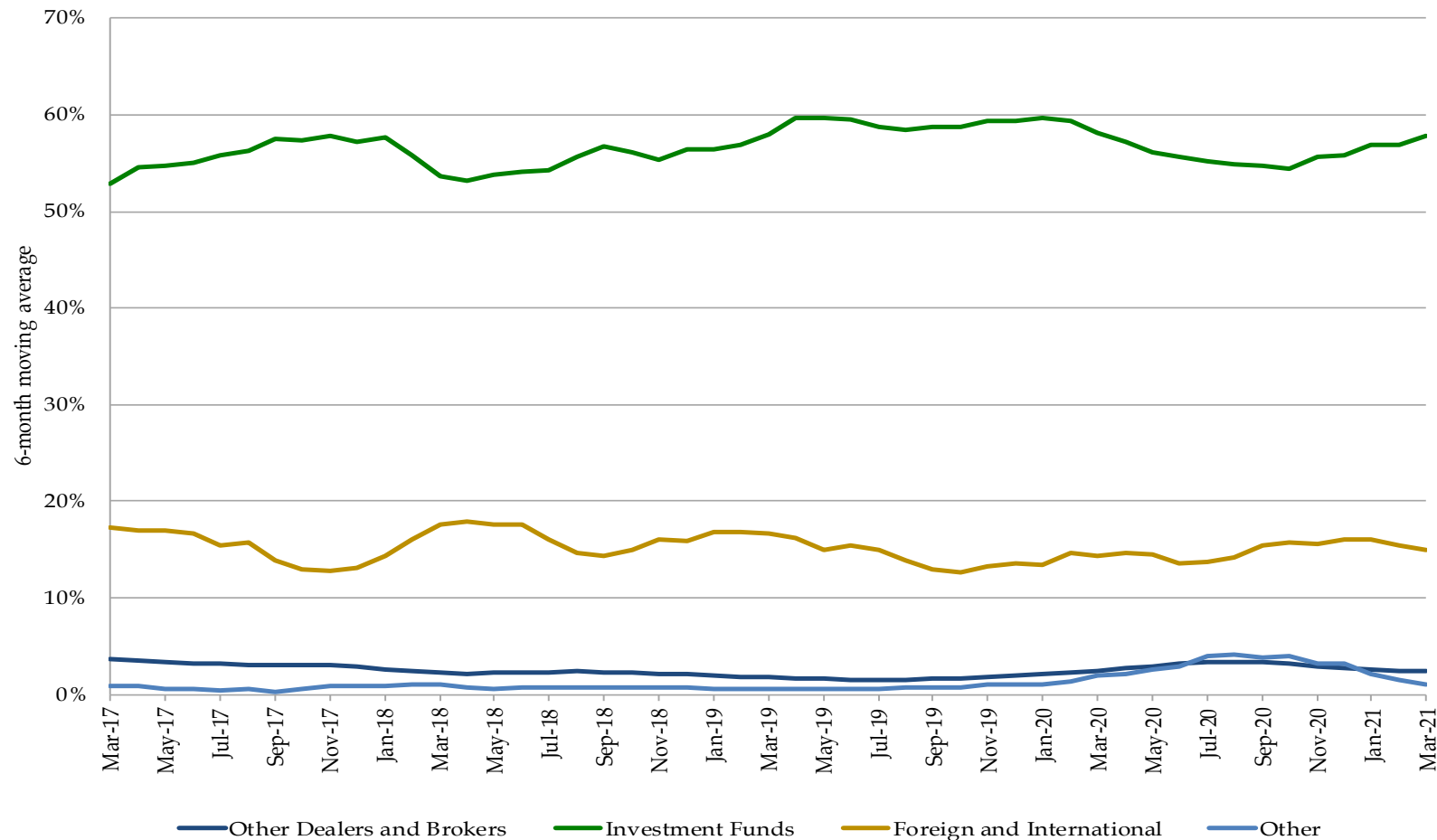
Excludes SOMA add-ons. The “Other” category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



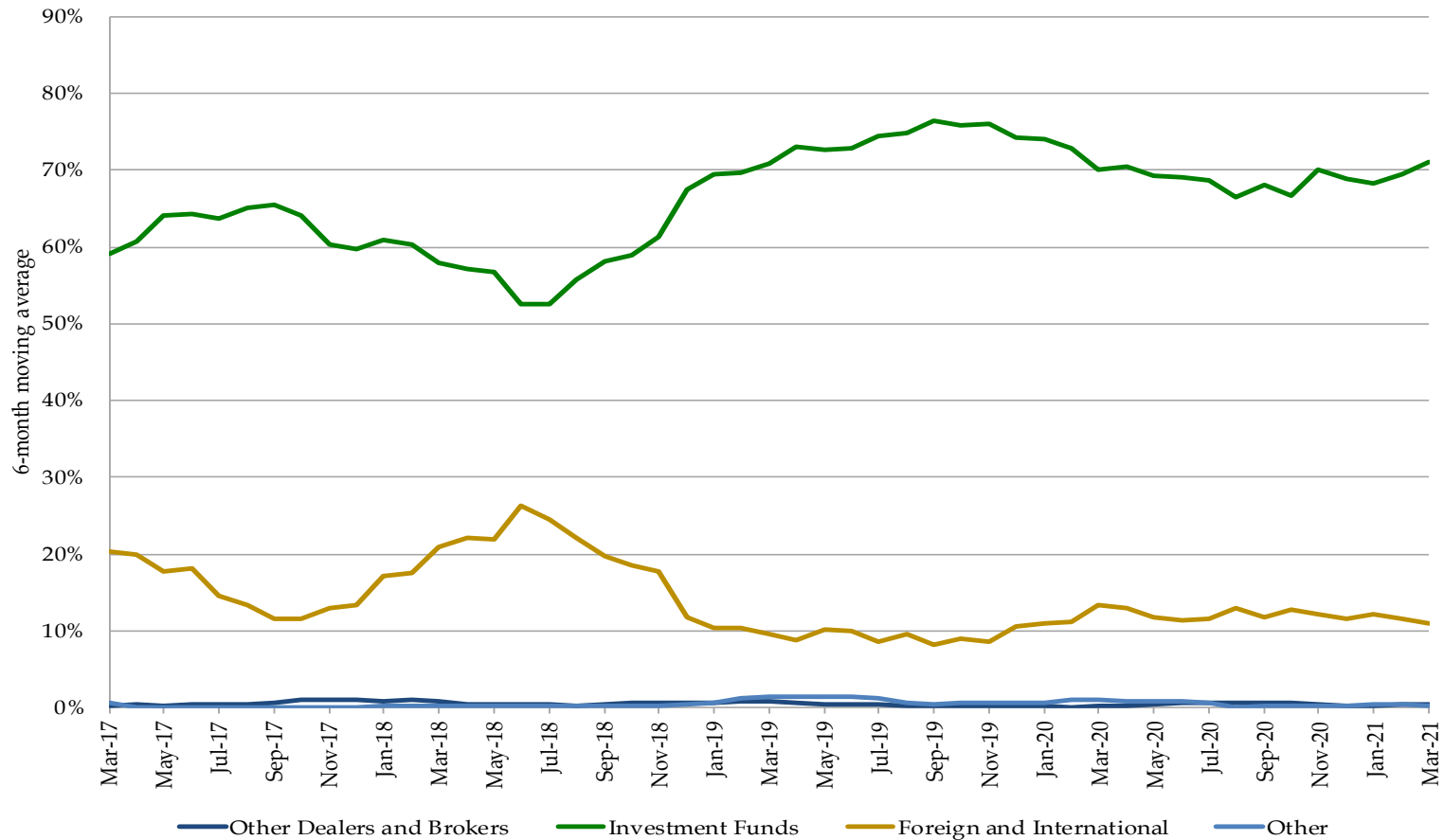
Excludes SOMA add-ons. The “Other” category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

Percent Awarded in 7-, 10-, 20-, 30-Year Nominal Security Auctions by Investor Class (6-Month Moving Average)



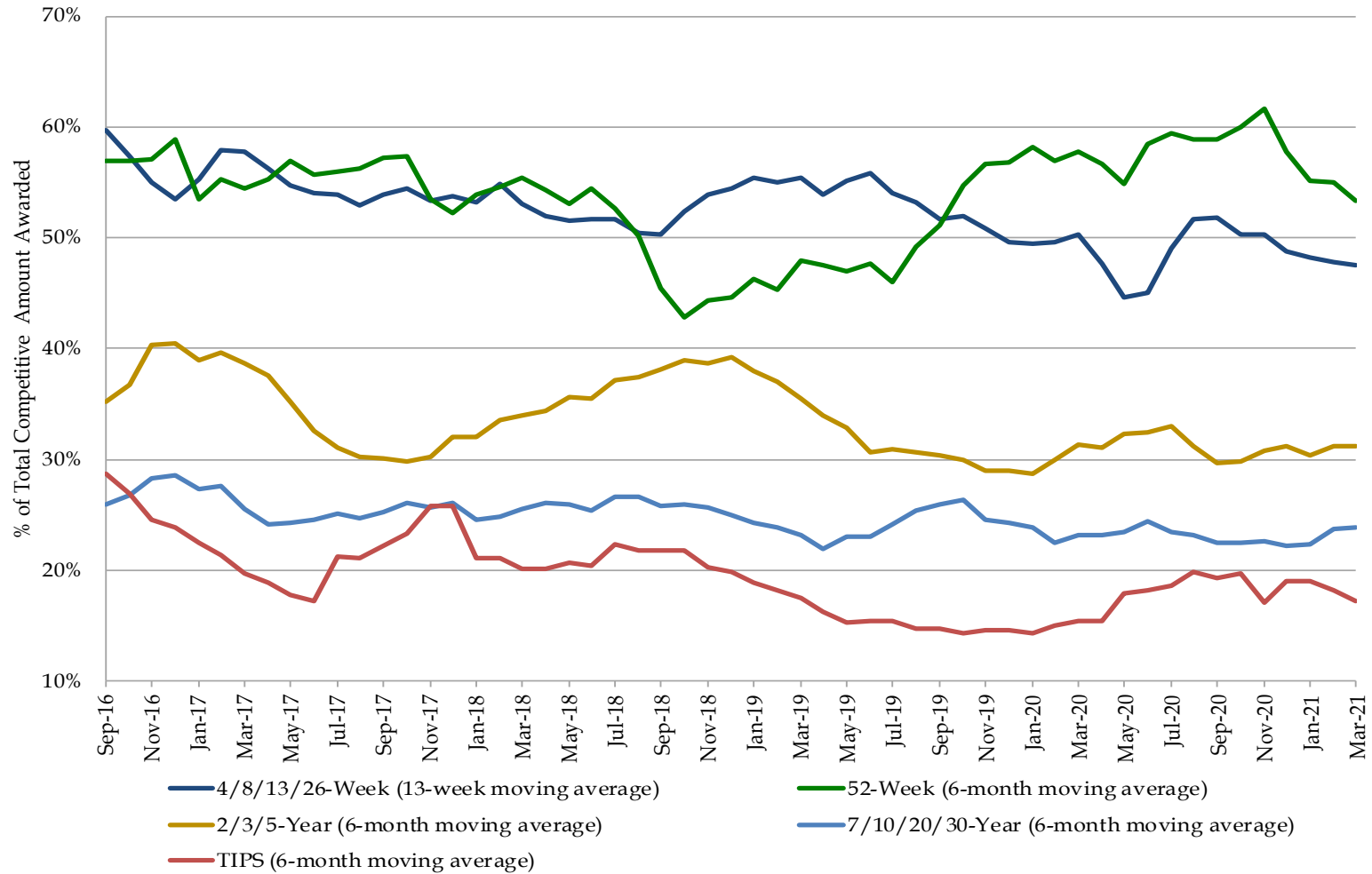
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



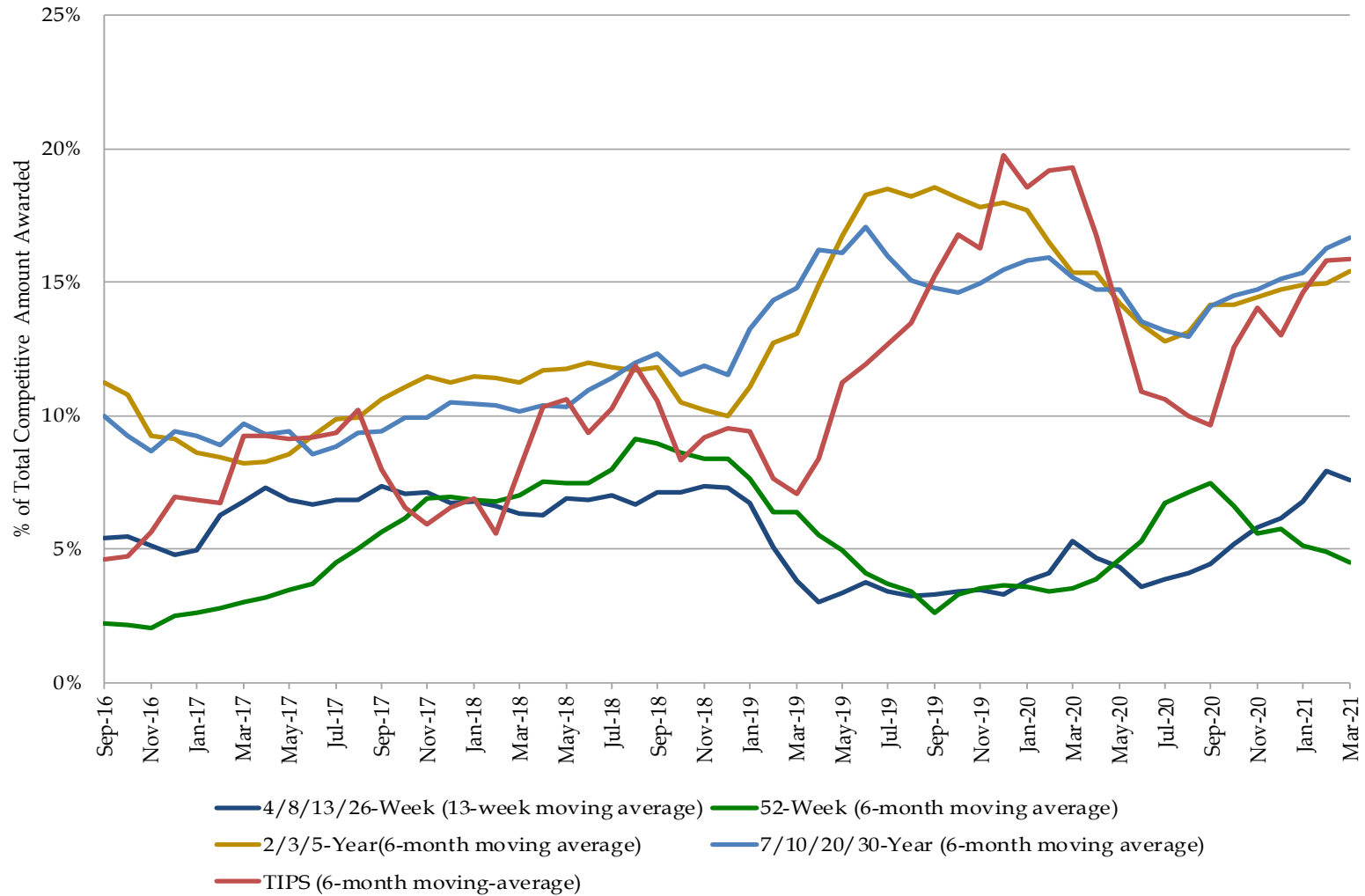
Excludes SOMA add-ons. The “Other” category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

Primary Dealer Awards at Auction



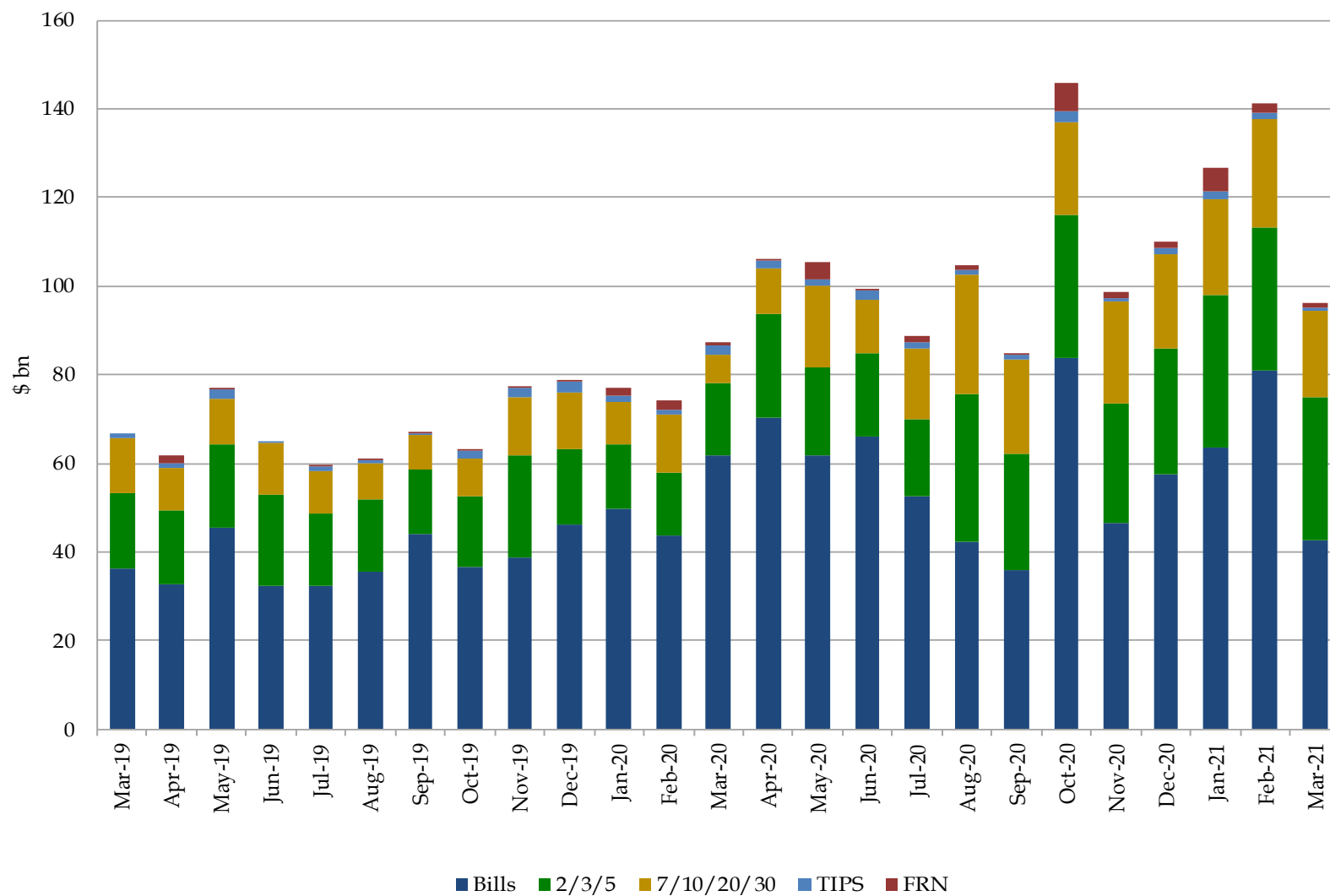
Competitive Amount Awarded excludes SOMA add-ons.

Direct Bidder Awards at Auction



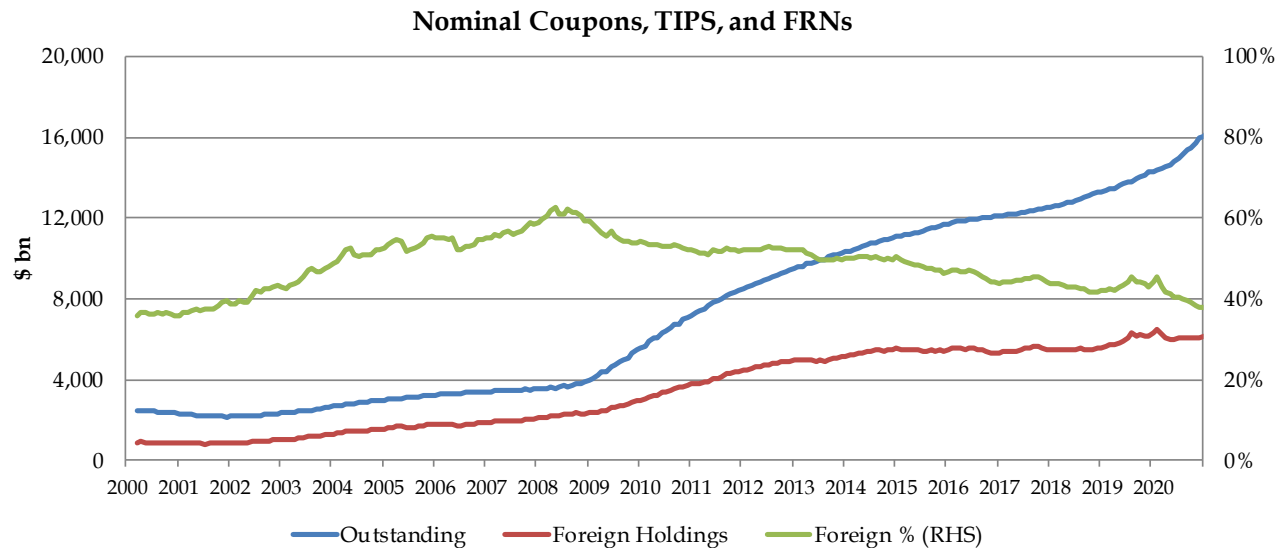
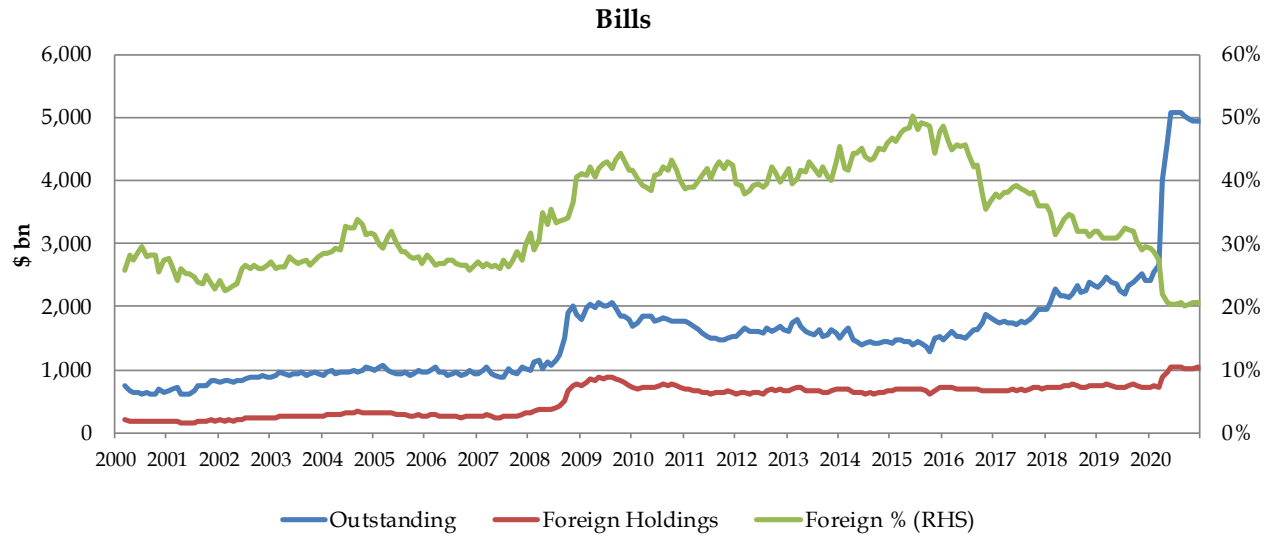
Competitive Amount Awarded excludes SOMA add-ons.

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 as of February 2021.

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

The seal of the U.S. Department of the Treasury is visible in the background, centered behind the word "Appendix". It is a circular emblem with a grey border. Inside the border, the words "THE DEPARTMENT OF THE TREASURY" are written in a circular path. At the bottom of the seal, the year "1789" is inscribed. The center of the seal features a shield with a chevron and stars, and a sword is positioned horizontally across the bottom of the shield.

**Projected Privately-Held Net Marketable Borrowing
Assuming Private Coupon Issuance & Total Bills Outstanding
Remain Constant as of 3/31/2021***

Fiscal Year	Bills	2/3/5	7/10/20/30	TIPS	FRN	Historical/Projected Net Borrowing Capacity
2016	289	(107)	515	58	41	795
2017	155	(66)	378	51	(0)	519
2018	438	197	493	45	23	1,196
2019	137	498	534	51	59	1,280
2020	2,652	538	724	46	55	4,014
2021	(360)	1,256	1,327	52	92	2,367
2022	0	1,044	1,373	49	80	2,545
2023	0	796	1,208	31	6	2,042
2024	0	509	1,303	52	0	1,864
2025	0	236	1,296	(14)	0	1,518
2026	0	14	1,290	(1)	0	1,303
2027	0	0	1,229	(1)	0	1,228
2028	0	0	810	(19)	0	791
2029	0	0	826	(12)	0	814
2030	0	0	802	2	0	805
2031	0	0	592	(15)	0	577

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.

*Privately-held marketable borrowing excludes rollovers (auction “add-ons”) of Treasury securities held in the Federal Reserve’s System Open Market Account (SOMA) but includes financing required due to SOMA redemptions.

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	1/12/2021	0.080	3.46	28.4	57.1	19.6	23.3	1.6	2.9	0.3
4-Week	1/19/2021	0.075	3.62	28.7	57.7	8.7	33.6	1.3	2.8	0.3
4-Week	1/26/2021	0.070	3.95	28.8	45.6	9.4	45.0	1.2	2.9	0.3
4-Week	2/2/2021	0.055	3.91	28.1	46.2	8.0	45.8	1.9	2.4	0.3
4-Week	2/9/2021	0.030	3.86	28.8	57.8	12.4	29.7	1.2	2.9	0.3
4-Week	2/16/2021	0.030	4.10	28.6	41.5	11.7	46.8	1.4	2.8	0.3
4-Week	2/23/2021	0.025	3.65	28.7	54.6	19.7	25.7	1.3	2.9	0.3
4-Week	3/2/2021	0.035	3.30	28.1	49.7	9.3	41.0	1.9	2.4	0.3
4-Week	3/9/2021	0.030	3.40	28.7	51.8	10.4	37.8	1.3	2.9	0.3
4-Week	3/16/2021	0.030	3.81	28.5	48.8	5.6	45.6	1.5	2.8	0.3
4-Week	3/23/2021	0.005	3.30	38.6	44.1	21.0	34.9	1.4	3.2	0.4
4-Week	3/30/2021	0.015	3.10	38.2	57.9	6.7	35.4	1.8	2.6	0.3
8-Week	1/12/2021	0.085	3.81	34.7	37.2	12.2	50.6	0.3	3.4	0.6
8-Week	1/19/2021	0.080	3.23	34.1	66.0	7.2	26.8	0.9	3.3	0.6
8-Week	1/26/2021	0.080	3.50	34.4	54.0	15.0	31.0	0.6	3.4	0.6
8-Week	2/2/2021	0.065	3.83	33.8	41.2	4.9	54.0	1.2	2.8	0.6
8-Week	2/9/2021	0.035	3.84	34.4	54.0	6.5	39.5	0.6	3.4	0.6
8-Week	2/16/2021	0.035	3.39	34.4	46.6	12.4	41.0	0.6	3.3	0.6
8-Week	2/23/2021	0.030	3.78	34.4	45.3	15.6	39.1	0.6	3.4	0.6
8-Week	3/2/2021	0.040	3.05	33.8	59.6	5.5	34.9	1.2	2.8	0.6
8-Week	3/9/2021	0.035	3.34	34.5	45.3	4.5	50.2	0.5	3.4	0.6
8-Week	3/16/2021	0.035	3.40	34.7	38.0	1.2	60.8	0.3	3.3	0.6
8-Week	3/23/2021	0.010	3.10	39.4	59.8	9.9	30.3	0.6	3.2	0.7
8-Week	3/30/2021	0.020	3.44	38.8	40.5	7.8	51.7	1.2	2.6	0.7

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

Bills (cont.)										
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	1/7/2021	0.090	2.95	53.3	45.8	4.6	49.7	0.7	6.9	1.6
13-Week	1/14/2021	0.090	2.92	52.5	49.6	11.7	38.6	1.5	6.6	1.6
13-Week	1/21/2021	0.085	2.99	52.8	52.2	3.2	44.6	1.2	7.6	1.7
13-Week	1/28/2021	0.080	2.92	52.3	55.6	7.0	37.4	1.7	7.4	1.6
13-Week	2/4/2021	0.065	2.88	52.8	52.7	8.9	38.4	1.2	7.3	1.7
13-Week	2/11/2021	0.035	3.02	52.9	46.3	15.8	37.9	1.1	6.1	1.6
13-Week	2/18/2021	0.040	2.72	52.9	43.9	4.4	51.7	1.1	7.1	1.6
13-Week	2/25/2021	0.030	2.88	52.3	51.5	7.3	41.2	1.7	6.0	1.6
13-Week	3/4/2021	0.040	3.06	53.0	41.1	2.7	56.2	1.0	7.2	1.6
13-Week	3/11/2021	0.045	3.06	53.1	41.9	3.6	54.6	0.9	5.2	1.6
13-Week	3/18/2021	0.030	3.31	55.9	41.3	5.8	52.9	1.1	4.9	1.6
13-Week	3/25/2021	0.015	3.16	55.5	37.7	3.5	58.8	1.5	2.0	1.6
13-Week	4/1/2021	0.020	2.68	56.0	56.6	5.0	38.4	1.0	6.9	1.7
26-Week	1/7/2021	0.090	3.24	50.5	39.4	4.3	56.3	0.5	6.5	3.1
26-Week	1/14/2021	0.090	3.29	50.1	34.7	10.8	54.5	0.9	6.2	3.1
26-Week	1/21/2021	0.095	3.09	50.2	47.4	2.9	49.7	0.8	7.2	3.1
26-Week	1/28/2021	0.085	3.48	49.5	44.4	5.6	50.0	1.5	7.0	3.1
26-Week	2/4/2021	0.070	3.41	50.1	41.3	3.2	55.6	0.9	6.9	3.1
26-Week	2/11/2021	0.050	2.99	50.0	55.1	13.1	31.8	1.0	5.8	3.1
26-Week	2/18/2021	0.060	3.02	50.1	47.6	3.5	48.9	0.9	6.7	3.1
26-Week	2/25/2021	0.045	2.81	49.5	59.1	6.6	34.2	1.5	5.7	3.0
26-Week	3/4/2021	0.060	2.91	50.2	51.1	6.4	42.4	0.8	6.8	3.1
26-Week	3/11/2021	0.060	3.55	50.2	26.2	1.2	72.7	0.8	4.9	3.0
26-Week	3/18/2021	0.055	2.94	53.3	42.2	5.0	52.8	0.8	4.7	3.1
26-Week	3/25/2021	0.040	2.96	52.5	45.0	3.3	51.7	1.5	1.9	3.0
26-Week	4/1/2021	0.040	2.93	53.4	41.0	3.8	55.2	0.6	6.5	3.2
52-Week	1/28/2021	0.090	3.92	33.7	45.7	7.9	46.4	0.3	4.6	4.1
52-Week	2/25/2021	0.070	3.36	33.8	52.1	3.5	44.5	0.2	3.8	4.0
52-Week	3/25/2021	0.070	3.46	33.7	54.4	2.8	42.8	0.3	1.2	3.8

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

Bills (cont.)										
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)*
6-Week	1/7/2021	0.085	3.13	30.0	74.3	7.4	18.3	0.0	0.0	0.4
6-Week	1/14/2021	0.085	3.18	30.0	68.4	7.6	23.9	0.0	0.0	0.4
6-Week	1/21/2021	0.085	3.34	30.0	63.7	12.2	24.1	0.0	0.0	0.4
6-Week	1/28/2021	0.070	3.94	30.0	59.3	9.2	31.5	0.0	0.0	0.4
6-Week	2/4/2021	0.050	4.05	30.0	57.4	8.3	34.3	0.0	0.0	0.4
6-Week	2/11/2021	0.035	3.43	30.0	64.7	20.8	14.5	0.0	0.0	0.4
6-Week	2/18/2021	0.040	3.10	30.0	55.8	7.4	36.7	0.0	0.0	0.4
6-Week	2/25/2021	0.025	3.24	30.0	53.7	8.8	37.5	0.0	0.0	0.4
6-Week	3/4/2021	0.040	3.54	30.0	44.0	8.3	47.7	0.0	0.0	0.4
6-Week	3/11/2021	0.030	3.75	30.0	51.1	6.9	42.0	0.0	0.0	0.4
6-Week	3/18/2021	0.015	3.75	35.0	50.2	8.5	41.3	0.0	0.0	0.4
6-Week	3/25/2021	0.010	3.16	40.0	47.9	9.0	43.1	0.0	0.0	0.5
6-Week	4/1/2021	0.015	2.97	40.0	44.7	10.3	45.0	0.0	0.0	0.5
15-Week	1/12/2021	0.090	3.73	25.0	50.2	9.1	40.6	0.0	0.0	0.8
15-Week	1/19/2021	0.090	3.84	25.0	50.9	8.2	40.9	0.0	0.0	0.8
15-Week	1/26/2021	0.085	4.21	25.0	43.2	8.0	48.8	0.0	0.0	0.8
15-Week	2/2/2021	0.075	4.07	25.0	57.7	9.6	32.7	0.0	0.0	0.8
15-Week	2/9/2021	0.055	3.84	25.0	60.2	21.5	18.3	0.0	0.0	0.8
15-Week	2/16/2021	0.045	3.61	25.0	53.5	10.1	36.3	0.0	0.0	0.8

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

Bills (cont.)										
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)*
17-Week	1/7/2021	0.085	3.93	30.0	47.2	5.5	47.3	0.0	0.0	1.0
17-Week	1/14/2021	0.090	3.61	30.0	51.4	6.5	42.0	0.0	0.0	1.1
17-Week	1/21/2021	0.090	3.78	30.0	42.7	5.9	51.4	0.0	0.0	1.1
17-Week	1/28/2021	0.075	3.95	30.0	58.7	5.5	35.8	0.0	0.0	1.1
17-Week	2/4/2021	0.060	3.97	30.0	52.9	7.9	39.2	0.0	0.0	1.1
17-Week	2/11/2021	0.040	3.80	30.0	41.5	13.2	45.4	0.0	0.0	1.1
17-Week	2/18/2021	0.050	3.24	30.0	58.4	9.4	32.2	0.0	0.0	1.0
17-Week	3/2/2021	0.045	3.16	30.0	59.7	4.9	35.4	0.0	0.0	1.0
17-Week	3/9/2021	0.050	3.71	30.0	29.7	7.8	62.4	0.0	0.0	1.0
17-Week	3/16/2021	0.050	3.75	30.0	50.2	9.4	40.4	0.0	0.0	1.0
17-Week	3/23/2021	0.040	3.42	35.0	48.0	6.8	45.2	0.0	0.0	1.2
17-Week	3/30/2021	0.030	3.65	35.0	20.8	5.0	74.2	0.0	0.0	1.2
17-Week	4/6/2021	0.030	3.49	35.0	41.5	5.2	53.2	0.0	0.0	1.2
22-Week	1/12/2021	0.090	3.57	30.0	45.3	15.1	39.7	0.0	0.0	1.4
22-Week	1/19/2021	0.090	3.62	30.0	58.6	6.8	34.7	0.0	0.0	1.4
22-Week	1/26/2021	0.090	3.63	30.0	41.2	6.1	52.7	0.0	0.0	1.4
22-Week	2/2/2021	0.080	3.59	30.0	55.5	6.5	37.9	0.0	0.0	1.4
22-Week	2/9/2021	0.055	3.57	30.0	49.5	14.8	35.7	0.0	0.0	1.4
22-Week	2/16/2021	0.055	3.23	30.0	60.3	7.0	32.7	0.0	0.0	1.4

*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	2/1/2021	0.125	2.67	59.8	27.7	15.6	56.6	0.2	8.1	14.5
2-Year	3/1/2021	0.119	2.44	59.7	30.7	12.0	57.3	0.3	13.0	15.5
2-Year	3/31/2021	0.152	2.54	59.8	31.7	17.6	50.7	0.2	10.8	15.2
3-Year	1/15/2021	0.234	2.52	57.9	33.2	14.6	52.2	0.1	5.8	20.4
3-Year	2/16/2021	0.196	2.39	57.9	31.2	16.0	52.7	0.1	21.0	25.4
3-Year	3/15/2021	0.355	2.69	57.9	34.0	18.2	47.8	0.1	3.6	19.7
5-Year	2/1/2021	0.424	2.34	61.0	25.4	14.1	60.5	0.0	8.2	36.6
5-Year	3/1/2021	0.621	2.24	61.0	28.6	14.4	57.1	0.0	13.2	38.9
5-Year	3/31/2021	0.850	2.36	60.9	25.3	16.6	58.1	0.1	11.0	37.9
7-Year	2/1/2021	0.754	2.30	62.0	19.6	16.3	64.1	0.0	8.4	51.3
7-Year	3/1/2021	1.195	2.04	62.0	39.8	22.1	38.1	0.0	13.4	54.0
7-Year	3/31/2021	1.300	2.23	61.9	24.7	18.0	57.3	0.1	11.1	52.6
10-Year	1/15/2021	1.164	2.47	38.0	20.0	17.8	62.2	0.0	3.8	41.8
10-Year	2/16/2021	1.155	2.37	41.0	20.5	18.9	60.6	0.0	14.9	56.7
10-Year	3/15/2021	1.523	2.38	38.0	25.4	17.8	56.8	0.0	2.4	40.3
20-Year	2/1/2021	1.657	2.28	24.0	25.7	14.5	59.7	0.0	3.2	49.8
20-Year	3/1/2021	1.920	2.15	27.0	29.1	16.0	54.9	0.0	5.8	57.7
20-Year	3/31/2021	2.290	2.51	24.0	21.6	17.0	61.4	0.0	4.3	49.6
30-Year	1/15/2021	1.825	2.47	24.0	14.2	17.2	68.6	0.0	2.4	65.6
30-Year	2/16/2021	1.933	2.18	27.0	22.2	17.3	60.5	0.0	9.8	90.3
30-Year	3/15/2021	2.295	2.28	24.0	19.2	20.2	60.6	0.0	1.5	61.0
2-Year FRN	2/1/2021	0.049	2.82	28.0	46.8	1.1	52.1	0.0	3.8	0.0
2-Year FRN	2/26/2021	0.045	2.88	26.0	39.3	1.1	59.7	0.0	0.0	0.0
2-Year FRN	3/26/2021	0.035	3.25	26.0	32.1	1.9	66.0	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	1/29/2021	(0.987)	2.68	15.0	17.7	19.5	62.8	0.0	0.0	16.0
10-Year TIPS	3/31/2021	(0.580)	2.42	13.0	10.8	15.2	74.0	0.0	2.3	16.1
30-Year TIPS	2/26/2021	(0.040)	2.31	9.0	17.2	14.6	68.1	0.0	0.0	28.2

*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.

Treasury Market Functioning

Treasury market liquidity has, at times, been strained during recent episodes of broader market stress. What lessons have been learned in recent years regarding Treasury market structure and vulnerabilities in the non-bank financial sector, and what efforts should be considered to improve market functioning and reduce the need for public sector interventions during future episodes of heightened uncertainty?

May 2021

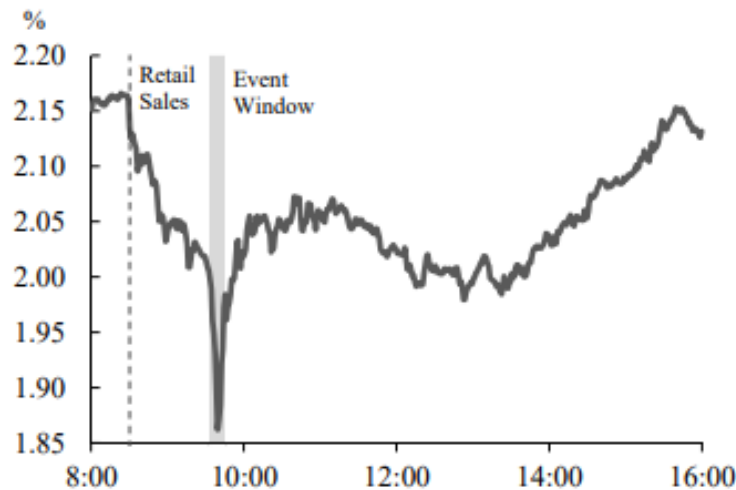
Agenda

- Events with notable shifts in UST liquidity
 - Flash Rally (October 2014)
 - Repo Spike (September 2019)
 - COVID-19 Crisis (March 2020)
 - February 25th, 2021
- What considerations do these events raise?
- What efforts could be made to improve market functioning in light of these considerations?

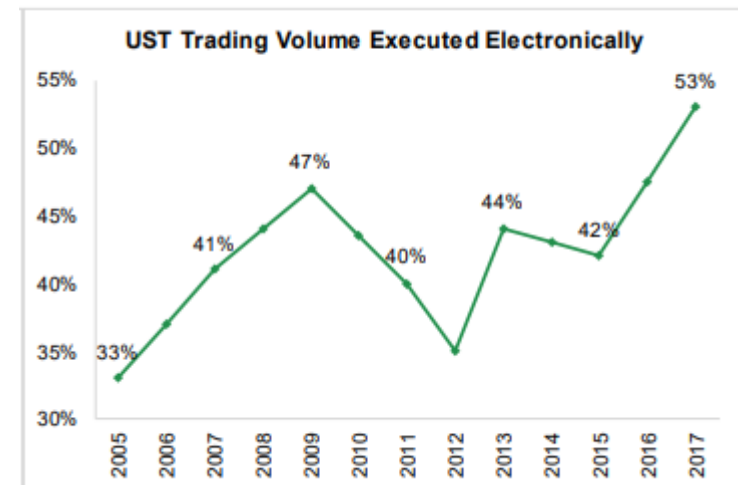
Stress in the Treasury markets: flash rally

- Over the past decade the Treasury secondary market has experienced four notable disruptions worth discussing: flash rally (October 2014), repo spike (September 2019), COVID-19 crisis (Spring 2020), and a liquidity breakdown following the 7yr auction Feb 25th, 2021.
- Flash rally (October 2014):** On October 15th 2014 the 10y Treasury yields experienced a 37bp intraday trading range and loss of liquidity, despite the lack of an obvious trigger in the form of data or significant policy announcements. This, combined with the increase in electronic trading of UST, raised questions about the increased role of PTFs (Proprietary Trading Firms) in the UST market.
- Normalization happened without official sector intervention.

On Oct 15th 2014 the 10y UST yield collapsed intraday



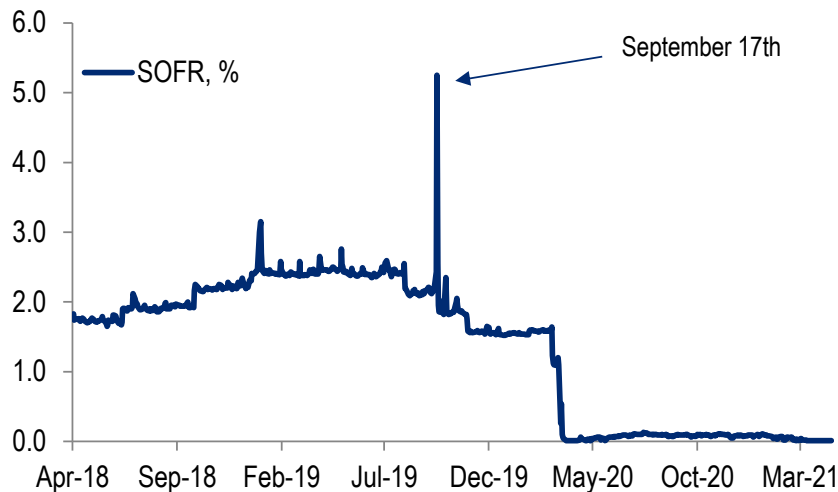
Electronic trading as a share of volume



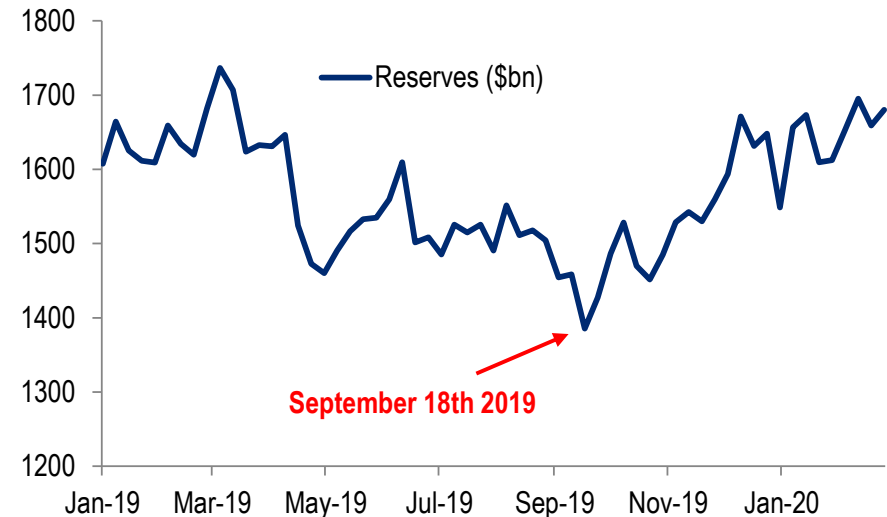
Stress in the Treasury markets: repo spike

- **Repo spike (September 2019):** On September 17th overnight Treasury repo rates spiked materially. That week there was a large drop in reserves due to corporate tax payments and settlement of UST issuance, coinciding with declining reserves due to the Fed's balance sheet normalization.
- It is important to note that this stress event originated as a funding crisis, due to scarcity of reserves. While this flowed through to UST cash liquidity, that was a response to funding volatility rather than a stress event driven by secondary market liquidity in UST.
- Through a combination of term and overnight repo operations, as well as technical adjustments to IOER and ON RRP, the Fed helped facilitate a return to normal market functioning.

Overnight repo rates spiked in 2019...



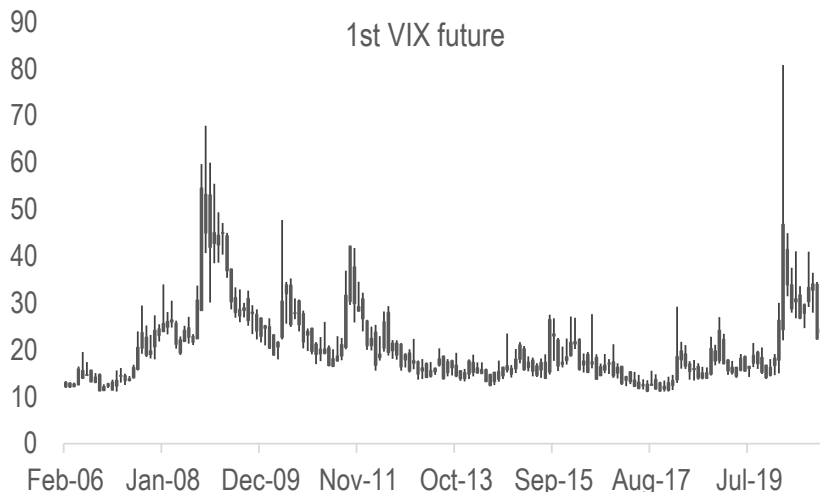
...as reserves shrunk



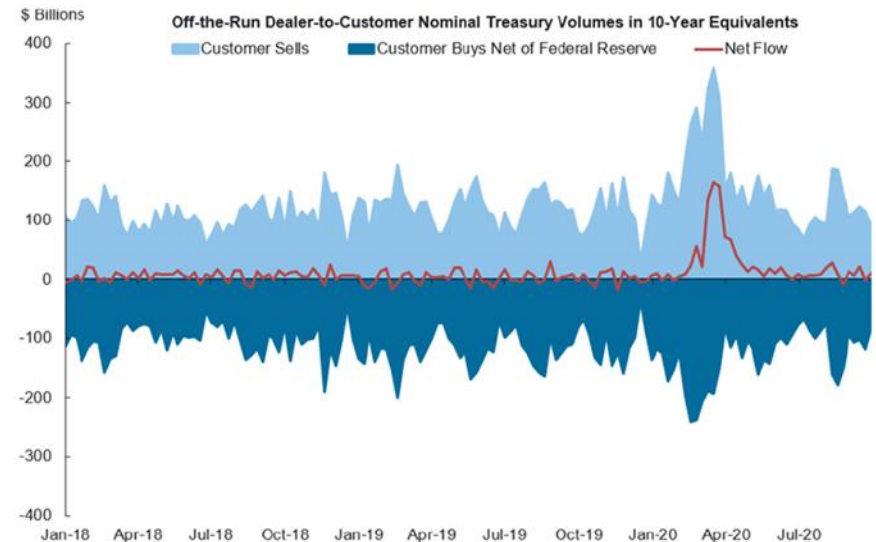
Stress in the Treasury Markets: COVID-19

- **COVID-19 pandemic:** The pandemic caused sweeping disruption and unprecedented uncertainty globally culminating in a series of business and government lockdowns in March 2020:
 - Increased economic uncertainty drove market volatility higher, widened credit spreads, and led to a rapid downdraft in equity markets. Volatility across financial instruments spiked, reducing risk tolerance, raising cash requirements in margin and, in some cases, forcing sales.
 - End users: Non-financial corporates tapped capital markets, demand for US dollars increased materially, prime money market funds (MMFs) experienced significant outflows, some open-ended funds experienced redemptions, and significant sales of USTs to fund the dash for cash.
 - Intermediators: Increased volatility and unprecedented scale and speed of market moves challenged risk intermediation. Regulatory constraints and operational challenges reduced flexibility in balance sheet and risk tolerance. Bid offer widened sharply, liquidity premium spiked in cash and futures, and market functioning was materially impaired.
 - Fed response was historic in scope and scale and restored functioning in the Treasury market and beyond.

VIX futures well surpassed '08 crisis levels



Weekly Treasury volumes net of Fed purchases, 10-year equivalents



Source: Bloomberg. Lorie Logan, "Treasury Market Liquidity and Early Lessons from the Pandemic Shock", 10-23-2020.

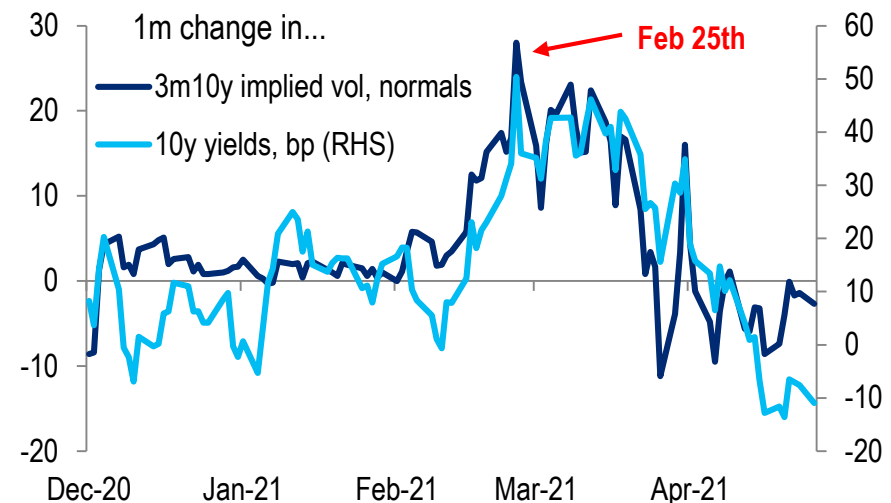
Stress in the Treasury Market: February 25th, 2021

- **February 25th 2021:** the 20y bond had a significant liquidity event:
 - The 20y bond cheapened against the curve intraday. The 10s20s30s fly moved higher by ~15bp before normalizing back by the end of the 26th.
 - Liquidity had declined following a weak 7y auction at 1pm which tailed by almost 4.5bp (~3 standard deviation event).
 - The 20y point had been cheapening against the curve entering the 25th on the back of a relatively weak 20y auction on the 17th (tailed by over 2bp).
 - Market conditions trended towards normalization without intervention in the following days.
- Liquidity had begun deteriorating in early February as the Treasury curve bear steepened on the back of expectations for a stronger economic reopening and the \$1.9tn fiscal stimulus package:
 - 1m10y implied volatilities increased by ~30 normal vols from Jan ME to Feb 25th.
 - The market priced in a more accelerated rate hiking cycle: on Feb 25th expectations reached ~3 rate hikes by YE23 up from only 1.4 on January ME.

On the 25th 20y USTs cheapened up dramatically on an intraday basis following the weak 7y auction



Implied vol and yields moved higher into February



Source: Bloomberg; Note: The RHS chart reports rolling 1m changes

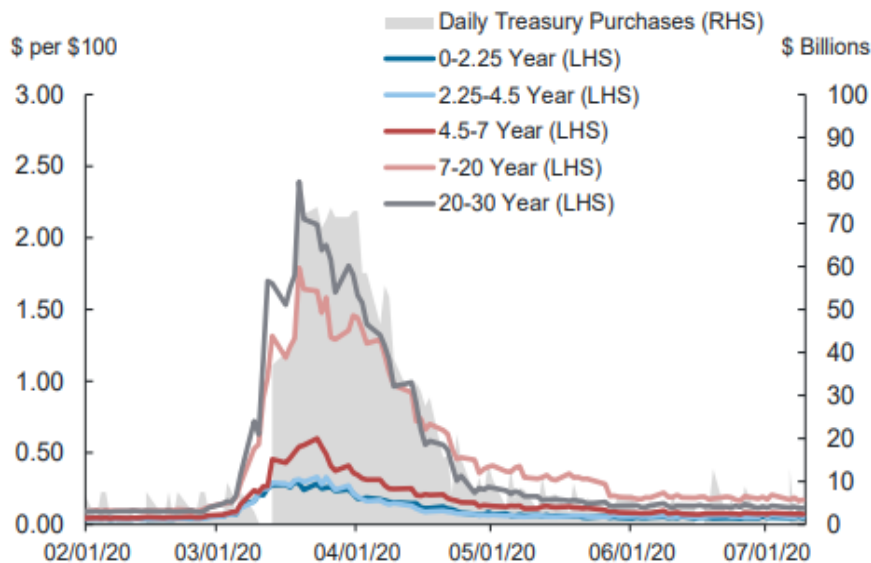
What considerations do these episodes raise?

- Liquidity within the UST complex can vary; on the runs tend to retain liquidity better
- Treasuries can be used as a source of cash in a time of stress, when other assets are less liquid
- Opportunistic players provide a valuable source of demand through cash/futures or broader relative value arbitrage, but quick exits can be disruptive.
- Intermediation has not kept pace with the scale of increase in the outstanding UST debt supply.
- While some episodes were naturally resolved, others required intervention from the official sector.
- Not all events have clear and easily anticipated triggers. Therefore tools to navigate volatility may be more valuable than tools that aim to fully prevent it.

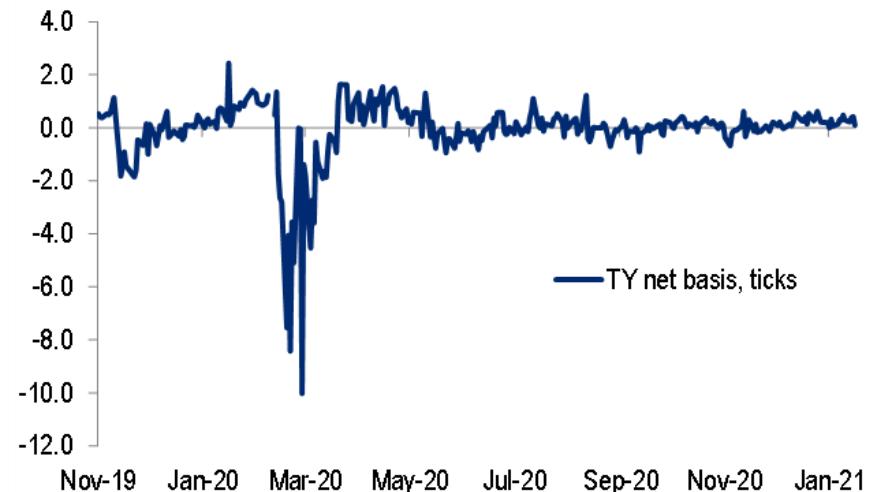
Liquidity within the UST complex can vary in times of stress

- Treasuries are frequently a source of safety in flight to quality episodes.
- In flight-to-quality episodes basis risk increases between off-the-run/on-the-run Treasuries and cash/futures.
 - For example in March 2020 investor demand was focused almost exclusively on on-the-run USTs and Treasury futures, both of which saw significant premiums to off-the-run securities.
 - Both on-the-run USTs and Treasury futures maintained better liquidity and volumes than off-the-run securities.

Treasury bid-ask spreads widened materially in March



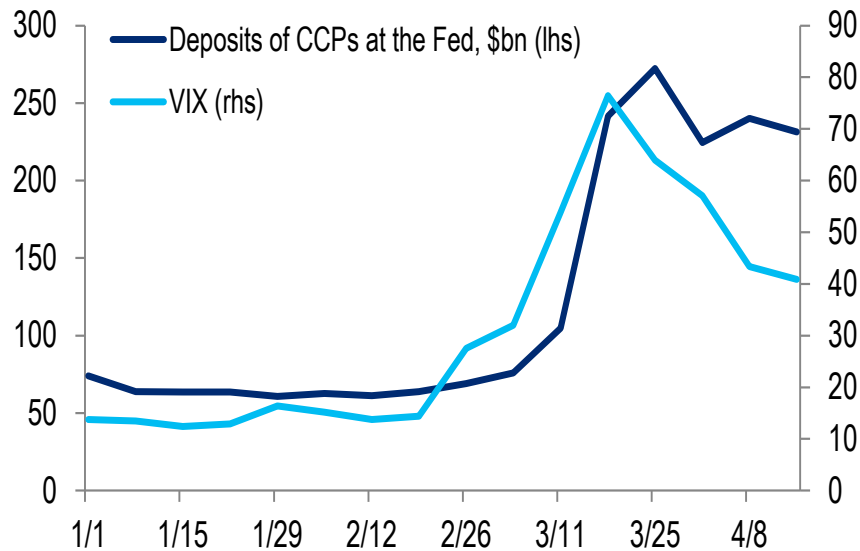
Treasury futures premium increased over cash bonds in March 2020



Treasuries can be a source of liquidity in a dash for cash

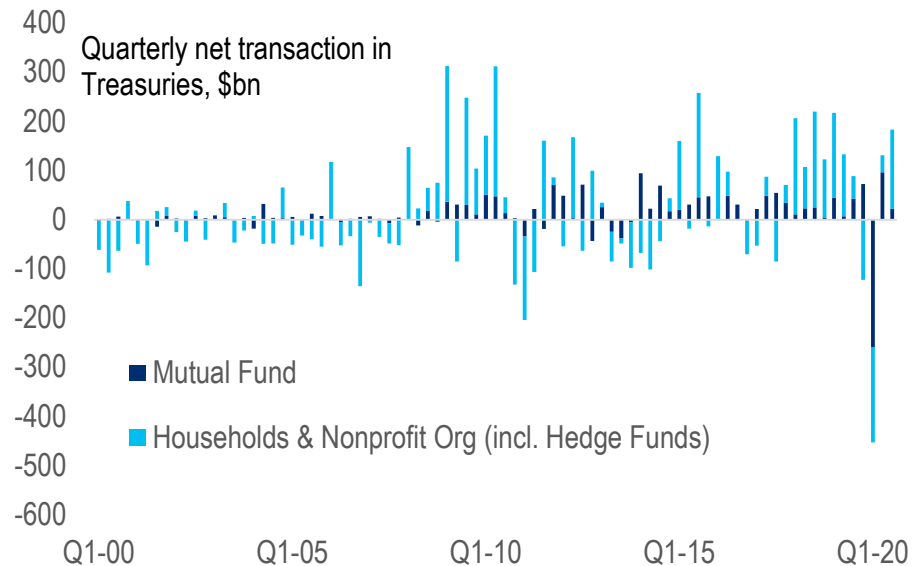
- Asset managers rely on treasuries for their unmatched liquidity especially in periods which require cash raises to offset increasing redemptions.
 - Liquidity challenges in other asset classes can drive selling in USTs.
- Foreign official accounts typically rely on USTs to store dollar holdings and assist in currency defense.
- Investors turn to the Treasury market to raise cash.
 - Margin requirements increased in March 2020; while not exclusively due to the increase in volatility, CCP deposits at the Fed increased by ~\$200bn.
 - Investors sourced duration in futures while selling off-the-run USTs to raise cash to meet redemptions.

Higher vol drove CCP IM requirements higher



Source: Fed's H.4.1 and Z1 release.

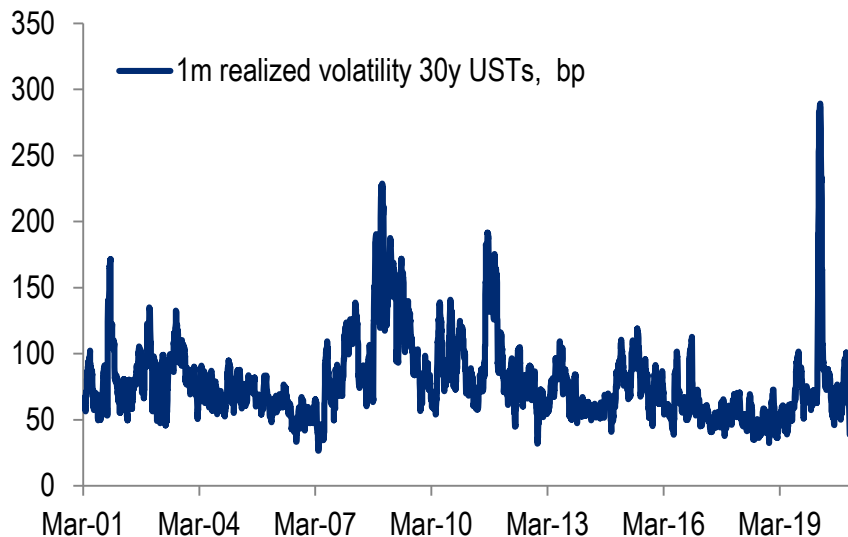
There was significant domestic selling by mutual funds



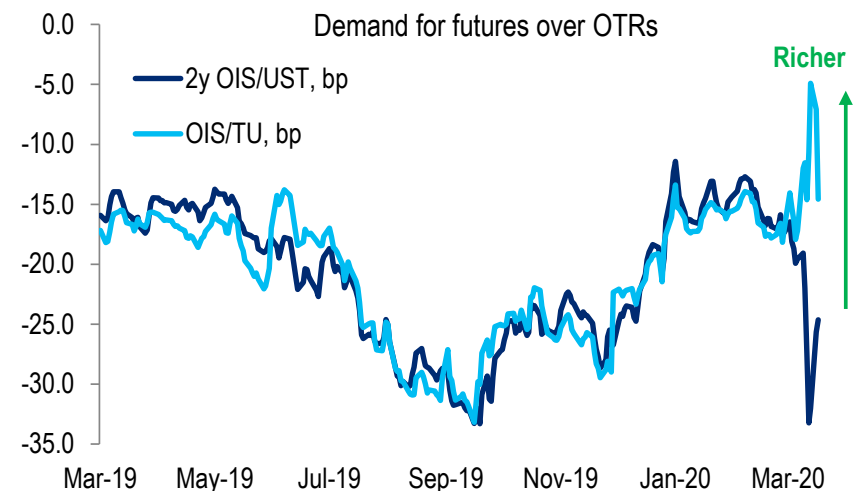
Leveraged trading can contribute to pro-cyclical risks

- Many opportunistic investors sell Treasury futures and buy off-the-run Treasuries to monetize the any presence of richness in futures and cheapness in off-the-runs.
 - This can serve to improve UST pricing and reduce cost to the taxpayer in normal markets.
 - Typically trades are highly levered, so sudden unwinds can be disruptive to market functioning.
- Variation margin can be a challenge when volatility of the basis rises.
 - Hedge funds typically hold the futures leg of the trade with one Futures Commission Merchant (FCM) while the financing of the bond leg is split amongst multiple dealers to optimize balance sheet pricing/availability. This creates cash flow timing issues as the CME is paid on trade date while VM for the bond leg of the trade comes in on T+1.
- Increased volatility can lead to increased IM requirements driving stop outs as evidenced by March 2020
 - TU and TY IM increased by 50% and US and WN IM requirements were doubled by mid-March 2020

UST volatility, especially at the long-end of the curve, drove the CME to increase IM requirements last year



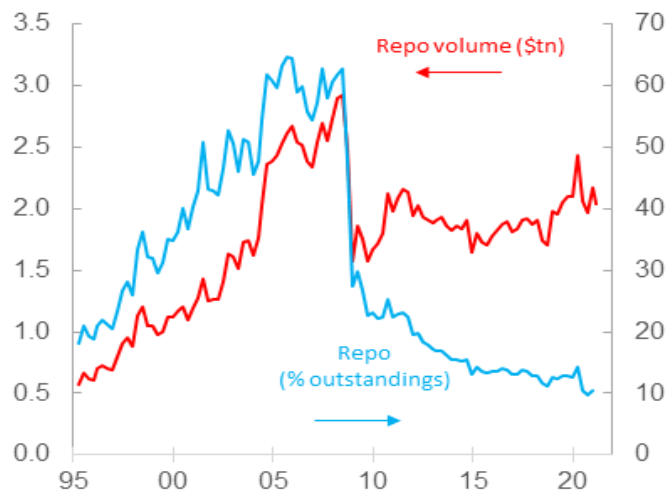
TU futures richened materially against 2y USTs in March 2020



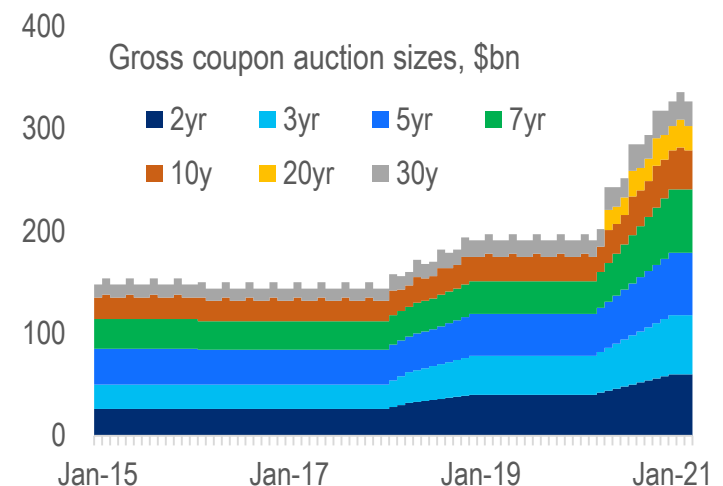
Role of intermediation amid evolving market structure

- Role of risk intermediaries became critical for market functioning, though March 2020 shows they have been unable to scale to the size of the market need without a shift in pricing:
 - Unprecedented volatility and a shifting market environment made it challenging for banks to quickly reallocate capital and balance sheet.
 - Strengthened risk controls for approval processes for large trades, shifts in risk limits, real time liquidity calculations make it hard for dealers to adapt and scale up in real time.
 - Regulatory ratios were often cited as a constraint for risk and balance sheet flexibility in March 2020.
- PTFs, which are primarily made up of high frequency trading firms, tend to pull back from the Treasury market during stress as seen during October 2014 and March 2020.
 - A decline in PTF liquidity, whether a reduction in size (as in October 2014) or a reduction in bid offer or participation at all, can contribute to lower order book depth and wider b/o.
- These factors can be increasingly relevant as the UST universe grows in absolute terms and relative to repo availability.

Repo availability has fallen relative to...



...the increase in coupon supply

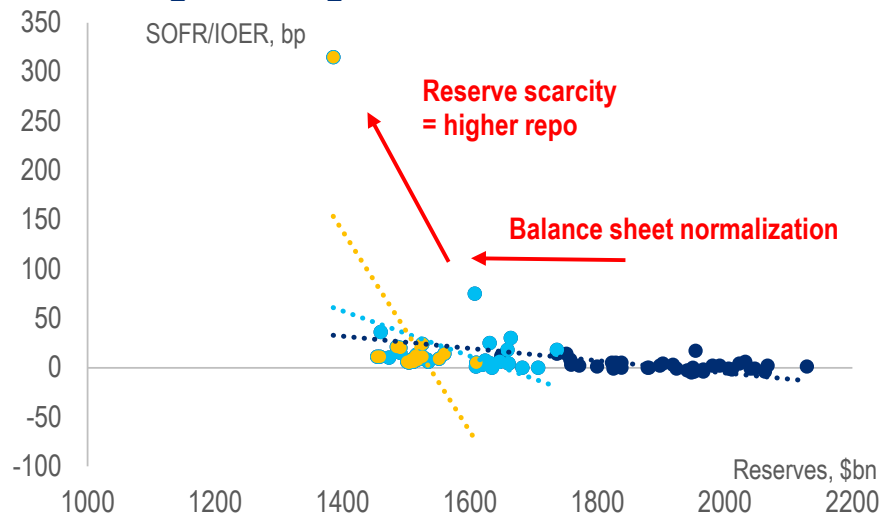


Fed tools can provided key support to market functioning

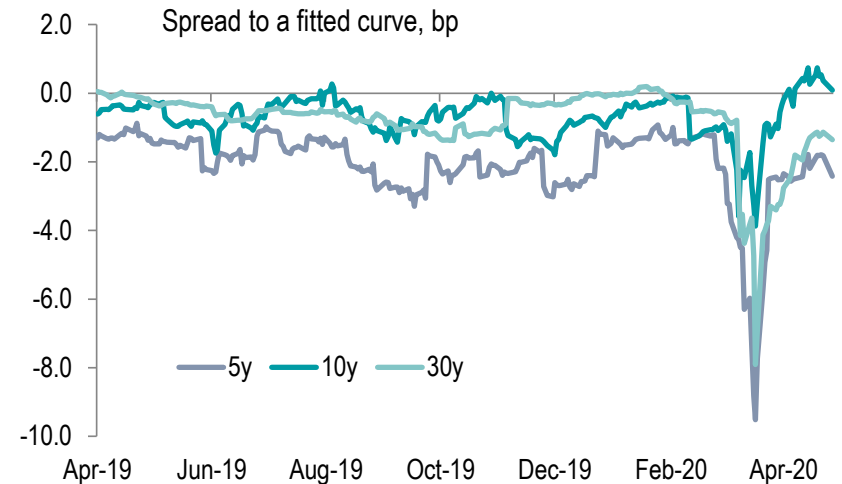
- At each FOMC meeting the FOMC authorizes and directs the Open Market Desk at the NY Fed to execute transactions in SOMA to fulfil policy goals. For example we highlight current goals to:
 - Undertake open market operations to maintain Fed effective in a specified target range (currently 0-0.25%).
 - Sustain smooth functioning of UST and MBS markets by increasing SOMA holdings of these securities.

Fed program	Target group	The programs were around during...			
		Flash rally	Repo spike	COVID crisis	20y liquidity stress
Asset purchases	UST holders	Yes	Normalization	Yes	Yes
FIMA Repo Facility	Central banks	No	No	Yes	Yes
Central bank swap lines	Central banks	Yes	Yes	Yes	Yes
Daily o/n repo operations	Primary dealers	No	No	Yes	Yes
Primary Dealer Credit Facility (PDCF)	Primary dealers	No	No	Yes	Yes
Money Market Mutual Fund Liquidity Facility (MMLF)	MMFs/Muni	No	No	Yes	Yes
Commercial Paper Funding Facility (CPFF)	Corporates/Muni	No	No	Yes	Yes
Main Street Lending Programs	Corporates	No	No	Yes	No
Municipal Liquidity Facility (MLF)	State/local	No	No	Yes	No
Paycheck Protection Program Liquidity Facility (PPPLF)	Banks	No	No	Yes	Yes
Primary Market Corporate Credit Facility (PMCCF)	Corporates	No	No	Yes	No
Secondary Market Corporate Credit Facility (PMCCF)	Corporates	No	No	Yes	No
Term Asset-Backed Securities Loan Facility (TALF)	Consumers/Corporates	No	No	Yes	No

Overnight funding rates are a function of reserves



Dislocations across the Treasury curve normalized following the Fed's UST purchases in March 2020



Source: Bloomberg; NY Fed; Internal calculations

What have we learned from these historic episodes?

- Emphasis should be placed on gathering and analyzing both public and non-public data.
- How should market participants and regulators balance the response to rare events?
 - Many market structure changes could impact the normal operating environment for USTs, structurally changing regular way market participation in primary and secondary markets
 - It is therefore critical for the official sector to incorporate structural impact to both normal and stressed market environments when considering various responses
 - Improvements with low permanent cost should clearly be made
- Tools to navigate volatility may be more valuable than tools that aim to fully prevent it

A standing repo facility

Proposal







- Offer US government and agency financing under pre-established arrangements in stress times
 - Include both independent and bank-affiliated dealers; careful consideration could be given to broader eligibility
 - Financing rates will be slightly above market rates, haircuts will be at market levels

Pros

- Help ease bank-affiliated dealers' unwillingness to lend and allow dealers to confidently meet the surge in demand for liquidity under stress
 - Reduce the intensity of the dash-for-cash by investors, as financing of USTs would be assured, albeit at penalty rates.
- Encourage more dealers to provide intermediation in competition with the current dominant dealers, all of which are affiliates of G-SIBs, which would help to reduce the considerable concentration of activity.

Cons

- Potential political resistance for a new facility which intervenes in funding markets.
- Introduces potential moral hazard concerns arise that dealers might take on excessive leverage and maintain inappropriately small liquidity buffers.
 - Can be addressed through prudential regulation- would need to be tailored to the independent dealers.
 - Price would need to balance BAU use by banks and avoid over reliance.
- Dealer balance sheet limits might erode the ability to tap this facility in times of stress

Would this proposal`					
Have helped in...				Have eliminated the need for official action?	Likely impact market structure in normal times?
The Flash Rally?	Repo spike?	The COVID crisis?	Feb 25, 2021?		
					

Green check: Would have helped materially; Question Mark: Impact uncertain; Salmon X: Unlikely to have helped; Red X: Would not have helped.

A standing buyback or purchase facility

Proposal






- Offer US government bond switch opportunities or straight buy backs under pre-established arrangements in stress times
 - Include both independent and bank-affiliated dealers; careful consideration could be given to broader eligibility
 - Switch rates should be slightly above market rates

Pros

- Help to normalize liquidity performance across the UST complex in times of stress.
- Buybacks give the Treasury an additional tool to manage the Treasury cash balance.
- Enable intermediaries to confidently meet the surge in demand for more liquid parts of the UST complex, albeit at penalty rates.
- Could possibly help reduce overall buying costs.
- Encourage more dealers to provide intermediation in competition with the current dominant dealers, all of which are affiliates of G-SIBs.
 - Reduce the considerable concentration of activity

Cons

- Challenging to structure; hard to anticipate and predefine the market need and, therefore, the set up.
- Questions around co-existence with traditional Fed actions like asset purchases.

Would this proposal`					
Have helped in...				Have eliminated the need for official action?	Likely impact market structure in normal times?
The Flash Rally?	Repo spike?	The COVID crisis?	Feb 25, 2021?		
					

Green check: Would have helped materially; Question Mark: Impact uncertain; Salmon X: Unlikely to have helped; Red X: Would not have helped.

Targeted bank regulatory changes (mainly on SLR)

Proposal







- Make SLR changes permanent
 - Propose to exclude reserves from SLR permanently, but not USTs
 - Logic being reserve balances at central bank are riskless, while USTs pose interest rate risk
 - Fed needs to review if an increase in minimum SLR requirement is needed with the exclusions
 - Note the exclusion of UST and reserves from SLR calculation lapsed at the end of Q1 2021
- Do not propose to lower the minimum SLR, as it will reduce bank safety and soundness
 - Replace some of the higher static buffers with a countercyclical component, to support market liquidity in stress times
- Pursue commensurate exemptions for the T1 leverage ratio to help custody banks as they are not SLR constrained.

Pros

- Improves facilitation in repo and UST cash during stress times, as this would contribute to increase balance sheet flexibility.
- Recognizes substitutability between reserves and USTs.

Cons

- While temporary exemption facilitated market digestion of supply increases due to COVID fiscal stimulus, it would not have fully prevented the March liquidity stress in isolation.

Would this proposal`					
Have helped in...				Have eliminated the need for official action?	Likely impact market structure in normal times?
The Flash Rally?	Repo spike?	The COVID crisis?	Feb 25, 2021?		
					

Green check: Would have helped materially; Question Mark: Impact uncertain; Salmon X: Unlikely to have helped; Red X: Would not have helped.

Mandated Central Clearing

Proposal

- Mandate central clearing, for either cash UST market or Repo market

Cash Market: Pros

- Increase confidence in capitalization of CCP members; concentrates counterparty risk, though this is not considered a material hurdle in cash trading
- CCP can improve market structure to prevent settlement failures in stress times
- Potentially improve financial stability by improving transparency

Cash Market: Cons

- Counterparty risk is limited in the UST market and was not the primary issue driving the March volatility
- Could impair market access for customers unable to accept mutualization of risk
- CCP margin requirements can be pro-cyclical during stress.
- Increased cost might cause more thinly capitalized players to stop participating in UST market

Repo Market: Pros

- Concentrates counterparty exposure with CCPs
- Increases netting benefits, effectively freeing up balance sheet
- Potentially improve financial stability by improving transparency

Repo Market: Cons

- Counterparty risk was not the primary issue driving the March volatility.
- Could impair market access for customers unable to accept mutualization of risk.
- CCP margin requirements can be pro-cyclical during stress.

Would this proposal`					
Have helped in...				Have eliminated the need for official action?	Likely impact market structure in normal times?
The Flash Rally?	Repo spike?	The COVID crisis?	Feb 25, 2021?		
✗	✗	✗	✗	✗	✓

Green check: Would have helped materially; Question Mark: Impact uncertain; Salmon X: Unlikely to have helped; Red X: Would not have helped.

All-to-All Trading

Proposal







- Encourage the further development “all-to-all” trading platforms, to facilitate asset managers and asset owners to trade with one another more directly. “All-to-all” trading participation is considered to be predicated on mandatory central clearing.

Pros

- May reduce reliance on primary dealers
- May reduce costs for end users

Cons

- Take up of all-to-all platforms has struggled thus far, suggesting interest level is not high enough to be pursued.
- All-to-all platforms could cut into the volume of CLOBs
 - Can cause the erosion of primary venue liquidity, which happened in the FX markets
- Off-the-run USTs are less frequently traded but account for 95% of the market, but current all-to-all platforms have focused on on-the-run USTs, indicating the value of intermediation in off the runs (primary contributors to the March volatility).

Would this proposal`					
Have helped in...				Have eliminated the need for official action?	Likely impact market structure in normal times?
The Flash Rally?	Repo spike?	The COVID crisis?	Feb 25, 2021?		
					

Green check: Would have helped materially; Question Mark: Impact uncertain; Salmon X: Unlikely to have helped; Red X: Would not have helped.

Improve data collection and disclosure & enhance transparency

Proposal

- Gather greater disclosure of financial conditions and activities of non bank financial institutions (NBFIs)
- Collect data for bilateral uncleared repo in the dealer-to-customer market
- Reconsider the scope of reporting requirements
- Review the pros and cons in advance of any change (timing or size) to TRACE dissemination

Pros

- Allow regulators to better monitor leverage and funding risks in the nonbank financial sector
- Increased transparency on financial conditions of NBFIs could also increase participation in the UST market, and improve confidence in central clearing

Cons

- Infrastructure build is burdensome, and cost may outweigh benefits
- Pricing nuances such as liquidity levels, especially in off-the-run securities, may not be captured
- Regular re-calibration may be necessary to ensure information is increasing transparency without impairing the market's ability to recycle risk
- Real time TRACE dissemination would expose inventory to the market, and likely lessen intermediary capacity, which is especially challenging in times of illiquidity.

Would this proposal`					
Have helped in...				Have eliminated the need for official action?	Likely impact market structure in normal times?
The Flash Rally?	Repo spike?	The COVID crisis?	Feb 25, 2021?		
✖	✖	✖	✖	✖	?

Green check: Would have helped materially; Question Mark: Impact uncertain; Salmon X: Unlikely to have helped; Red X: Would not have helped.

Conclusions

- While post financial crisis regulation strengthened bank capitalization and balance sheets, it has contributed to intermediation headwinds for primary dealers. Significant market volatility and higher margin calls worsened the stress for intermediaries and investors alike.
- While the unwind of levered bond basis or RV trades likely exacerbate market moves in times of stress, in normal market environments they serve to reduce cost to the taxpayer.
 - Separation of futures clearing and cash repo for package trades increases liquidity costs of carrying positions, exacerbated in times of stress.
- The speed and adaptability of the Fed response, when necessary, is powerful. In the COVID-19 crisis, it drove a sharp recovery.
 - The impact of the SLR exemption, while not instantaneously impactful, was meaningful in the market's ability to digest the sharp increase in supply.
- When considering proposed solutions, it is critical to consider the impact to both normal and stressed market operating environments.
- Mechanisms that introduce counter cyclical forces could benefit the market in times of stress without material disadvantage to the normal operating environment.
 - The most promising policy proposals include the SLR exemption and the standing repo facility.