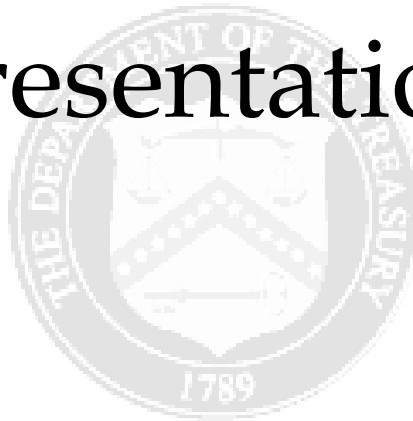


# Treasury Presentation to TBAC



# Office of Debt Management



Fiscal Year 2024 Q1 Report

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\*All sources are from Treasury unless otherwise specified

# Section I: Executive Summary



# Highlights of Treasury's February 2024 Quarterly Refunding Presentation to the Treasury Borrowing Advisory Committee (TBAC)

## Receipts and Outlays through Q1 FY2024

	\$ billion	Change from same period last year (\$ billion)	Change from same period last year (%)	As % of GDP	Change from same period last year (GDP %)
Total Receipts thru Q1 FY2024	\$1,108	\$82	8%	15.9%	0.4%
Total Outlays thru Q1 FY2024	\$1,618	\$171	12%	23.2%	1.3%

## Treasury's Projected Privately-held Net Marketable Borrowing for the Current and Next Fiscal Quarters

Treasury OFP Near Term Fiscal Projections	Privately Held Net Marketable Borrowing (\$ billion)	Assumed End-of-Quarter Cash Balance (\$ billion)
Q2 FY2024	760	750 (Mar)
Q3 FY2024	202	750 (Jun)

## Projected Privately-held Net Marketable Borrowing for the Next Three Fiscal Years from Various Sources\*

Fiscal Year	Primary Dealers, Median January 2024 (\$ billion)	OMB Budget, July 2023 (\$ billion)	CBO Budget, June 2023 (\$ billion)
2024	2,467	2,718	2,240
2025	1,975	1,907	1,821
2026	1,979	1,696	1,676

\*All privately-held net marketable borrowing estimates are "normalized" with details from page 18.

Uncertainty regarding funding needs in FY2024 to FY2026 remains relatively high, reflecting a variety of views on the path of monetary policy, the duration of SOMA redemptions, and the outlook for the economy.

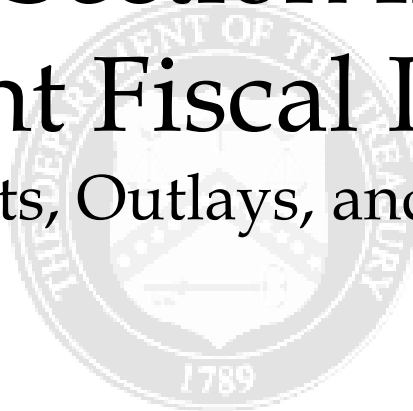
## Latest Market Expectations for Treasury Financing in January 2024:

- Primary dealers generally expected increases in nominal coupon issuance identical in magnitude and distribution to the increases implemented at the November refunding; dealers also expected continued increases in bill supply.
- Most dealers expected that coupon size increases from the February refunding would be the last needed in the near-term, while uncertainty about the pace and duration of balance sheet normalization could be addressed via changes in bill supply; several dealers suggested that additional coupon increases may be needed sometime in 2025 due to higher deficits.
- With respect to TIPS, dealers broadly expected increases of \$1 billion in the 10-year reopening with many dealers expecting small increases in the new issue 5- and 30-year tenors in the coming quarter.

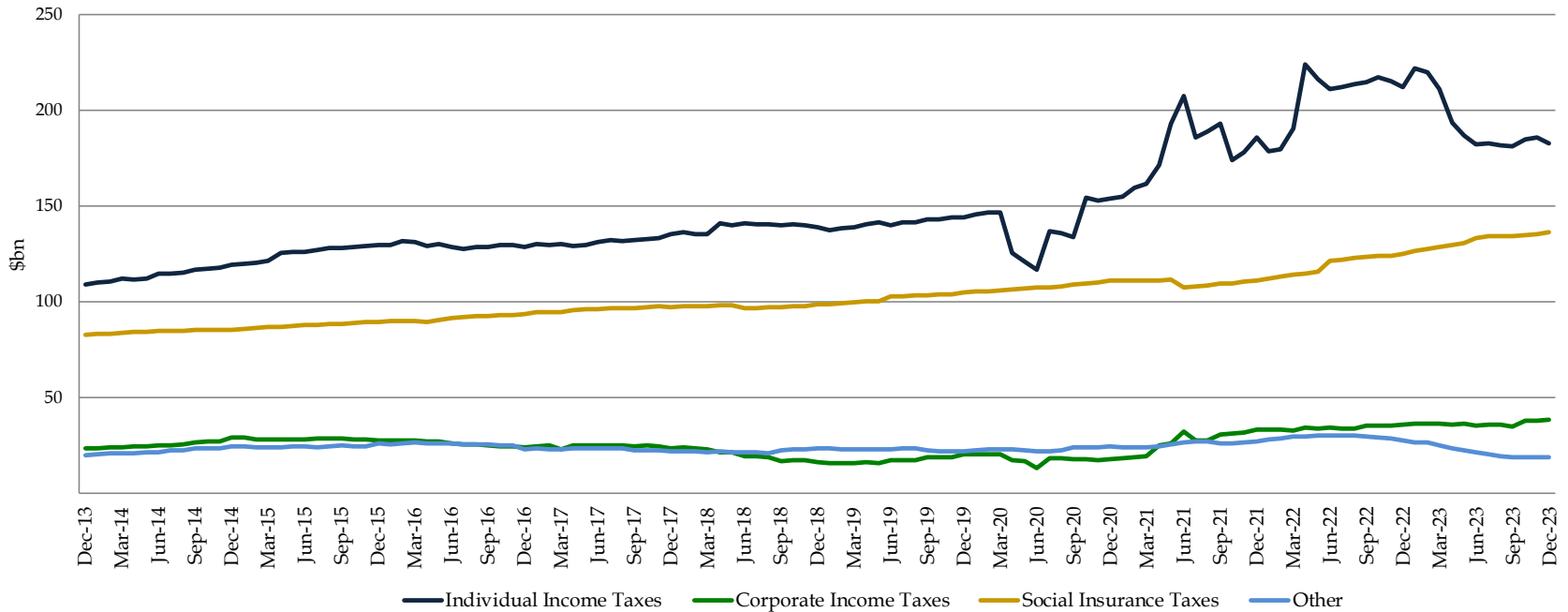
# Section II:

# Recent Fiscal Results

Receipts, Outlays, and Deficits



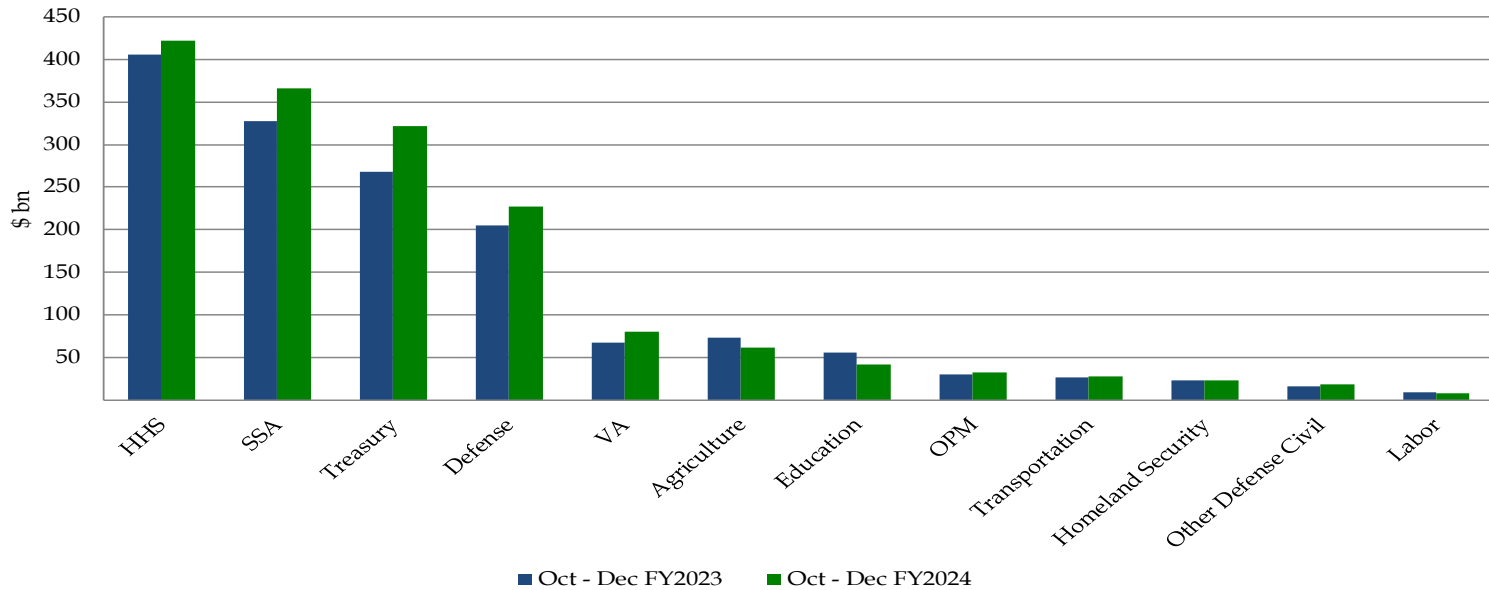
## Monthly Receipt Levels (12-Month Moving Average)



Notable Receipt Category	YoY change thru Q1 FY24 (\$ billion)	YoY change thru Q1 FY24 (%)	Comments
Non-withheld and SECA taxes	+\$41	45%	IRS extended several major deadlines for some taxpayers, including those in California, from FY 2023 into FY 2024.
Gross Corporate Taxes	+\$43	36%	IRS extended several major deadlines for some taxpayers, including those in California, from FY 2023 into FY 2024.
Withheld & FICA taxes (calendar adjusted)	-\$4	0%	Due to wage and employment growth, offset by the absence of the CARES deferral repayment.

Tax receipts for Q4 FY2020 reflect the adjustment of April and June 2020 tax deadlines to July 15<sup>th</sup>, 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.

## Largest Outlays

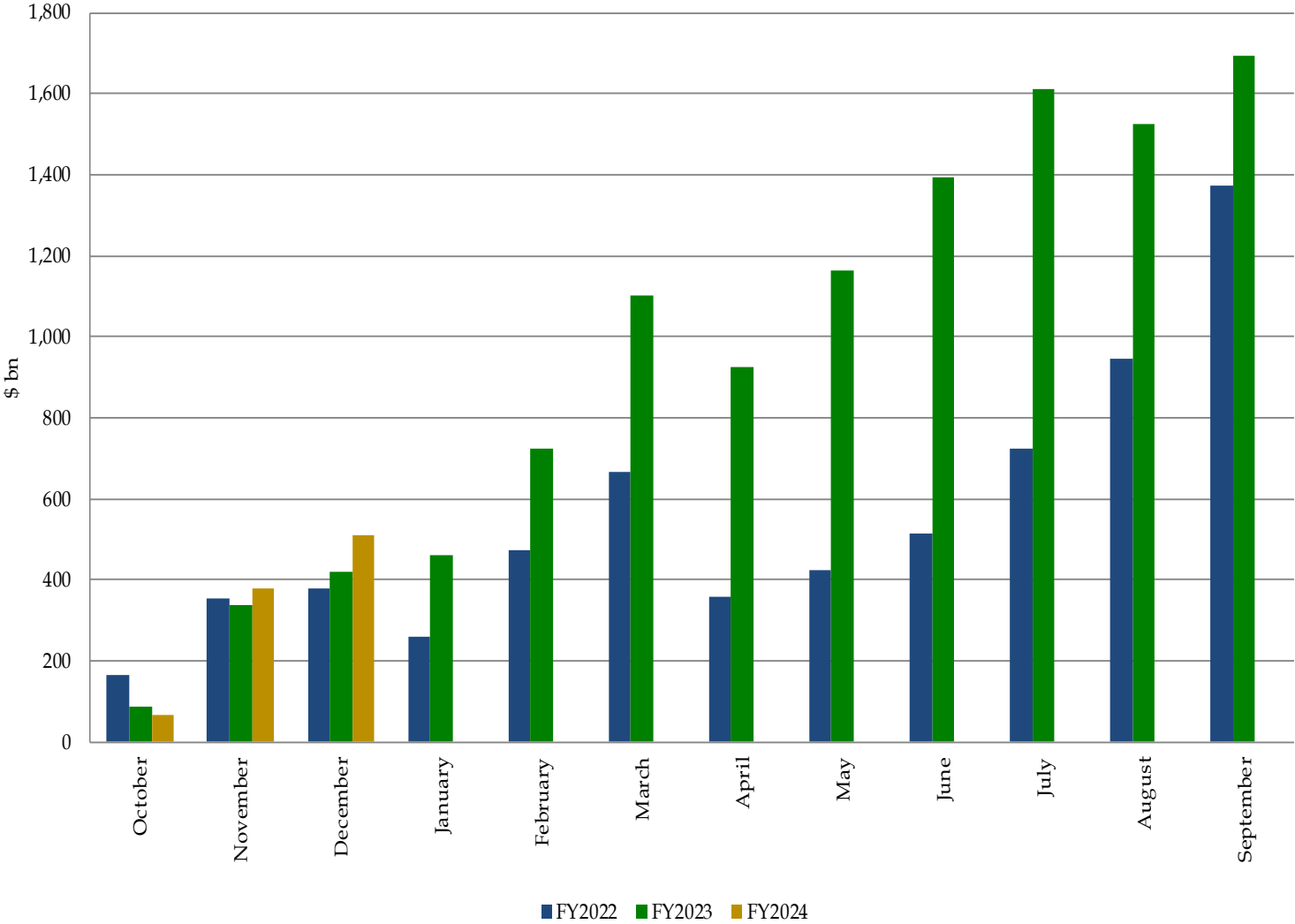


Notable Outlay Category	YoY change thru Q1 FY24 (\$ billion)	YoY change thru Q1 FY24 (%)	Comments
Social Security Administration (calendar adjusted)	+\$39	+12%	Primarily due to increases from cost-of-living adjustments and an increased number of beneficiaries.
Health and Human Services (calendar adjusted)	+\$17	+4%	Due to increases in Medicare spending.
Department of Defense (calendar adjusted)	+\$22	+11%	Due to increased spending for military personnel, operations, maintenance and procurement.
Department of Treasury	+\$54	+20%	Primarily due to a \$78 billion (37%) increase in gross interest on public debt. Offset by lower Employee Retention Tax Credits (-\$20 billion).
Department of Veterans Affairs (calendar adjusted)	+\$12	+18%	Due to benefit increases.
Department of Education	-\$13	-24%	Due to several upward modifications that increased outlays last year.
Department of Agriculture	-\$12	-16%	Due to the end of the emergency allotments for the Supplemental Nutrition Assistance Program there were discontinued in March 2023.
Other (not in the chart above)	+\$58	+236%	Including \$62 billion increase in Federal Deposit Insurance Corporation outlays used primarily to repay liabilities incurred in March and April 2023.

Outlays in the chart above are on a calendar adjusted basis



# Cumulative Budget Deficits by Fiscal Year



# Section III:

# Various Fiscal Forecasts

Primary Dealers, OMB, CBO



# Recent Economic Forecasts

## Primary Dealer Median Estimates January 2024

	<u>CY2024</u>	<u>CY2025</u>	<u>CY2026</u>
	<u>% Change from Q4 to Q4</u>		
<b>GDP</b>			
<i>Real</i>	1.2	1.9	2.0
<i>Nominal</i>	3.4	4.2	4.2
<b>Inflation</b>			
<i>CPI Headline</i>	2.5	2.3	2.2
<i>CPI Core</i>	2.8	2.4	2.3
	<u>Fourth Quarter Levels</u>		
<b>Unemployment Rate (%)</b>	4.3	4.3	4.2
	<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>
<b>Deficits (\$bil)</b>	\$1,778	\$1,819	\$1,800

## CBO Estimates July 2023

	<u>CY2024</u>	<u>CY2025</u>	<u>CY2026</u>
	<u>% Change from Q4 to Q4</u>		
<b>GDP</b>			
<i>Real</i>	1.5	2.4	na
<i>Nominal</i>	3.9	4.5	na
<b>Inflation</b>			
<i>CPI Headline</i>	2.7	2.2	na
	<u>Fourth Quarter Levels</u>		
<b>Unemployment Rate (%)</b>	4.7	4.5	na
	<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>
<b>Deficits (\$bil)</b>	\$1,501	\$1,649	\$1,586

## OMB Estimates July 2023

	<u>CY2024</u>	<u>CY2025</u>	<u>CY2026</u>
	<u>% Change from Q4 to Q4</u>		
<b>GDP</b>			
<i>Real</i>	1.8	2.4	2.0
<i>Nominal</i>	4.1	4.5	4.1
<b>Inflation</b>			
<i>CPI Headline</i>	3.3	2.5	2.3
	<u>Fourth Quarter Levels</u>		
<b>Unemployment Rate (%)</b>	4.3	4.1	4.1
	<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>
<b>Deficits (\$bil)</b>	\$1,894	\$1,710	\$1,567

Note: OMB's Economic assumptions for July 2023 were established in June 2023.

CBO's economic assumptions (of GDP, Inflation and Unemployment) were published in July 2023, while CBO deficit forecasts were from the June 2023 CBO budget updates. [Budget and Economic Data](#) | [Congressional Budget Office \(cbo.gov\)](#)

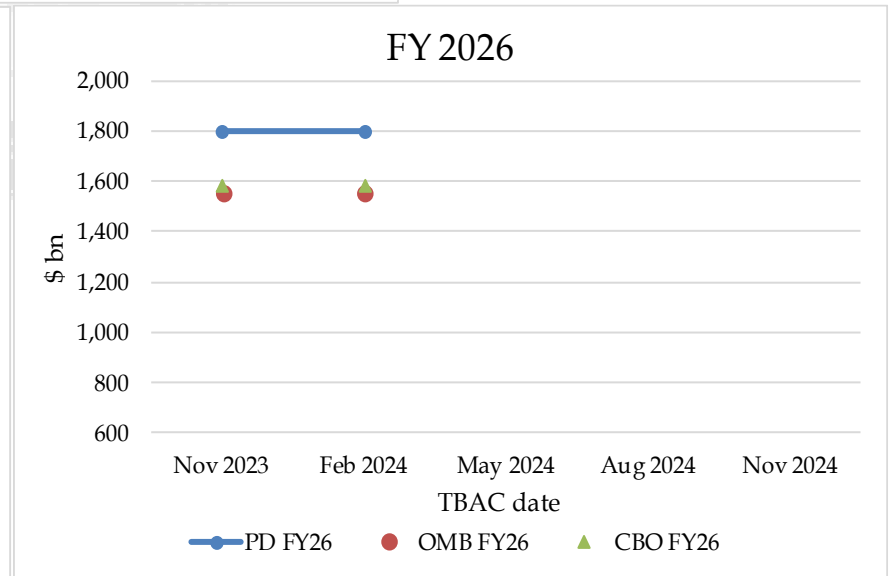
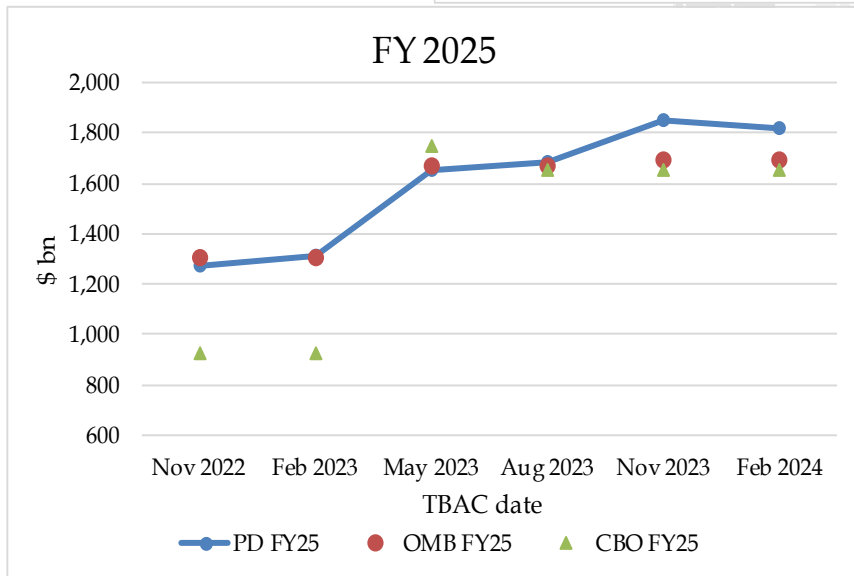
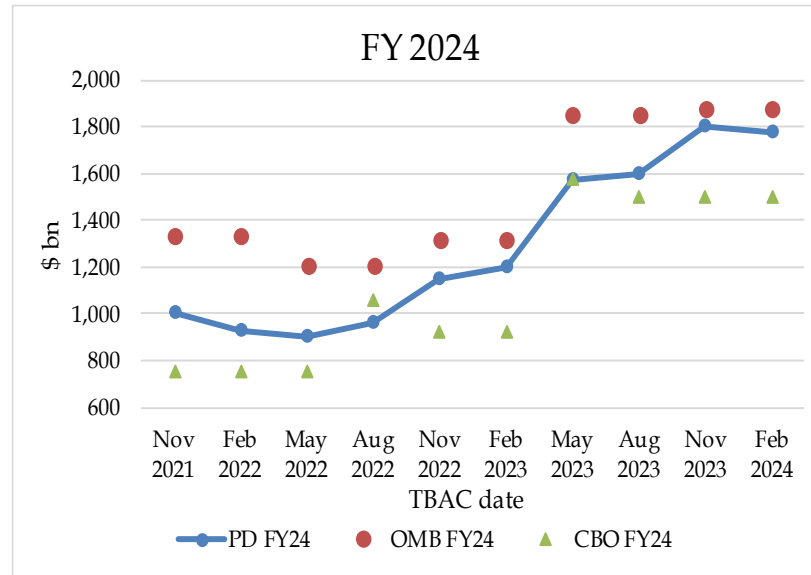
## Recent Deficit Forecasts

- Primary dealers slightly decreased their deficit estimates in January 2024 relative to estimates they provided in October 2023.
- Dealers generally suggested that risks for higher deficits were asymmetric to the upside, noting the potential for lagged effects on economic growth given the Fed’s efforts to tighten financial conditions over the last 21 months, the path of future monetary policy (including balance sheet normalization), and fiscal policy post the November elections.
- The latest OMB and CBO estimates in the table below are provided for reference.

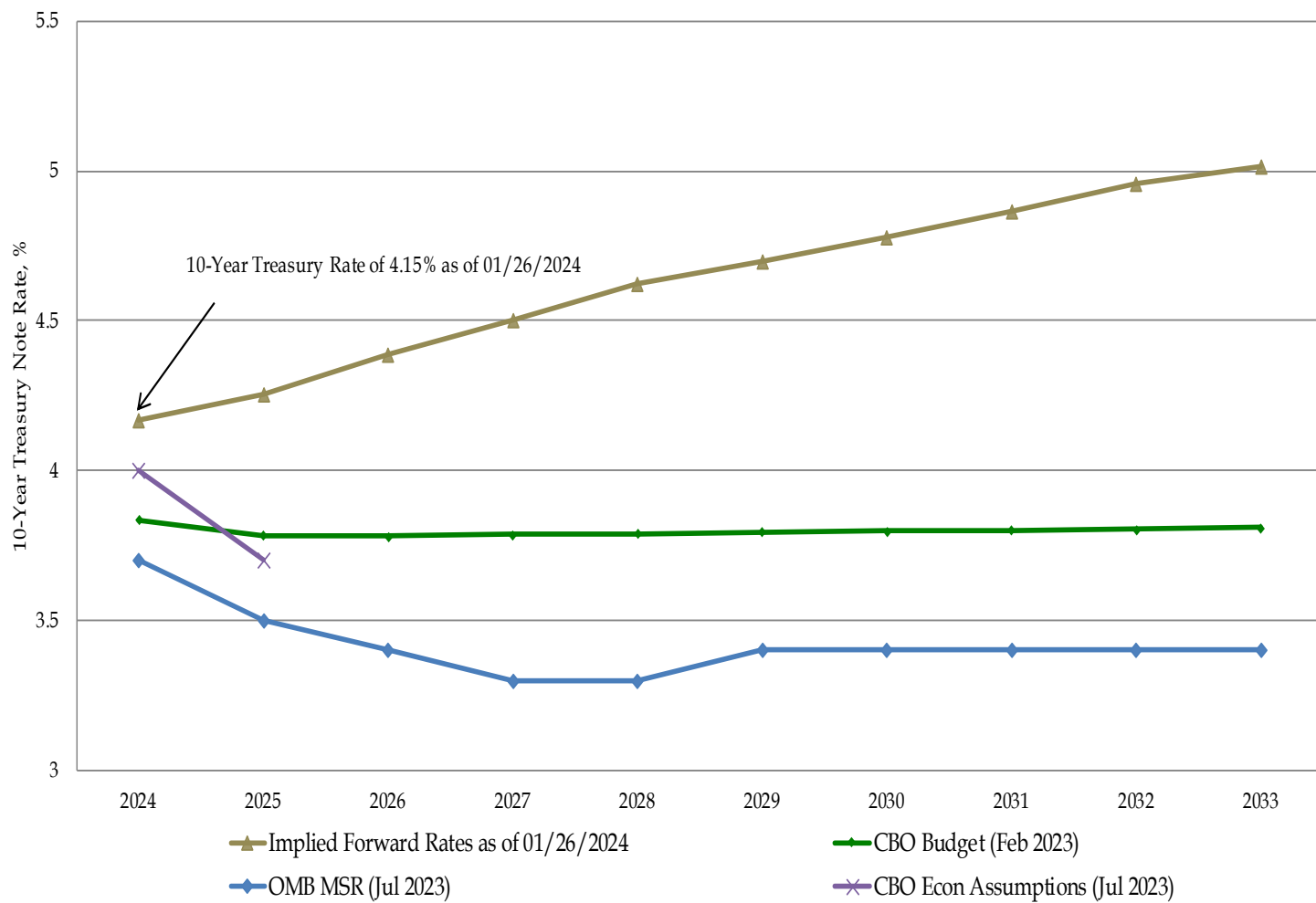
Deficit Estimates (\$ billion)	PD 25th Percentile	Primary Dealers (Median)	PD 75th Percentile	Change from Prior Quarter (Median)	OMB	CBO
FY2024	1,700	1,778	1,854	-22	1,894	1,501
FY2025	1,760	1,819	1,906	-31	1,710	1,649
FY2026	1,755	1,800	1,925	0	1,567	1,586
As of date	Jan-24	Jan-24	Jan-24		Jul-23	Jun-23

- OMB projections are using estimates are from Table S-1 of “Mid-Session Review, Budget of The U.S. Government,” July 2023. Adjusted to reflect the latest assumptions about student loans.
- CBO projections are using estimates are from Table 1 of “How the Fiscal Responsibility Act of 2023 Affects CBO’s Projections of Federal Debt,” June 2023.


# Evolution of Median Primary Dealer, OMB, and CBO Deficit Estimates



## Interest Rate Assumptions: 10-Year Treasury Note



Section IV:  
Estimated Borrowing Needs and  
Financing Implications

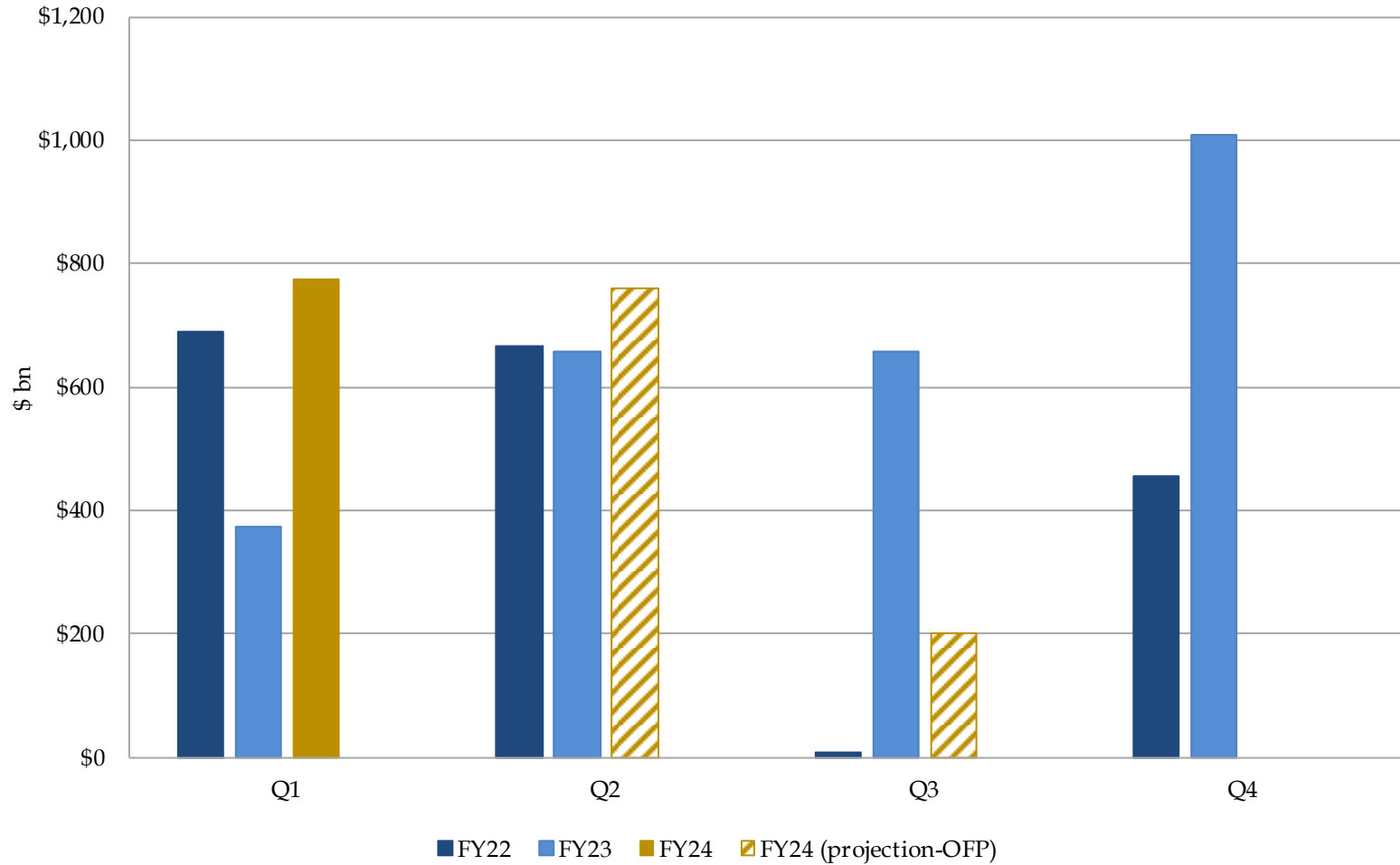


## Assumptions for Financing Section (pages 16 to 20)

- Portfolio and SOMA holdings as of 12/31/2023, unless otherwise noted (see slide 20).
- Estimates assume privately announced issuance sizes and patterns remain constant for nominal coupons, TIPS, and FRNs given the issuance sizes in effect in January 2024, while using total bills outstanding of ~\$5.7 trillion, unless otherwise noted (see slide 20).
- The principal on the TIPS securities was accreted to each projection date based on market ZCIS levels as of 12/31/2023, unless otherwise noted (see slide 20).
- No attempt was made to account for future financing needs.
- **Privately-held marketable borrowing** excludes rollovers (auction “add-ons”) of Treasury securities held in the Federal Reserve 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 privately-held net marketable borrowing but, all else equal, when the securities mature and assuming the Fed does not redeem any maturing securities, this 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.



# Privately-Held Net Marketable Borrowing Outlook



# Implied Bill Funding for the Current and Next Quarters Based on Recent Borrowing Estimates

## Sources of Privately-Held Financing in FY24 Q2

January - March 2024	
Assuming Constant Coupon Issuance Sizes*	
Treasury Announced Net Marketable Borrowing**	760
Net Coupon Issuance	318
Implied Change in Bills	442

## Sources of Privately-Held Financing in FY24 Q3

April - June 2024	
Assuming Constant Coupon Issuance Sizes*	
Treasury Announced Net Marketable Borrowing**	202
Net Coupon Issuance	447
Implied Change in Bills	(245)

Security	January - March 2024 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance			Security	April - June 2024 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net		Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	54	70	(16)	132	146	(14)	2-Year FRN	106	68	38	238	214	24
2-Year	177	162	15	330	336	(6)	2-Year	180	145	35	510	481	29
3-Year	156	159	(3)	300	291	9	3-Year	156	140	16	456	431	25
5-Year	180	79	101	336	152	184	5-Year	183	35	148	519	187	332
7-Year	122	72	50	236	145	91	7-Year	123	107	16	359	252	107
10-Year	114	47	67	226	102	124	10-Year	114	59	55	340	160	180
20-Year	42	0	42	84	0	84	20-Year	42	0	42	126	0	126
30-Year	66	0	66	131	0	131	30-Year	66	0	66	197	0	197
5-Year TIPS	0	0	0	42	0	42	5-Year TIPS	42	26	16	84	26	58
10-Year TIPS	34	47	(13)	49	47	2	10-Year TIPS	16	0	16	65	47	18
30-Year TIPS	9	0	9	9	0	9	30-Year TIPS	0	0	0	9	0	9
Coupon Subtotal	954	636	318	1,875	1,218	657	Coupon Subtotal	1,028	581	447	2,903	1,799	1,104

\* Keeping announced issuance sizes and patterns constant for nominal coupons, TIPS, and FRNs.

\*\* Assumes end-of-March 2024 and end-of-June 2024 and cash balances of \$750 billion and \$750 billion respectively versus end-of-December 2023 cash balance of \$769 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>

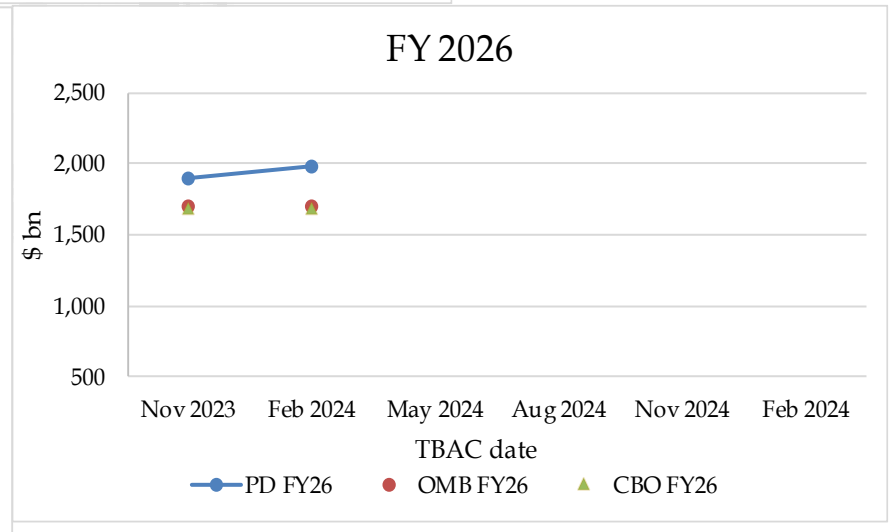
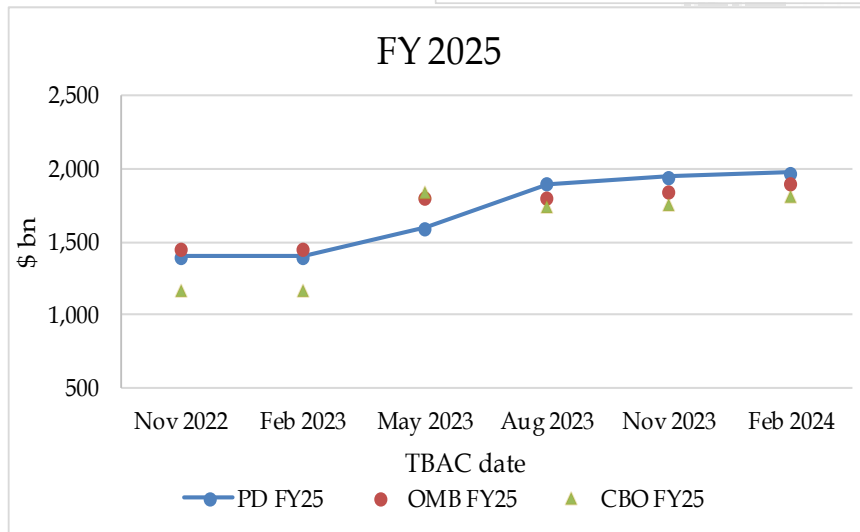
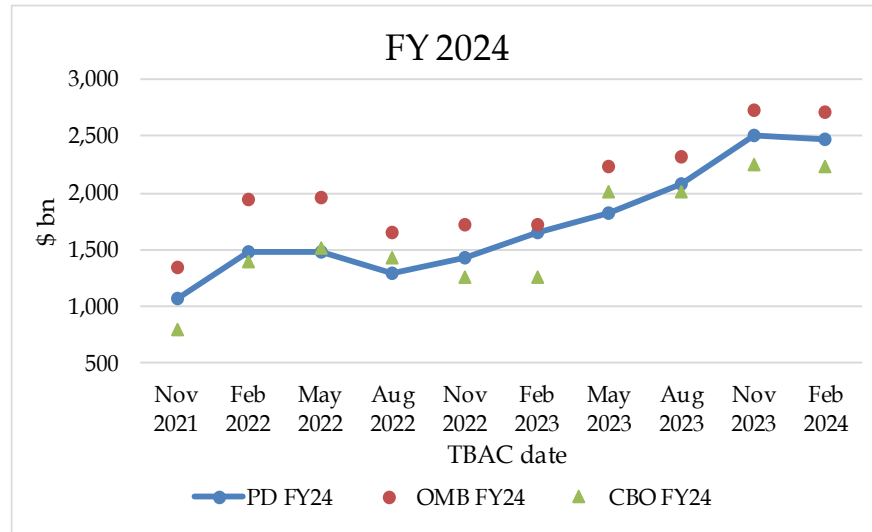
## Longer-Term Privately-Held Net Marketable Borrowing Estimates and SOMA Redemption Assumptions

### FY 2024-2026 Deficits and Privately-Held Net Marketable Borrowing Estimates, in \$ billions

	Primary Dealer			OMB	CBO
	25th	Median	75th		
FY 2024 Deficit	1,700	1,778	1,854	1,894	1,501
FY 2025 Deficit	1,760	1,819	1,906	1,710	1,649
FY 2026 Deficit	1,755	1,800	1,925	1,567	1,586
FY 2024 SOMA Redemption	520	596	696		
FY 2025 SOMA Redemption	0	75	196		
FY 2026 SOMA Redemption	0	0	0		
FY 2024 Privately-Held Net Marketable Borrowing*	2,327	2,467	2,555	2,718	2,240
FY 2025 Privately-Held Net Marketable Borrowing*	1,850	1,975	2,150	1,907	1,821
FY 2026 Privately-Held Net Marketable Borrowing*	1,800	1,979	2,045	1,696	1,676
Estimates as of:		Jan-24		Jul-23	Jun-23

- \*All privately-held net marketable borrowing estimates of are “normalized” using:
  - 1) the median Primary Dealer’s estimates for SOMA redemptions, and
  - 2) PD’s median end of fiscal year 2024 cash balance of \$750 billion, held constant in out years.
- OMB projections are using estimates are from Table S-1 of “Mid-Session Review, Budget of The U.S. Government,” July 2023. Adjusted to reflect the latest assumptions about student loans.
- CBO projections are using estimates are from Table 1 & 2 of “How the Fiscal Responsibility Act of 2023 Affects CBO’s Projections of Federal Debt ,” June 2023.

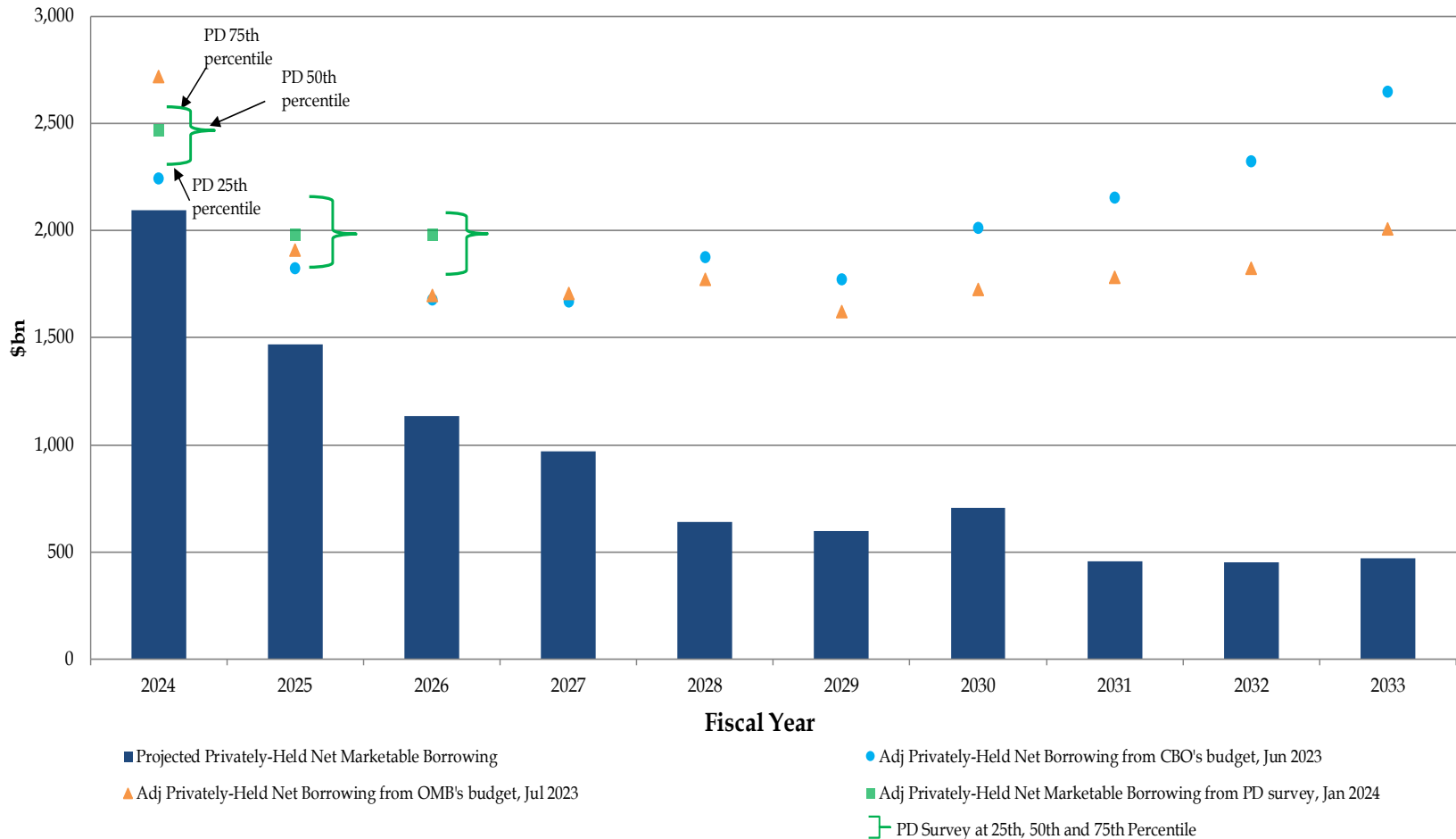
# Evolution of Median Primary Dealer, OMB, and CBO Privately-Held Net Marketable Borrowing Estimates\*



\* Note that both the OMB and CBO privately-held net marketable borrowing estimates are calculated by adjusting their respective deficit estimates using dealer's median SOMA redemption estimates. In addition, all the PD, OMB and CBO privately-held borrowings are normalized with the same cash balance changes. See slide 18 for details.

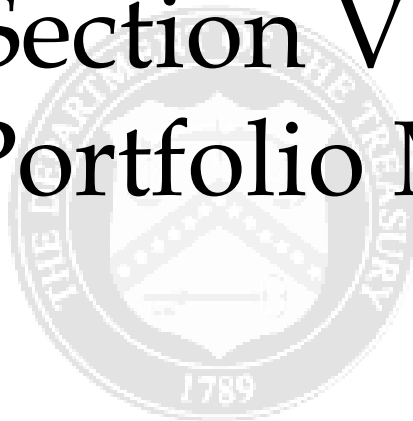
# Projected Privately-Held Net Marketable Borrowing

Assuming Private Coupon Issuance & Total Bills Outstanding Remain Constant as of 01/31/2024\*



\*Treasury's latest primary dealer survey median/interquartile range estimates can be found on page 18. OMB's borrowing projections are from Table S-1 of "Mid-Session Review, Budget of The U.S. Government," July 2023. Adjusted to reflect the latest assumptions about student loans. CBO's borrowing projections are using estimates from Table 2 of "How the Fiscal Responsibility Act of 2023 Affects CBO's Projections of Federal Debt," June 2023. OMB and CBO borrowing estimates from FY24 to FY26 are normalized to privately-held net borrowing after adding PD survey median SOMA redemption assumptions for FY24/25/26. In addition, all privately-held net borrowing estimates are normalized with PD's FY24 median ending cash balance of \$750 billion.

# Section V: Select Portfolio Metrics



Note: Several of the portfolio metric charts that follow include three years of projected metrics.

**These projections are hypothetical and are meant for illustrative purposes only. The projections contained in these charts should not be interpreted as representing any future policy decisions regarding Treasury financing.**

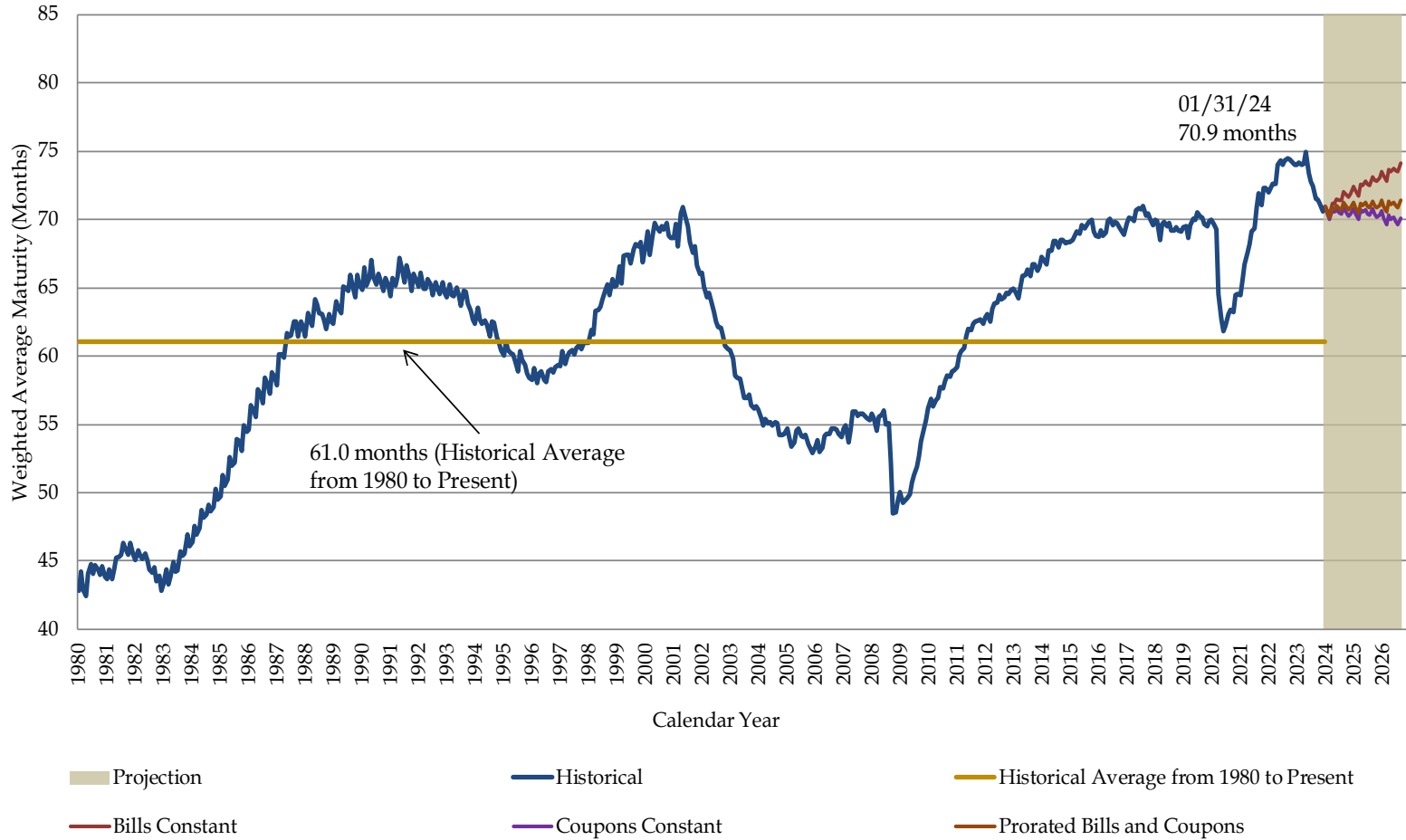
Projections illustrate how various portfolio metrics could evolve under three hypothetical financing scenarios. The scenarios were chosen to illustrate a potential range of portfolio metric outcomes based on hypothetical issuance choices.

The scenarios are:

- 1) ***“Coupons Constant”***: Treasury maintains **coupon, FRN, and TIPS auction sizes constant** as of January 2024 and addresses any changes in financing needs by only increasing or decreasing T-bill auction sizes;
- 2) ***“Bills Constant”***: Treasury maintains **T-bills aggregate supply constant** at \$5.8 trillion as of 1/31/2024 and increases or decreases coupon, FRN, and TIPS auction sizes in response to financing needs in a manner that maintains current issuance proportions going forward;
- 3) ***“Prorated Bills and Coupons”***: Treasury maintains **T-bills share constant** at 21.8% as of 1/31/2024 and addresses any changes in financing needs by pro rata increasing or decreasing coupon, FRN, and TIPS auction sizes.

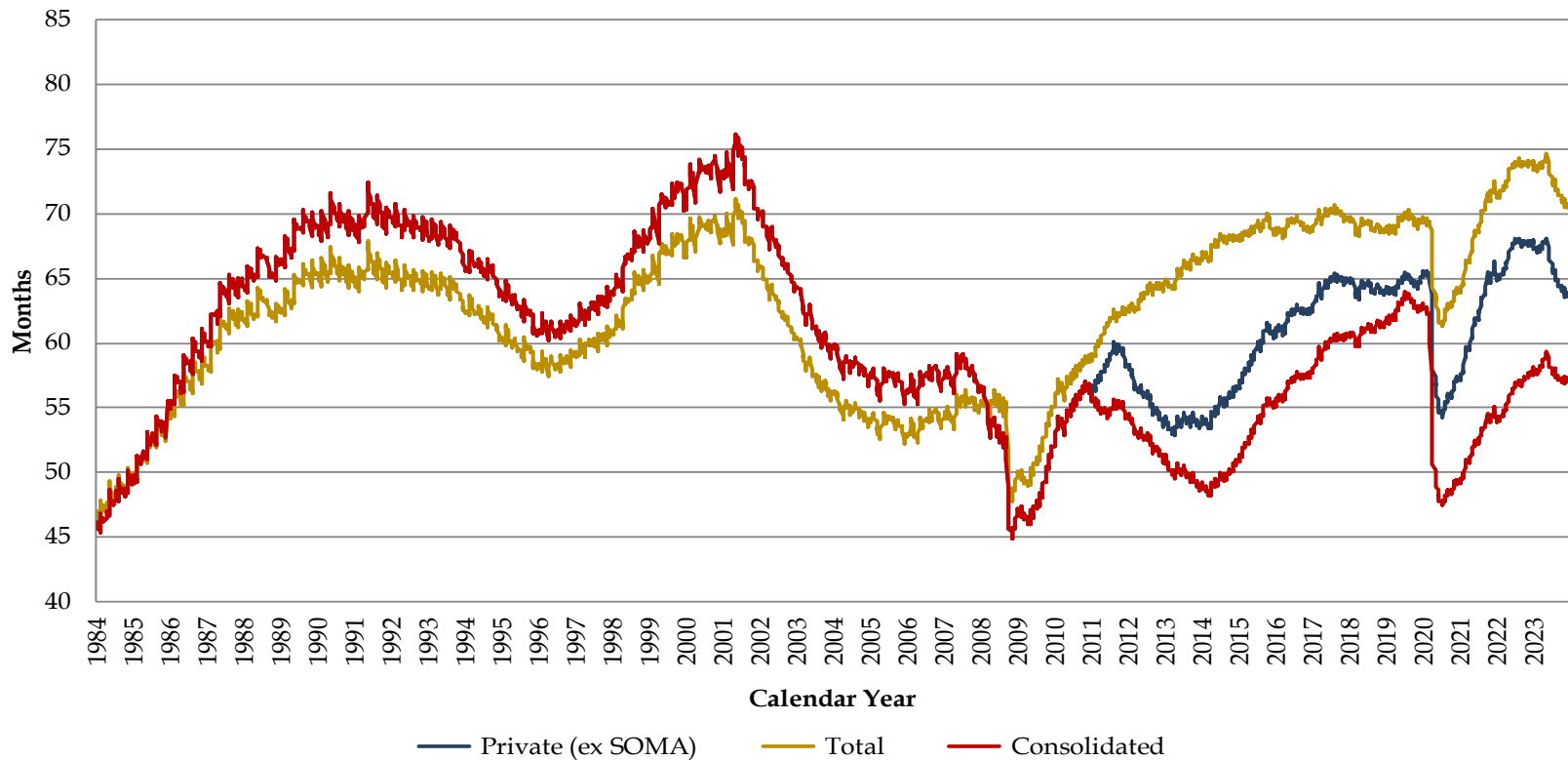
Privately-held net marketable borrowing needs used in the projections section of these charts are proxied using median primary dealer estimates for FY24, FY25 & FY26 (see page 18).

## Weighted Average Maturity of Marketable Debt Outstanding





## Consolidated WANRR Calculation\*

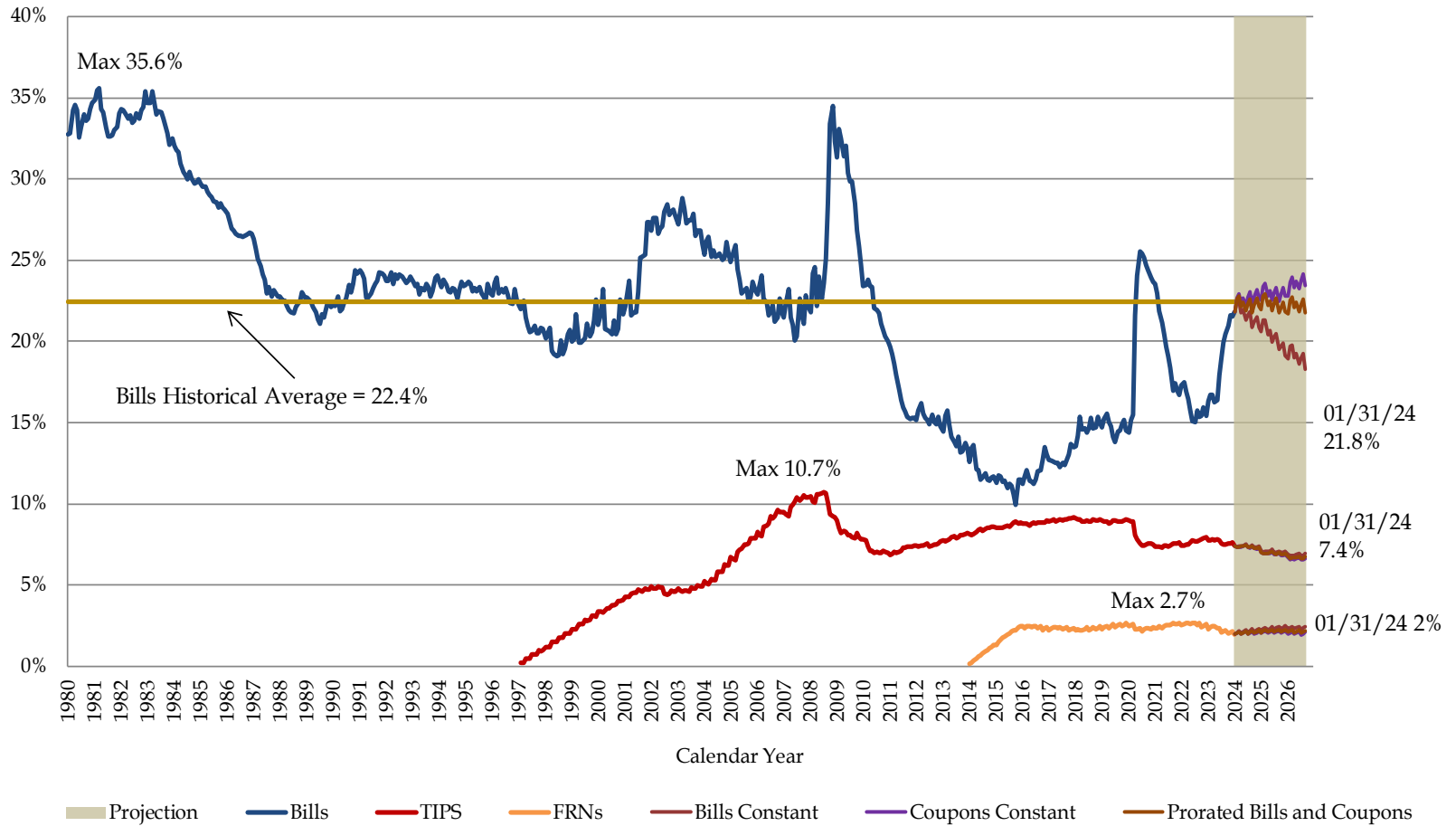


\* Weighted Average Next Rate Reset (WANRR) is a “Weighted Average Maturity” metric that attempts to adjust for the floating rate aspect of some Treasury debt. The WANRR is the average time until the outstanding debt’s interest rate is set to a new interest rate. For bills and fixed rate notes and bonds, the next rate reset is equal to the maturity date.

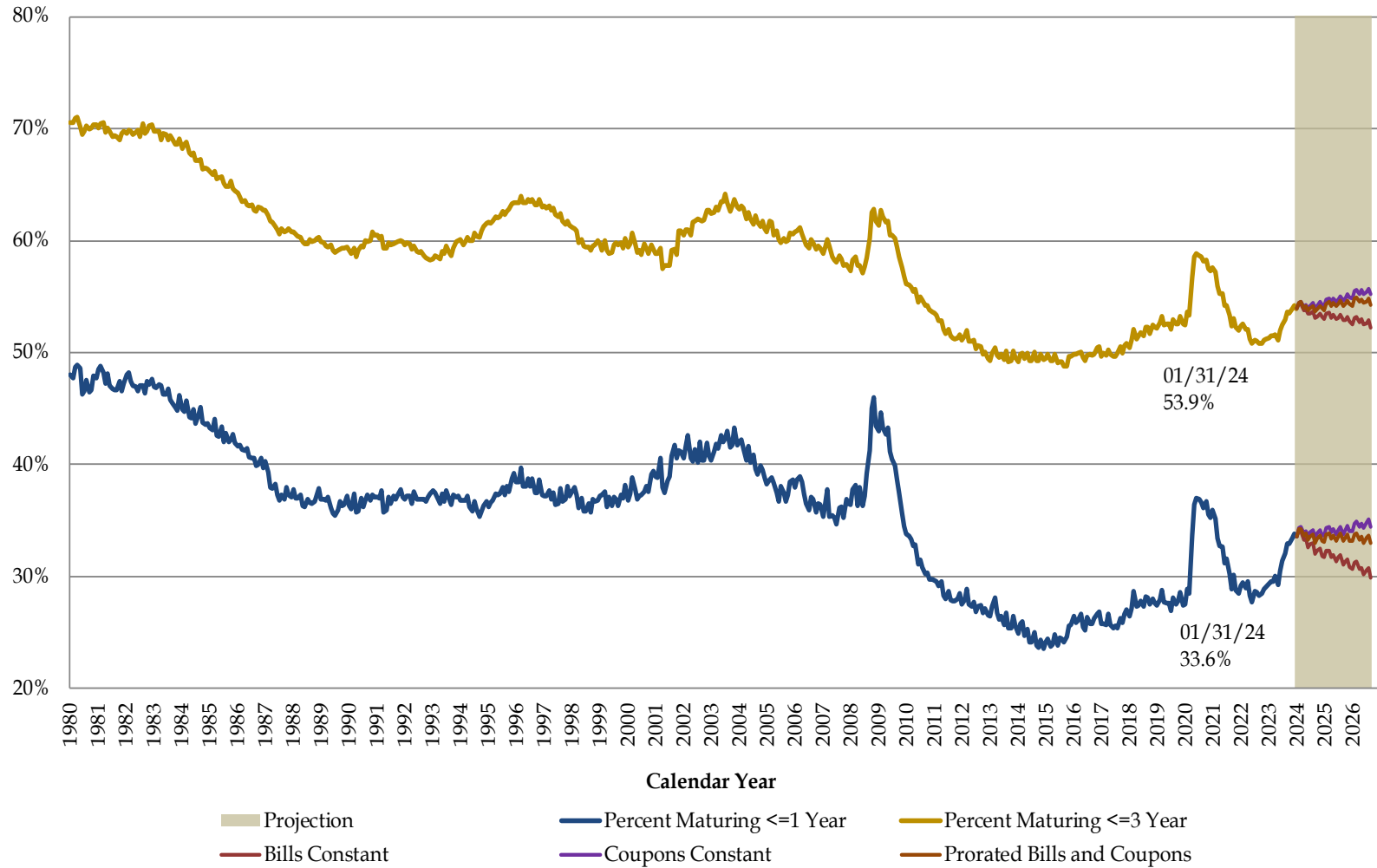
In contrast, for floating rate obligations, the time between the next rate reset date or maturity date is examined and the shorter period is used in the calculation.

The consolidated outstanding debt is defined as the private amount plus SOMA Treasury securities holdings less currency amount. In this calculation, SOMA Treasury holdings greater than the level of currency outstanding is treated as if it is a daily rate reset.

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



# Treasury Maturity Profile

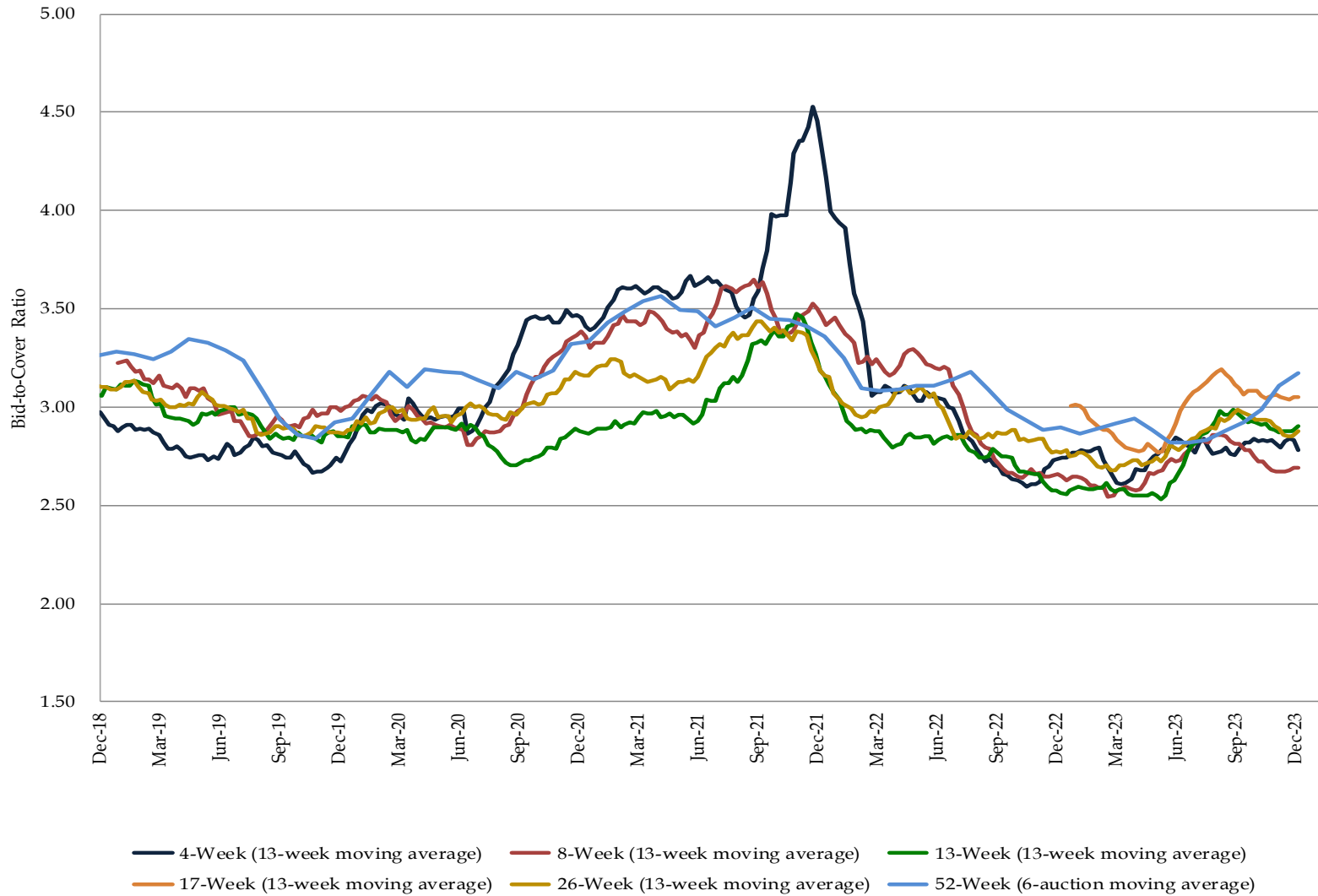


# Section VI: Select Demand Metrics

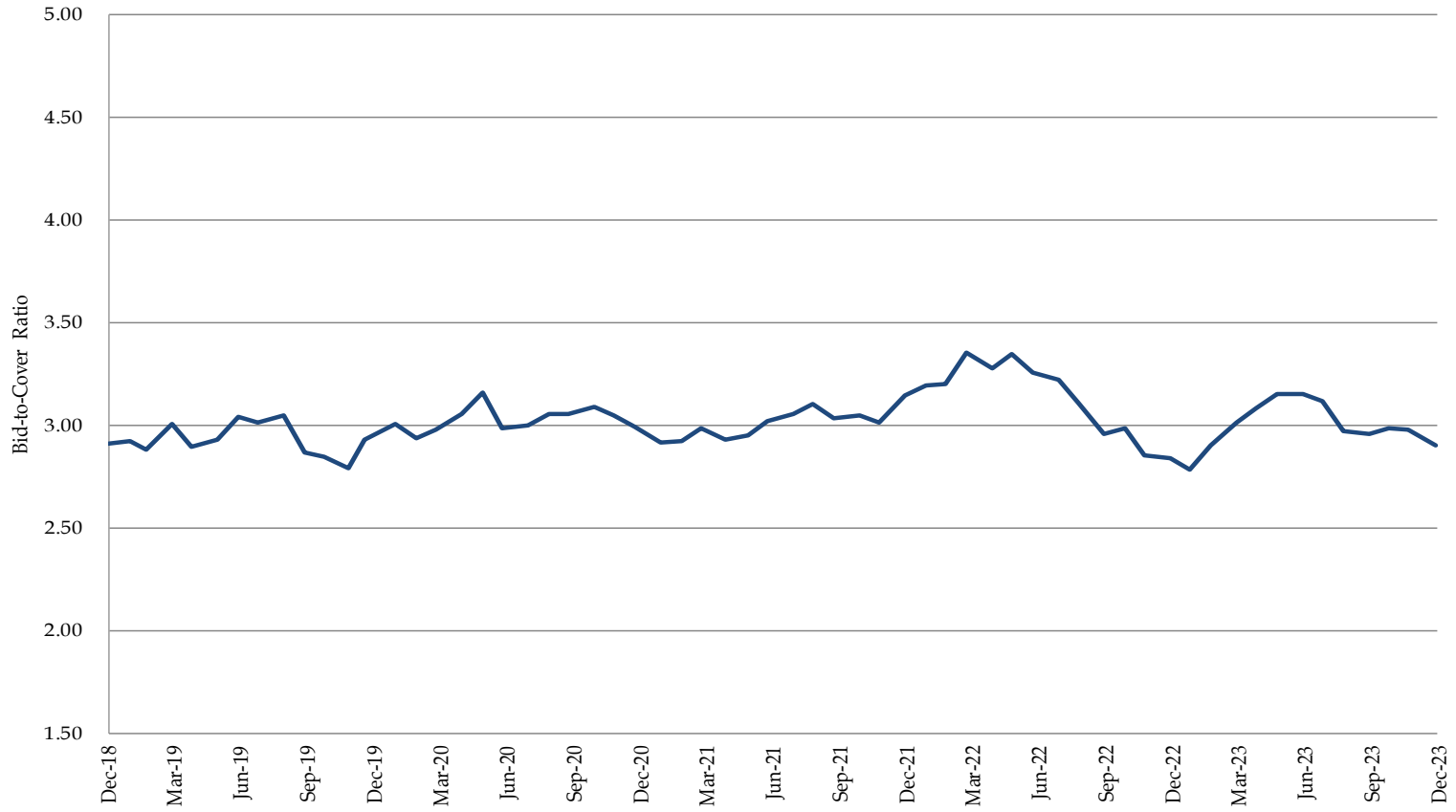
Bid-to-Cover Data, Investor Class Data,  
Direct & Primary Dealer Awards, and Foreign Demand



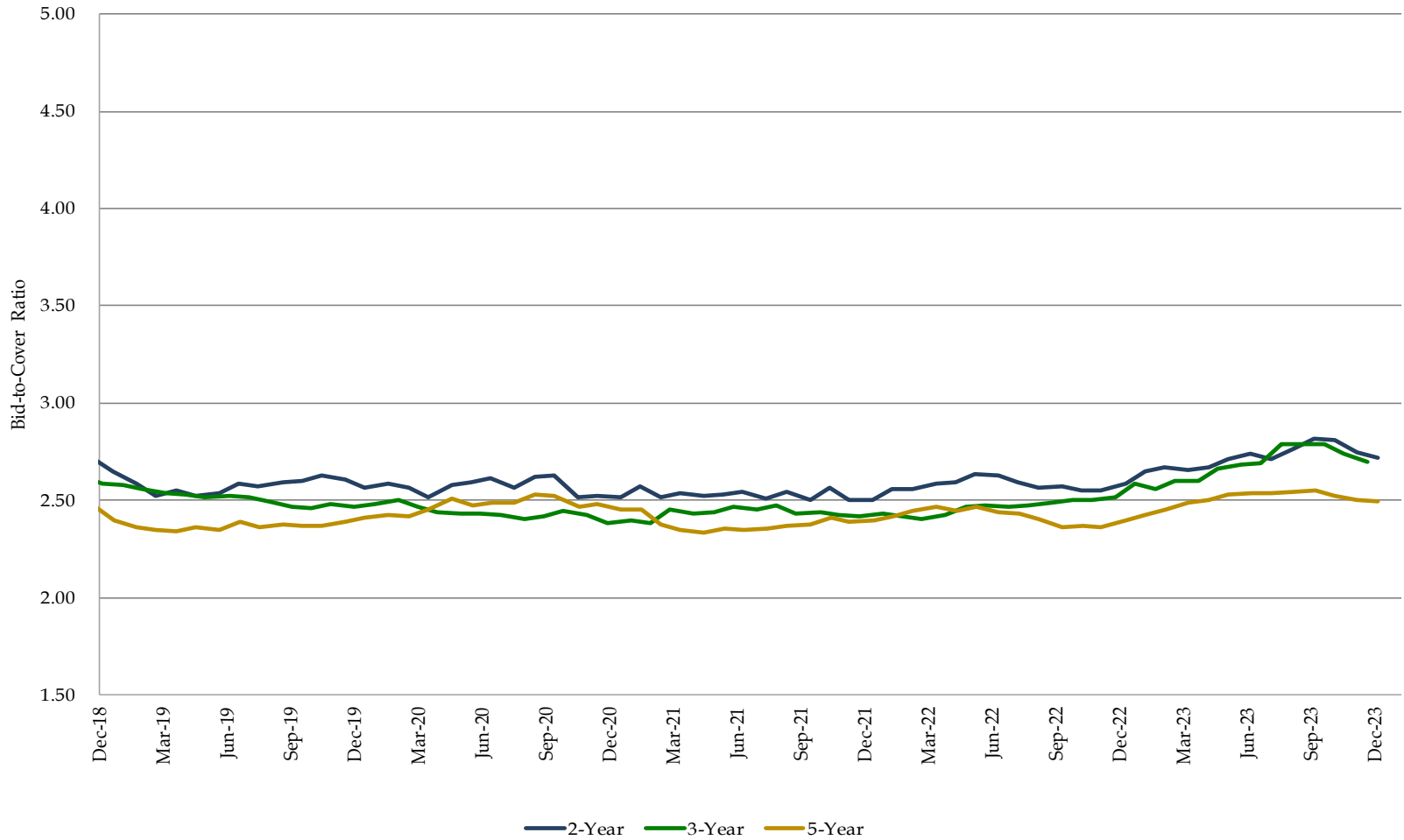
# Bid-to-Cover Ratios for Treasury Bills



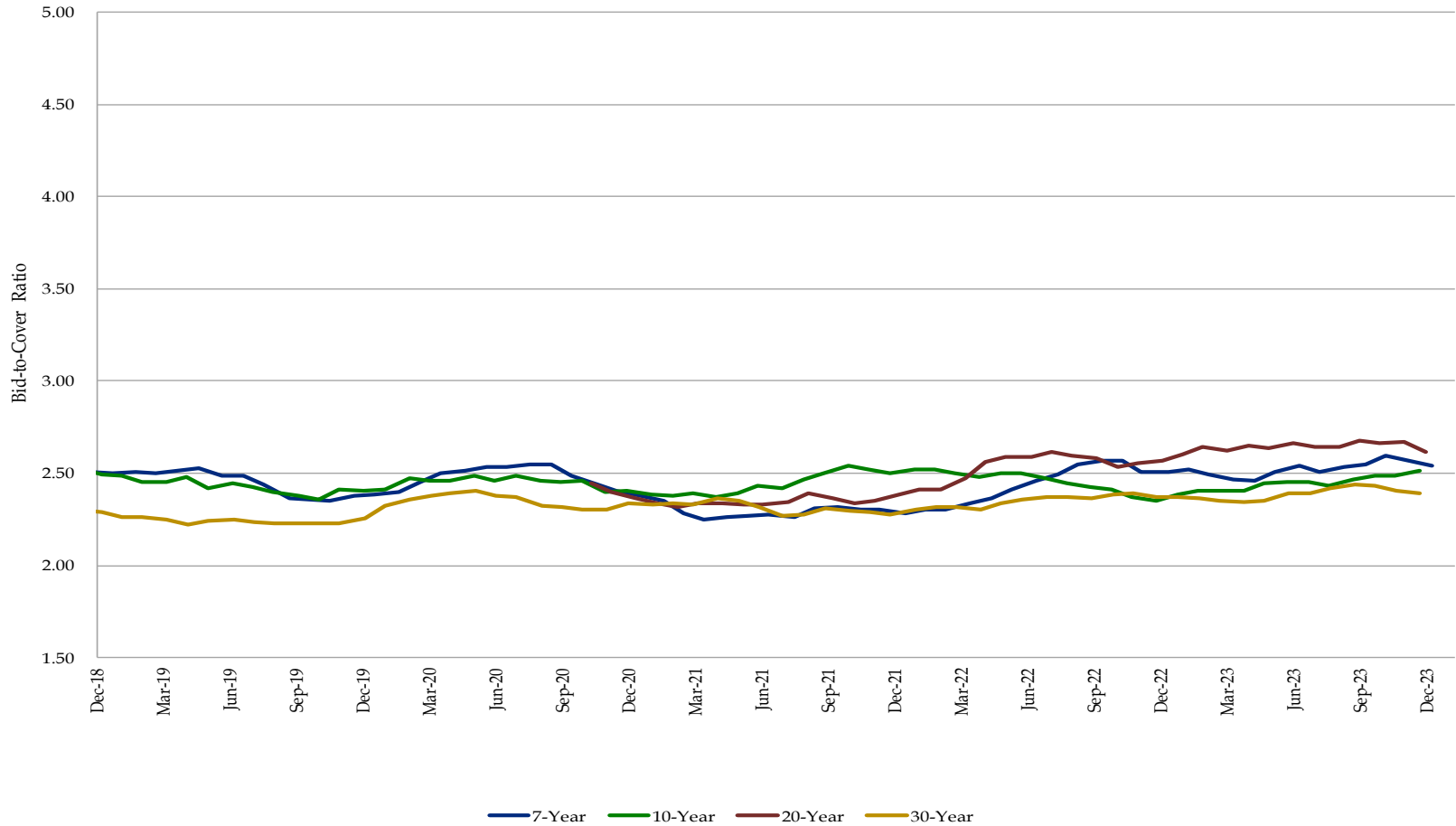
## Bid-to-Cover Ratios for FRNs (6-Month Moving Average)



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

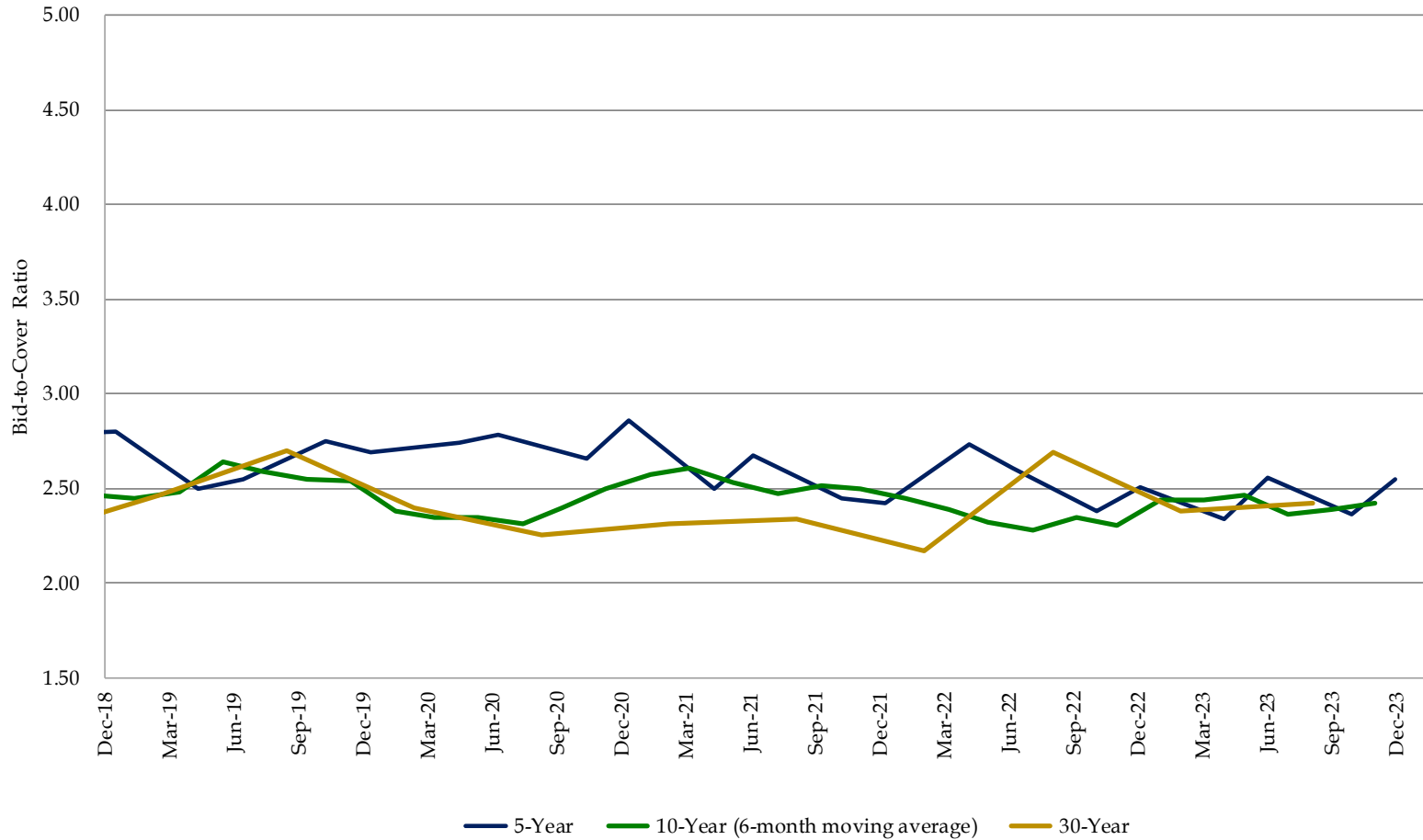


## Bid-to-Cover Ratios for 7-, 10-, 20-, and 30-Year Nominal Securities (6-Month Moving Average)

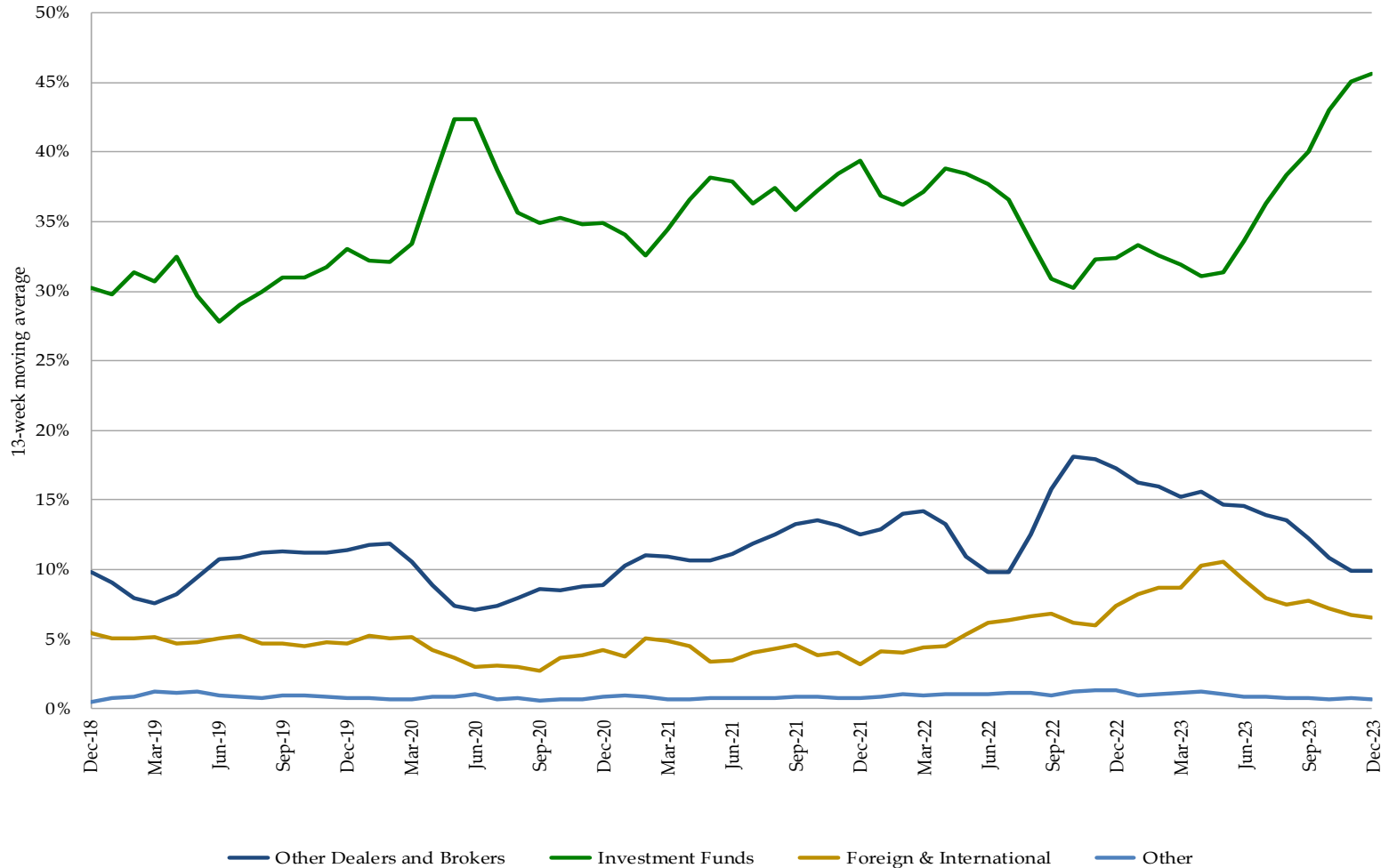




## Bid-to-Cover Ratios for TIPS

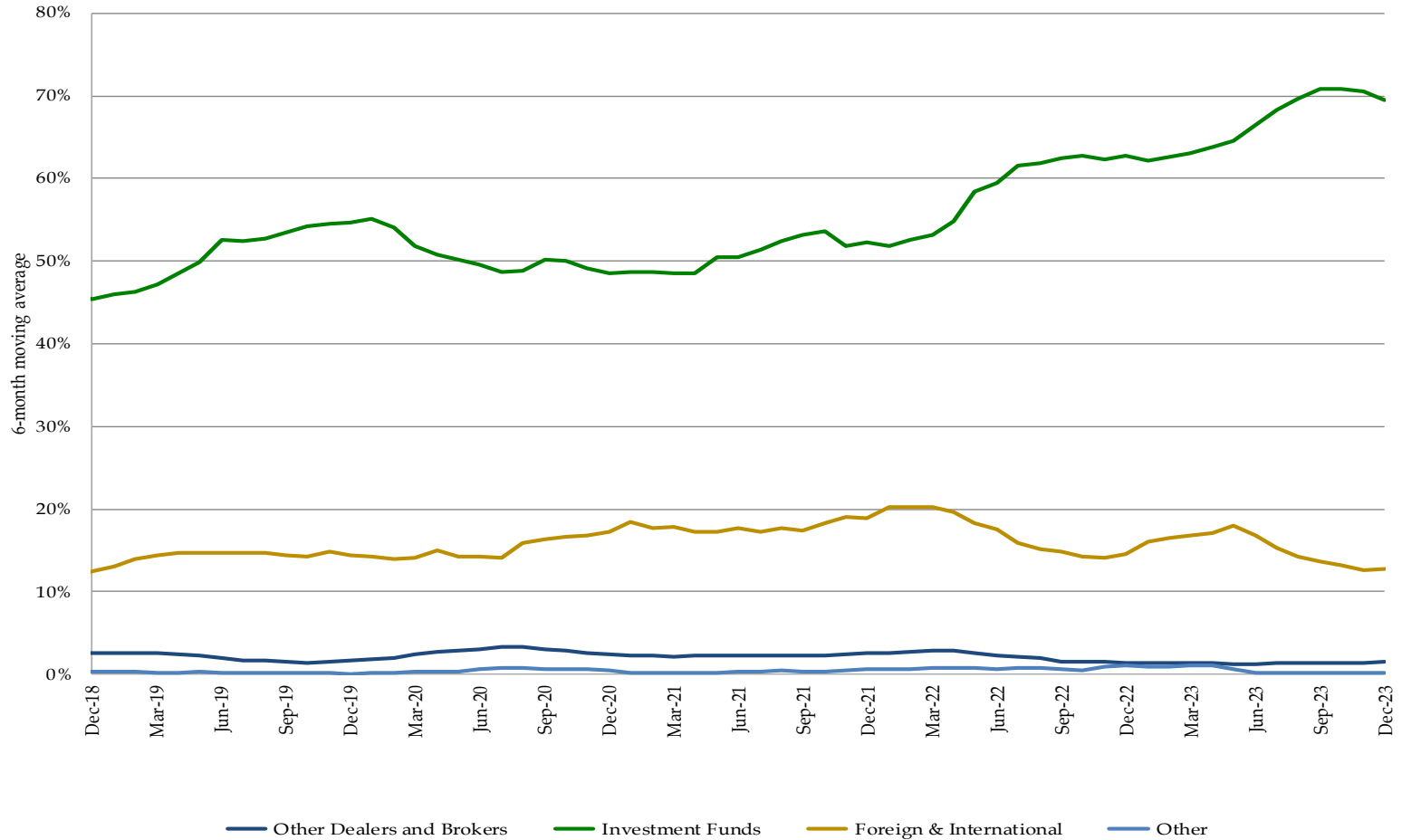


## Percent Awarded in Bill Auctions by Investor Class (13-Week Moving Average)



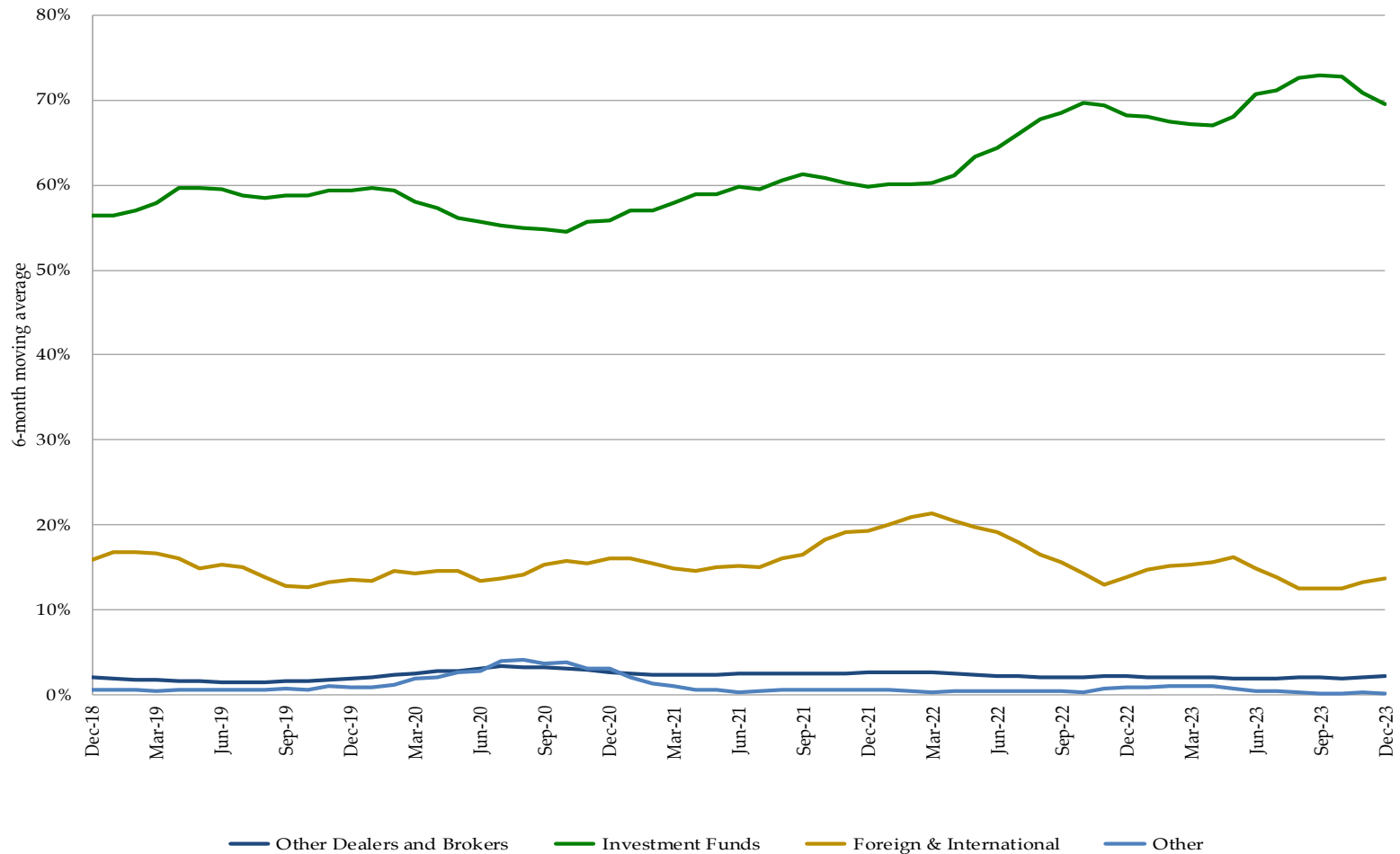
Excludes SOMA add-ons. The “Other” category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



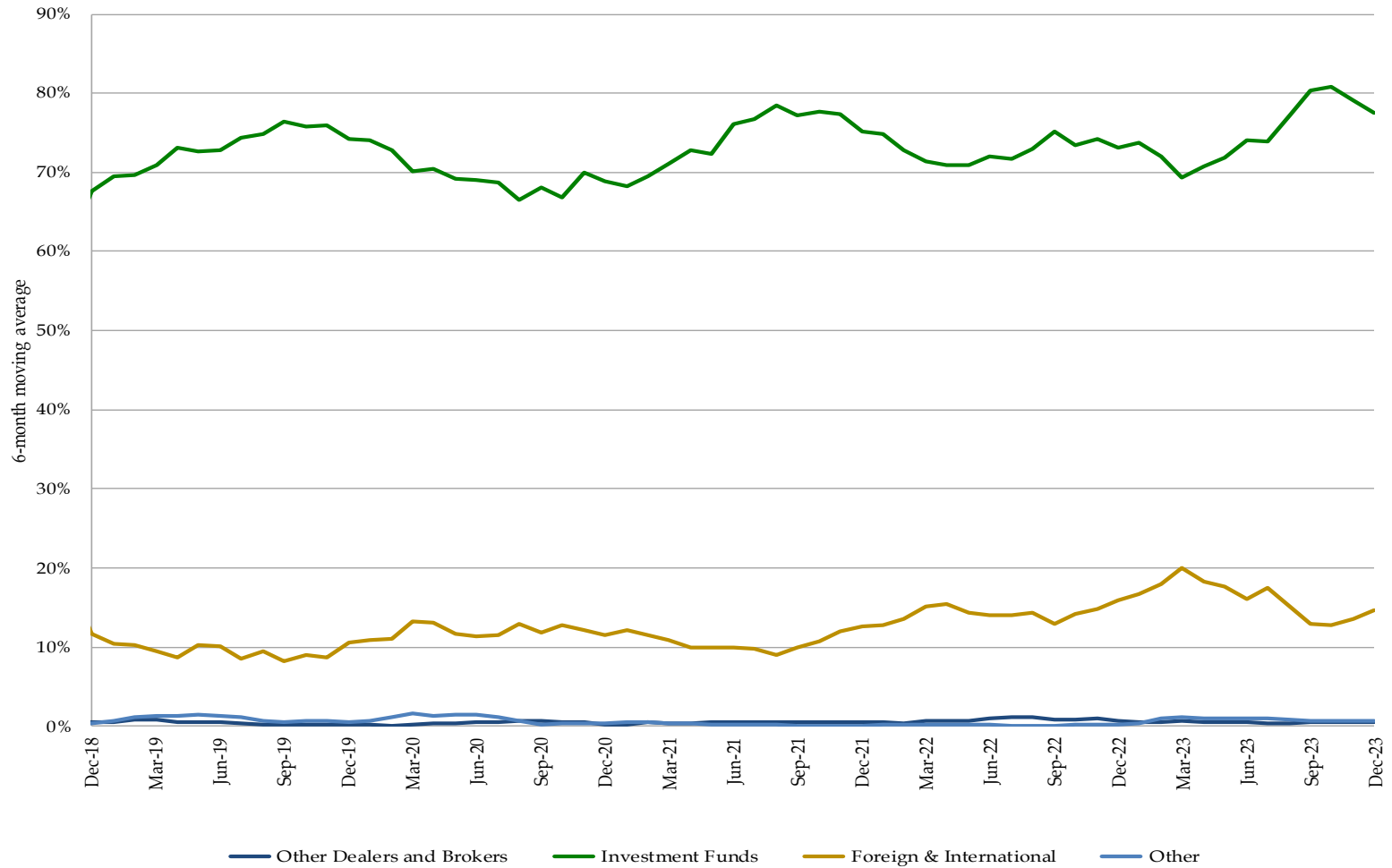
Excludes SOMA add-ons. The “Other” category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



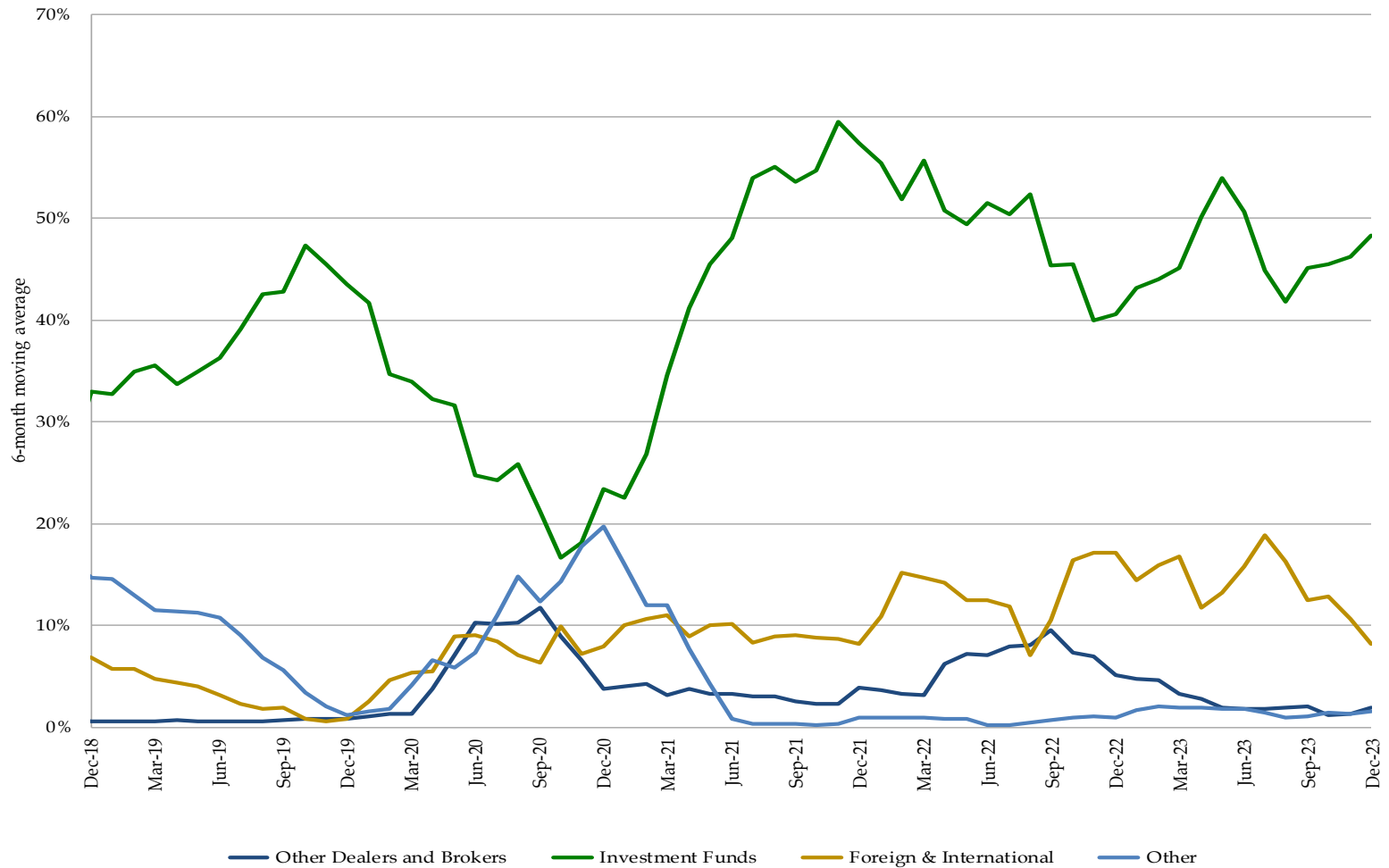
Excludes SOMA add-ons. The “Other” category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



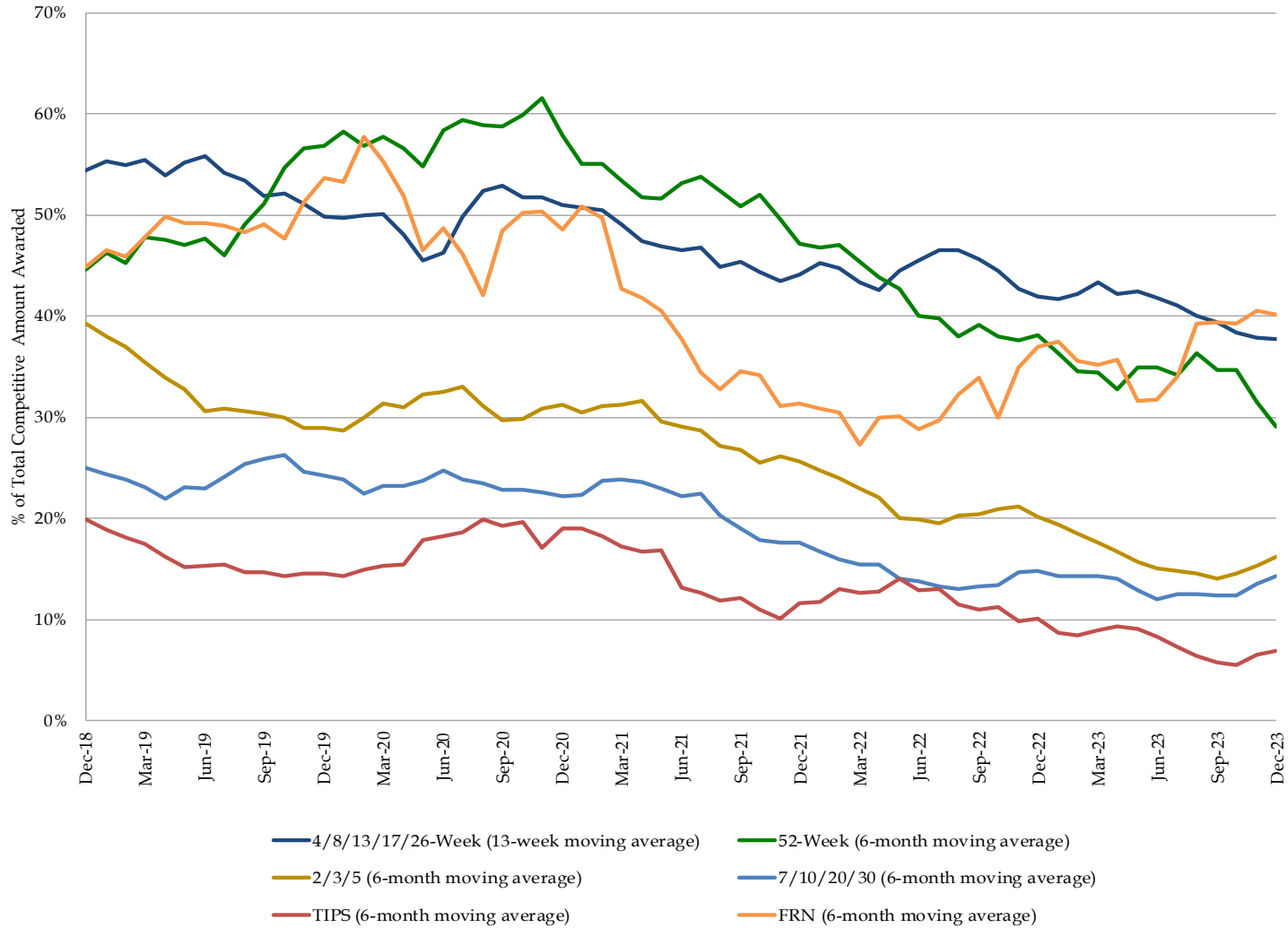
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

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



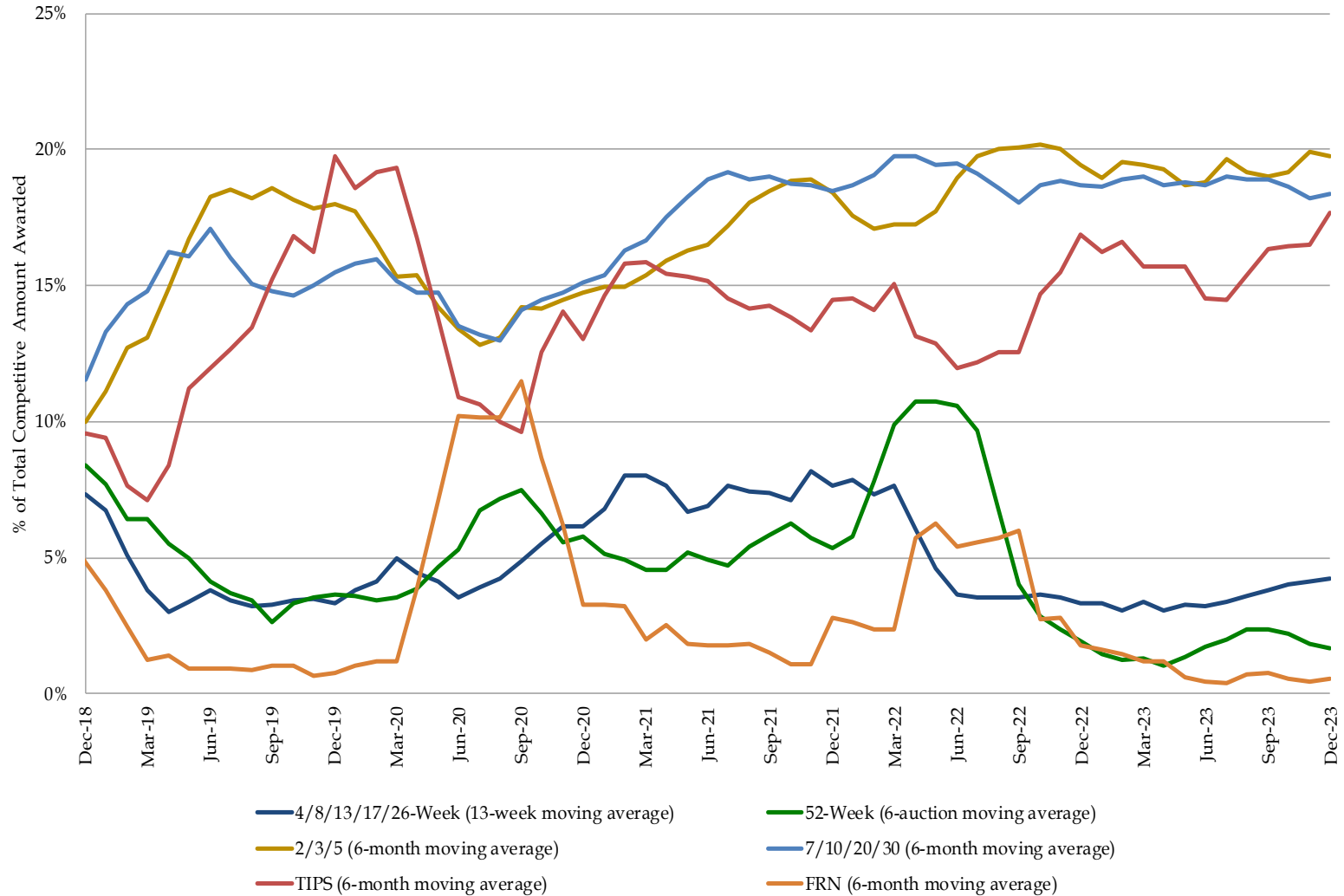
Excludes SOMA add-ons. The "Other" category includes categories that are each less than 5%, which include Depository Institutions, Individuals, Pension and Insurance.

## Primary Dealer Awards at Auction



Competitive Amount Awarded excludes SOMA add-ons.

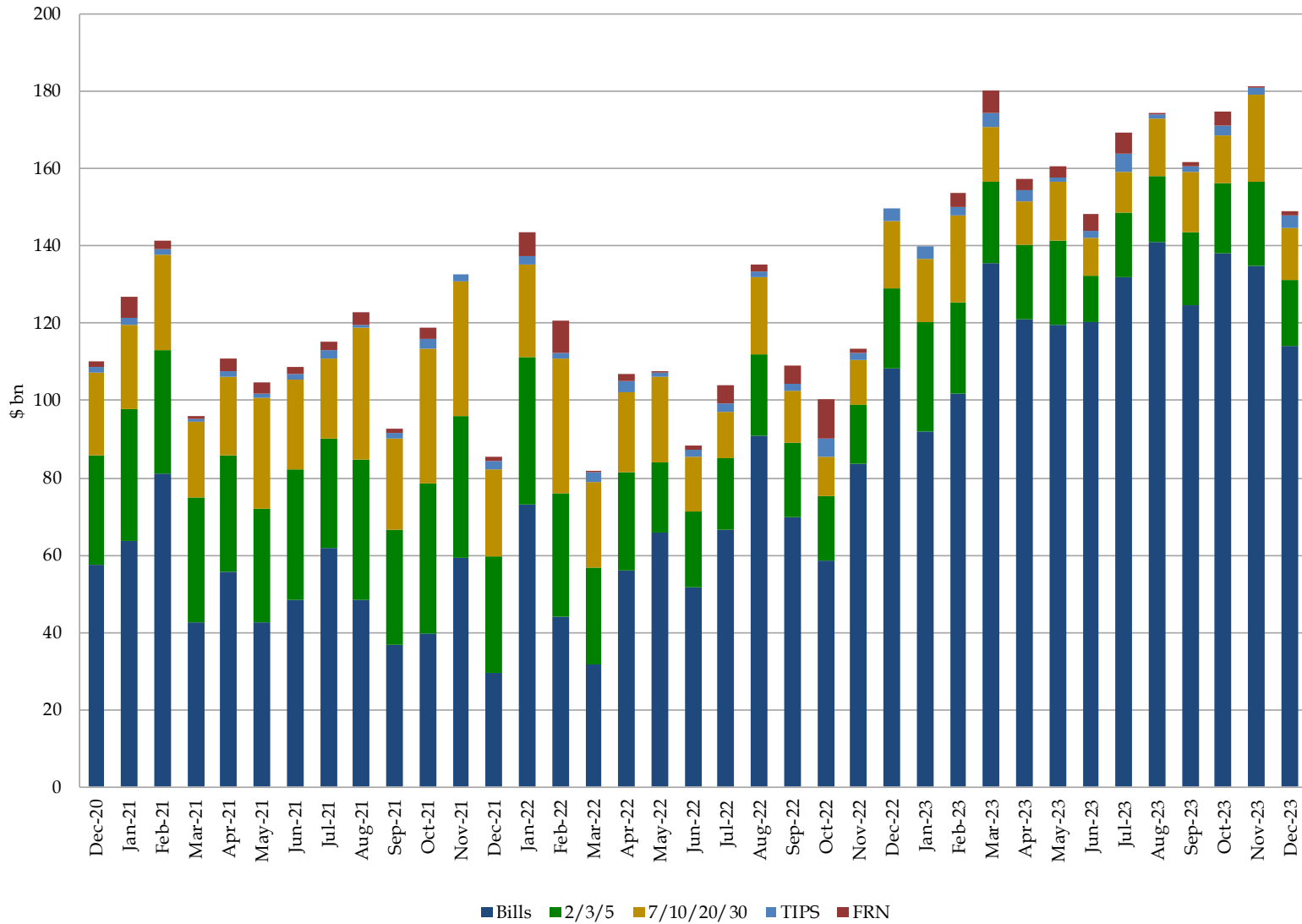
# Direct Bidder Awards at Auction



Competitive Amount Awarded excludes SOMA add-ons.

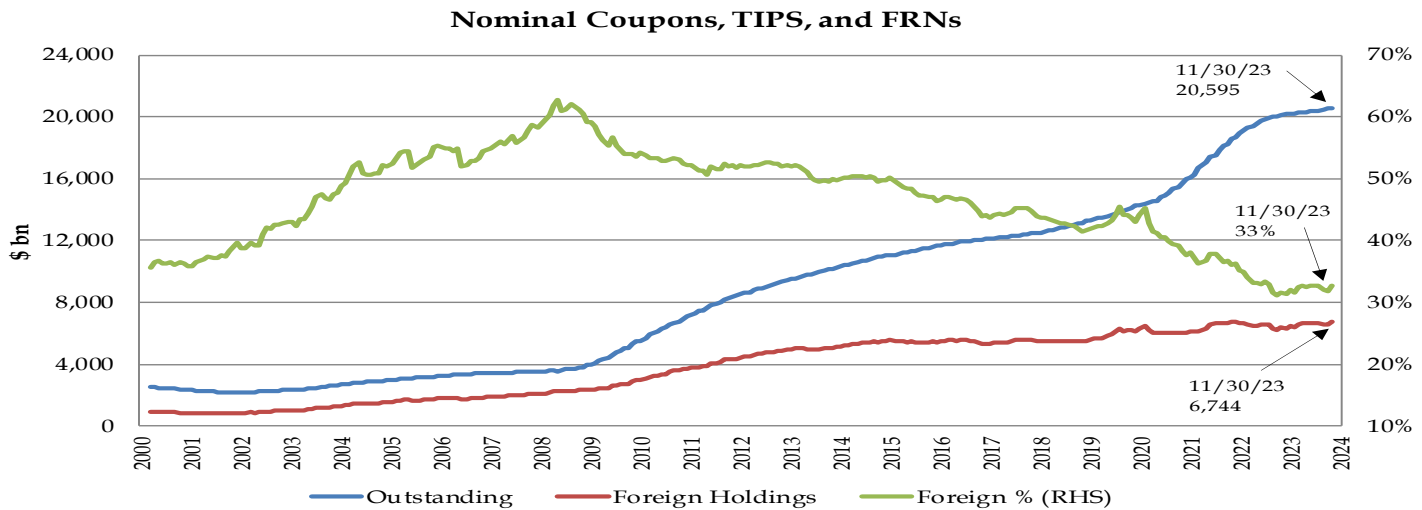
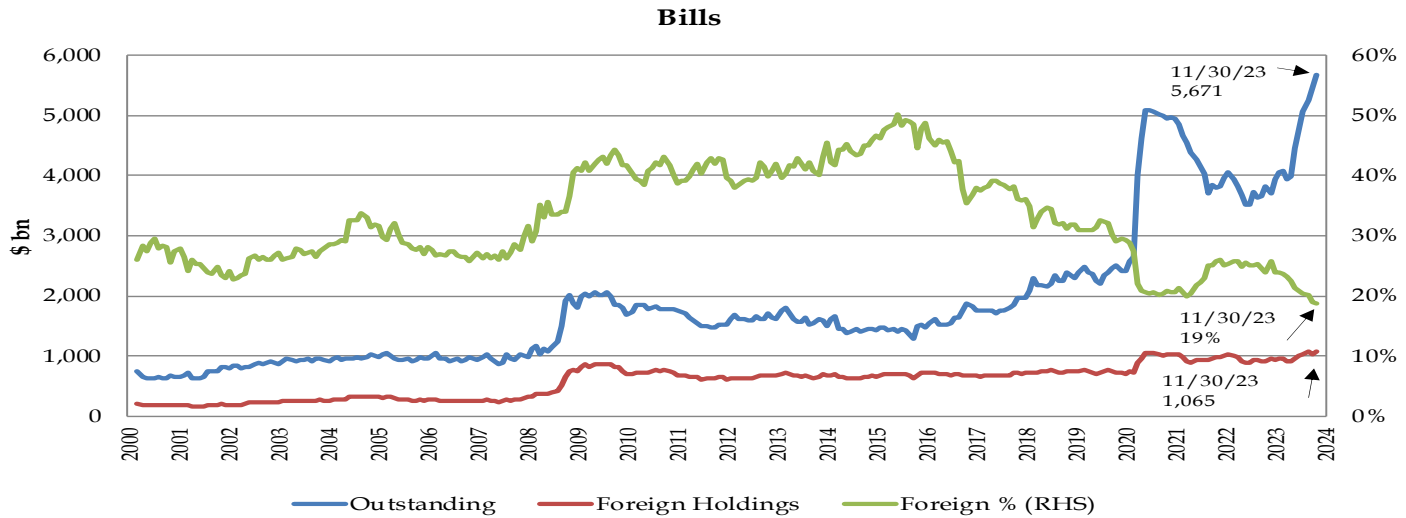


## Total Foreign Awards of Treasuries at Auction, \$ billions



Foreign includes both private sector and official institutions.

# Total Foreign Holdings



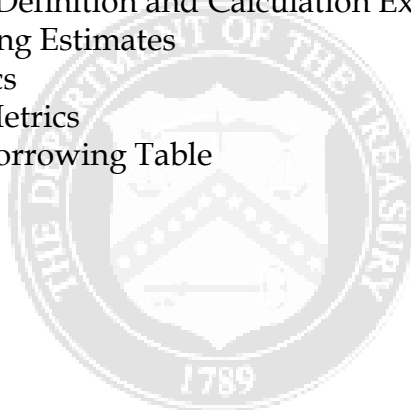
Source: Treasury International Capital (TIC) System as of November 2023.

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.

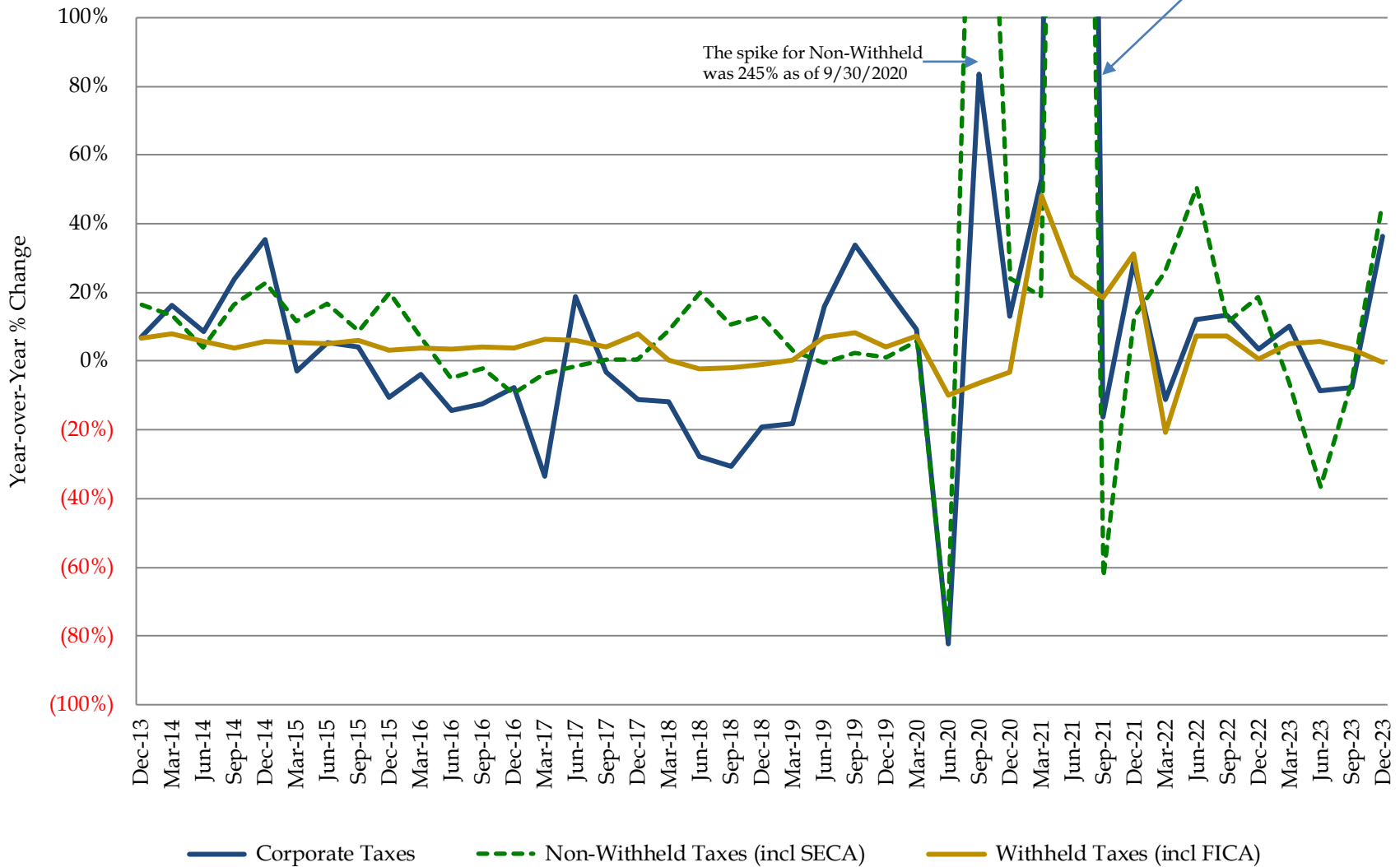
# VII. Appendix

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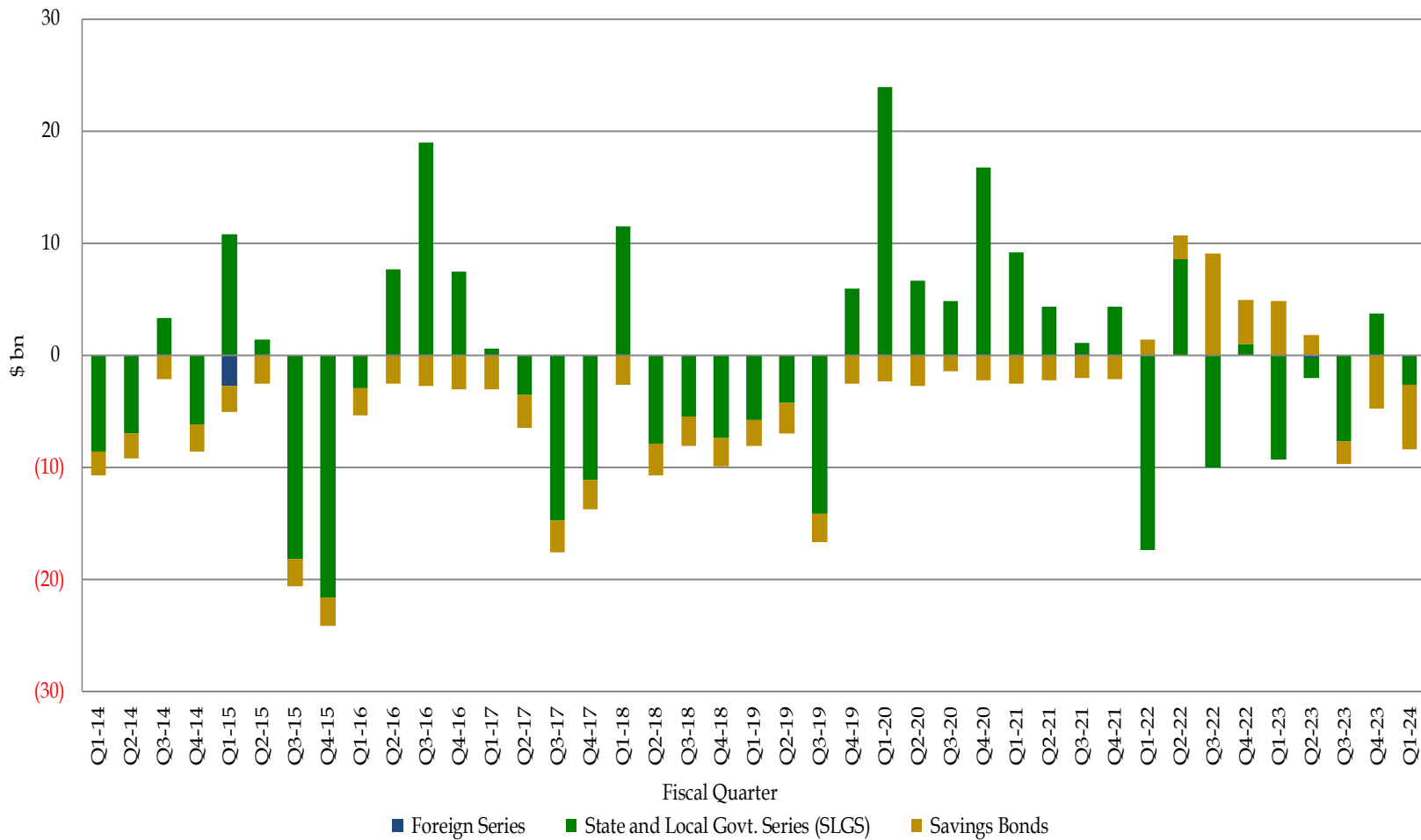


# Quarterly Tax Receipts

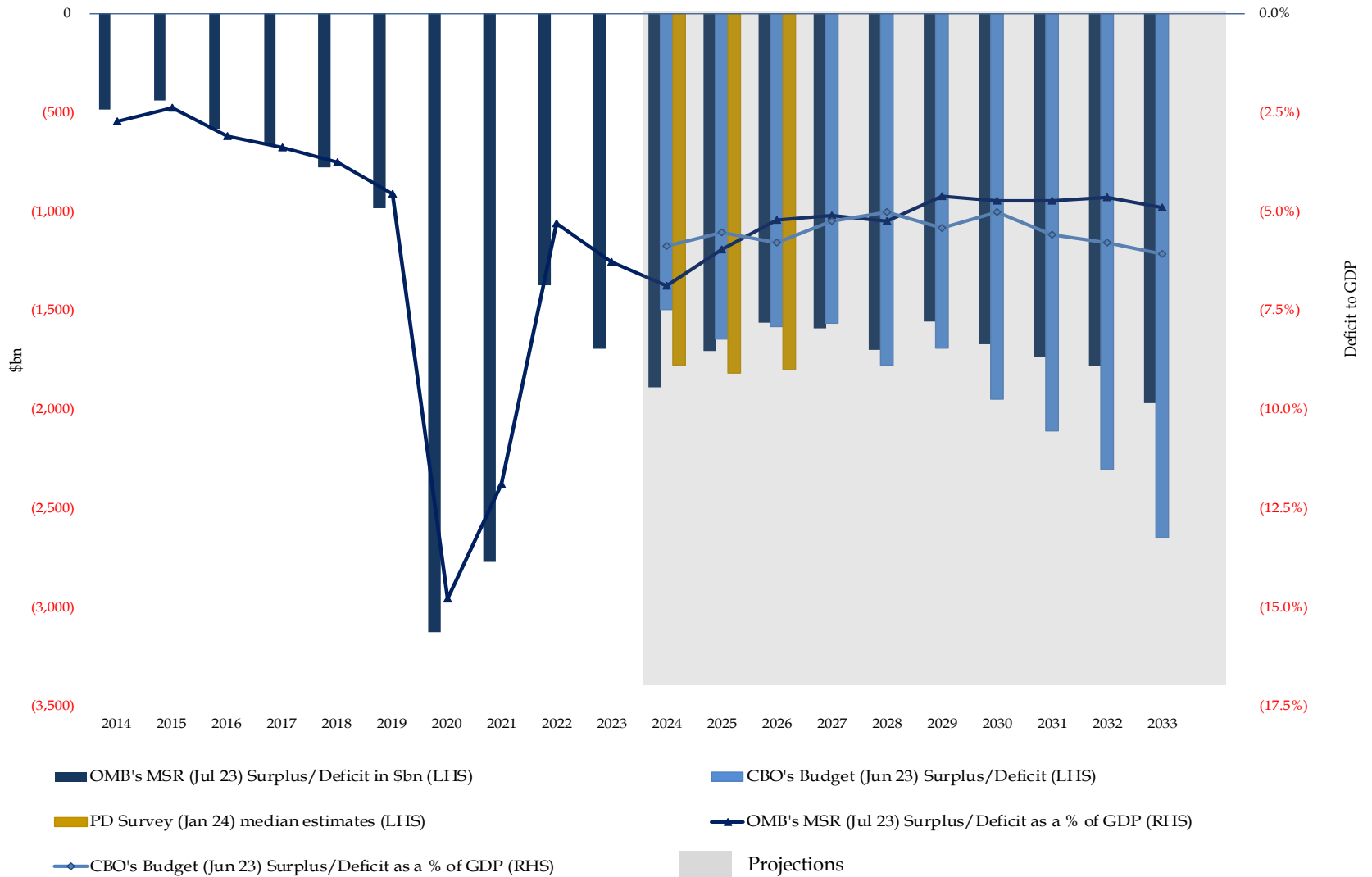


Quarterly tax receipts for Q4 FY2020 reflect the adjustment of April and June 2020 tax deadlines to July 15<sup>th</sup>, 2020.

## Treasury Net Nonmarketable Borrowing



## Budget Surplus/Deficit\*



\*OMB's projections are from OMB's Table S-1 of "Mid-Session Review, Budget of The U.S. Government," July 2023. Adjusted to reflect the latest assumptions about student loans.

CBO's projections are from Table 1 of "How the Fiscal Responsibility Act of 2023 Affects CBO's Projections of Federal Debt," June 2023.

## Sources of Privately-Held Financing in FY24 Q1

October - December 2023	
Net Bill Issuance	437
Net Coupon Issuance	338
Subtotal: Net Marketable Borrowing	776
Ending Cash Balance	769
Beginning Cash Balance	657
Subtotal: Change in Cash Balance	112
Net Implied Funding for FY24 Q1*	664

Security	October - December 2023 Bill Issuance			Fiscal Year-to-Date Bill Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
4-Week	1,150	1,150	0	1,150	1,150	0
8-Week	1,065	955	110	1,065	955	110
13-Week	969	875	94	969	875	94
17-Week	722	606	116	722	606	116
26-Week	878	681	197	878	681	197
52-Week	176	136	40	176	136	40
CMBs						
6-Week	935	870	65	935	870	65
CMBs	0	185	(185)	0	185	(185)
Bill Subtotal	5,895	5,458	437	5,895	5,458	437

Security	October - December 2023 Coupon Issuance			Fiscal Year-to-Date Coupon Issuance		
	Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	78	76	2	78	76	2
2-Year	153	174	(21)	153	174	(21)
3-Year	144	131	13	144	131	13
5-Year	156	73	83	156	73	83
7-Year	114	73	41	114	73	41
10-Year	112	55	57	112	55	57
20-Year	42	0	42	42	0	42
30-Year	65	0	65	65	0	65
5-Year TIPS	42	0	42	42	0	42
10-Year TIPS	15	0	15	15	0	15
30-Year TIPS	0	0	0	0	0	0
Coupon Subtotal	921	582	338	921	582	338

Total	6,816	6,040	776	6,816	6,040	776
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\*By adjusting the change in cash balance, Treasury arrives at the net implied funding number.

## Privately-Held Net Marketable Borrowing Definition and Calculation Example

### **FY 2022 Actual Deficits and Privately-Held Net Marketable Borrowing, in \$ billions**

	FY 2022 Actual
FY 2022 Deficit	1,375
FY 2022 + Change in Cash Balance	421
FY 2022 + Other Means of Financing (e.g. Direct Loans)	-125
<b>FY 2022 = Total Net Marketable Borrowing</b>	<b>1,671</b>
FY 2022 + SOMA Redemption	150
<b>FY 2022 = Privately-Held Net Marketable Borrowing</b>	<b>1,821</b>

- Actual deficits are sourced from the Monthly Treasury Statement.
- Actual change in cash balance is sourced from the Daily Treasury Statement. Change in cash balance = cash balance of Sept 30, 2022 - cash balance of Sept 30, 2021
- Other Means of Financing include cash flows associated with federal credit programs, such as those related to student loans and loans to small businesses.
- Privately-Held Net Marketable Borrowing = Total Net Marketable Borrowing + SOMA Redemption
- SOMA redemption is the amount that the Federal Reserve redeems securities that Treasury has to replace with privately-held marketable borrowing. Actual SOMA redemptions amounts is from the Sources and Uses Reconciliation Table.
- Actual Privately-Held Net Marketable Borrowing is from the Sources and Uses Reconciliation Table.



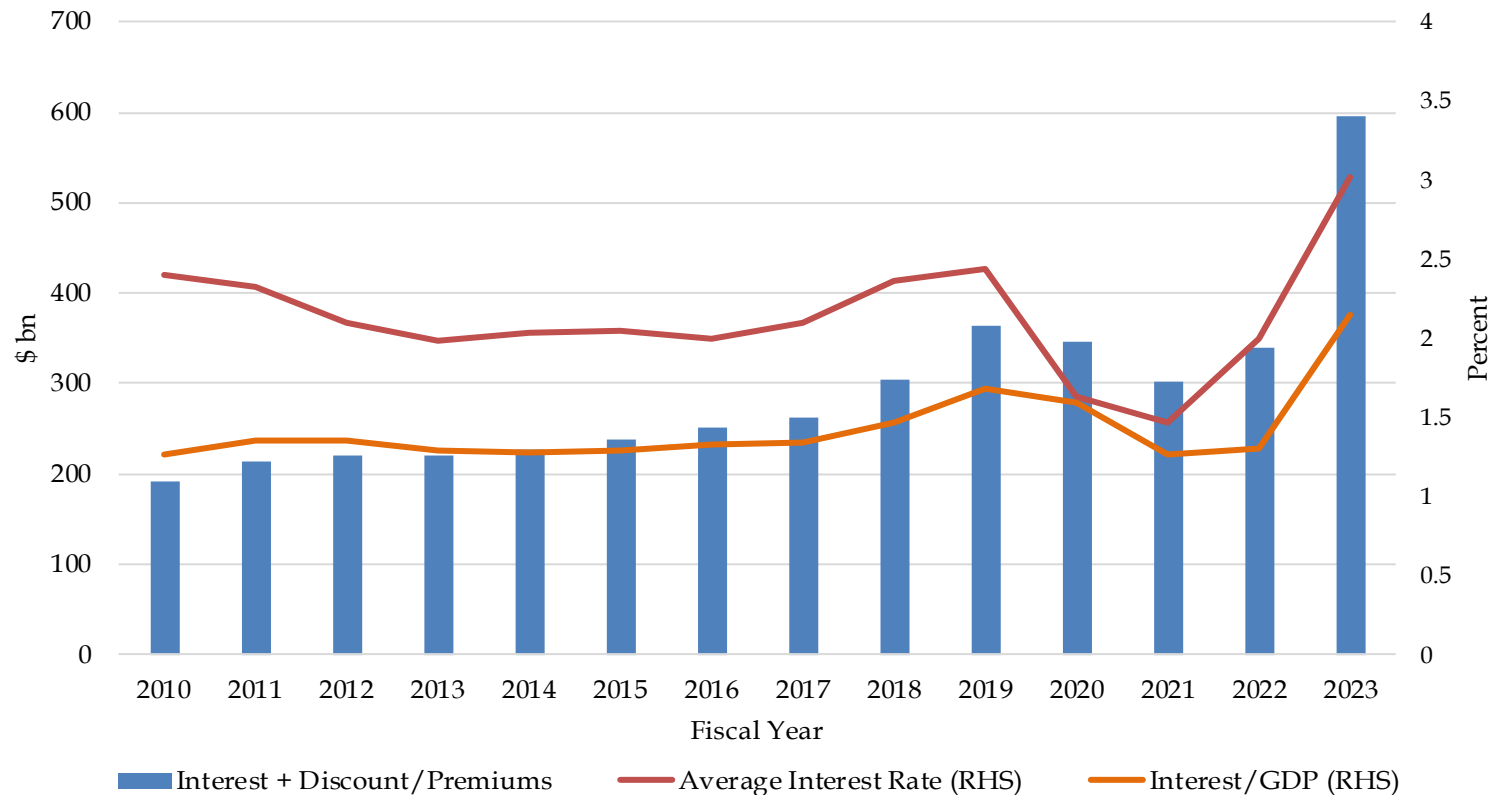
## FY 2024-2026 Deficits and Privately-Held Net Marketable Borrowing Estimates, in \$ billions

	Primary Dealer			OMB	CBO
	25th	Median	75th		
FY 2024 Deficit	1,700	1,778	1,854	1,894	1,501
FY 2025 Deficit	1,760	1,819	1,906	1,710	1,649
FY 2026 Deficit	1,755	1,800	1,925	1,567	1,586
FY 2024 Change in Cash Balance	93	93	93	0	0
FY 2025 Change in Cash Balance	0	0	0	0	0
FY 2026 Change in Cash Balance	0	0	0	0	0
FY 2024 Total Net Marketable Borrowing				2,029	1,551
FY 2025 Total Net Marketable Borrowing				1,832	1,746
FY 2026 Total Net Marketable Borrowing				1,696	1,676
FY 2024 SOMA Redemption	520	596	696		
FY 2025 SOMA Redemption	0	75	196		
FY 2026 SOMA Redemption	0	0	0		
FY 2024 Privately-Held Net Marketable Borrowing*	2,327	2,467	2,555	2,718	2,240
FY 2025 Privately-Held Net Marketable Borrowing*	1,850	1,975	2,150	1,907	1,821
FY 2026 Privately-Held Net Marketable Borrowing*	1,800	1,979	2,045	1,696	1,676

Estimates as of:	Jan-24	Jul-23	Jun-23
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- \*All privately-held net marketable borrowing estimates of are “normalized” using:
  - 1) the median Primary Dealer’s estimates for SOMA redemptions, and
  - 2) PD’s median end of fiscal year 2024 cash balance of \$750 billion, held constant in out years.
- OMB projections are using estimates are from Table S-1 of “Mid-Session Review, Budget of The U.S. Government,” July 2023. Adjusted to reflect the latest assumptions about student loans.
- CBO projections are using estimates are from Table 1 & 2 of “How the Fiscal Responsibility Act of 2023 Affects CBO’s Projections of Federal Debt ,” June 2023.

## Historical Marketable Treasury Debt Service Cost

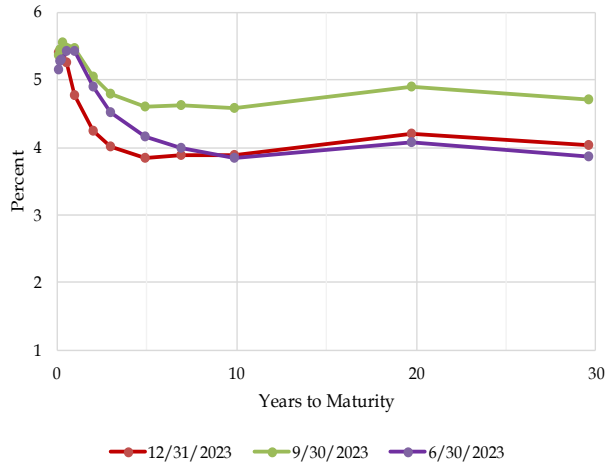


Source: <https://fiscaldata.treasury.gov/datasets>

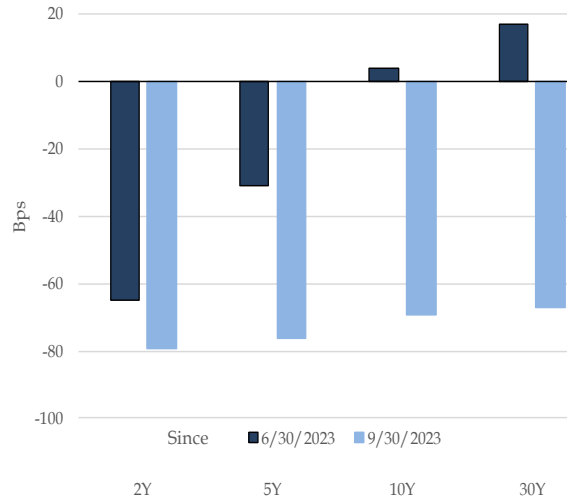
The average interest rates for total marketable debt do not include the Treasury Inflation-Indexed Securities and the Treasury Floating Rate Notes. However, they include securities from Federal Financing Bank. The average interest rates in the chart are as of corresponding fiscal year-end-dates.

# Various Historical Treasury Interest Rate Metrics

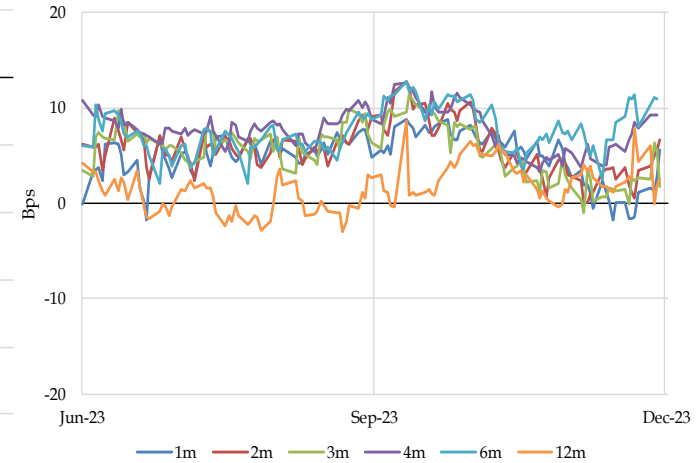
**Treasury Nominal Yield Curve as of specified dates**



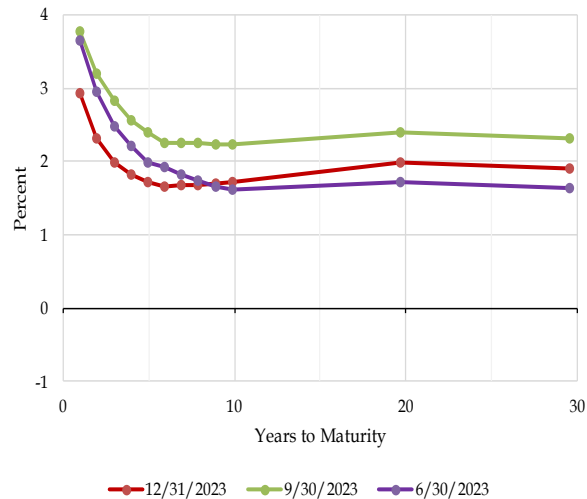
**Nominal Yield Changes in Selected Tenors Through the end of 12/31/23**



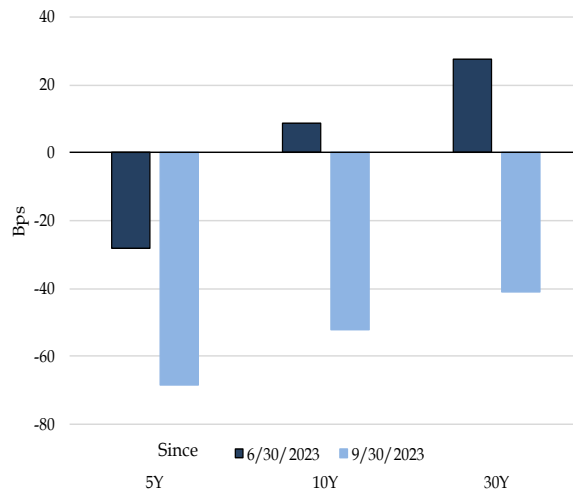
**Bills-SOFR OIS spreads Through the end of 12/31/23**



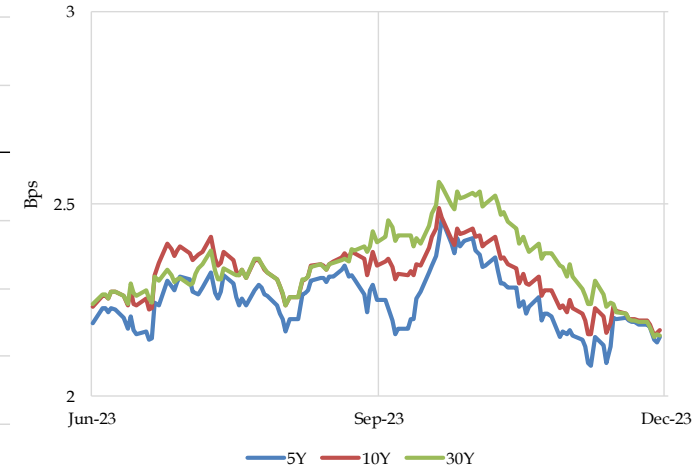
**Treasury Real Yield Curve as of specified dates**



**Real Yield Changes in Selected Tenors Through the end of 12/31/23**



**Breakevens Through the end of 12/31/23**



**Projected Privately-Held Net Marketable Borrowing  
Assuming Private Coupon Issuance & Total Bills Outstanding  
Remain Constant as of 01/31/2024\***

Fiscal Year	Bills	2/3/5	7/10/20/30	TIPS	FRN	Historical/Projected Net Borrowing Capacity
2019	137	498	534	51	59	1,280
2020	2,652	538	724	46	55	4,015
2021	(1,315)	1,260	1,328	55	92	1,420
2022	(53)	744	1,027	61	42	1,821
2023	1,689	319	680	50	(38)	2,699
2024	548	568	857	84	36	2,093
2025	0	520	883	20	44	1,468
2026	0	213	880	38	2	1,133
2027	0	188	763	21	0	972
2028	0	195	444	(1)	0	638
2029	0	30	567	1	0	597
2030	0	0	691	15	0	706
2031	0	0	453	3	0	457
2032	0	0	471	(21)	0	450
2033	0	0	483	(14)	0	469

\*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.

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	10/10/2023	5.310	2.95	85.0	33.2	2.7	64.1	5.0	0.7	0.8
4-Week	10/17/2023	5.325	2.79	88.4	27.2	2.4	70.4	6.6	0.7	0.9
4-Week	10/24/2023	5.305	2.98	88.2	28.4	4.7	66.9	6.8	0.7	0.9
4-Week	10/31/2023	5.295	2.94	89.8	26.7	3.8	69.6	5.2	0.6	0.9
4-Week	11/7/2023	5.290	2.91	89.9	31.6	3.1	65.3	5.1	0.7	0.9
4-Week	11/14/2023	5.290	2.57	89.8	47.6	4.4	48.0	5.2	0.7	0.9
4-Week	11/21/2023	5.290	2.75	90.1	32.5	4.2	63.3	4.9	0.7	0.9
4-Week	11/28/2023	5.300	2.58	80.2	41.2	4.0	54.8	4.8	0.7	0.8
4-Week	12/5/2023	5.290	2.75	74.9	39.5	6.1	54.4	5.1	0.4	0.8
4-Week	12/12/2023	5.285	3.08	75.0	36.0	4.6	59.5	5.0	0.4	0.8
4-Week	12/19/2023	5.270	2.86	75.2	31.2	5.3	63.5	4.8	0.4	0.8
4-Week	12/26/2023	5.265	2.68	75.1	36.2	7.8	56.0	4.9	0.4	0.8
4-Week	1/2/2024	5.325	2.35	75.4	58.2	3.6	38.3	4.6	0.4	0.8
8-Week	10/10/2023	5.355	2.46	76.3	43.9	5.8	50.3	3.7	0.6	1.5
8-Week	10/17/2023	5.345	2.88	83.0	32.9	2.9	64.2	2.0	0.6	1.6
8-Week	10/24/2023	5.325	2.63	82.5	36.1	4.0	59.9	2.5	0.6	1.6
8-Week	10/31/2023	5.330	2.52	83.5	40.5	3.7	55.8	1.5	0.6	1.6
8-Week	11/7/2023	5.300	2.70	83.6	34.6	5.2	60.2	1.4	0.6	1.6
8-Week	11/14/2023	5.285	2.70	82.1	41.0	3.5	55.5	2.9	0.6	1.6
8-Week	11/21/2023	5.280	2.63	83.7	41.1	4.0	54.9	1.3	0.6	1.6
8-Week	11/28/2023	5.280	2.73	78.9	34.4	4.9	60.6	1.1	0.7	1.5
8-Week	12/5/2023	5.280	2.75	78.6	39.2	3.2	57.5	1.4	0.4	1.5
8-Week	12/12/2023	5.275	2.82	78.6	40.2	3.4	56.5	1.4	0.4	1.5
8-Week	12/19/2023	5.275	2.83	78.5	46.0	2.8	51.2	1.5	0.4	1.5
8-Week	12/26/2023	5.270	2.74	78.5	41.1	1.2	57.7	1.5	0.4	1.5
8-Week	1/2/2024	5.285	2.59	78.6	33.8	1.7	64.5	1.4	0.4	1.5

\*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	10/5/2023	5.345	2.77	68.0	40.6	4.8	54.7	3.0	5.2	2.3
13-Week	10/12/2023	5.340	2.79	70.0	32.5	4.9	62.6	3.0	4.5	2.3
13-Week	10/19/2023	5.340	3.16	72.5	27.7	4.2	68.1	2.5	4.8	2.4
13-Week	10/26/2023	5.310	2.85	70.5	29.3	6.4	64.3	4.5	4.6	2.4
13-Week	11/2/2023	5.325	2.78	72.8	33.7	5.1	61.2	2.2	8.2	2.5
13-Week	11/9/2023	5.285	2.91	72.5	32.1	6.1	61.8	2.5	6.2	2.5
13-Week	11/16/2023	5.285	2.76	72.8	33.8	4.0	62.1	2.2	7.2	2.5
13-Week	11/24/2023	5.270	2.90	72.8	33.1	4.7	62.2	2.2	5.9	2.4
13-Week	11/30/2023	5.280	2.87	73.2	40.3	3.9	55.8	1.8	5.6	2.5
13-Week	12/7/2023	5.250	2.98	72.8	32.4	5.3	62.3	2.2	1.4	2.3
13-Week	12/14/2023	5.260	2.99	72.7	37.6	6.9	55.5	2.3	1.5	2.3
13-Week	12/21/2023	5.260	2.89	72.7	42.7	2.9	54.4	2.3	0.6	2.3
13-Week	12/28/2023	5.260	3.07	72.7	33.0	3.7	63.3	2.3	2.6	2.4
17-Week	10/10/2023	5.350	2.96	53.3	41.6	3.4	55.0	0.7	0.4	2.2
17-Week	10/17/2023	5.355	3.37	55.3	35.8	2.7	61.5	0.7	0.4	2.2
17-Week	10/24/2023	5.355	3.27	55.2	27.8	4.4	67.8	0.8	0.4	2.2
17-Week	10/31/2023	5.335	2.96	53.5	40.0	3.5	56.5	2.5	0.4	2.2
17-Week	11/7/2023	5.340	2.89	55.4	36.5	5.8	57.7	0.7	0.4	2.2
17-Week	11/14/2023	5.285	3.06	54.6	40.3	3.0	56.7	1.4	0.4	2.2
17-Week	11/21/2023	5.255	3.17	55.3	42.2	2.7	55.1	0.7	0.4	2.3
17-Week	11/28/2023	5.260	3.08	55.3	35.0	2.3	62.7	0.7	0.5	2.3
17-Week	12/5/2023	5.240	2.92	55.3	47.3	4.7	48.0	0.7	0.3	2.2
17-Week	12/12/2023	5.240	2.97	55.4	47.5	3.3	49.3	0.6	0.3	2.2
17-Week	12/19/2023	5.250	2.84	55.3	49.9	4.2	45.9	0.7	0.3	2.2
17-Week	12/26/2023	5.220	2.99	55.2	41.9	3.5	54.6	0.8	0.3	2.2
17-Week	1/2/2024	5.210	3.15	55.5	39.9	3.8	56.3	0.5	0.3	2.2

\*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)*
26-Week	10/5/2023	5.340	2.88	61.6	30.3	2.8	66.9	2.4	4.7	4.2
26-Week	10/12/2023	5.320	2.79	63.3	35.7	5.1	59.2	2.7	4.1	4.2
26-Week	10/19/2023	5.335	2.91	65.8	32.7	2.8	64.5	2.2	4.4	4.4
26-Week	10/26/2023	5.325	2.70	65.6	40.3	8.6	51.1	2.4	4.2	4.4
26-Week	11/2/2023	5.320	2.90	66.0	34.8	7.2	58.0	2.0	7.4	4.6
26-Week	11/9/2023	5.260	2.92	65.5	33.5	7.7	58.8	2.5	5.6	4.5
26-Week	11/16/2023	5.270	2.75	65.7	38.6	3.7	57.7	2.3	6.6	4.6
26-Week	11/24/2023	5.230	2.55	65.9	49.1	5.5	45.4	2.1	5.3	4.5
26-Week	11/30/2023	5.240	3.01	66.4	37.1	3.8	59.1	1.6	5.1	4.5
26-Week	12/7/2023	5.190	2.66	65.8	46.2	10.2	43.6	2.2	1.3	4.2
26-Week	12/14/2023	5.190	3.03	65.8	46.1	4.5	49.5	2.2	1.4	4.2
26-Week	12/21/2023	5.130	3.10	65.5	30.7	2.7	66.6	2.5	0.5	4.2
26-Week	12/28/2023	5.080	3.23	65.7	27.9	0.5	71.6	2.3	2.3	4.3
52-Week	10/5/2023	5.185	3.21	42.2	23.5	0.1	76.4	1.8	3.2	5.7
52-Week	11/2/2023	5.135	2.89	42.5	33.9	1.8	64.3	1.5	4.8	6.0
52-Week	11/30/2023	4.935	3.56	42.3	27.3	0.2	72.5	1.7	3.3	5.8
52-Week	12/28/2023	4.595	3.27	42.6	21.0	1.4	77.6	1.4	1.5	5.6
6-Week CMB	10/5/2023	5.330	2.46	64.8	62.6	7.5	29.9	0.2	0.0	0.9
6-Week CMB	10/12/2023	5.360	2.74	69.8	36.0	2.3	61.7	0.2	0.0	1.0
6-Week CMB	10/19/2023	5.325	3.12	74.8	31.7	3.0	65.3	0.2	0.0	1.1
6-Week CMB	10/26/2023	5.300	3.01	74.8	31.7	3.0	65.3	0.2	0.0	1.1
6-Week CMB	11/2/2023	5.295	2.81	74.8	33.8	2.4	63.8	0.2	0.0	1.1
6-Week CMB	11/9/2023	5.290	2.84	74.8	33.6	3.0	63.4	0.2	0.0	1.1
6-Week CMB	11/16/2023	5.290	2.64	74.8	37.2	3.7	59.1	0.2	0.0	1.1
6-Week CMB	11/24/2023	5.285	2.96	74.8	41.3	4.5	54.2	0.2	0.0	1.0
6-Week CMB	11/30/2023	5.285	2.92	69.8	41.9	4.5	53.6	0.2	0.0	1.0
6-Week CMB	12/7/2023	5.285	3.04	69.7	41.8	4.7	53.5	0.3	0.0	1.0
6-Week CMB	12/14/2023	5.285	2.85	69.8	43.8	3.9	52.3	0.2	0.0	1.0
6-Week CMB	12/21/2023	5.270	3.02	69.8	43.2	4.4	52.5	0.2	0.0	1.0
6-Week CMB	12/28/2023	5.280	2.85	69.8	37.4	6.1	56.5	0.2	0.0	1.0

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

Nominal Coupons & FRNs										
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	10/31/2023	5.055	2.64	50.3	17.6	20.3	62.0	0.7	0.0	12.0
2-Year	11/30/2023	4.887	2.54	53.3	18.8	23.9	57.4	0.7	0.6	12.9
2-Year	1/2/2024	4.314	2.68	56.3	18.6	19.5	61.9	0.7	0.0	13.5
3-Year	10/16/2023	4.740	2.56	45.8	22.1	21.9	56.0	0.2	0.0	15.9
3-Year	11/15/2023	4.701	2.67	47.5	16.3	19.1	64.6	0.5	0.9	17.0
3-Year	12/15/2023	4.490	2.42	49.6	26.2	21.7	52.1	0.4	0.0	17.5
5-Year	10/31/2023	4.899	2.36	51.8	19.4	19.1	61.5	0.2	0.0	28.6
5-Year	11/30/2023	4.420	2.46	54.8	16.8	17.6	65.5	0.2	0.6	31.0
5-Year	1/2/2024	3.801	2.50	57.8	14.0	15.4	70.6	0.2	0.0	32.7
7-Year	10/31/2023	4.908	2.70	37.7	11.0	18.4	70.6	0.3	0.0	28.0
7-Year	11/30/2023	4.399	2.44	38.6	20.3	15.8	63.9	0.4	0.4	29.5
7-Year	1/2/2024	3.859	2.50	39.7	16.9	19.4	63.7	0.3	0.0	30.5
10-Year	10/16/2023	4.610	2.50	34.9	18.7	20.9	60.3	0.1	0.0	34.9
10-Year	11/15/2023	4.519	2.45	39.7	15.1	15.2	69.7	0.3	0.8	40.7
10-Year	12/15/2023	4.296	2.53	36.9	17.3	18.9	63.8	0.1	0.0	37.1
20-Year	10/31/2023	5.245	2.59	12.9	11.9	15.2	72.9	0.1	0.0	20.5
20-Year	11/30/2023	4.780	2.58	15.8	9.5	16.5	74.0	0.2	0.2	25.8
20-Year	1/2/2024	4.213	2.55	12.9	12.9	20.7	66.4	0.1	0.0	21.1
30-Year	10/16/2023	4.837	2.35	20.0	18.2	16.7	65.1	0.0	0.0	40.5
30-Year	11/15/2023	4.769	2.24	23.9	24.7	15.2	60.1	0.1	0.5	49.1
30-Year	12/15/2023	4.344	2.43	20.9	14.2	17.3	68.5	0.1	0.0	44.1
2-Year FRN	10/31/2023	0.170	3.23	26.0	28.2	0.1	71.7	0.0	0.0	0.1
2-Year FRN	11/24/2023	0.200	2.84	26.0	34.3	0.6	65.1	0.0	0.0	0.0
2-Year FRN	12/29/2023	0.250	2.93	26.0	37.0	0.5	62.5	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)**
5-Year TIPS	10/31/2023	2.440	2.36	21.9	9.2	17.6	73.2	0.1	0.0	12.7
5-Year TIPS	12/29/2023	1.710	2.55	20.0	6.1	18.2	75.7	0.0	0.0	11.2
10-Year TIPS	11/30/2023	2.180	2.32	14.9	13.6	16.2	70.2	0.1	0.2	16.8

\*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.



# Discussion of Treasury Futures Positions Across Different Investor Types

Treasury Borrowing Advisory Committee

January 30<sup>th</sup>, 2024

*“According to Treasury futures positioning data, asset manager long positions and leveraged fund short positions have increased significantly. Please discuss the factors that could be driving this dynamic. What are the reasons for asset managers to prefer the Treasury futures market over the cash market for their duration needs? What type of activity does the leveraged short positioning reflect; for example, to what extent could this be cash-futures basis trading activity? What are important factors to consider when monitoring changes in cash-futures basis positions?”*

# Summary

- In this presentation, we examine the large increases in asset manager longs and leveraged fund shorts in Treasury futures and propose potential structural factors that may be contributing to the persistent increases over time.
- We discuss specific reasons why asset managers use Treasury futures and find that their strategic asset allocation has resulted in lower Treasury allocations and a potential structural need for Treasury futures.
- We also discuss how leveraged funds use Treasury futures, and what types of levered strategies might result in consistently opposing positions relative to asset managers.
- We conclude that relative-value trading strategies are the most likely driver of structural leveraged fund shorts in Treasury futures and propose some relevant relationships for Treasury to monitor on the Treasury futures basis trade.
- We suggest that a mutually beneficial relationship exists between asset managers and leveraged fund positioning in Treasury futures.
- We conclude with a brief discussion of potential interactions between asset-managers and leveraged fund positioning and possible areas of future research.

# **Review of CFTC Futures Data**

# Overview of CFTC Positioning Data

- The CFTC *Traders in Financial Futures (TFF)* report separates large traders in the financial markets into four categories<sup>(1)</sup>:

## CFTC Traders in Financial Futures (TFF) Categories

### Dealer / Intermediary

*“Includes large banks (U.S. and non-U.S.) and dealers in securities, swaps and other derivatives.”*

### Asset Manager / Institutional

*“Institutional investors, including pension funds, endowments, insurance companies, mutual funds and those portfolio/investment managers whose clients are predominantly institutional. “*

### Leveraged Funds

*“Typically hedge funds and various types of money managers, including registered commodity trading advisors (CTAs); registered commodity pool operators (CPOs) or unregistered funds identified by CFTC.3”*

### Other Reportables

*“Includes corporate treasuries, central banks, smaller banks, mortgage originators, credit unions and any other reportable traders not assigned to the other three categories.”*

# Overview of CFTC Positioning Data

- Investor category data is available since 2006.
- We first show in Figure 1 total futures open interest<sup>(1)</sup> vs. the size of the Treasury market.<sup>(2)</sup>
- For Treasuries, we use total coupons outstanding excluding SOMA holdings.
- Open interest has grown with the overall size of the Treasury market.
- As a percentage of the market (Figure 2), open interest has been stable after a large decline during the global financial crisis. Recently we've seen re-leveraging and wider range.

Figure 1: Treasury Futures Open Interest (Face Amount) vs. Treasury Coupons Outstanding (ex. SOMA)

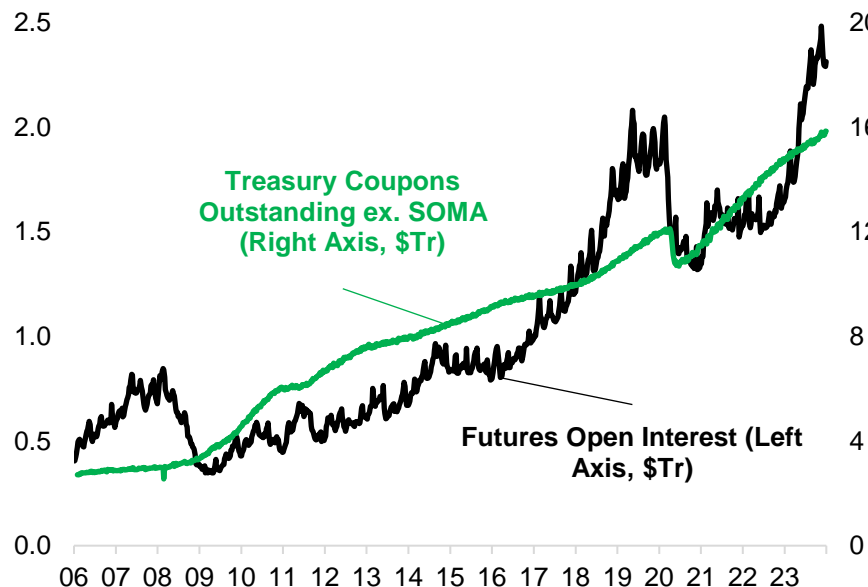
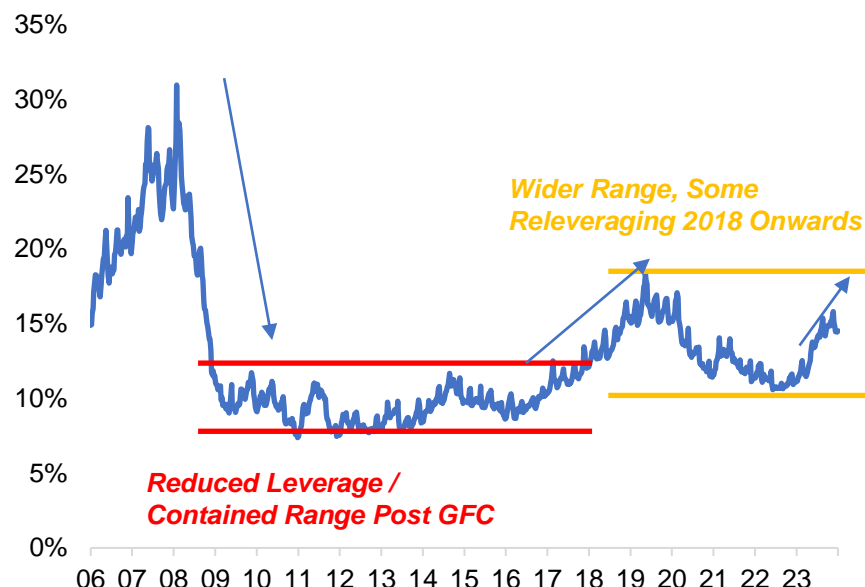


Figure 2: Treasury Futures Open Interest (Face Amount) % of Treasury Coupons Outstanding (ex. SOMA)



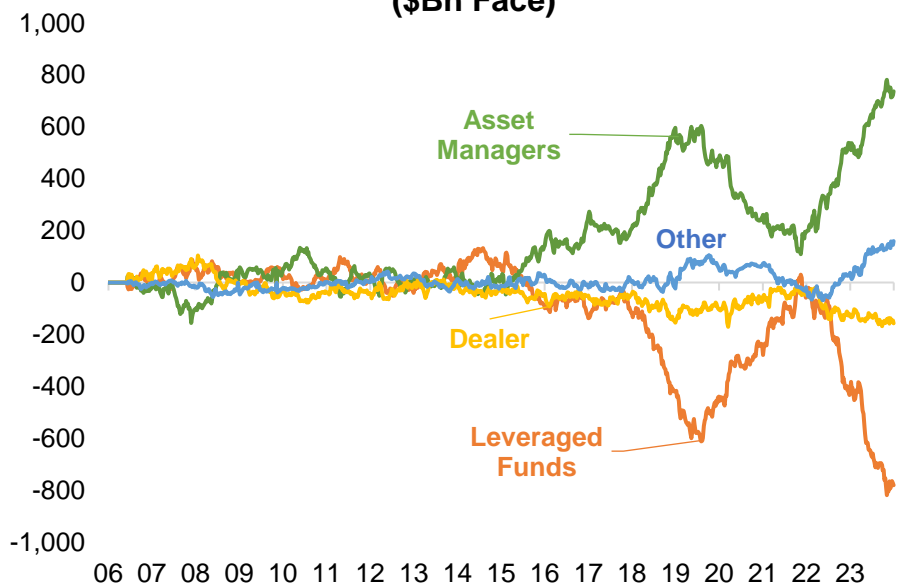
(1) Data on Treasury futures is sourced from the CFTC Traders in Financial Futures report as of Dec 2023

(2) Data on Treasury securities is sourced from US Treasury and NY Fed as of Dec 2023

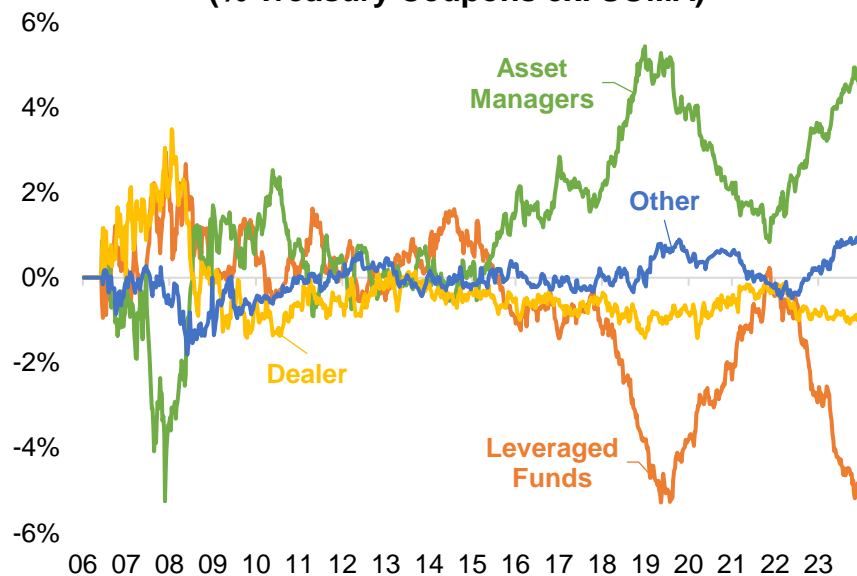
# Overview of CFTC Positioning Data

- Recently there have been large increases in both asset manager and leveraged fund positions in Treasury futures.
- Since November 2021, asset managers (AM) have increased their net position from \$100bn to over \$700bn, while leveraged funds (LF) have moved from flat to short almost \$800bn.<sup>(1)</sup>
- When normalized by the size of the Treasury market<sup>(2)</sup> in Figure 4, recent trends look similar. One interesting thing to note is the size of AM and LF positions is similar to 2019 peak (not larger).
- In the 2006-2007 period, AM and LF relative positions were flipped. This change could indicate a structural evolution in the ecosystem and how different investors behave.

**Figure 3: Net Treasury Futures By Investor Type (\$Bn Face)**



**Figure 4: Net Treasury Futures by Investor Type (% Treasury Coupons ex. SOMA)**



(1) Data on Treasury futures is sourced from the CFTC Traders in Financial Futures report as of Dec 2023

# Overview of CFTC Positioning Data

- Most of the net position in futures is concentrated in shorter duration contracts (TU, FV, and TY) likely due to larger amounts of Treasuries outstanding in these maturity buckets.
- Currently, these three contracts represent 80% of the net asset manager **notional** position and 55% of the net **TY equivalent** position.
- For purposes of the analysis we have focused on notional exposure, as opposed to DV01 exposure, because it is most consistent with quantities of repo/funding needs.
  - That said, there are likely important things to consider around DV01 exposure, since it would more accurately reflect interest rate risk concentration in longer duration securities.

Figure 5: Net TU Position  
(\$Bn Face)

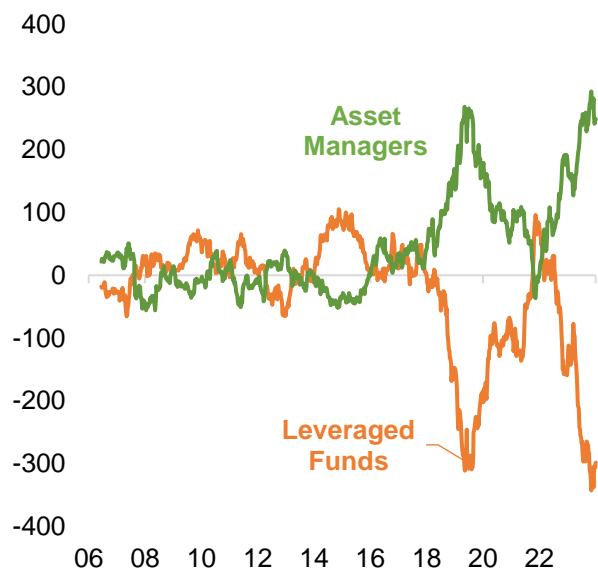


Figure 6: Net FV Position  
(\$Bn Face)

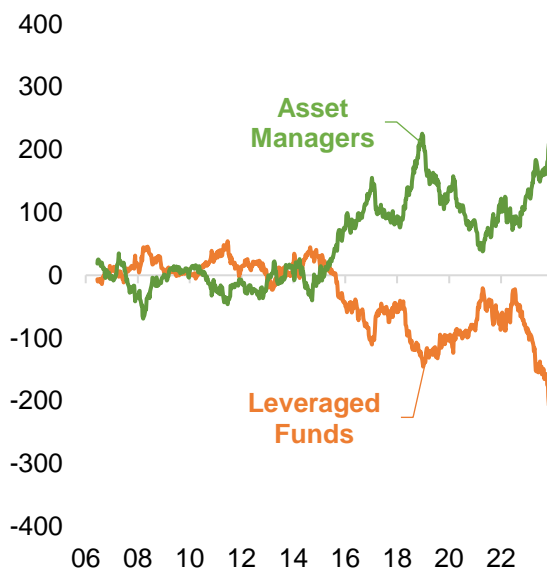
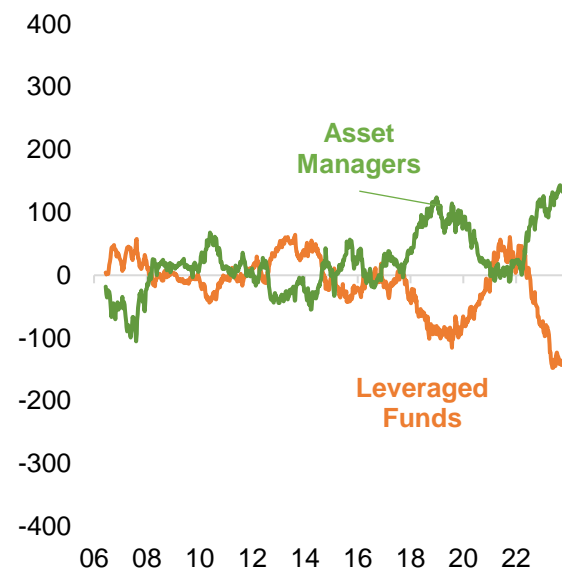


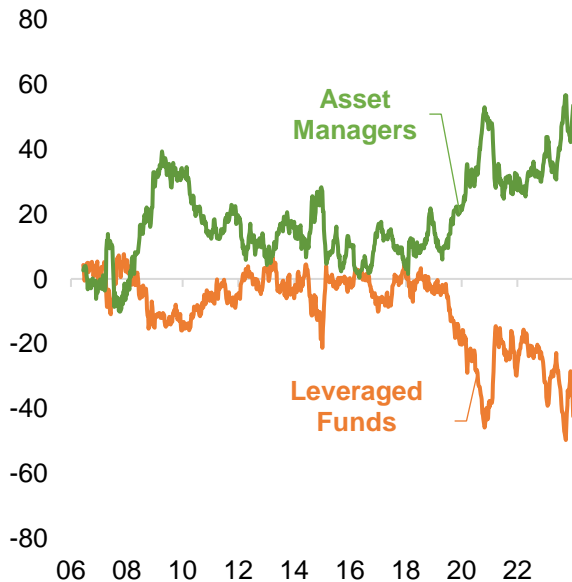
Figure 7: Net TY Position  
(\$Bn Face)



# Overview of CFTC Positioning Data

- We also show data for US and WN contracts (note the axis change) as well as all contracts in TY equivalent terms as of the end of 2023.
- While the contours are not all the same, the broad trends recently (expansion of AM longs and LF shorts) are consistent across all Treasury futures contracts.

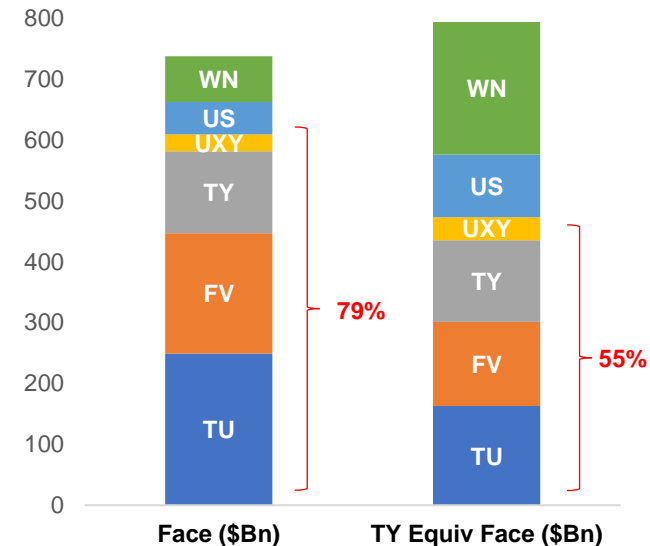
**Figure 8: Net US Position (\$Bn Face)**



**Figure 9: Net WN Position (\$Bn Face)**



**Figure 10: Asset Manager Current Face Amount & TY Equivalent Breakdown**



(1) Data on Treasury futures is sourced from the CFTC Traders in Financial Futures report as of Dec 2023



# **Asset Manager Discussion**

# How do Asset Managers Use Futures?

- **Active asset managers likely use Treasury futures for the following reasons:**
  1. Expressing directional views on duration and yield curve.
  2. Hedging and managing interest rate risk across different sectors & curve points.
  3. Obtaining financing / leverage to implement active views vs. benchmark.
  
- **Why might asset managers use Treasury futures instead of Treasuries?**
  1. Could simplify execution and operations (negates need for cash / repo trades).
  2. Eliminates reporting repo interest expense.
  3. Guidelines might not allow repo leverage (mostly separate accounts).
  4. Likely more leverage flexibility compared to 40-Act repo limits.

# How do Asset Managers Use Futures?

- The CFTC data shows that in recent years, asset managers have had a net long bias in Treasury futures, even with large swings in Treasury yields (10y yield of 0.5% in '21 to 5.0% in '23). Why would this be?
- First, what types of positions might cause asset managers to be net long Treasury futures?
  1. Active rate views (either long duration or curve steepener)
    - Based on an empirical analysis of 20 large mutual funds, asset managers appeared to trade short duration after the large drop in yields during the COVID pandemic. During this period, there was a large drop in the asset manager net futures long position, but it remained net long.
    - The empirical results<sup>(1)</sup> in Figure 12 show that asset managers have since moved closer to neutral, and yet the net futures positions now stand at an all-time high.
  2. Financing certain active and/or non-index portfolio allocations
    - **We view this as the most likely explanation for why asset managers might have a structural position in futures and will expand on that view in the coming slides**

Figure 11: Asset Manager Net Futures vs. 10Y Yield

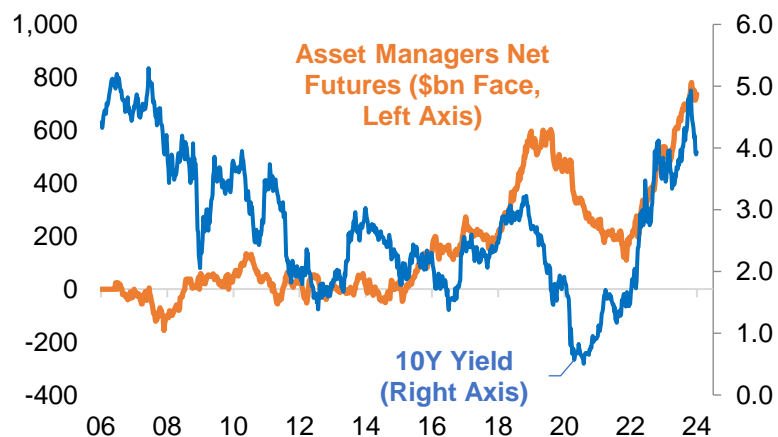
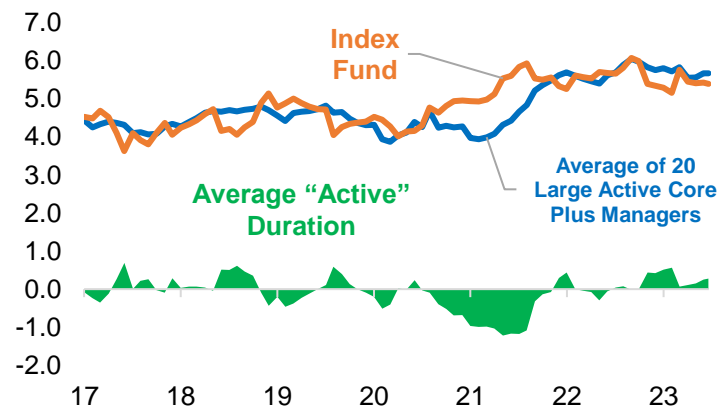


Figure 12: Asset Manager Empirical Duration Using Three Factor Regression<sup>(1)</sup>



(1) Sourced from Bloomberg and the presenter's firm's calculations. Fund returns are regressed on US 10Y, DXY, and IG Corporate OAS. Data as of 01/17/2024

# Asset Managers: Product Mix Tends to Favor Futures Relative to Treasury Repo

- Below, we show in Table 1 a broad overview of different asset management products with associated regulatory requirements for repo and futures usage.
- We focus on active fixed-income, since passive strategies, which largely track cash indices, are probably less likely to use Treasury futures.
- Based on industry estimates<sup>(1)</sup>, we conclude that most of CFTC asset manager data represents mutual funds and actively-managed separate accounts.

**Table 1: Asset Management Products Regulatory Requirements for Repo and Futures Usage**

Product Type	Governance	Guidelines	Allow Economic Leverage?	Allow Repo?	Allow Futures?
Active Mutual Fund	SEC / 1940 Act	Prospectus/SAI	Yes	Yes <sup>(2)</sup> , 50%	Yes
Active ETF	SEC / 1940 Act	Prospectus/SAI	Yes	Yes <sup>(2)</sup> , 50%	Yes
Collective Trust	ERISA	Prospectus/SAI	Yes	No	Yes
UCITS	ESMA / UCITS	Prospectus/SAI	Yes	Yes	Yes
Separate Account		Client IMA	Depends	Depends	Depends

(1) When looking at eVestment data for several large asset managers, we found that nearly 90% of AUM was in mutual funds and separate accounts as of Q3 2023

(2) 40-Act limit depends on the mutual fund's approach to repo under SEC rule 18f-4. Prior to 2020 introduction of 18f-4, repo was typically limited to 50%.

# Asset Managers: Product Mix Tends to Favor Futures Relative to Treasury Repo

- Mutual funds are regulated by the Investment Company Act of 1940 (“40-Act”)
  - While established in 1940, various rules and amendments to the 40-Act have been adopted over time.
  - For many years prior to 2020, the applicable rules created incentives for mutual funds to favor derivatives like futures over repo in certain cases, including limitations on the size of repo borrowing.
  - Rule 18f-4 adopted in 2020 established a new option for mutual funds to treat repo like other derivatives (which are subject to a “VaR test”), though some funds may not have updated their documentation or practices to utilize it. Given the change was relatively recent, its potential impacts warrant further investigation.
  - If not using this new option, mutual funds must limit their repo borrowing to 50% of NAV to meet the applicable asset coverage requirements.
  - In our view, many mutual funds are still limiting the size of their repo borrowing and achieving leverage through futures.
  
- Separate accounts are typically governed by the client investment management agreement (IMA) and associated investment guidelines.
  - Partial but representative data<sup>(1)</sup> suggests that most institutional accounts do not permit repo.
  - Futures therefore are in many cases the only way to obtain leverage in a separate account.

**Table 2: Separately Managed Accounts Investment Guidelines for Repo/Futures <sup>(1)</sup>**

	Core / Core Plus	Short Duration	Inflation	Credit
% SMA AUM that allows economic leverage	74%	98%	77%	84%
% SMA AUM that allows usage of repo	54%	12%	25%	25%
% SMA AUM that allows usage of Tsy futures	78%	27%	85%	97%

(1) Sourced from presenter firm’s data and may not correlate with aggregate industry level

# Asset Managers: 40-Act Mutual Fund Investment Expense Accounting Also Favors Futures

- While 40-Act mutual funds can use repurchase agreements, the “interest expense” associated with repos must be reported separately as an investment expense.
- In 2018, in accordance with FINRA Rule 2210(d)(5), some fund analysis providers started including “interest expense” in their databases of total expense ratios which include management fees and administrative fixed-costs.
- This change had the effect of making providers who prioritize Treasury repo over futures look more expensive, even though the two products are similar economically and repo is often less expensive.
- FINRA issued clarification D.1.2. in 2019, and while efforts have been made to exclude interest expense from published expense ratios<sup>(1)</sup>, the reality is that if a fund has high interest expense, it raises questions, even if interest expense generally associated with portfolio structures or leverage that are expected to add value to the overall portfolio.

## Typical Mutual Fund Operating Expenses Listed in Prospectus

Management Fees

Distribution Fees

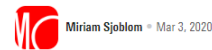
Legal Fees

**Interest Expense**

Acquired Fund Fees

## One Expense Ratio to Rule Them All

What is the adjusted expense ratio, and why should you care?



Share ↗

If you haven't been distracted by pandemic fears, falling stock prices, and U.S. Treasury yields plumbing new lows, you may have come across a new data point on Morningstar.com: the adjusted expense ratio. As we've noted before, our analysts have long used a modified version of the prospectus net expense ratio to make cost comparisons when researching and rating funds. That figure used to be incorporated in our methodology for calculating the prospectus net expense ratio, but we launched it as a separate data point in 2019. Here's why the adjusted expense ratio is important.

**Adjusted Expense Ratio, Defined** To calculate the adjusted expense ratio, we start with the gross expense ratio reported in a fund's prospectus, which is the percentage of fund assets expected to be paid over a year for operating expenses, management fees, and interest and dividend expenses. The net expense ratio takes that figure and removes any contractual fee waivers and reimbursements. The adjusted expense ratio further strips out interest and dividend expenses from the net figure, a step that helps provide the end investor with an apples-to-apples comparison of expense ratios across funds.

(1) [One Expense Ratio to Rule Them All | Morningstar](#)

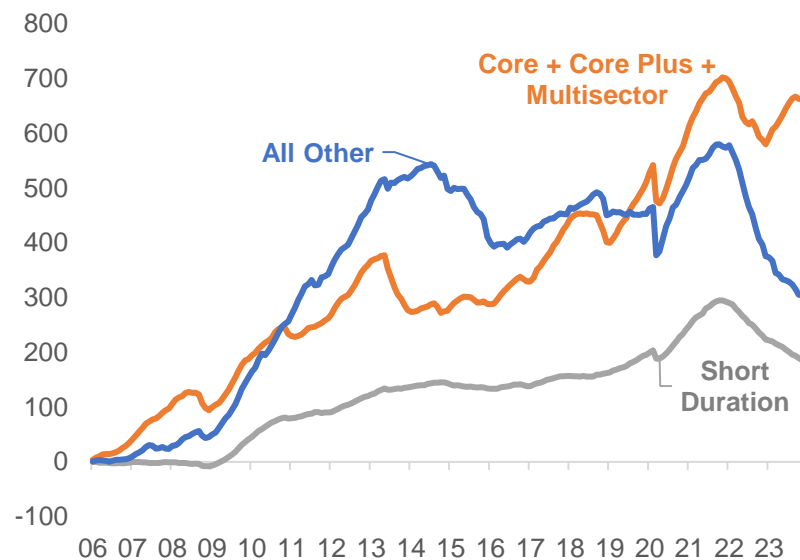
# Asset Managers: Largest Fixed-Income Categories

- The largest fixed-income mutual fund category is intermediate core / core plus at 39% of total assets. Many funds are benchmarked to the Bloomberg U.S. Aggregate Index (“the Agg”), which is a fairly good, but not complete, representation of the U.S bond market.
- Recently flows into short-duration products have also been substantial, where many funds are benchmarked to 1-3Y Government/Credit and 1-3Y Corporate indices.
- We go into some detail on the composition of these indices in the next slide.

Table 3: Fixed-Income Mutual Fund Sector Breakdown <sup>(1)</sup>

Morningstar Sub-Category	Total Net Assets (\$Bn)	% Fixed-Income Category
Intermediate Core-Plus Bond	681	25%
Intermediate Core Bond	381	14%
Short-Term Bond	339	12%
Multisector Bond	267	10%
High Yield Bond	244	9%
Ultrashort Bond	142	5%
Nontraditional Bond	109	4%
Inflation-Protected Bond	85	3%
Intermediate Government	82	3%
Corporate Bond	75	3%
Bank Loan	75	3%
Global Bond-USD Hedged	56	2%
Global Bond	46	2%
Emerging Markets Bond	43	2%
Other	109	4%
<b>Total</b>	<b>2,734</b>	<b>100%</b>

Figure 13: Cumulative Fixed-Income Strategy Flows (2006-2023, \$bn) <sup>(1)</sup>



(1) Sourced from Morningstar as of 12/29/2023

# Asset Managers: Benchmark Indices

- Presently, the Agg is about 42% Treasuries, and in total, about 80% government risk <sup>(1)</sup>. It is an investment-grade only, market value weighted index. The 1-3Y Gov/Credit index is 66% Treasuries and over 70% government risk.
- Notably, the main explanatory market risk factor for the Agg is the level of Treasury yields, which generally account for over 75% of the modeled risk of the index.

Table 4: Bloomberg Aggregate Index <sup>(2)</sup>			
Sector	Market Value %	YTM	Duration
<b>Treasuries</b>	<b>42%</b>	<b>4.07</b>	<b>6.15</b>
Government Related	5%	4.59	5.26
<b>Agency</b>	<b>2%</b>	<b>4.44</b>	<b>3.42</b>
<i>Local Authority</i>	1%	4.80	8.03
<i>Sovereign</i>	1%	5.20	8.58
<i>Supranational</i>	1%	4.22	3.47
IG Corporate	25%	5.09	7.10
<i>Industrial</i>	14%	4.97	7.85
<i>Utility</i>	2%	5.10	8.82
<i>Financial Institutions</i>	8%	5.31	5.31
Securitized	29%	4.67	5.53
<b>Agency MBS</b>	<b>27%</b>	<b>4.63</b>	<b>5.66</b>
<i>ABS</i>	0%	4.92	2.76
<i>CMBS</i>	2%	5.36	4.26
<b>Total</b>	<b>100%</b>	<b>4.52</b>	<b>6.17</b>

Table 5: Bloomberg 1-3Y Government Credit <sup>(2)</sup>			
Sector	Market Value %	Yield to Maturity	Duration
<b>Treasuries</b>	<b>66%</b>	<b>4.30</b>	<b>1.89</b>
Government Related	8%	4.55	1.71
<b>Agency</b>	<b>5%</b>	<b>4.58</b>	<b>1.68</b>
<i>Local Authority</i>	0%	4.52	1.86
<i>Sovereign</i>	0%	4.81	1.70
<i>Supranational</i>	3%	4.46	1.72
IG Corporate	25%	5.13	1.78
<i>Industrial</i>	12%	4.91	1.74
<i>Utility</i>	1%	5.10	1.81
<i>Financial Institutions</i>	12%	5.36	1.82
<b>Total</b>	<b>100%</b>	<b>4.53</b>	<b>1.85</b>

(1) The term "government risk" refers to Treasury debt, Agency debt, and Agency MBS and is highlighted in red.

(2) Sourced from Bloomberg as of 12/29/2023. Treasury weights exclude SOMA holdings.



# Asset Managers: Structural Credit Overweights

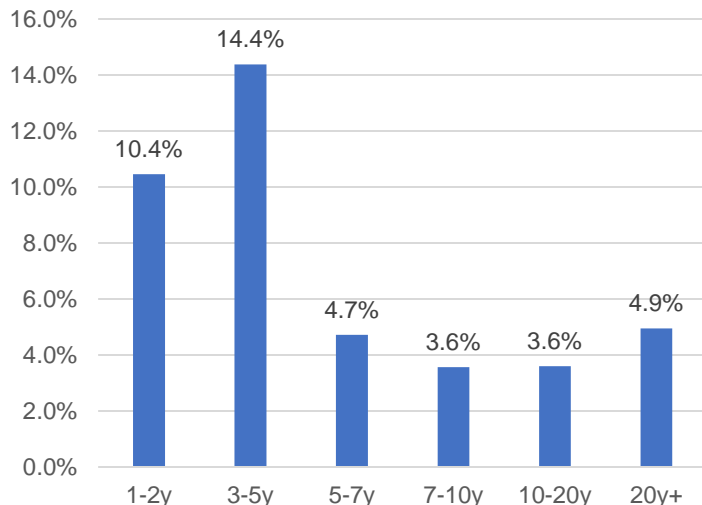
- When managing against the Bloomberg Aggregate Index, active managers will often allocate to higher yielding spread assets to achieve an income advantage and a more diversified portfolio given the heavy interest rate sensitivity of the benchmark.
- Spread sector investment decisions are made in assets of varying durations and maturities, and are often thought of separately from interest rate investment decisions.
- Although asset managers have different investment approaches, we believe it's common to separate decisions made on interest rate duration and credit spread duration.
- Futures allow asset managers to make credit allocation decisions relatively seamlessly, without impacting interest rate risk exposures, but can introduce basis risk between the futures allocation and the Treasury allocation in the index.
- While the process is more precise with Treasuries + repo, it is more cumbersome to implement operationally.
- **It's likely that structural overweight positions in credit products could result in persistently higher allocations to Treasury futures amongst asset managers.**

# Asset Managers: Structural Credit Overweights

When allocating out of Treasuries into credit sectors, we highlight two broad transaction types. We focus on the second type and the implications for how asset managers hedge duration and curve.

- **Matched substitution:** The manager buys a credit and can sell a Treasury of similar duration.
  - Results in a reduction of the Treasury allocation and an increase in credit exposure. Minimal need for futures or repo.
- **Mismatched substitution:** The manager buys a credit and must sell a Treasury of different duration.
  - To control for duration and curve risk, the manager will need to use futures or repo and reverse repo<sup>(1)</sup>.
  - This happens for several reasons, to name a few:
    - (1) Manager buys a floating rate credit asset with zero duration.
    - (2) Manager runs out of similar duration Treasuries to sell from the portfolio.
    - (3) Manager buys a non-USD credit asset.

**Figure 14: Bloomberg Agg Index Treasury Allocation by Maturity Bucket<sup>(2)</sup>**



**Table 6: Ways to Hedge Duration and Curve Risk With Mismatched Treasury/Credit Substitution**

Type	Transactions Involved	Cost/Benefit
<b>Perfect Hedge with Repo and Borrow</b>	(1) Buy credit (2) Short perfect Treasury hedge (3) Borrow perfect Treasury (4) Repo another Treasury to fund credit	- Most operationally complex - Generates interest expense
<b>Partial Hedge with Repo Only</b>	(1) Buy credit (2) Short Treasury futures hedge (3) Repo another Treasury to fund credit	- Some operational complexity - Generates interest expense - Introduces some curve risk
<b><u>Futures Hedge</u></b>	(1) <u>Buy credit</u> (2) <u>Sell Treasury</u> (3) <u>Execute futures curve trade</u>	- <u>Less operationally complex</u> - <u>Introduces basis and curve risk</u>

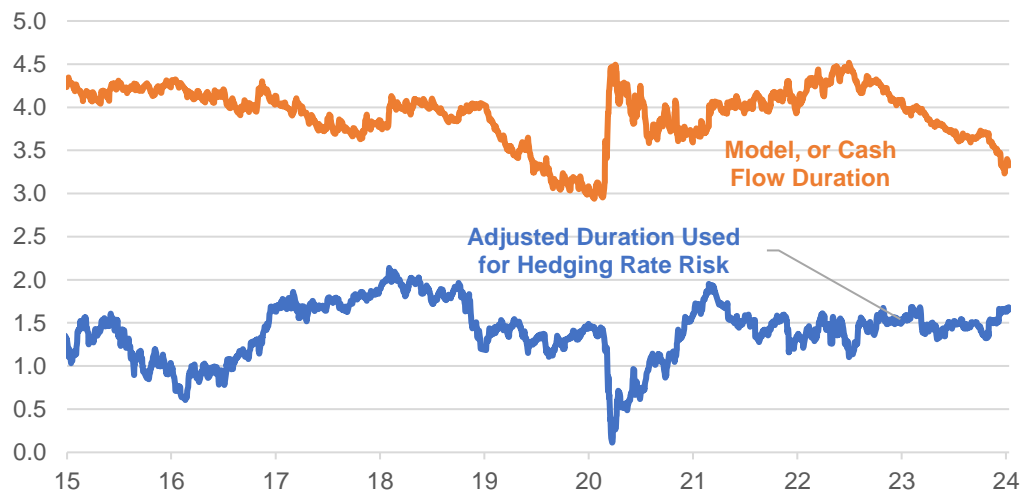
(1) Note, we assume portfolio managers will typically use the cheapest form of repo with lowest haircut (Treasuries)

(2) Sourced from Bloomberg as of 12/29/2023.

# Asset Managers: Structural Credit Overweights

- A separate complication, which is obscure but meaningful, is that portfolio managers will sometimes treat credit duration differently than risk-free duration. This matters more for lower quality credit products, where spread volatility dwarfs interest rate volatility. Bonds that trade on dollar price, like lower rated high yield, exhibit lower “empirical duration.”<sup>(1)</sup>
- Therefore, an allocation out of Treasuries into lower quality credit, would typically require a manager to buy back more duration in futures, compared to higher quality credit.

**Figure 15: Bloomberg High Yield Bond Index<sup>(2)</sup>**



(1) Empirical duration can be thought of as a statistical duration as opposed to a cash flow duration

(2) Sourced from Bloomberg as well as the presenter's firm's calculations as of 01/10/2024

# Asset Managers: Structural Credit Overweights

Four examples<sup>(1)</sup> where a mismatched substitution results in a net long position in futures:

- **Example 1: Buying a floating rate asset**
- Manager sells Treasuries, replaces risk with Treasury futures, buys a floating rate CLO.
- Since the CLO has no duration, for a 5% allocation, a +5.0% net futures position is created.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.10%	
Buy	Treasury Futures	4.8%		0.31			
<b>Buy</b>	<b>CLO</b>	<b>5.0%</b>	<b>5.0%</b>	<b>0.00</b>	<b>2.0</b>	<b>8.00%</b>	<b>2.32%</b>
<b>Net Treasury Futures</b>		<b>4.8%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.12%</b>	<b>0.12%</b>

- **Example 2: Buying an asset with duration < 2 years**
- Manager sells Treasuries, replaces risk with Treasury futures, buys a 1y duration ABS, hedges duration with TU futures.
- For a 5.0% allocation to the ABS, a +1.7% net futures position is created, net duration change is zero.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.1	
Buy	Treasury Futures	4.8%		0.31			
Buy	Short-Dated ABS	5.0%	5.0%	0.06	1.2	6.7	2.14%
Sell	TU Futures Hedge	-3.1%		(0.06)			
<b>Net Treasury Futures</b>		<b>1.7%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.11%</b>	<b>0.11%</b>

(1) Data in the examples shows the presenter's firm's calculations

(2) These simplified examples exclude potential yield impact of Treasury-futures basis or FX hedging cross-currency basis

# Asset Managers: Structural Credit Overweights

Four examples<sup>(1)</sup> where a mismatched substitution results in a net long position in futures:

- **Example 3: Buying a high spread credit asset**
- Similar to previous examples, but the high-risk credit is modeled with a duration less than its cash flow weighted duration. Because of this, the manager has to sell fewer futures to hedge the credit allocation than are bought to replace Treasuries.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.1	
Buy	Tsy Futures	4.8%		0.31			
Buy	High Yield Corp	5.0%	5.0%	0.08	5.3	7.9	3.33%
Sell	Tsy Futures Hedge	-2.1%		(0.08)			
<b>Net Treasury Futures</b>		<b>2.6%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.17%</b>	<b>0.17%</b>

- **Example 4: Buying a Non-USD asset**
- Also similar to previous examples. In this case, the manager buys a non-USD credit with a different base currency curve.
- For a 5.0% allocation to the credit, the manager ends up long 5.0% Treasury futures and short 5.0% non-USD futures.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.1	
Buy	Treasury Futures	4.8%		0.31			
Buy	EUR IG Credit	5.0%	5.0%	0.22	7.2	3.9	1.40%
Sell	5Y Bobl Futures Hedge	-5.0%		(0.22)			
Sell	EUR/USD Fwd	-5.0%					
<b>Net Treasury Futures</b>		<b>4.8%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.07%</b>	<b>0.07%</b>

(1) Data in the examples shows the presenter's firm's calculations

(2) These simplified examples exclude potential yield impact of Treasury-futures basis or FX hedging cross-currency basis

# Asset Managers: Structural Credit Overweights

- Stylized example shows what an active manager's allocation could often look like (Figure 17) compared to an index (Figure 16). In this example, the actively managed portfolio has a 20% out-of-index credit allocation and a higher yield than the index but maintains the same duration and yield curve exposure.
- To accomplish this, the active positions are funded by selling Treasuries, the net duration and curve are hedged with Treasury futures (resulting in a net long futures exposure and positive net leverage).
- Alternatively, the manager could have repo'd Treasuries to fund the allocations which would have generated interest expense.

Figure 16: Bloomberg Agg Index

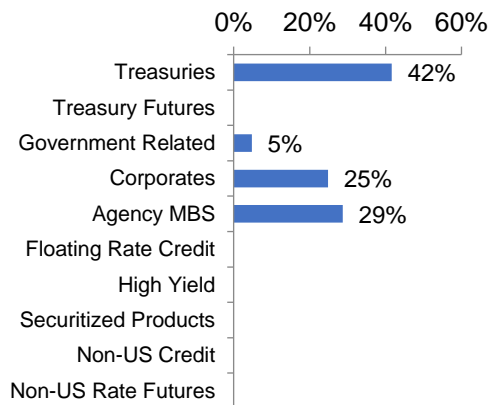


Figure 17: Hypothetical Active Manager

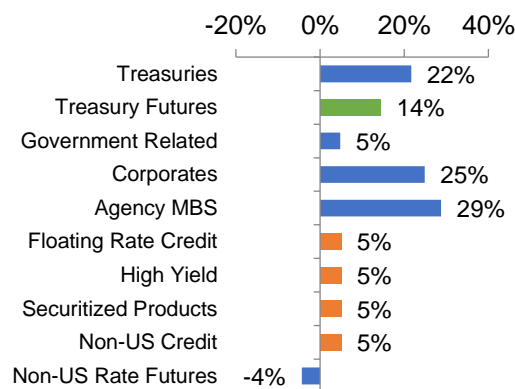
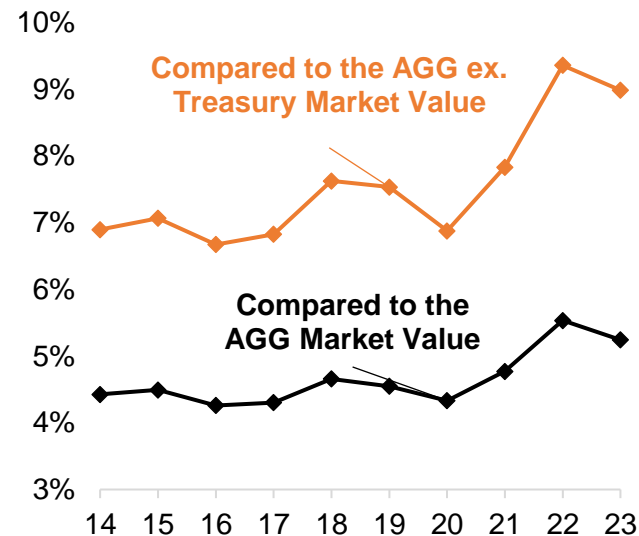


Figure 18: Recent Growth in Floating Securitized Assets<sup>(2)</sup>



Aggregate Index			Active Manager		
Yield	Duration	Avg. OAS	Yield	Duration	Avg. OAS
4.52	6.17	0.38	5.36	6.17	1.07

(1) Sourced from Bloomberg as of 12/29/2023 and the presenter's firm's calculations

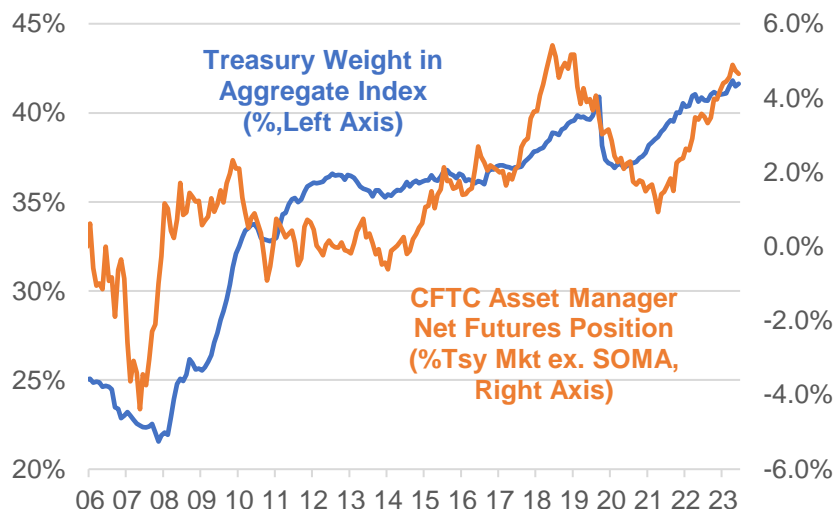
(2) Sourced from Bank of America as of Dec 2023

# Asset Managers: Structural Credit Overweights

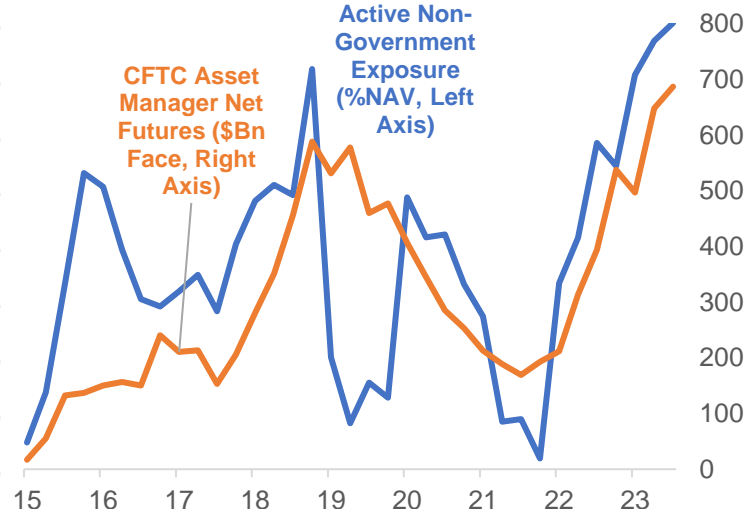
Looking deeper at index and industry data, two observations are worth investigating further:

- (1) There appears to be a positive relationship between the Treasury allocation in the Aggregate Index<sup>(1)</sup>, and the CFTC asset manager net futures position (as a % of the Treasury market), shown in Figure 19
  - It's not obvious why this relationship exists. One possible explanation is that as Treasury allocations have risen over time, asset managers chose to increase their overweights to higher returning credit sectors relative to Treasuries.
- (2) Using eVestment data<sup>(2)</sup> and looking at rough sector positioning for 14 large core and core plus active management platforms (\$900bn AUM), there does appear to be a correlation between the AUM weighted active credit sector exposure and the CFTC asset manager net futures position
  - This relationship lends some support to the hypothesis that Treasury futures are used to fund active credit sector positions
  - It does not prove the point definitively, however. More investigation into the types of credit assets owned is required.

**Figure 19: Treasury Index Weight vs. Asset Manager Net Futures Position % of Tsy Mkt**



**Figure 20: eVestment Active Non-Govt Allocation AUM Weighted Avg of 14 Large Asset Managers**



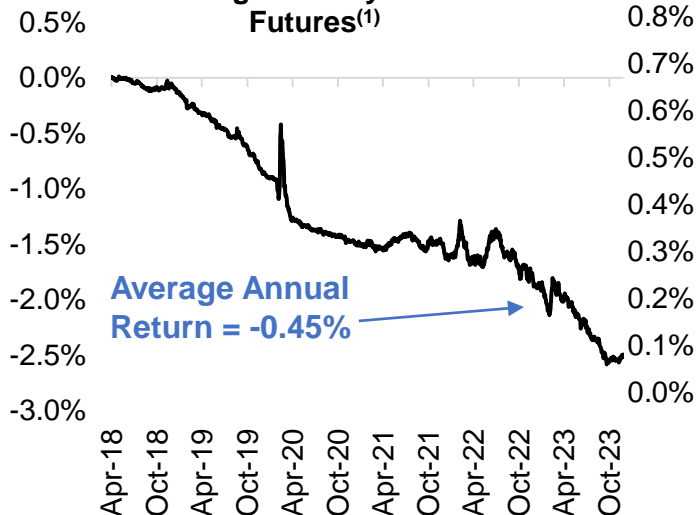
(1) Sourced from Bloomberg, CFTC, and the presenter's firm's calculations as of 12/29/2023

(2) Sourced from eVestment as of Q3 2023

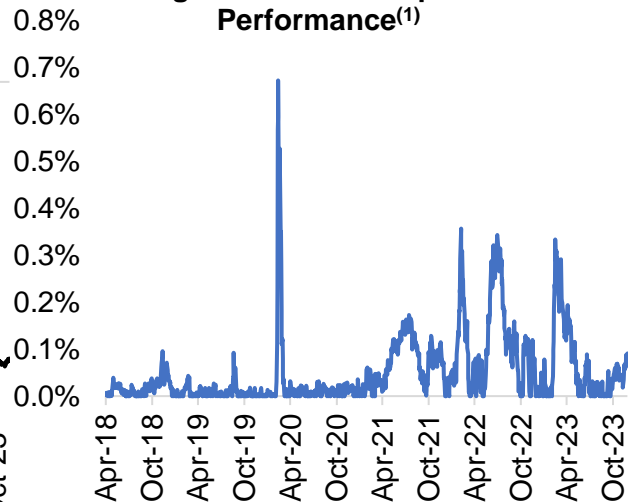
# Illustration of Futures Replication Costs

- In Figure 21 we show the cumulative performance costs from replicating the Bloomberg Treasury Index with the 6 available Treasury futures contracts.
- The methodology assumes a key-rate duration hedged portfolio and subtracts the cash return using the overnight SOFR rate.
- Importantly, the return shown here is not the same as a pure basis trade (long CTD, short Treasury future), it includes the performance of the whole Treasury market.
- From 2018-2023, futures replication had an **average annual cost of 0.45%**. Most fixed-income spread products have hurdled that carry cost (Figure 23).

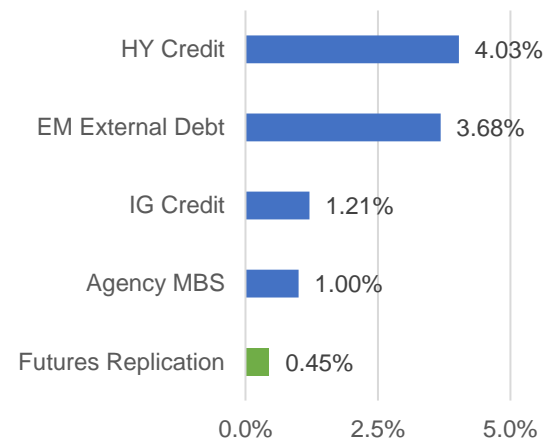
**Figure 21: Cost of Replicating Bloomberg Treasury Index with Futures<sup>(1)</sup>**



**Figure 22: Trough to Peak Changes in Futures Replication Performance<sup>(1)</sup>**



**Figure 23: Credit Spreads vs. Cost of Tsy Futures (2018-2023 Avg)**



(1) Data shows the presenter's firm's calculations as of 12/29/2023



# Leveraged Fund Discussion

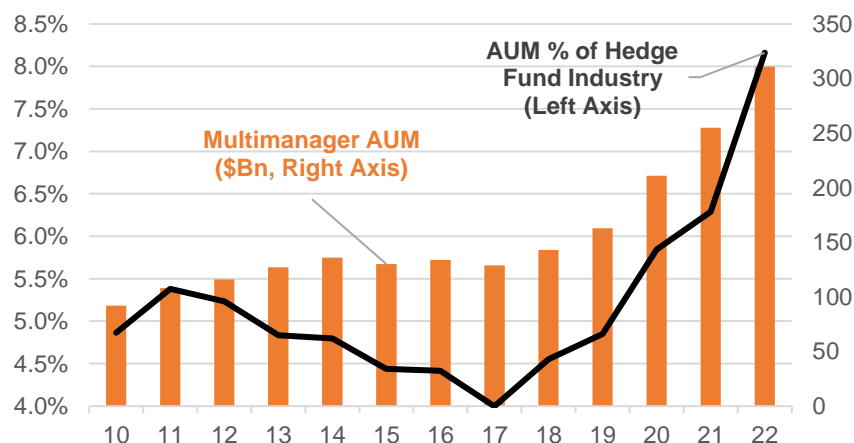
# How Do Leveraged Funds Use Treasury Futures?

- Leveraged funds typically use futures for some of the same reasons asset managers do:
  1. Taking directional views on duration and yield curve
  2. Hedging and managing interest rate risk across different sectors
- One important difference, however, is that leveraged funds employ relative-value strategies with greater size relative to their assets under management (more leverage).
- These relative-value strategies seem likely to reside mostly within the multimanager community, and potentially within some single strategy relative-value or quantitative hedge funds.
- As shown in Figure 24, because of strong performance, multimanager strategies have grown faster than the rest of the industry. With this may have come a growth in dedicated relative value AUM.

**Hedge Fund Strategies**

Strategy	Typical Use of Futures?
Macro	Directional
CTA/Momentum	Directional
Risk Parity	Directional
Quant	Directional + RV
Relative-Value	RV
Multimanager	Directional + RV

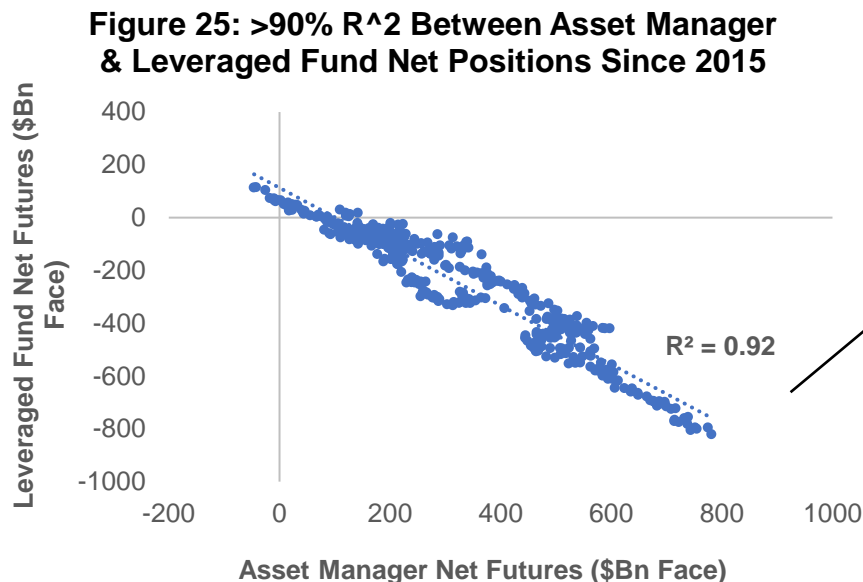
**Figure 24: Growth in Multimanager AUM <sup>(1)</sup>**



(1) Sourced from Goldman Sachs Research as of Dec 2022

# How Do Leveraged Funds Use Treasury Futures?

- While asset managers have shown a net long bias in futures, the opposite is true of leveraged funds, which have showed a persistent net short bias, despite large swings in markets.
- Similar to the discussion about asset managers, we think it's unlikely that directional positions are generating a structural bias to futures positioning recently.
  - But large hedge funds and CTA's are likely to have influenced shorter term positions at various times.
- As has been discussed extensively by regulators and market participants, it seems most likely to us that the persistent futures short by leveraged funds reflects Treasury basis relative-value positions.
- As we showed on the prior slides, there is a persistent risk premium to be harvested in Treasury futures basis. It appears that asset managers are willing to pay this premium to invest in higher yielding products, while hedge funds earn the premium.

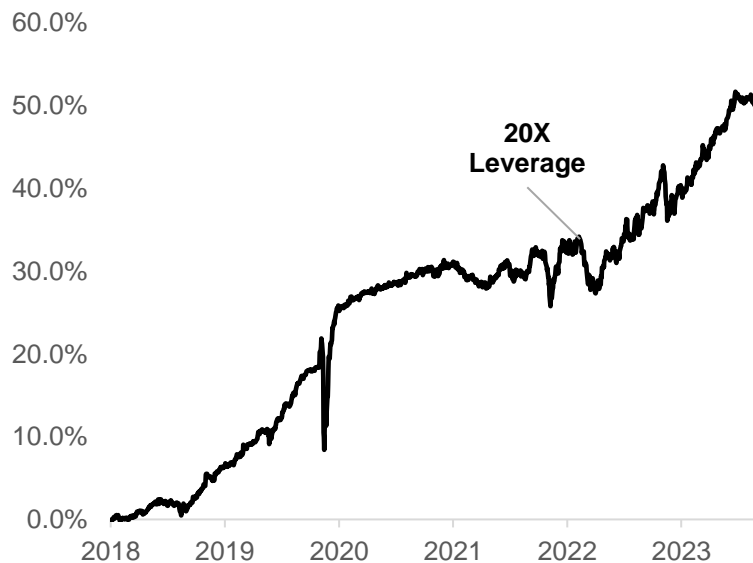


- Asset manager and leveraged fund positions track each other with a 92% R<sup>2</sup> since 2015
- Logically, it makes little sense that these two investor categories would take opposing directional views with such a high frequency
- **Structural factors seem more likely to explain this relationship, where hedge funds facilitate structural futures demand by asset managers as the Treasury market has grown**

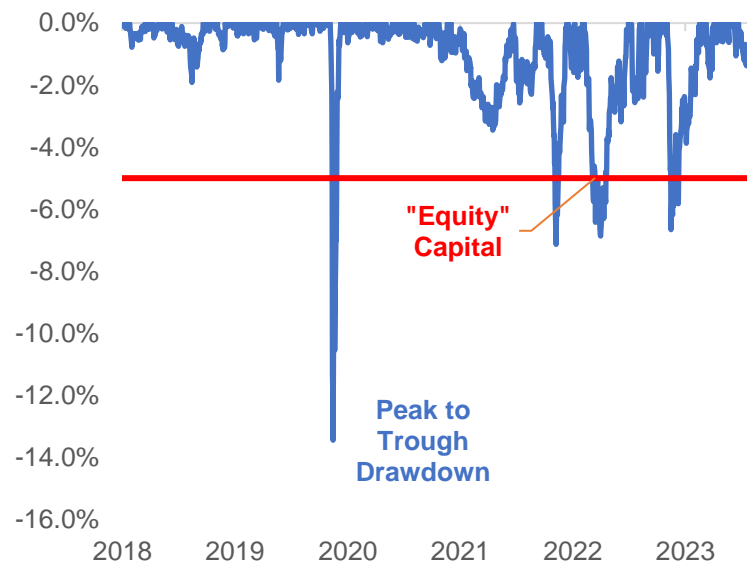
# Leveraged Funds: Returns in the Treasury Basis Trade

- We can estimate the returns to the basis trade using the data on the cost of futures replication:
  - We assume a leverage ratio of 20x and show cumulative performance (excess of cash return).
  - Anecdotally, 20x appears to be a good approximation of leverage typically used in these trades. Repo and futures margins do permit higher leverage, however. 20x leverage could generate 9-10% annualized excess returns using this framework.
  - March 2020 would have more than wiped out equity capital in such a strategy, explaining the stress during this period. To the extent these strategies live inside of multimanager, other capital may have been injected during this period.

**Figure 26: Cumulative Excess Returns Treasury Index vs. Futures**



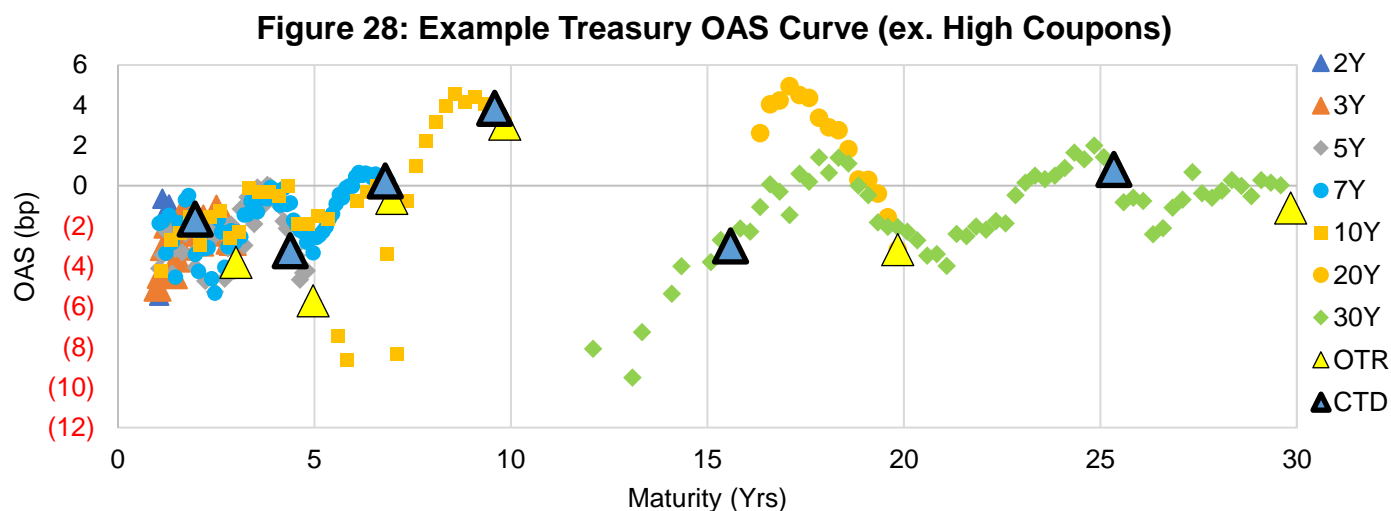
**Figure 27: Peak to Trough Drawdown Using 20x Leverage Multiple**



(1) Data shows the presenter's firm's calculations as of 12/29/2023

# Leveraged Funds: Returns in the Treasury Basis Trade

- The performance we show is an approximation and not that of a pure basis trade (future vs. CTD).
- That said, it's likely that hedge funds who implement the basis trade do so in ways that involve using Treasuries other than CTDs, with numerous other real-world complexities to consider, including:
  - Type of repo funding (term v. daily)
  - CTD switch option (recall volatility in USZ3 in Fall 2023)
  - Spot vs. deferred CTD analysis
  - Futures roll timing, optimal delivery and wildcard option
  - Barriers to entry given balance sheet scarcity/repo capacity
  - Usage of cheaper off-the runs
- In addition to expensive implied repo, looking below, we see that futures CTDs can often trade with negative spreads to Treasury fitted curve.
  - Similar to “on-the-run” Treasuries, it's likely that CTDs trade this way due to a liquidity premium vs. off-the-runs.
  - Recalling the period of March 2020, dealers reported<sup>(1)</sup> large liquidations in off-the-run sectors from the relative-value community, suggesting that basis implementation involves more varied expressions.



(1) See page 56 of this report <https://home.treasury.gov/system/files/221/CombinedChargesforArchivesQ22021.pdf>

# Leveraged Funds: Estimating Size of the Basis Trade

- Recent research from the Fed <sup>(1)</sup> suggests that the basis trade has grown in size lately, similar to levels seen in 2018-2019. They cite the futures data, but also show some evidence from the sponsored repo market and collateral posting data, shown below:
  - Another piece of research <sup>(2)</sup> released in September of 2023 quantifies the basis trade at \$550bn at the end of 2022.
  - The authors used data from form PF, and the size seems fairly consistent with size of futures exposure at the time.
  - Bottom line, estimating size of relative-value AUM is hard especially as a large portion of capital pursuing these strategies may be embedded in multimanager hedge-funds, where little public data on sub-strategy allocations is available.

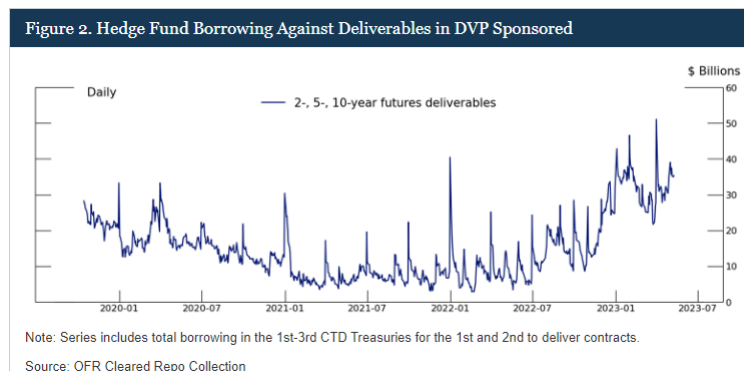
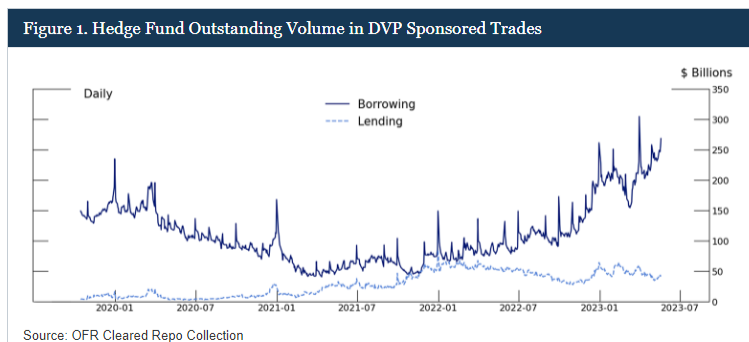


Table 1: The impact on hedge funds of a floor on Treasury repo haircuts

Make Full Screen

	As of December 2022	200 bps min. haircut, no change in borrowing	200 bps min. haircut, no change in capital
Treasury repo borrowing	\$553 billion	\$553 billion	\$247 billion
Capital supporting Treasury repo	\$9.88 billion	\$22.29 billion	\$9.88 billion
Leverage on Treasury repo	56-to-1	25-to-1	25-to-1

Note: The first column reflects data and estimates as of December 2022. The second and third columns consider the effects of a hypothetical 200-basis point floor on Treasury repo haircuts faced by hedge funds. The second column assumes borrowing remains at Dec. 2022 levels, while the third column assumes borrowing levels adjust to post-requirement leverage levels.

(1) <https://www.federalreserve.gov/econres/notes/feds-notes/recent-developments-in-hedge-funds-treasury-futures-and-repo-positions-20230830.html>  
 (2) <https://www.federalreserve.gov/econres/notes/feds-notes/hedge-fund-treasury-exposures-repo-and-margining-20230908.html>

# Leveraged Funds: Monitoring the Basis Trade

Some potential metrics to consider monitoring:

Item	Notes
<b>Treasury Futures Open Interest Relative to the Size of Treasury Market</b>	<ul style="list-style-type: none"><li>Disproportionate growth could indicate excessive systemic leverage.</li></ul>
<b>Size of Cleared Repo Market</b>	<ul style="list-style-type: none"><li>Will be more valuable when all Treasury repo is cleared in 2026.</li></ul>
<b>Treasury-Futures Basis Valuations</b>	<ul style="list-style-type: none"><li>Viewed in the context of changes to open interest, valuations could be an important indicator.</li><li>For example, if cash richens vs. futures and open interest is growing, suggests position crowding.</li></ul>
<b>Dealer Inventories of Treasury Securities</b>	<ul style="list-style-type: none"><li>Supplement with real time flow color in off-the-run trading activity.</li></ul>
<b>Term structure of Repo Funding Levels</b>	<ul style="list-style-type: none"><li>Monitor overnight vs. term repo spreads as an indicator of funding pressures.</li></ul>
<b>Changes in Margin Requirements</b>	<ul style="list-style-type: none"><li>Monitor CME exchange margins and repo.</li></ul>
<b>Concentration of Funding Sources in Bilateral Repo Market</b>	<ul style="list-style-type: none"><li>Overreliance on single institutions could create counterparty risk.</li></ul>

# **Potential Interactions Between Asset Managers & Levered Fund Positions**



# Potential Interactions to Consider

- Amidst record Treasury issuance, and procyclical fiscal stimulus, we conclude that a symbiotic relationship has emerged between asset managers and hedge funds.
  - Large procyclical deficits have driven Treasury weights higher in bond indices at a time when the economy is relatively healthy and active bond managers prefer credit relative to Treasuries.
  - This cyclical preference for credit, alongside the structural asset allocation of active bond managers, may be resulting in lower cash Treasury demand and increased use of Treasury futures.
  - This preference for futures vs. cash improves valuations and the investment opportunity for RV hedge funds.
- While the system seems stable to us now, it's worth thinking through potential risks that might arise, as asset managers have moved down in liquidity while hedge funds have increased leverage.
  - A reduction in credit risk by asset managers would naturally facilitate unwinding the basis trade by hedge funds.
  - However, if asset managers experience rapid outflows while market liquidity is impaired, these outflows could initially be funded through Treasury sales. This type of behavior could pressure RV basis positions, and it's possible this dynamic was at play during March 2020 when everyone in the market scrambled for liquidity. We see below a high tail risk correlation between Treasury-futures basis performance and 1-3y Corporate spreads. This period likely also simply reflected extreme liquidity preference which would pressure secured vs. unsecured funding spreads.

Figure 29: Trailing 1Y US Deficit (%GDP) vs. 1Y Average Unemployment Rate

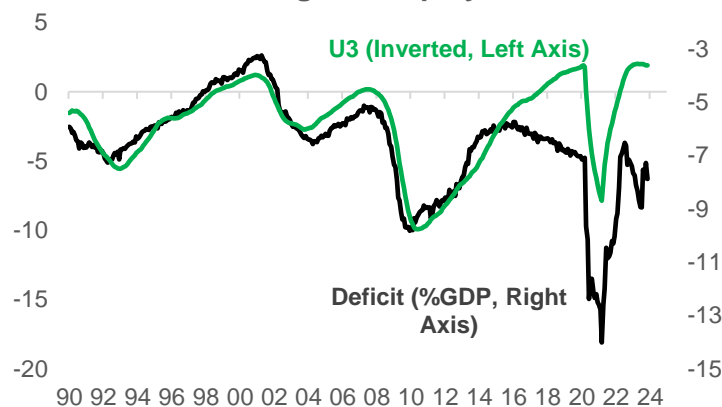
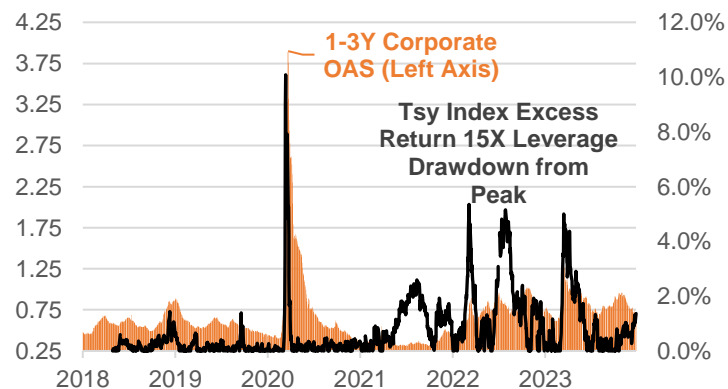


Figure 30: Short Maturity Credit Spreads vs. Proxied Basis Trade Drawdowns



(1) Sourced from Bloomberg and the presenter's firm's calculations as of Dec 2023

# Conclusions and Areas of Further Research

- The structural asset allocation preference of active fixed-income managers appears to create a need to own Treasury futures persistently over time.
- Procyclical fiscal stimulus, which has contributed to rising Treasury allocations in bond indices alongside a healthy economy, may be amplifying this trend.
- While there is a cost to using Treasury futures, this cost is easily hurdled by active managers who are allocating out of Treasuries into more attractive sectors.
- Persistent demand for Treasury futures likely contributes to rich valuations when compared to Treasury bonds. This valuation creates an investment opportunity for relative-value strategies that can utilize leverage to exploit small price differences.
- There are a number of relationships that are worthwhile for Treasury to monitor when tracking the Treasury futures basis trade over time. Treasury repo clearing may provide an opportunity to gain greater insights in the coming years.
- Potential areas of future study could include the following:
  - More granular research into asset manager quarterly holdings through time.
  - More detailed analysis of the size of non-index credit and floating rate markets.
  - Quantitative modeling of variables that seem to contribute to asset manager futures positions, including the size of the Treasury allocation in the index, quarterly estimates of credit holdings, and empirical duration exposure of major bond mutual funds.
  - Greater study of potential interactions between asset manager and leveraged funds, particularly during times of market stress and liquidity contraction.