Treasury Presentation to TBAC

Office of Debt Management



Fiscal Year 2024 Q2 Report

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Section I: Executive Summary

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

Receipts and Outlays through Q2 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 Q2 FY2024	\$1,108	\$140	7%	15.6%	0.2%
Total Outlays thru Q2 FY2024	\$1,618	\$103	3%	23.2%	-0.5%

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

Treasury OFP Near Term Fiscal	Privately Held Net Marketable	Assumed End-of-Quarter
Projections	Borrowing (\$ billion)	Cash Balance (\$ billion)
Q3 FY2024	243	750 (Jun)
Q4 FY2024	847	850 (Sep)

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

Figeal Vear	Primary Dealers, Median April	OMB Budget, March	CBO Budget, February		
FISCAL LEAL	2024 (\$ billion)	2024 (\$ billion)	2024 (\$ billion)		
2024	2,421	2,570	2,450		
2025	1,999	1,958	1,982		
2026	1,823	1,655	1,766		

*All privately-held net marketable borrowing estimates are "normalized" with details from page 18. Uncertainty regarding funding needs in FY2025 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 April 2024:

- Primary dealers expected no changes to nominal coupon issuance sizes at the May refunding.
- With respect to TIPS, all dealers expect a \$1 billion increase to the 5-year reopening in June, and most expect a \$1 billion increase to the 10-year new issue in July.

Section II: Recent Fiscal Results Receipts, Outlays, and Deficits

Monthly Receipt Levels (12-Month Moving Average)



—Individual Income Taxes —Corporate Income Taxes —Social Insurance Taxes —Other

	YoY change thru Q2	YoY change thru	1789
Notable Receipt Category	FY24 (\$ billion)	Q2 FY24 (%)	Comments
			IRS extended several major deadlines for some taxpayers, including those in California,
Non-withheld and SECA taxes	+\$34	12%	from FY 2023 into FY 2024.
			IRS extended several major deadlines for some taxpayers, including those in California,
Gross Corporate Taxes	+\$51	32%	from FY 2023 into FY 2024.
			Increased due to wage and employment growth, partially offset by the non-recurrence of the
Withheld & FICA taxes	+\$45	3%	CARES deferral repayment.
			IRS pared backlog in January 2023 at a non-recurring rate. Also, the refund season in 2024
Individual Refunds	-\$26	-13%	started later than 2023.

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.

Largest Outlays



Oct - Mar FY2023 Oct - Mar FY2024

YoY change thru YoY change thru Notable Outlay Category Q2 FY24 (\$ billion) Q2 FY24 (%) Comments Due to benefit increases from cost-of-living adjustments (COLA). The rate of growth will continute to decrease over the remainder of the fiscal year as the Social Security Administration COLA decreased from 8.7% in calendar year 2023 to 3.2% in calendar year (calendar adjusted) +\$61 +9% 2024. Health and Human Services +3% Due to increases in Medicare spending. (calendar adjusted) +\$22 Department of Defense (calendar adjusted) Due to higher military personnnel, operation, and maintenance spending. +\$29 +7% Primarily due to a \$138 billion (36%) increase in gross intrest on the public debt, offset by lower tax credits (-\$17 billion). Department of Treasury +\$112+21% Department of Veterans Affairs Due to increased spending per person and veterans' increased use of health (calendar adjusted) care facilities. +\$20+14% Due to several upward modifications for Federal Direct Student Loans that Department of Education -\$43 -35% increased outlays last year. Due to a \$36 billion Special Financial Assistance payment in January 2023 to shore up troubled multi-employer pension plans as part of the Amercian Department of Labor -\$30 -51% Rescue Plan Act.

Outlays in the chart above are on a calendar adjusted basis

Cumulative Budget Deficits by Fiscal Year



■ FY2022 ■ FY2023 ■ FY2024

Section III: Various Fiscal Forecasts Primary Dealers, OMB, CBO

Recent Economic Forecasts

	Prim	ary Dealer	Median I	Estimate	s Aj	pril 2024				
				<u>CY20</u>	24	<u>CY2025</u>	CY2026			
				<u>%</u> C	hang	<u>ge from Q4</u>	to <u>Q4</u>			
	GDP									
	Re	al		2.0)	2.0	2.0			
	No	ominal		4.7	7	4.2	4.2			
	Infla	tion								
	CI	PI Headline		3.2)	2.4	2.3			
	CI	PI Core		3.3	;	2.5	2.3			
				For	ırth	Quarter L	evels			
	Unen	nployment	Rate (%)	4.0)	4.1	4.0			
				<u>FY20</u>	<u>24</u>	<u>FY2025</u>	<u>FY2026</u>			
	Defic	tts (\$bil)		\$1,6	35	\$1,800	\$1,792			
CBO Estimates February	2024			5.0	ON	/IB Estim	ates March 2	024		
	<u>CY2024</u>	<u>CY2025</u>	<u>CY2026</u>					<u>CY2024</u>	<u>CY2025</u>	<u>CY2026</u>
	<u>% Chang</u>	<u>ge from Q4</u>	to <u>Q4</u>	-				<u>% Chang</u>	<u>e from Q4</u>	<u>to Q4</u>
GDP					GE	DP				
Real	1.5	2.2	2.2	1789		Real		1.3	2.0	2.0
Nominal	3.5	4.3	4.1			Nominal		3.6	4.1	4.1
Inflation					Inf	lation				
CPI Headline	2.5	2.2	2.2			CPI Head	line	2.5	2.3	2.3
	D 4	T								
	<u>Fourth</u>	Quarter Le	vels			-		Fourth	Quarter Le	evels
Unemployment Kate (%)	4.4	4.4	4.4		Ün	employn	ent Rate (%)	4.1	4.0	3.9
	<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>		P	A	• • •	<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>
Dericits (\$D11)	\$1,582	\$1,//2	\$1,692		De	ticits (\$b	11)	\$1,860	\$1,781	\$1,546

Note: OMB's Economic assumptions are from "Budget of The U.S. Government, Fiscal Year 2025," March 2024. CBO's economic assumptions are from "The Budget and Economic Outlook: 2024 to 2034," February 2024. They reflect developments in the economy as of December 5, 2023, incorporating the effects of the Fiscal Responsibility Act of 2023.

Recent Deficit Forecasts

- Primary dealers marginally decreased their deficit estimates in April 2024 relative to estimates they provided in January 2024.
- Dealers cited higher than expected corporate tax receipts and an outlook for stronger economic growth as driving the improvement in the near-term fiscal outlook. Several dealers noted significant upside risks to 2025 and 2026 fiscal forecasts centered around higher for longer interest rates (resulting in increased debt service costs), geopolitical developments, and a potential extension of the Tax Cuts and Jobs Act.
- The latest OMB and CBO estimates in the table below are provided for reference.

	PD 25th	Primary Dealers	PD 75th	Change from Prior		
Deficit Estimates (\$ billion)	Percentile	(Median)	Percentile	Quarter (Median)	OMB	CBO
FY2024	1,518	1,635	1,700	-143	1,860	1,582
FY2025	1,773	1,800	1,824	-19	1,781	1,772
FY2026	1,700	1,792	1,860	-8	1,546	1,692
As of date	Apr-24	Apr-24	Apr-24		Mar-24	Feb-24

- OMB projections are using estimates are from Table S-10 of "Budget of The U.S. Government, Fiscal Year 2025," March 2024.
- CBO projections are using estimates are from "The Budget and Economic Outlook: 2024 to 2034," February 2024.

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 03/31/2024, 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 April 2024, while using total bills outstanding of ~\$6.1 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 03/31/2024, 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. Additionally, buybacks are not expected to significantly affect privately-held net marketable borrowing as new issuance replaces securities that are bought back.

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 Q4

Sources of Privately-Held Financing in FY24 Q3

April - June 2024		July - September 202	24
Assuming Constant Coupon Issuance Sizes*		Assuming Constant Coupon Issuance Sizes*	
Treasury Announced Net Marketable Borrowing**	243	Treasury Announced Net Marketable Borrowing**	847
Net Coupon Issuance	540	Net Coupon Issuance	557
Implied Change in Bills	(297)	Implied Change in Bills	290
		1	

April - June 2024		Fiscal Year-to-Date				July	- September 2	024	Fiscal Year-to-Date				
Coupon Issuance		Coupon Issuance				Co	Coupon Issuance			Coupon Issuance			
Security	Gross	Maturing	Net	Gross	Maturing	Net	Security	Gross	Maturing	Net	Gross	Maturing	Net
2-Year FRN	114	68	46	248	214	34	2-Year FRN	86	68	18	334	282	52
2-Year	204	145	59	537	481	56	2-Year	276	178	98	813	659	154
3-Year	174	140	34	480	431	49	3-Year	174	153	21	654	584	70
5-Year	207	35	172	546	187	359	5-Year	280	127	153	826	314	512
7-Year	131	107	24	368	252	116	7-Year	176	92	84	544	344	200
10-Year	120	59	61	350	160	190	10-Year	120	60	60	470	221	249
20-Year	42	0	42	126	0	126	20-Year	55	0	55	181	0	181
30-Year	69	0	69	202	0	202	30-Year	69	0	69	271	0	271
5-Year TIPS	44	26	18	86	26	60	5-Year TIPS	0	0	0	86	26	60
10-Year TIPS	16	0	16	65	47	18	10-Year TIPS	34	43	(9)	99	90	9
30-Year TIPS	0	0	0	9	0	9	30-Year TIPS	8	0	8	17	0	17
Coupon Subtotal	1,121	581	540	3,017	1,799	1,218	Coupon Subtotal	1,278	721	557	4,295	2,519	1,776

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

** Assumes end-of-June 2024 and end-of-September 2024 and cash balances of \$750 billion and \$850 billion respectively versus end-of-March 2024 cash balance of \$775 billion. Financing Estimates released by the Treasury can be found here: <u>http://www.treasury.gov/resource-center/data-chart-center/quarterly-refunding/Pages/Latest.aspx</u>

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

	Pr	imary Deal	er	OED	OMD	CIIO
	25th	Median	75th	OFP	ONB	CBU
FY 2024 Deficit	1,518	1,635	1,700		1,860	1,582
FY 2025 Deficit	1,773	1,800	1,824		1,781	1,772
FY 2026 Deficit	1,700	1,792	1,860		1,546	1,692
FY 2024 SOMA Redemption	578	600	622	705		
FY 2025 SOMA Redemption	90	130	195			
FY 2026 SOMA Redemption	0	0	0			
FY 2024 Privately-Held Net Marketable Borrowing*	2,315	2,421	2,526	2,614	2,570	2,450
FY 2025 Privately-Held Net Marketable Borrowing*	1,888	1,999	2,046		1,958	1,982
FY 2026 Privately-Held Net Marketable Borrowing*	1,739	1,823	1,960		1,655	1,766
Estimates as of:		Apr-24		Apr-24	Mar-24	Feb-24

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

• All privately-held net marketable borrowing estimates (excluding OFP) of are "normalized" using:

- 1) the median Primary Dealer's estimates for SOMA redemptions, and
- 2) OFP's fiscal year 2024 cash balance of \$850 billion, held constant in out years.
- OMB projections are using estimates are from Table S-10 of "Budget of The U.S. Government, Fiscal Year 2025," March 2024.
- CBO projections are using estimates are from "The Budget and Economic Outlook: 2024 to 2034," February 2024.

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 borrowing estimates 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 04/30/2024*



*Treasury's latest primary dealer survey median/interquartile range estimates can be found on page 18. OMB projections are using estimates are from Table S-10 of "Budget of The U.S. Government, Fiscal Year 2025," March 2024. CBO projections are using estimates are from "The Budget and Economic Outlook: 2024 to 2034," February 2024. OMB and CBO borrowing estimates from FY24 to FY26 are normalized to privately-held net marketable borrowing after adding PD survey median SOMA redemption assumptions for FY24/25/26. In addition, all privately-held net marketable borrowing estimates are normalized with OFP's FY24 ending cash balance assumption of \$850 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 <u>are meant for illustrative purposes only</u>. The projections contained in these charts <u>should not</u> 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 April 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 \$5.9 trillion as of 4/30/2024 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 4/30/2024 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

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

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



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

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



50% 45%40%35% 13-week moving average 30% 25% 20% 15%10%5% 0% Mar-19 Jun-19 Sep-19 Dec-19 Mar-20 Jun-20 Sep-20 Dec-20 Sep-22 Dec-22 Sep-23 Dec-23 Mar-21 Jun-21 Sep-21 Dec-21 Mar-22 Jun-22 Mar-23 Jun-23 Mar-24 - Foreign & International Other Dealers and Brokers Investment Funds Other _ _

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.



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

Bills



Source: Treasury International Capital (TIC) System as of February 2024.

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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Treasury Net Nonmarketable Borrowing



Budget Surplus/Deficit*



* OMB projections are using estimates are from Table S-10 of "Budget of The U.S. Government, Fiscal Year 2025," March 2024. CBO projections are using estimates are from "The Budget and Economic Outlook: 2024 to 2034," February 2024.

Sources of Privately-Held	Financing in FY24	Q2
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January - March 2024

Net Bill Issuance	409
Net Coupon Issuance	339
Subtotal: Net Marketable Borrowing	748
Ending Cash Balance	775
Beginning Cash Balance	769
Subtotal: Change in Cash Balance	6
Net Implied Funding for FY24 Q2*	742

	Jan	uary - March 2	024	Fis	Fiscal Year-to-Date				
		Bill Issuance			Bill Issuance				
Security	Gross	Maturing	Net	Gross	Maturing	Net			
4-Week	1,165	1,115	50	2,315	2,265	50			
8-Week	1,130	1,070	60	2,195	2,025	170			
13-Week	1,004	969	35	1,973	1,844	129			
17-Week	766	698	68	1,488	1,304	184			
26-Week	904	784	120	1,782	1,465	317			
52-Week	138	102	36	314	238	76			
CMBs									
6-Week	990	950	40	1,925	1,820	105			
CMBs	0	0	0	0	185	(185)			
Bill Subtotal	6,097	5,688	409	11,992	11,145	846			

	Jan	uary - March 2	024	Fiscal Year-to-Date				
	C	Coupon Issuanc	e	Coupon Issuance				
Security	Gross	Maturing	Net	Gross	Maturing	Net		
2-Year FRN	56	70	(14)	134	146	(12)		
2-Year	180	162	18	333	336	(3)		
3-Year	162	159	3	306	291	15		
5-Year	183	79	104	339	152	187		
7-Year	123	72	51	237	145	92		
10-Year	118	47	71	230	102	128		
20-Year	42	0	42	84	0	84		
30-Year	68	0	68	133	0	133		
5-Year TIPS	0	0	0	42	0	42		
10-Year TIPS	34	47	(13)	49	47	2		
30-Year TIPS	9	0	9	9	0	9		
Coupon Subtotal	975	636	339	1,896	1,218	678		
				-				
Total	7,072	6,324	748	13,887	12,364	1,524		

*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
FY 2022 = Total Net Marketable Borrowing	1,671
FY 2022 + SOMA Redemption	150
FY 2022 = Privately-Held Net Marketable Borrowing	1,821

- 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.

	F	rimary Deale	er			CPO
	25th	Median	75th	OFP	OMB	Сво
FY 2024 Deficit	1,518	1,635	1,700		1,860	1,582
FY 2025 Deficit	1,773	1,800	1,824		1,781	1,772
FY 2026 Deficit	1,700	1,792	1,860		1,546	1,692
FY 2024 Change in Cash Balance	93	93	93	193	143	0
FY 2025 Change in Cash Balance	0	0	0		0	0
FY 2026 Change in Cash Balance	-14	0	40		0	0
FY 2024 Total Net Marketable Borrowing					1,920	1,657
FY 2025 Total Net Marketable Borrowing					1,828	1,852
FY 2026 Total Net Marketable Borrowing					1,655	1,766
FY 2024 SOMA Redemption	578	600	622	705		
FY 2025 SOMA Redemption	90	130	195			
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FY 2024 Privately-Held Net Marketable Borrowing*	2,315	2,421	2,526	2,614	2,570	2,450
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FY 2026 Privately-Held Net Marketable Borrowing*	1,739	1,823	1,960		1,655	1,766
Estimates as of:		Apr-24		Apr-24	Mar-24	Feb-24

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

• All privately-held net marketable borrowing estimates (excluding OFP) of are "normalized" using:

- 1) the median Primary Dealer's estimates for SOMA redemptions, and
- 2) OFP's fiscal year 2024 cash balance of \$850 billion, held constant in out years.

• OMB projections are using estimates are from Table S-10 of "Budget of The U.S. Government, Fiscal Year 2025," March 2024.

• CBO projections are using estimates are from "The Budget and Economic Outlook: 2024 to 2034," February 2024.



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



Source: Bloomberg

Projected Privately-Held Net Marketable Borrowing Assuming Private Coupon Issuance & Total Bills Outstanding Remain Constant as of 04/30/2024*

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	651	736	902	86	52	2,427
2025	0	808	955	23	68	1,855
2026	0	438	952	41	10	1,441
2027	0	326	835	24	0	1,185
2028	0	294	513	2	0	809
2029	0	84	639	1	0	724
2030	0	0	766	14	0	780
2031	0	0	504	1	0	506
2032	0	0	507	(23)	0	484
2033	0	0	519	(16)	0	503
2034	0	0	437	(23)	0	414

*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	1/9/2024	5.290	2.96	74.6	39.1	4.6	56.3	5.4	0.4	0.8			
4-Week	1/16/2024	5.280	2.78	74.7	47.1	5.3	47.6	5.3	0.4	0.8			
4-Week	1/23/2024	5.285	2.81	79.3	45.1	3.0	51.9	5.7	0.4	0.8			
4-Week	1/30/2024	5.280	2.86	84.7	35.7	3.1	61.2	5.3	0.4	0.9			
4-Week	2/6/2024	5.280	2.78	89.7	35.8	4.6	59.6	5.3	0.5	0.9			
4-Week	2/13/2024	5.280	2.97	89.5	34.0	2.7	63.3	5.5	0.5	0.9			
4-Week	2/20/2024	5.280	2.75	89.4	36.8	4.1	59.1	5.6	0.5	0.9			
4-Week	2/27/2024	5.285	2.80	89.4	29.8	3.1	67.1	5.6	0.5	0.9			
4-Week	3/5/2024	5.285	2.80	89.4	37.2	2.6	60.2	5.6	0.1	0.9			
4-Week	3/12/2024	5.280	2.76	89.4	41.3	4.4	54.3	5.6	0.1	0.9			
4-Week	3/19/2024	5.280	2.79	89.4	35.6	4.5	59.9	5.6	0.1	0.9			
4-Week	3/26/2024	5.270	3.00	79.5	28.8	4.4	66.8	5.5	0.1	0.8			
4-Week	4/2/2024	5.285	2.74	69.5	35.5	6.1	58.4	5.5	0.3	0.7			
8-Week	1/9/2024	5.285	2.80	78.4	36.1	3.3	60.6	1.6	0.4	1.5			
8-Week	1/16/2024	5.275	2.98	78.4	40.1	4.0	55.8	1.6	0.4	1.5			
8-Week	1/23/2024	5.275	3.06	83.4	43.6	3.2	53.2	1.6	0.4	1.6			
8-Week	1/30/2024	5.275	2.85	88.3	49.4	4.5	46.0	1.7	0.4	1.7			
8-Week	2/6/2024	5.265	2.75	88.3	45.4	3.6	50.9	1.7	0.4	1.7			
8-Week	2/13/2024	5.270	2.75	88.2	41.0	3.2	55.8	1.8	0.4	1.7			
8-Week	2/20/2024	5.270	2.66	88.3	38.2	4.6	57.2	1.7	0.4	1.7			
8-Week	2/27/2024	5.275	2.78	88.3	42.6	3.1	54.4	1.7	0.4	1.7			
8-Week	3/5/2024	5.285	2.71	88.2	42.1	3.2	54.7	1.8	0.1	1.7			
8-Week	3/12/2024	5.280	2.90	88.3	38.8	3.7	57.5	1.7	0.1	1.7			
8-Week	3/19/2024	5.275	2.87	88.3	38.9	5.1	56.0	1.7	0.1	1.6			
8-Week	3/26/2024	5.270	2.93	83.2	42.2	3.7	54.1	1.8	0.1	1.6			
8-Week	4/2/2024	5.275	2.89	78.3	32.7	3.9	63.4	1.7	0.3	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	1/4/2024	5.245	2.71	72.7	39.9	3.7	56.4	2.3	4.6	2.4		
13-Week	1/11/2024	5.235	2.95	72.2	42.5	6.2	51.3	2.8	4.1	2.4		
13-Week	1/18/2024	5.225	2.99	72.1	37.9	4.3	57.7	2.9	4.3	2.4		
13-Week	1/25/2024	5.225	3.03	74.4	43.6	5.4	51.1	2.6	4.4	2.5		
13-Week	2/1/2024	5.210	2.84	76.6	38.9	5.1	56.0	2.4	8.2	2.7		
13-Week	2/8/2024	5.235	2.91	76.3	38.0	6.5	55.5	2.7	6.3	2.6		
13-Week	2/15/2024	5.230	2.92	76.6	32.6	5.4	62.0	2.4	7.2	2.7		
13-Week	2/22/2024	5.230	2.84	76.7	35.6	3.7	60.8	2.3	5.8	2.5		
13-Week	2/29/2024	5.255	2.93	76.7	37.0	3.6	59.3	2.3	5.5	2.5		
13-Week	3/7/2024	5.240	2.65	76.7	43.1	5.9	50.9	2.3	0.3	2.4		
13-Week	3/14/2024	5.250	2.53	76.7	49.7	6.3	44.0	2.3	0.3	2.4		
13-Week	3/21/2024	5.245	2.81	73.6	42.6	10.2	47.2	2.4	0.2	2.3		
13-Week	3/28/2024	5.230	2.88	70.5	34.2	7.5	58.3	2.5	0.5	2.2		
17-Week	1/9/2024	5.200	3.09	55.4	43.0	3.2	53.8	0.6	0.3	2.3		
17-Week	1/16/2024	5.180	3.19	55.4	40.3	2.9	56.8	0.6	0.3	2.3		
17-Week	1/23/2024	5.185	3.22	57.4	39.3	4.9	55.7	0.6	0.3	2.4		
17-Week	1/30/2024	5.185	2.76	59.5	41.0	6.1	52.9	0.5	0.3	2.4		
17-Week	2/6/2024	5.150	2.69	59.4	47.4	6.8	45.8	0.6	0.3	2.4		
17-Week	2/13/2024	5.180	2.97	59.4	41.8	3.1	55.1	0.6	0.3	2.4		
17-Week	2/20/2024	5.215	3.07	59.5	35.5	3.7	60.8	0.5	0.3	2.4		
17-Week	2/27/2024	5.215	2.97	59.3	34.8	4.6	60.6	0.7	0.3	2.4		
17-Week	3/5/2024	5.225	2.86	59.4	44.1	3.9	52.0	0.6	0.1	2.4		
17-Week	3/12/2024	5.205	2.84	59.3	42.5	4.2	53.3	0.7	0.1	2.4		
17-Week	3/19/2024	5.210	3.00	59.3	43.2	5.6	51.2	0.7	0.1	2.3		
17-Week	3/26/2024	5.215	2.73	59.3	49.7	5.4	44.9	0.7	0.1	2.4		
17-Week	4/2/2024	5.205	2.77	59.4	48.8	4.7	46.5	0.6	0.2	2.4		

*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	1/4/2024	5.045	3.06	66.0	29.4	7.7	62.9	2.0	4.2	4.4	
26-Week	1/11/2024	5.030	3.06	65.7	37.1	5.3	57.6	2.3	3.7	4.4	
26-Week	1/18/2024	4.975	3.17	65.7	26.0	5.4	68.6	2.3	3.9	4.4	
26-Week	1/25/2024	5.020	2.92	67.7	23.1	6.8	70.1	2.3	4.0	4.6	
26-Week	2/1/2024	4.985	3.14	67.8	22.1	4.3	73.6	2.2	7.2	4.8	
26-Week	2/8/2024	5.045	2.91	67.8	34.8	5.9	59.3	2.2	5.6	4.7	
26-Week	2/15/2024	5.065	2.77	67.7	30.2	4.9	64.9	2.3	6.4	4.7	
26-Week	2/22/2024	5.100	2.96	67.5	31.5	5.8	62.8	2.5	5.2	4.5	
26-Week	2/29/2024	5.130	2.92	67.8	28.0	1.9	70.1	2.2	4.9	4.5	
26-Week	3/7/2024	5.105	2.59	67.8	40.1	8.2	51.7	2.2	0.3	4.2	
26-Week	3/14/2024	5.100	2.95	67.8	32.6	6.0	61.4	2.2	0.3	4.2	
26-Week	3/21/2024	5.130	2.76	67.9	39.6	3.6	56.8	2.1	0.2	4.2	
26-Week	3/28/2024	5.105	2.72	67.9	30.1	3.8	66.1	2.1	0.5	4.3	
52-Week	1/25/2024	4.570	3.05	44.3	22.6	1.3	76.1	1.7	2.6	6.0	
52-Week	2/22/2024	4.695	2.76	44.6	24.2	4.9	70.9	1.4	3.4	5.9	
52-Week	3/21/2024	4.810	2.88	44.5	45.7	2.9	51.4	1.5	0.1	5.6	
6-Week CMB	1/4/2024	5.290	2.72	69.7	37.6	2.9	59.4	0.3	0.0	1.0	
6-Week CMB	1/11/2024	5.280	2.93	69.7	37.9	4.7	57.4	0.3	0.0	1.0	
6-Week CMB	1/18/2024	5.285	2.89	69.7	33.9	5.2	60.9	0.3	0.0	1.0	
6-Week CMB	1/25/2024	5.280	2.85	74.7	42.9	3.6	53.5	0.3	0.0	1.1	
6-Week CMB	2/1/2024	5.280	2.70	79.7	50.0	4.2	45.8	0.3	0.0	1.1	
6-Week CMB	2/8/2024	5.280	2.87	79.7	41.2	4.7	54.2	0.3	0.0	1.1	
6-Week CMB	2/15/2024	5.280	2.73	79.7	37.4	4.6	58.0	0.3	0.0	1.1	
6-Week CMB	2/22/2024	5.280	2.78	79.7	39.5	2.6	57.9	0.3	0.0	1.1	
6-Week CMB	2/29/2024	5.290	2.61	79.6	43.1	3.1	53.8	0.4	0.0	1.1	
6-Week CMB	3/7/2024	5.285	2.88	79.7	45.1	3.1	51.7	0.3	0.0	1.1	
6-Week CMB	3/14/2024	5.285	2.80	79.7	46.7	6.5	46.8	0.3	0.0	1.1	
6-Week CMB	3/21/2024	5.280	2.90	74.7	43.1	5.7	51.3	0.3	0.0	1.0	
6-Week CMB	3/28/2024	5.280	3.01	69.7	47.1	4.8	48.1	0.3	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	1/31/2024	4.365	2.57	59.5	14.8	19.9	65.3	0.5	0.0	14.4			
2-Year	2/29/2024	4.691	2.49	62.4	14.7	20.1	65.2	0.6	2.7	15.3			
2-Year	4/1/2024	4.595	2.62	65.3	13.4	20.9	65.8	0.7	0.0	15.5			
3-Year	1/16/2024	4.105	2.67	51.6	17.8	16.8	65.3	0.4	0.0	18.3			
3-Year	2/15/2024	4.169	2.58	53.6	15.7	18.3	66.0	0.4	4.0	20.5			
3-Year	3/15/2024	4.256	2.60	55.8	14.4	15.6	70.0	0.2	0.0	19.2			
5-Year	1/31/2024	4.055	2.31	60.8	20.4	18.7	60.9	0.2	0.0	34.7			
5-Year	2/29/2024	4.320	2.41	63.8	16.8	19.7	63.5	0.2	2.8	36.7			
5-Year	4/1/2024	4.235	2.41	66.8	12.7	16.8	70.5	0.2	0.0	37.1			
7-Year	1/31/2024	4.109	2.57	40.8	13.9	17.0	69.1	0.2	0.0	31.4			
7-Year	2/29/2024	4.327	2.58	41.8	15.6	14.8	69.6	0.2	1.8	32.4			
7-Year	4/1/2024	4.185	2.61	42.9	12.9	17.4	69.7	0.1	0.0	32.0			
10-Year	1/16/2024	4.024	2.56	36.9	15.1	18.7	66.1	0.1	0.0	36.9			
10-Year	2/15/2024	4.093	2.56	41.8	13.0	16.1	71.0	0.2	3.1	46.6			
10-Year	3/15/2024	4.166	2.51	38.9	17.1	18.6	64.3	0.1	0.0	38.9			
20-Year	1/31/2024	4.423	2.53	12.9	17.3	20.5	62.2	0.1	0.0	21.1			
20-Year	2/29/2024	4.595	2.39	15.8	21.2	19.7	59.1	0.2	0.7	26.7			
20-Year	4/1/2024	4.542	2.79	12.9	9.3	17.2	73.5	0.1	0.0	20.8			
30-Year	1/16/2024	4.229	2.37	21.0	14.5	17.7	67.8	0.0	0.0	43.1			
30-Year	2/15/2024	4.360	2.40	24.9	14.8	14.5	70.7	0.1	1.8	56.8			
30-Year	3/15/2024	4.331	2.47	22.0	13.9	16.8	69.3	0.0	0.0	45.2			
2-Year FRN	1/31/2024	0.245	3.61	28.0	16.4	0.1	83.4	0.0	0.0	0.1			
2-Year FRN	2/23/2024	0.200	2.99	28.0	34.2	0.2	65.6	0.0	0.0	0.0			
2-Year FRN	4/1/2024	0.190	3.22	28.0	41.1	0.4	58.6	0.0	0.0	0.0			

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Issue	Settle Date	Stop Out Rate (%)	Bid-to- Cover Ratio	Competitive Awards (\$bn)	% Primary Dealer	% Direct	% Indirect	Non- Competitive Awards (\$bn)	SOMA "Add Ons" (\$bn)	10-Year Equivalent (\$bn)**
10-Year TIPS	1/31/2024	1.810	2.62	17.9	3.2	17.5	79.3	0.1	0.0	20.5
10-Year TIPS	3/28/2024	1.932	2.35	16.0	12.0	16.0	72.0	0.0	0.0	17.5
30-Year TIPS	2/29/2024	2.200	2.43	8.9	9.0	17.6	73.4	0.1	0.4	25.3

*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.

Office of Debt Management



Regular Treasury Buyback Program Details April 2024

Executive Summary

- > Treasury's buyback program focuses on two debt management objectives:
 - Liquidity Support: Establish a predictable opportunity for market participants to sell off-the-run securities.
 - **Cash Management:** Reduce volatility in Treasury's cash balance and bill issuance, minimize bill supply disruptions, and/or reduce borrowing costs over time.
- As noted at the <u>last refunding</u>, Treasury plans to announce the date of the first regular buyback operation on May 1st.
 - The <u>latest tentative buyback schedule</u> will be available on the quarterly refunding webpage.
- Initially, Treasury will seek offers for at most 20 CUSIPs in each operation due to temporary settlement process limitations.
- Liquidity Support buybacks will generally take place once per week on Wednesday afternoons as multiple price reverse auctions available to primary dealers through the Federal Reserve Bank of New York's FedTrade application.
 - Initially, Treasury will only conduct buybacks with primary dealers. Other market participants are welcome to access buybacks through a primary dealer. Treasury anticipates considering whether to allow other counterparties to directly participate in the future.
 - In contrast to bidding in Treasury auctions, pro-rata participation in Treasury buybacks is not part of the expectations for primary dealers.
- Treasury plans to announce a tentative schedule of buybacks for the subsequent quarter at each quarterly refunding.
 - Treasury will provide an update on the temporary 20 CUSIP limit at the August 2024 refunding.

Buyback Buckets

- Treasury will conduct buybacks across nine maturity buckets.
 - Seven for nominal coupon securities and two for TIPS.
- > Treasury will buy back securities from only one buyback bucket at a time.
- Two buyback buckets differ slightly from previous communications.
 - The 0-to-2-year nominal coupons bucket is now the 1-month to 2-year bucket.
 - The 0-to-7.5-year TIPS bucket is now the 1-year to 7.5-year bucket.

Treasury Buyback Buckets

Product	Objective	Maturity Sector
Nominal Coupons	Cash Management & Liquidity Support	1Mo to 2Y
Nominal Coupons	Liquidity Support	2Y to 3Y
Nominal Coupons	Liquidity Support	3Y to 5Y
Nominal Coupons	Liquidity Support	5Y to 7Y
Nominal Coupons	Liquidity Support	7Y to 10Y
Nominal Coupons	Liquidity Support	10Y to 20Y
Nominal Coupons	Liquidity Support	20Y to 30Y
TIPS	Liquidity Support	1Y to 7.5Y
TIPS	Liquidity Support	7.5Y to 30Y

Buyback Calendar

- At each Quarterly Refunding, Treasury will publish a tentative calendar of both Liquidity Support and Cash Management buybacks for the upcoming quarter on the TreasuryDirect <u>Buyback Announcements & Results</u> page and the <u>Quarterly Refunding webpage</u>.
- In general, Treasury's buyback schedule attempts to cover all buyback buckets at least once per quarter while avoiding holidays or other events such as major economic data releases and FOMC announcements.
- The tentative buyback calendar will include the same fields as the small-value buyback calendar that Treasury released in March 2024.
 - See below for a sample calendar that is based on the small-value buybacks that Treasury conducted in April 2024.
- Treasury may conduct buybacks that do not appear on the tentative calendar and may revise the tentative calendar after publication.

Sample Buyback Calendar

Announcement Date	Operation Date and Time (EI)	Settlement Date	Operation Type	Security Type & Maturity Range	Maturity Date Range	Minimum Purchase Amount	Maximum Purchase Amount	Maximum Number of Eligible Securities
4/2/24	4/3/24 1:40 to 2:00 pm	4/4/24	Liquidity Support	Nominal Coupons 20Y to 30Y	4/4/44 - 4/3/54	\$0	\$200 million	20
4/9/24	4/10/24 1:40 to 2:00 pm	4/11/24	Cash Management	Nominal Coupons 1Mo to 2Y	5/11/24 - 4/10/26	\$0	\$200 million	20
4/16/24	4/17/24 1:40 to 2:00 pm	4/18/24	Liquidity Support	TIPS 7.5Y to 30Y	10/18/31 - 4/17/54	\$0	\$200 million	20

Buyback Purchase Limit Calculation

- > Treasury uses two criteria to determine the purchase limit for a given security:
 - **Free Float in Dollars:** The amount outstanding less the sum of SOMA holdings and the stripped amount will remain above **\$10 billion** for nominal coupon securities and above **\$5 billion** for TIPS after the buyback operation settles, see **Formula E** below.
 - **SOMA Holding Percent:** SOMA holdings will not exceed 70% of a securities' outstanding par amount after the buyback is settled. Because buybacks reduce the overall par outstanding, see **Formula F** below.
- Treasury buys back securities in \$1 million lots, see **Formula H** for details.
- Securities with a purchase limit less than \$10 million are excluded from Treasury buyback operations.

	Formula	912810FH6	912810QA9	912810QX9	9128282A7
Date		4/22/24	4/22/24	4/22/24	4/22/24
Par Outstanding (\$MM)	А	\$19,497	\$25,909	\$41,995	\$65,349
SOMA Holdings (\$MM)	В	\$9,598	\$18,072	\$26,598	\$10,765
Stripped Amount (\$MM) as of 3/31/24	С	\$6	\$101	\$1,079	\$10
Free Float Floor (\$MM)	D	\$5,000 (TIPS)	\$10,000 (Nominals)	\$10,000 (Nominals)	\$10,000 (Nominals)
Free Float Dollar Limit (\$MM)	$\mathbf{E} = \mathbf{MAX} \{ \mathbf{A} \textbf{-} (\mathbf{B} \textbf{+} \mathbf{C} \textbf{+} \mathbf{D}) , 0 \}$	\$4,893	\$0	\$4,318	\$44,574
SOMA Percent Limit (\$MM)	F = A - (10/7)*B so that $B / (A - F) = 70%$	\$5,786	\$92	\$3,997.85	\$49,970.43
Lesser of Two Limits (\$MM)	$G = MIN\{ E, F \}$	\$4,893	\$0	\$3,997.85	\$44,574
Lot Size (\$MM)	$H = FLOOR{G, $1 MM}$	\$4,893	\$0	\$3,997	\$44,574
Final Purchase Limit (\$MM)	I = IF H \geq \$10 MM THEN H ELSE \$0	\$4,893	\$0	\$3,997	\$44,574

Purchase Limit Calculation Examples

Buyback Security Exclusions

- In general, securities in a buyback bucket not excluded by one of the rules below are eligible for purchase in a buyback operation.
- Treasury may update its exclusion criteria from time to time.

Operation Type	Exclusion Name	Description of Exclusion Rule			
Liquidity Support & Cash Management	On-the-Runs and Near On-the-Runs	Recently issued securities that are not past their first coupon payment date.			
	Securities Close to Coupon Payment Date	Securities that have coupon payment dates that fall within two business days prior to, or on, a buyback operation settlement date.			
	CTD and Near CTD Securities	Treasury securities that are reasonably likely to be the cheapest-to-deliver for a futures contract.			
	Repo Specials	Treasury securities that are trading significantly special in repurchase agreement markets or are otherwise in exceptional demand compared with similar issues.			
	Purchase Limits	Securities with a purchase limit less than \$10 million according to the previous slide are excluded.			
	Exceptional Situations	Treasury may decline to buy back securities that are in high demand.			
Cash Management	Rich to Treasury Bills	Coupon securities that are trading at a significantly lower yield than Treasury bills with similar maturities.			
	Maturing Near Tax Payment Dates	Coupon securities that mature around quarterly tax payment dates or the April tax season.			

Buyback Announcements and Results

- Both buyback announcements and results may be found on the <u>Buyback Announcements &</u> <u>Results</u> TreasuryDirect page.
- In general, one day prior to a scheduled buyback operation, Treasury will publish a <u>Preliminary Announcement</u> at 11:00 AM.
 - Contains a list of securities that will likely be included in the buyback operation along with the tentative size and timing of the operation. Also includes delivery instructions and other relevant details.
- Typically, on the day of a buyback operation, Treasury will publish a <u>Final Announcement</u> at 11:00 AM.
 - Treasury expects to update the preliminary list of eligible CUSIPs only if changes in market conditions trigger an exclusion rule listed on Slide 6.
 - Data fields are identical to the Preliminary Announcement.
 - The list of eligible CUSIPs will not change after the Final Announcement is published.
- After the buyback operation concludes, Treasury will publish <u>operation results</u> that show both the total amount that Treasury has bought back and weighted average accepted prices at a CUSIP level.

Additional Program Details

- The objectives of Cash Management and Liquidity Support buybacks have not changed since Treasury's last updates at the <u>August</u> and <u>May</u> 2023 refundings.
 - Buybacks are not intended to change the overall maturity profile of the debt outstanding.
 - Treasury does not intend to use buybacks to respond to episodes of acute market stress.
 - Amounts spent to buy back securities will be treated like any other source of borrowing needs for debt management purposes. Treasury will not attempt to directly align additional issuance with securities bought back at a specific tenor.
- Treasury aims to be a price-sensitive buyer. Actual buyback amounts are determined during an operation and depend on the evaluation of offers.
 - > Treasury may buy back less than the announced maximum amount.
- Treasury buybacks are structured as a *redemption* that reduces a CUSIP's par amount outstanding by exactly the amount that is bought back.
 - > Treasury securities that are purchased through buyback operations are retired upon settlement.
- The 20 CUSIP maximum for buybacks is currently in place because of operational limitations related to buyback settlement reporting. Treasury aims to remove restrictions on CUSIP count as soon as these operational limitations are addressed. Treasury will provide an update at the August 2024 refunding.
- Treasury may revisit certain aspects of its buyback program from time to time and will provide updates at subsequent refundings.

Buyback Resources

- Buyback announcements, results, regulations, and lists of eligible CUSIPs are available at <u>https://treasurydirect.gov/auctions/announcements-data-results/buy-backs/</u>
- For additional details and frequently asked questions please refer to Treasury's buyback FAQs at <u>https://treasurydirect.gov/help-center/faqs/buyback-faqs/</u>
- Primary dealers may call the Federal Reserve Bank of New York Trading Desk with submission and verification questions. For system-related problems, dealers may call the Federal Reserve Bank of New York Primary Dealer Support.
- For questions related to buyback announcements and disclosure, please contact Treasury's Bureau of the Fiscal Service at <u>buybacks@fiscal.treasury.gov</u>
- Direct all other questions related to buybacks to Treasury's Office of Debt Management at <u>dl_odm_buybacks@treasury.gov</u> (note the leading underscore).

Potential 6-Week Benchmark

Treasury has regularly been issuing the 6-week cash management bill since June 2023 and last refunding stated it would announce a decision on whether to change the 6-week to benchmark status at an upcoming refunding. Based on your recommendations for the appropriate level of bills outstanding in the medium to long term, should Treasury change the 6-week to benchmark status? What factors should Treasury consider before making a decision on the 6-week?

Treasury Borrowing Advisory Committee April 30, 2024

6-Week Benchmark Bill Factors

TBAC believes the following factors should be considered by the Treasury in making this determination.

- What is the anticipated trajectory of future Treasury bill issuance, and will that be supportive of another benchmark bill?
- Will the Treasury maintain the flexibility to increase/decrease front end issuance with an additional benchmark bill?
- How has the recent demand for the 6-week cash management bill(CMB) compared to other benchmark bills?
- Will future investor demand continue to support the 6-week bill issuance?
- How would the 6-week bill satisfy the Treasury's goal of "regular and predictable" issuance and would this benchmark offering complement the current debt management process?
- Are their any risks/downsides to an additional benchmark bill?

Treasury's Issuance of Bills Is Expected to Grow with Deficits

- After the onset of the pandemic and the resulting passage of the CARES act, Treasury bill supply surged \$2.5 trillion to \$5.1 trillion in just 3 months.
- Treasury bills as a percentage of total marketable debt increased to 25%, declined to 15% as Treasury termed out debt and surged again in 2023 post debt ceiling resolution.
- Bill supply is expected to decline in the second quarter due to seasonal tax receipts and may decline further if the Fed begins tapering its quantitative tightening program.
- With projected deficits expected to average over \$1.75 trillion for the next 10 years and even with the current supply of bills representing nearly 22% of marketable debt, Treasury bill issuance could be expected to grow by as little as \$1 trillion to be at the lower end of the TBAC recommended range of 15-20% or as much as \$3 trillion to be at the top end of the range.
- Without the 6-week CMB, total benchmark bills would need to increase by over 8% likely requiring auction sizes for the 4-week and 8-week to grow considerably. Conversely, if funding needs declined, Treasury would have the flexibility to reduce the relatively high current auction sizes even with an additional benchmark bill.



Sources: Bloomberg, Treasury, CBO (Deficit Projections)

6-Week Treasury Bill Size Has Been Consistent with Other Benchmark Bills

- Treasury began regular weekly issuance of its 6-week bill coming out of the resolution of the debt limit impasse in June 2023 both to rebuild the cash balance that was depleted in the impasse and to finance the ongoing deficit. (See Treasury announcement: <u>https://www.treasurydirect.gov/instit/annceresult/press/preanre/2023/SPL_20230607_1.pdf</u>)
- The 6-week CMB has had a stable and predictable issuance pattern over the past year. Weekly issuance sizes of the 6-week CMB have remained between \$45 and \$80 billion over this period.
- CMBs have historically been utilized by the Treasury for targeted, short-term cash management needs such as around tax receipt dates and debt ceiling management. CMBs may be used more sparsely going forward with the Treasury's new additional option of buybacks for cash management purposes.
- CMBs as percent of bill issuance has declined in recent years. The 6-week bill remains the only regular CMB issue.



Source: Bloomberg, Treasury

Investor Demand for 6-Week Treasury Bills Remains Strong

- Treasury bill demand remains strong as the Treasury has increased its reliance on bills.
- Bid-to-cover ratios, a proxy of investor demand, for the 6-week bill have been in line with the other benchmark bills.
- The bid-to-cover ratio for the 6-week bill has averaged just under 3, at 2.9 times, since its regular issuance began last June. This level matches the average for the benchmark bills over the same period and is greater than the average bid-to-cover for the surrounding 4-week and 8-week bills.
- Benchmark bills bid-to-cover ratios have averaged 3.01 over the past 4 years.



Investor Demand for 6-Week Treasury Bills Remains Strong (cont.)

- Clearing levels for the 6-week bill have also remained well supported when compared to benchmarks.
- The 6-week bill auctions have cleared in a tight range vs OIS with the average spread over the past 10 months at less than 1 basis point, in line with the other benchmark bills.
- The shorter 4- to 8-week bills have experienced a slightly better spread to OIS reflecting the higher demand for short-term liquidity.



Money Market Funds Have Been a Large Buyer of Increased Bill Issuance

- As Treasury has ramped up its issuance of bills in the past 12 months, it has been money market funds that have been the largest marginal buyer.
- Money market funds currently account for 32% of all Treasury bill investors on an expanding base of supply.
- The "other" bucket of Treasury investors has grown since 2021 as the Fed has increased short-term rates and new entrants such as stablecoin providers have joined more traditional institutional investors.
- Retail Investors have also been a meaningful direct buyer of Treasury bills as short-term rates have increased.


Composition of Money Market Funds Has Shifted in Recent Years

- Demand from money market funds has steadily risen over the past 10 years as the growth in assets and the changing regulatory landscape have encouraged more Treasury exposure.
- \$1 trillion of prime money market fund assets migrated to government money market funds during the last round of money market reform in 2015 and 2016.
- New liquidity rules, effective this month, require all taxable money market funds to maintain at least 25% daily and 50% weekly liquidity. Treasury bills are deemed both daily and weekly liquid by the SEC.
- Money market fund bill positions have increased to 35% of assets since the debt ceiling resolution.



Is Demand from Money Market Funds Peaking?

- Money market funds are required by regulations to maintain a weighted average maturity(WAM) of 60 days or less. Since January of 2023, Government Money Market Funds have extended their WAM by roughly 20 days reflecting the potential pivot from the Fed to an easing policy and rate cuts.
- Although money market funds have a limited ability to extend further, the short tenor of a 6-week bill provides a liquid option for these investors without meaningfully lengthening their maturity profile.
- The Fed Reverse Repo Facility, primarily used by money market funds, has been in decline for the past year as investors shifted into the growing Treasury bill supply. Utilization at the Fed has recently dropped below \$500 billion.
- The lower Fed RRP balance could be a sign of less excess demand from money market funds moving forward.



Sources: Crane Data, Bloomberg

The 6-Week Bill Rounds Out an Expanding Weekly Auction Schedule

- The current 6-week bill is positioned well within the Treasury's weekly auction schedule. Treasury has been auctioning the 6-week bill on Tuesdays with settlement and maturity of these bills on Thursdays. These consistent Tuesday/Thursday settlements align with maturities which offers investors multiple options for maturing bills.
- Some Treasury bill investors, specifically Treasury Only money market funds, prefer shorter duration securities to manage their portfolios. The alignment of the 6-week auction, with different settlement and maturity than the 4-week and 8-week bill provides optionality for these investors. The 6-week bill can therefore be an attractive complement to the current benchmark 4-week, 8-week, 13-week, 17-week, 26week and 52-week bills.
- From a debt management standpoint, having a 6-week benchmark can help further diversify the distribution of bill maturities, thereby creating more tools to manage the Treasury's changing funding needs.

Bills	Monday	Tuesday	Wednesday	Thursday	Friday
4-Week		Settle/Maturity		Auction	
6-Week		Auction		Settle/Maturity	
8-Week		Settle/Maturity		Auction	
13-Week	Auction			Settle/Maturity	
17-Week		Settle/Maturity	Auction		
26-Week	Auction			Settle/Maturity	
52-Week*		Auction		Settle/Maturity	

* 52-Week Bill issued once every four weeks

Potential Risk/Downside to Adding a 6-Week Benchmark Bill

- An increased reliance on short-term bills will result in larger maturities, rollover risk and therefore a larger Treasury General Account to manage that risk.
- As the Treasury looks to expand its offerings of shorter dated debt, it may consider longer dated options in the front end of the market to lessen the rollover risk.
 - 5-month bills could be an option, but the longer maturities may be more constraining to WAM sensitive investors like MMFs.
 - A one-year Treasury floater, akin to the two-year FRN, could help manage rollover risk and satisfy any WAM constraints for investors.



Treasury General Account

Recommendation

Based on the projected growth in total Treasury bill issuance, the current demand from investors for Treasury bills and the compatibility of the 6-week bill issuance schedule for both investors and the Treasury, it is recommended that the Treasury move the 6-week bill to a benchmark status. Even if investor demand wanes in future years or Treasury relies less on bill issuance, the current auction sizes are healthy enough to adjust lower. By moving the 6-week from a cash management bill to a benchmark bill, the Treasury would reinforce their goal of "regular and predictable" issuance by signaling to the market that the Treasury expects to continue to offer these bills as part of its regular debt management process.

April 30, 2024

TBAC Charge

New Products or Processes

Treasury is always considering ways to minimize borrowing costs, better manage its liability profile, enhance market liquidity, and expand the investor base in Treasury securities. In light of these objectives, we would like the Committee to comment on the likely costs and benefits of potential new Treasury products that might assist Treasury in achieving some or all of these objectives. In addition, are there any other debt management tools or processes that Treasury should consider utilizing? In answering the question, please review the practices and products employed by debt management authorities around the world.

Executive Summary

- The borrowing needs of the Treasury over the coming years are expected to drive an increase in issuance
- The share of outstanding Treasuries held by its two largest investor types (foreign investors and the Federal Reserve) has been decreasing in recent years
- In this context, we will explore potential new products and processes that achieve some or all of the objectives that guide Treasury's decisions:
 - Minimizing its borrowing costs
 - Expanding its investor base
 - Enhancing market liquidity
 - Managing its liability profile
- We will consider the following products:
 - Products previously used by Treasury: callable bonds
 - New products for Treasury: Green bonds, ability to strip Treasury notes / bonds into floaters and inverse floaters
 - Variants of existing Treasury products: 1-year FRN, 3-year TIPS, ultra long-end issuance and FRNs tied to note / bond yields
- We will also discuss some potential process changes or new processes:
 - Adapting the timing of Treasury settlements
 - Reopening operation, securities lending and issuance add-ons
 - Primary dealer league tables

Recommendations presented in these materials are preliminary but attractive from a blue sky perspective in the context of the debt management challenge and objectives outlined above. Further investigation is recommended before launching any new product or process.

Projected Borrowing Needs (as of January 2024)

Expected to Drive an Increase in Issuance

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



Source: Treasury presentation to TBAC, Q1 2024: https://home.treasury.gov/system/files/221/TreasuryPresentationToTBACQ12024.pdf

*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.

Holders of US Treasuries Over Time

% Held by Foreign Investors and the Federal Reserve Has Been Decreasing



Source: Federal Reserve Z1 Report

"Other Domestic" includes GSEs, issuers of asset-backed securities, security brokers and dealers, holding companies and other financial businesses

Treasury's Key Criteria for Assessing Potential New Products and Processes

- When considering new products or processes, Treasury will evaluate them in light of the following objectives:
 - Minimizing its borrowing costs
 - Treasury seeks to minimize its borrowing costs over the long term
 - This is achieved in large part by issuing in a regular and predictable manner
 - From time to time, modifications to the types of products and tenors issued and to the processes surrounding issuance can also help with this objective
 - Expanding its investor base
 - Given the scale of Treasury's issuance, seeking out as broad an investor base as possible is a key element in Treasury's strategy to issue debt efficiently and to support a well-functioning market
 - Enhancing market liquidity
 - Taking steps to achieve the highest degree of market liquidity possible makes Treasuries a more attractive asset, thereby increasing demand and reducing borrowing costs over time
 - Market liquidity must be considered in the context of market volatility and other structural factors that support the resilience of the Treasury market as well
 - Managing its liability profile
 - In managing its debt issuance, Treasury takes into consideration its future financing needs, shorter term cash management, and other considerations that could vary when analyzed across a range of economic outcomes and market environments
- We will discuss potential new products and processes by considering whether they can assist Treasury in achieving some or all of these objectives and by taking into account other considerations such as operational complexity and overhead required to launch and maintain these products or processes

Potential New Products

Potential New Products Discussed in Past TBAC Charges

Since 2012



* Note that this includes products discussed but not necessarily recommended by the TBAC

Background and Rationale

Expansion of Investor Base	~
Interest Savings	?
Improved Liability Profile Management	~
Enhanced Market Liquidity	_
Development Work / Operational Uplift	×

Recommendation: Treasury could consider exploring the issuance of callable bonds for the following reasons:

- Access to an expanded investor base: investors looking for yield enhancement by selling optionality
- While coupon at issuance would be higher, potential for lower interest cost if rates move down after issuance (possibility to call the bond and refinance)
- Complementary to existing Treasury instruments (bullet notes / bonds and FRNs) in terms of convexity profile of the Treasury's liabilities
- Callable bonds are bonds that the issuer can decide to redeem before their contractual maturity
 - We suggest bonds with a par call, where the issuer would repay the par value of the bond (plus accrued interest) upon call exercise
 - The issuer would be incentivized to call the bond if it can refinance the bond at a lower rate
- Callable bonds typically have a "non-call period", during which the issuer cannot call the bond. After that, they typically have Bermudan calls, which means that there will be multiple dates on which the issuer can choose to call the bond
 - For example, a "30nc5" callable bond with semi-annual calls is a 30-year bond that can be called by the issuer once every 6 months starting with the period five years after the bond was issued
- To compensate for the option implied by the call feature of the bond, the issuer will need to pay a higher coupon on a callable bond than on the corresponding bullet bond
 - Investor demand is often driven by this higher coupon: investors who are seeking enhanced yield by selling optionality can buy callable bonds
- While it might be counterintuitive given the higher coupon, Treasury's interest costs could be lowered by issuing a callable rather than a bullet:
 - Many issuers of callable bonds hedge them by trading cancellable swaps and see value in callables when they can be issued at tighter level than bullets on a hedged basis due to investor demand specific to callable bonds
 - Should Treasury prefer not to hedge, the potential lower interest payments would come from the ability to call the bond at par and refinance at lower rates if
 rates go down after issuance, for example in a recessionary environment
- The potential scale of the expanded investor base is best illustrated by the \$12tn+ of outstanding bonds with call / prepayment options:
 - The USD callable bond market is greater than \$2 trillion, including \$750bn of agency callables and \$130bn of Formosa callables
 - The \$10tn+ agency mortgage-backed securities (MBS) market is also used by investors to enhance yield by selling optionality
- Outstanding callable sovereign debt is limited: Spain (\$1.2bn issued in 2019), Belgium (\$0.4bn issued in 2013) as well as multiple bonds issued by developing countries, especially in Latin America
 - However, other developed countries have issued callable bonds in the past, including the US until 1984 (most recent issuance was \$102bn of 30nc25 issued between 1977 and 1984, called and refinanced at much lower rate levels between 2002 and 2009)

Overview of the Agency Callable Bond Market

- In the US, the three largest issuers of callable bonds are government agencies: the Federal Home Loan Banks (FHLB), the Federal Farm Credit Banks (FFCB) and Freddie Mac. Fannie Mae is also in the top ten
- The size of the outstanding agency callable bond market is ~\$750bn, with annual issuance of ~\$200bn to \$400bn over the past 5 years
 - Most agency callable bonds are short-dated: 75% were issued with a tenor of 5 years or less and 92% with a tenor of 10 years or less
 - The non-call periods are also short: 86% were issued with a non-call period of 1 year or less
- The investor base is comprised of a mix of asset managers (including money market funds), state & local governments, pension funds and insurance companies
 - The primary driver of investor demand is the increased yield relative to bullet bonds, especially from investors who cannot sell options via derivatives
- The size and relative steadiness of GSE callable issuance indicate that there could be enough investor demand for callables issued by government entities to justify introducing this new product
 - Further study would be warranted to estimate the potential size of that demand



Historical Gross Issuance of Agency Callable Bonds



Breakdown of Outstanding Debt by Tenor / Non-Call Period

			Non-Call Period									
		<= 1m	3m	6m	9m	1y	18m	2у	Зy	4y	5y	Total
	<= 1y	0.0%	6.5%	5.0%	1.4%	1.6%						14.5%
	2у	0.5%	2.4%	2.0%	0.5%	3.7%	3.3%					12.3%
	Зy	1.5%	5.5%	2.1%	0.5%	3.3%	0.1%	0.3%				13.4%
	4y	0.2%	2.7%	2.3%	0.2%	3.3%	0.3%	1.2%	0.0%	0.0%		10.3%
	5y	2.1%	6.2%	4.1%	0.5%	7.2%	0.7%	3.3%	0.6%	0.0%		24.7%
Tenor	7y	0.0%	2.5%	1.4%	0.0%	2.8%	0.1%	0.8%	0.6%	0.0%		8.1%
	10y	0.0%	1.8%	1.4%	0.1%	4.2%	0.1%	0.6%	0.4%	0.0%	0.3%	9.0%
	15y		0.8%	1.1%	0.1%	2.6%	0.0%	0.5%	0.2%	0.0%	0.4%	5.7%
	20y	0.0%	0.2%	0.3%	0.0%	1.1%	0.0%	0.0%	0.1%		0.2%	1.9%
	30y		0.0%	0.0%		0.1%		0.0%	0.0%		0.0%	0.2%
	Total	4.4%	28.6%	19.7%	3.3%	29.9%	4.6%	6.7%	1.8%	0.2%	0.9%	100%

Tenors and Non-Call Periods are rounded up

Expansion of Investor Base ✓ Interest Savings ? Improved Liability Profile Management ✓ Enhanced Market Liquidity Development Work / Operational Uplift ¥

Impact on Interest Costs

Expansion of Investor Base	1
Interest Savings	?
Improved Liability Profile Management	1
Enhanced Market Liquidity	-
Development Work / Operational Uplift	×

To illustrate the interest cost differential between a bullet and a callable bond, we will assume a 5nc1, the most common structure in the agency callable market:

- As of 15-Apr-2024, we would estimate the coupon of the callable as 5.98%, 134bps higher than a bullet
 - Note that the cheapness of Bermudan* volatility driven by investor demand for callable bonds leads to this level being 4bps tighter than what would be implied by the European* options market. For longer-dated structures (e.g. 10nc1), this benefit could exceed 10bps
 - While this cheapness may vary over time, it has been fairly consistent over the past 10 years
- The bottom left chart compares the average interest cost to Treasury over 5 years between the callable and the bullet bond, as a function of the date on which the bond is called and of the refinancing rate on the called date
 - The 134bps coupon spread between callable and bullet would be more than offset by the benefit of the call option if the refinancing rate is 4.31% or lower in 1 year, 3.75% or lower in 2 years or 2.63% or lower in 3 years
- For a specific example of how this could have played out in the recent past, the bottom right chart shows the same analysis for a hypothetical 5nc1 bond issued 5 years ago (spread of 56bps between callable and bullet, lower than today due to lower implied volatilities and a steeper interest rate curve at the time). Each dot represents the potential refinancing rate each year after issuance
 - Given the significantly lower rates in 2020, the bond could have been called and refinanced after 1 year, lowering the average coupon to 0.83% (154bps lower than the 5y bullet rate in April 2019)



5nc1 Scenario Analysis: Pricing as of 15-Apr-2024



Source: Presenting member calculation, as of 15-Apr-2024. Levels are indicative only and for discussion purposes.

Levels were calculated assuming a SOFR-flat issuer and adjusted for spot swap spreads to be reflective of the Treasury curve.

* Bermudan options have multiple possible exercise date while European options only have a single exercise date. Supply/demand dynamics in the callable bond market are the primary driver of market-implied Bermudan volatility while market-implied European volatility is based on a broader set of market participants and a much larger volume of transactions, especially in the derivatives market

5nc1 Scenario Analysis: Pricing as of 15-Apr-2019

Considerations

Expansion of Investor Base	1
Interest Savings	?
Improved Liability Profile Management	1
Enhanced Market Liquidity	-
Development Work / Operational Uplift	×

"Regular and Predictable" Framework	 In considering the issuance of callable bonds, Treasury would need to factor in the potential rate-sensitivity of supply/demand dynamics: As an issuer, Treasury might be more incentivized to issue callables when rates are high, given the potential for calling the bond and refinancing at lower rates On the other hand, investor demand might be stronger when rates are lower and investors have more interest in yield enhancement However, these factors are typically mitigated by the price of the call option and, as a result, callables could still fit within the "regular and predictable" framework in most rate environments (with the possible exception of a regime of extremely low rates)
Choice of Issuance Tenors and Non-Call Periods	 It is common for issuers of callable bonds to be reactive to investor demand in deciding which tenors and non-call periods to use for issuance Given Treasury's "regular and predictable" framework, we would recommend focusing on tenors / non-call periods which have seen the most consistent demand so that Treasury can plan to issue in size with minimal variations in structure over time In this respect, targeting the investor base of agency callables would make most sense, with structures such as 5nc1 Treasury previously issued 30nc25 callables – we don't expect that there would be enough investor demand or potential for interest savings to justify such a long non-call period
Optimal Option Exercise	 When issuing a callable bond with a European call (single exercise date), deciding whether to call the bond is relatively straightforward, although a long notification period (Treasury previously used 4 months) can be more challenging when the call option is close to at-the-money For callable bonds with a Bermudan call (multiple possible exercise dates), the exercise decision is more complex as the issuer needs to decide not just <u>whether</u> to call the bond but also <u>when</u> to call the bond (now or at a later date) By exercising the bond at an earlier date, the issuer can refinance and decrease its interest payments earlier but is foregoing the option to call the bond and refinance at a later date, when the interest savings could be greater If it were to issue callable bonds, Treasury would need to develop a model to decide when it is optimal to call the bond
Impact on WAM	 When communicating the WAM of its outstanding debt, Treasury would need to consider how to treat the uncertainty regarding the maturity of callable bonds As an alternative to using their contractual maturity, Treasury could consider using an option-adjusted maturity, which would vary over time as the call probability on the possible exercise dates changes This would have the benefit of presenting a "best estimate" at a given point time of the expected maturity of outstanding callables The option-adjusted maturity could be derived from the optimal option exercise model discussed above The choice to use contractual vs. option-adjusted maturity should only have a minor impact on WAM unless callable issuance share becomes large and/or Treasury chooses to use longer-dated tenors than what we suggest above
Stripping	 Stripping callable bonds would introduce instruments with interesting duration / convexity profile: C-STRIPS and P-STRIPS would the equivalent of interest-only (IO) and principal-only (PO) mortgage-backed securities However, it would introduce additional challenges (non-fungibility of C-STRIPS, operational complexity) We believe that, initially, Treasury should consider issuing callable bonds that are not eligible for stripping If Treasury does not issue callables in the long-end of the curve (where stripping demand is more pronounced), we do not believe that the inability to strip will increase interest costs

2. Green Bonds

Overview

Expansion of Investor Base	~
Interest Savings	?
Improved Liability Profile Management	-
Enhanced Market Liquidity	-
Development Work / Operational Uplift	×

- **Recommendation:** Treasury could consider exploring the issuance of green bonds for the following reasons:
 - Access to a growing investor base which couldn't invest in traditional US Treasuries to the same extent: institutional investors with a target allocation for green investments (e.g. pension funds), investment funds with a climate-related mandate (1200+ funds globally as of year-end 2022*)
 - Benefit from the potential demand for green bonds denominated in USD specifically (only 22% of the outstanding universe is USD-denominated vs. 49% EUR-denominated)
 - Empirically, the issuance of green bonds has been at levels similar to or marginally tighter than traditional bonds from the same issuer and with the same maturity
- Green bonds are bonds issued to fund projects with environmental benefits
 - Most of the green bonds issued are "use of proceeds" bonds: their proceeds are allocated for green projects but they are backed by the entire balance sheet of the issuer
 - Example of eligible expenditures in green bonds issued by large sovereigns include clean transportation, energy efficiency, renewable energy, living and natural resources, pollution prevention / control and climate change adaptation
- While the first green bonds were issued in 2007 by the European Investment Bank (EIB) and the World Bank, it was in the late 2010s that the market started growing at a meaningful pace, driven in part by sovereign issuance
- As of April 2024, the total outstanding amount of green bonds is ~\$2.6 trillion, of which 17% were issued by sovereigns and another 19% were issued by supranationals and other government entities
- All major sovereign issuers in developed markets, except for the US, have issued green bonds:
 - European Union: France (\$81bn outstanding), Germany (\$70bn), Italy (\$40bn), Netherlands (\$25bn)...
 - Other G10 issuers: United Kingdom (\$65bn), Japan (\$11bn), Canada (\$7bn)...
- While a small green premium ("greenium") benefiting issuers has been observed in most issuance to date, it may not persist as the market matures
 - Investor demand outpacing supply has been the primary factor driving pricing so far but the relative depth and liquidity of green bonds vs. traditional bonds might become more of a factor in the future
 - We recommend that the decision to issue green bonds on a regular and predictable basis be primarily based on Treasury's investor base expansion objective, with greenium only being a potential secondary benefit
- Considerations:
 - Upfront work would be required to develop a green bond framework and ongoing work required to implement it (e.g. process for evaluation and selection of projects, management of proceeds, reporting)
 - It could be relevant to study ICMA's Green Bond Principles (GBP) and practices followed by other major sovereigns
 - There could be more investor demand for green bonds linked to incremental green spending (not previously authorized spending) due to concerns over "greenwashing". If so, the use of green bonds may need to be included in the legislation authorizing the spending
 - An alternative to green bonds could be sustainability-linked bonds (SLBs), with a coupon that varies depending on sustainability performance targets. However, we would not recommend SLBs given the potential difficulty in defining the targets and the penalty-based approach to sustainability objectives



2033 2036

22%

Expansion of Investor Base

3. Potential Variants of Existing Products

	1y FRN	3y TIPS	Ultra Long End	Note / Bond- Linked FRN
Expansion of Investor Base	×	-	1	?
Interest Savings	-	-	×	?
Improved Liability Profile Management	×	×	?	-
Enhanced Market Liquidity	√	×	-	-
Development Work / Operational Uplift	-	-	-	×

We recommend that Treasury explore the issuance of 1-Year FRNs and 3-Year TIPS, as suggested in prior TBAC charges

1-Year FRN

- In its <u>Q3 2019 charge</u>, TBAC recommended the issuance of a 1-year SOFR FRN
- The benefits of a 1-year FRN relative to a 2-year FRN include:
 - Incremental demand from government money market funds given their WAL limits (not to exceed 120 days)
 - Potential new demand from securities lending participants and investors looking for a repo / cash alternative (for SOFR FRNs in particular)
 - Increased market liquidity resulting from a more diversified investor base
- A 1-year FRN compares favorably to increased bill issuance given the ability for Treasury to term out its funding while keeping a WAM profile attractive to government money market funds
- We expect that there would be sufficient demand for either a 1-year SOFR FRN or a 1year T-bill FRN

3-Year TIPS

- In its <u>Q2 2023 charge</u>, TBAC recommended increased TIPS issuance to maintain the TIPS share of outstanding debt given higher deficits and increased TIPS maturities
- In its <u>Q4 2023 charge</u>, TBAC suggested that Treasury evaluate the suitability of issuing frontend TIPS
- The issuance of 3-year TIPS could have the following benefits:
 - Ability for Treasury to increase TIPS issuance to keep TIPS share of outstanding debt stable, e.g. issuing \$25bn per quarter would increase TIPS outstanding by \$300bn, increasing TIPS share by ~1% and keeping it in the TBAC-recommended range of 7-9%
 - Avoids increasing auction size for existing tenors to an extent where the market might have difficulty absorbing supply
 - Increases liquidity of the front-end of the TIPS curve and potentially taps into investor demand for securities most sensitive to short-term inflation expectations
- The fact that there is currently most demand for the shortest TIPS tenor (5y) leads us to believe that a nearby tenor (3-year) would be well received but more work needs to be done to determine if there would be sufficient demand to absorb the additional supply

While potential investor demand would need to be explored further, Treasury could also revisit ultra long-end issuance and consider the issuance of FRNs linked to Treasury note / bond yields

Ultra Long-End Issuance

- In its <u>Q2 2017 charge</u>, TBAC considered the issuance of ultra long-end bonds (40, 50 or 100-year bonds) and concluded that a reintroduction of the 20-year bond would be more attractive but that further study of ultra-long securities might be warranted, including 50-year zero-coupon bonds
- In its <u>Q1 2019 charge</u>, TBAC recommended that Treasury consider the issuance of perpetual debt and of zero-coupon bonds
- While we do not believe that ultra-long-end issuance should be a priority in the short to medium-term, the following products could be worth exploring at a later stage:
 - Ultra long-end zero-coupon bonds could be attractive for investors seeking a higher amount of duration per dollar invested than is available with any existing Treasury instrument
 - Perpetual bonds could be attractive given the greater ability to reopen the same bond over time and have acceptable liquidity

FRNs Linked to Treasury Note / Bond Yields

- In Japan, there are ~\$230bn of outstanding 10y JGB floaters indexed to 10y JGB yields (issuance of ~\$1bn to \$2bn per month in recent years)
 - They are targeted at retail investors looking for yield enhancement in an upward sloping curve environment
 - An earlier program targeted at institutional investors was discontinued
- The demand for such a product might be specific to Japan given the extended period of near-zero short-term interest rates and could be very sensitive to the shape of the yield curve
- However, Treasury could explore if there is enough demand for this product in the US likely as nonmarketable securities issued to retail – to justify the overhead to launch / maintain such a product (it is unknown at this stage)
- The ability to strip Treasuries into a pair of floaters and inverse floaters (discussed next) could be an alternative path for investors looking for such exposure

4. Stripping Treasuries Into Floaters and Inverse Floaters

Expansion of Investor Base	×
Interest Savings	-
Improved Liability Profile Management	-
Enhanced Market Liquidity	-
Development Work / Operational Uplift	×

Treasury could consider expanding the STRIPS program to provide market participants the ability to strip a fixed-rate Treasury into a floater and inverse floater

- This potential new product could expand the investor base to investors currently using structured products to obtain such duration profiles: the outstanding par value of agency Inverse Interest-Only (Inverse IO) CMOs is ~\$420bn*
- For example, \$100 of a 5% coupon Treasury could be stripped into \$50 of a Treasury floater with a coupon of SOFR flat and \$50 of a Treasury inverse floater with a coupon of (10% SOFR), with both the floater and inverse floater having a coupon floored at 0% and capped at 10%
 - This would allow the holder of the inverse floater to have more duration per unit of investment than a fixed rate Treasury
- Another example would be to strip \$100 of a 5% coupon Treasury into \$50 of a levered Treasury floater with a coupon of 1.5*SOFR and \$50 of a levered inverse floater with a coupon of (10% 1.5*SOFR), with a 0% floor and 10% cap on the coupon in both cases
 - The levered floater would allow its holder to be short duration, something not currently possible when buying existing Treasury products
- Such a stripping program would be more operationally challenging than the existing STRIPS program (e.g. calculation of the floating interest payments), especially if the offering is designed to be flexible in terms of reference index, floating rate multiplier and/or floor/cap strikes



Illustration of Stripping a 5% Fixed Rate US Treasury into a Floater and an Inverse Floater

* Note: an inverse IO does not have any principal repayment – the entire principal repayment would be paid to holders of the other tranche(s) of the CMO, e.g. the floater tranche

5. GDP Bonds / Longevity Bonds

	GDP Bond	Longevity Bond
Expansion of Investor Base	-	?
Interest Savings	×	×
Improved Liability Profile Management	~	-
Enhanced Market Liquidity	-	-
Development Work / Operational Uplift	×	×

While these products could at some point be worth considering, we do not recommend them in the short to medium-term: their novelty may result in low investor demand and/or high interest costs

GDP Bonds

- The issuance of GDP-linked bonds has been explored by other sovereigns in the past, with the primary benefit to the issuer being counter-cyclicality (i.e. less interest payment on the debt when the economy is doing poorly)
- The design could be similar to TIPS, with interest and return of principal being indexed to nominal GDP instead of CPI
 - A scaling factor lower than 1 for the principal repayment might be necessary to issue the bond at par since nominal GDP growth can exceed the nominal level of rates for extended periods
 - The lag used in these instruments would need to consider the potential for revisions to the GDP data
- Aside from GDP-linked warrants issued by countries restructuring their debt (e.g. Argentina, Greece), there has not been issuance of GDP-linked debt by major countries
- The reluctance to issue has come in part from the expected premium that may be demanded by investors for the novelty and pro-cyclicality of the instrument from the investor's perspective

Longevity Bonds

- Longevity bonds are bonds whose cashflows are indexed to the longevity of a reference population
- A possible design would be to:
 - Pay interest on the par value of the bond multiplied by the percentage of the reference population alive at the beginning of the current period, and
 - Make a partial repayment of principal for the change in the size of the reference population since the prior period
- The target investors for such an instrument would be defined benefit pension funds and insurance companies that underwrite lifetime annuities and are exposed to longevity extension
 - However, it may be difficult to identify reference populations that will provide an effective hedge against the specific longevity exposure of these institutions
- Treasury would also need to consider the extent to which it is already exposed to a longevity extension (e.g. Social Security benefits)



Illustrative GDP Bond Cashflows¹

Nominal GDP

Index

100.0 104.7

105.3

117.9

126.2

133.7

Nominal GDP

YoY (%)

4.7%

0.6%

11.9%

7.1%

5.9%

31-Dec-18

31-Dec-19

31-Dec-20

31-Dec-21

31-Dec-22

31-Dec-23

Coupon

1%

Interest

Payments

1.05

1.05

1.18

1.26

1.34

Coupon

Nominal

GDP Index

Rate *

1. Assumes annual cashflows for simplicity. The coupon / factor are illustrative and not intended to represent the level at which such a bond would or should have been issued

Total

Cashflows

1.05

1.05

1.18

1.26

121.65

Factor

90%

Principal

Repayment

120.31

Scaling

Factor *

Nominal

GDP Index

2. Assumes 5% interest and a hypothetical survivorship curve of a population of 50-year-old Americans at issuance

Illustrative Longevity Bond Cashflows²

Potential New Products Discussed in This Charge

Summary Table

Potential New Product	Issuance by Other Countries (Developed Markets)	Expansion of Investor Base	Interest Savings (other than resulting from an expansion of the investor base)	Improved Liability Profile Management	Enhanced Market Liquidity	Development Work / Operational Uplift
Callable Bonds	Small outstanding callables in Belgium and Spain	\checkmark	? (savings if rates go down)	\checkmark	-	×
Green Bonds	All major issuers except the US	~	? (potential greenium)	-	Η	×
1-Year FRN		>	Ι	\checkmark	~	-
3-Year TIPS		-	Ι	~	~	-
Ultra Long-End Issuance	Many countries, including UK, Japan, France, Spain and Austria	~	*	?	_	_
FRNs Indexed to Treasury Note / Bond Yields	Japan (indexed to 10y JGBs)	?	?	Ι	Ι	×
Floaters / Inverse Floaters (Stripping)		\checkmark	-	-	-	×
GDP Bonds		I	*	~	Ι	×
Longevity Bonds		?	×	_	_	×

We recommend that Treasury conduct further study to determine if these products should be launched

Treasury could also consider these products

We do not recommend that Treasury consider these products in the short to medium-term (but they may be worth exploring in the future)

Potential New Processes

1. Adapting the Timing of Treasury Settlement

Current Issuance Schedule

Settlement of Treasury issuance varies by product / tenor:

- Bills settle on Tuesdays or Thursdays, depending on tenor
- Notes, bonds and FRNs settle on the 15th of the month or the last calendar day of the month, depending on tenor
- TIPS settle on the last business day of the month
- When the 15th and/or last calendar day of the month falls on a Tuesday or Thursday, the amount settling on that date can be very large as both bills and a subset of notes, bonds, FRNs and TIPS will settle on the same day
 - See below for the example of February 2024

Issuance Pattern for US Treasuries

	Tenor	Auction Frequency	Issue Date		
	4-Week	Weekly	Tuesday		
	8-Week	Weekly	Tuesday		
	13-Week	Weekly	Thursday		
Bills	26-Week	Weekly	Thursday		
	17-Week	Weekly	Tuesday		
	52-Week	Monthly	Thursday		
	CMB	Ad hoc	Ad hoc		
	2-Year	Monthly	Last calendar day of the month*		
	3-Year	Monthly	15th of the month*		
Notes	5-Year	Monthly	Last calendar day of the month*		
	7-Year	Monthly	Last calendar day of the month*		
	10-Year	Monthly	15th of the month*		
Danda 20-Year		Monthly	Last calendar day of the month*		
Donus	30-Year	Monthly	15th of the month*		
	5-Year	Quarterly	Last business day of the month		
TIPS	10-Year	Bi-Monthly	Last business day of the month		
	30-Year	Semi-Annually	Last business day of the month		
EBNIe	2 Voor	Monthly	Last calendar day of the month*		
FRINS	z-real	wonthiy	(Last Friday of the month for reopenings)		

* If that date is not a valid business day, the issue date will be the next valid business day

Monday Tuesday Wednesday Thursday Friday 01-Feb-24 02-Feb-24 42d Bill 79.5 13w Bill 86.0 26w Bill 75.3 240.8 Total 05-Feb-24 06-Feb-24 07-Feb-24 08-Feb-24 09-Feb-24 4w Bill 95.1 42d Bill 79.5 8w Bill 89.7 13w Bill 84.2 17w Bill 59.3 26w Bill 73.7 Total 244.0 Total 237.4 12-Feb-24 13-Feb-24 14-Feb-24 15-Feb-24 16-Feb-24 4w Bill 95.1 42d Bill 79.5 8w Bill 89.7 13w Bill 85.1 17w Bill 59.3 26w Bill 74.4 3y Note 57.9 44.8 10y Note 30v Bond 26.4 Total 244.0 Total 368.1 19-Feb-24 20-Feb-24 21-Feb-24 22-Feb-24 23-Feb-24 4w Bill 95.1 42d Bill 79.5 FRN 28.0 8w Bill 89.7 13w Bill 83.7 17w Bill 59.3 26w Bill 73.2 52w Bill 47.1 244.0 Total Total 283.5 26-Feb-24 27-Feb-24 28-Feb-24 29-Feb-24 4w Bill 95.1 42d Bill 79.5 8w Bill 897 13w Bill 83.4 17w Bill 59.3 26w Bill 72.9 2y Note 65.6 5y Note 66.6 7y Note 43.6 20y Bond 16.5 30y TIPS 9.2 Total 244.0 437.4 Total

Data Source: Treasury Direct. The amount issued is calculated by multiplying the total face value accepted by the price resulting from the auction.

US Treasuries Issued in February 2024 (\$bn, by Issue Date)

1. Adapting the Timing of Treasury Settlement

Daily Settlements Have Increased Materially in Recent Years

In recent years, the increased amount of issuance, especially bills, has resulted in a material increase in the number of days with a large notional of Treasuries settling

- In Q1 2024 alone, there were 23 days with settlements between \$200 and 300bn, 3 days with settlements between \$300 and 400bn and 1 day with settlements above \$400bn
- This can present challenges for primary dealers who must consider the mismatch in timing between their cash outflows (payment to the US Treasury) and their cash inflows (payment from clients on whose behalf they placed orders)
- Pre-funding these intraday liquidity needs is an added cost to primary dealers and could result in increased funding pressures on peak settlement days as bill issuance grows
- Some potential solutions to consider and analyze would include:
 - Introducing a third settlement day for some bill tenors (e.g. Wednesday)
 - Adapting the settlement date of coupon bonds to avoid bill settlement days
 - Introducing a mechanism to settle different bonds at different times during the day
- Operational feasibility and impact on ability for investors such as money market funds to roll bills as they mature would need to be considered

US Treasuries Issuance Amount (in \$bn, by Issue Date)

\$bn 50 500 200-300bn 45 450 300-400bn 400bn+ 40 400 35 350 30 300 25 250 20 200 15 150 10 100 5 50 ` 20¹ 20² 20² 20¹ 20¹⁰ 20¹ 2010

Number of Days with Issuance Amount > \$200bn

Data Source: Treasury Direct. The amount issued is calculated by multiplying the total face value accepted by the price resulting from the auction.

2. Reopening Operations

- Treasury could explore conducting reopening operations as a complementary program to the buyback program it will soon be launching
- Reopening operations could allow Treasury to:
 - Smooth out the maturity profile of Treasuries across the curve
 - Limit dislocations caused by the scarcity of certain securities
 - Decrease its interest cost by reopening securities trading "rich" in the secondary market
- However, the constraints considered for buybacks¹ should also apply to reopenings:
 - Reopenings should not have a harmful impact to the "regular and predictable" framework
 - Reopenings should not be used to fundamentally change the maturity profile of the Treasury curve or to mitigates episodes of acute market stress
 - We recommend excluding current CTD bonds to avoid adding uncertainty in futures delivery, which could negatively impact market liquidity for both futures and cash Treasuries. We don't expect the same issue with potential CTD bonds or future CTD bonds
- Given that there is no corresponding objective in the upcoming buyback program, more work would be needed to understand what approach Treasury could use to identify "rich" securities to target for reopenings and to capture the richness without being disruptive to the market



Current Maturity Profiler per Quarter

Z Spread Curve² (2026 to 2034 Maturities)

- 1. See May 2023 Presentation to TBAC: https://home.treasury.gov/system/files/221/TreasurySupplementalQRQ22023.pdf
- 2. Source: Presenting member calculation, as of 17-Apr-2024

3. Securities Lending

- Treasury could consider facilitating securities lending for Treasuries that are not in the Fed's SOMA portfolio or that the Fed holds in very small quantity
 - The presence of a securities lending backstop for all Treasury securities could ensure access and delivery, alleviating scarcity and risk of fails, thereby enhancing the ability
 for dealers to make two-way prices
 - Operationally, this could entail a back-to-back, cash-for-cash reverse repo of desired Treasury collateral. Treasuries created under this program would be for repo purposes only
 - If such collateral were created, it would mean that there is more of the bond available in repo than the outstanding issue size. For this reason, it would make sense to exclude
 such amounts for inclusion in bond indices, even on a temporary basis
 - The Fed's lending facility currently awards loans on competitive bidding in a multiple price auction, with the bid rate representing the lending fee rate that participants would be willing to pay to borrow the security. It is typically equivalent to the spread between the general collateral rate and the specials rate. Treasury could consider a similar approach for the "special issue" bonds
- In the UK, the standing repo facility is managed by the Debt Management Office (DMO) rather than by the Bank of England
 - The lending rate is set as a spread to the BoE's bank rate (the spread is currently 75bp), though this has varied over time
 - Having a fixed rate across securities is likely to be more effective in enhancing secondary market liquidity and simpler to implement, although at the cost of potentially distorting price discovery
- In evaluating the merits of a securities lending program, Treasury should evaluate the impact that it could have on the "regular and predictable" framework
 - While increasing the ability to borrow any Treasury security could be seen as a positive in that respect, the potential for the size of an issue available in the repo market to vary over time could be seen as a negative



Fed's SOMA Holdings Vary Significantly By Security¹

1. Source: Federal Reserve Bank of New York. Note: X-axis is not to scale

4. Issuance Add-Ons

Maintaining a "Reserve" Option to Lower Costs / Enhance Liquidity

- Currently, Treasury's practice is to place the entire amount of issuance at the primary auction. This results in a regular and predictable outcome but means that Treasury could be missing out on the ability to satisfy additional future demand for that particular security.
- An alternative approach used by the German DMO is the concept of 'retained holdings'
 - The bulk of Germany's market financing is raised through a multiple price auction. An issuance volume target is announced ahead of the auction, and on auction day, about 80% of the target is raised in the primary market. The remaining 20% is credited to the DMO's 'holdings' representing the retention quote
 - In the weeks following the auction, the retention quote is released into the markets, both to contribute to secondary market liquidity and to smooth issuance over time. These securities are sold directly into the secondary market by the Bundesbank
 - In theory, such an approach offers the ability to be somewhat opportunistic with issuance without relying on a syndication process. The retained amount, if unused, could also be used to alleviate security shortages
- It is not clear how this enhanced flexibility could fit within the "regular and predictable" framework used by Treasury
- Another approach, already discussed in the Q1 2019 charge, is syndication, and the ability to issue additional amounts based on demand indications, via a "greenshoe" option
 - This approach may be more appropriate for new products where demand is uncertain



Bond Notional Retained by the German DMO Over Time¹

5. Primary Dealer League Tables

- As part of their issuance framework, some sovereign issuers publish league tables of primary dealers to incentivize behavior that helps achieve the objectives of the issuance strategy, such as supporting market liquidity and contributing to the minimization of borrowing costs
- For example, the French DMO (Agence France Tresor) publishes annual league tables ranking primary dealers on three criteria:
 - Primary market participation in auctions and buybacks (40% weight)
 - Market share in the secondary market (40% weight)
 - Qualitative assessment of the quality of services provided (e.g. advice provided to the DMO) (20% weight)
- While the use of dealer league tables in more prevalent in countries that rely on syndication, Treasury could explore whether their use could help achieve some of the objectives of its issuance strategy

French DMO League Table of Primary Dealers (2023)¹

Primary Market (40%)			Secondary Market (40%)		Quality of Services (20%)			Overall Ranking	
1	BNP Paribas	1	BNP Paribas		1	BNP Paribas	1	BNP Paribas	
2	Societe Generale	2	Citi			Societe Generale	2	Societe Generale	
3	HSBC	3	Deutsche Bank		3	Credit Agricole	3	Citi	
4	JPMorgan	4	JPMorgan		4	HSBC	4	JPMorgan	
5	Citi	5	Credit Agricole		5	JPMorgan	5	HSBC	
6	Credit Agricole	6	Morgan Stanley		6	Citi	6	Credit Agricole	
7	Morgan Stanley	7	Societe Generale		7	Natixis	7	Deutsche Bank	
8	Deutsche Bank	8	Barclays		8	Bank of America	8	Morgan Stanley	
9	Bank of America	g	HSBC		9	Morgan Stanley	9	Bank of America	
10	Goldman Sachs	1) Bank of America		10	Deutsche Bank	10	Barclays	

1. Source: French DMO (Agence France Tresor): https://www.aft.gouv.fr/en/publications/communiques-presse/21-february-2024-2023-league-table-most-active-primary-dealers-svts

Conclusion

- To achieve some or all of its objectives (expansion of investor base, minimized borrowing costs, improved liability profile management and enhanced liquidity) in the context of an expected increase in issuance, we recommend that Treasury explore the issuance of the following products:
 - <u>Callable bonds</u> would allow an expansion of the investor base to investors who seek enhanced yield by selling optionality when investing in callable bonds or residential MBS. If issued unhedged, callable bonds would potentially allow Treasury to lower its interest costs during recessionary environments, when Treasury could benefit from calling the bonds and refinancing at potentially lower rates
 - <u>Green bonds</u> would allow an expansion of the investor base given the rapidly growing assets-under-management of funds or mandates restricted to green investments. All major sovereign issuers in developed markets, other than the US, have already issued green bonds
 - The issuance of <u>1-year FRNs</u>, in addition to the existing 2-year FRNs, would see more demand from money market funds given their WAM / WAL constraints and could improve the liquidity of the FRN curve. This could also reduce the need to increase bill issuance
 - The issuance of <u>3-year TIPS</u> could allow Treasury to keep the outstanding TIPS share stable without relying on increased auction size for existing tenors that may be difficult for the market to absorb
- While we would assign a higher priority to the potential new products above, Treasury could also consider:
 - Revisiting ultra long-end issuance, with a possible focus on zero-coupon bonds or perpetual bonds rather than par bonds
 - FRNs linked to Treasury note / bond yields for retail investors
 - The ability to strip fixed-rate Treasuries into floaters and inverse floaters (levered or not) to introduce duration profiles not achievable with existing Treasury products
- Note that the products mentioned above, with the exception of 1-year FRNs and short-dated TIPS, would require development work and/or an operational uplift that would need to be evaluated further
- Finally, Treasury could consider further studying process changes that could improve the functioning of the Treasury market:
 - Adapting the timing of Treasury settlements to reduce the intraday funding needs of primary dealers on large settlement days
 - Reopening program complementary to the buyback program that Treasury is soon launching
 - Processes used by other sovereigns that Treasury could consider include a securities lending program and primary dealer league tables

Appendix

Historical Issuance of Callable US Treasuries

- 88 callable US Treasuries were issued from 1917 to 1984
- During the most recent period (1977 to 1984), \$102bn were issued, all of them 30year bonds which were only callable after 25 years (5 years prior to maturity)
- Given the level of rates at the time, they had very high coupons, ranging from 7.625% to 14%, with a weighted average of 10.7%
- With the secular decline in rates in the four decades after issuance, there was a significant incentive for Treasury to call these bonds when they first became callable (2002 to 2009)
- The prevailing level of 5-year Treasury yield on the call date was ~340 to ~1125bps lower than the coupon of these callable bonds, resulting in significant interest savings from calling them and refinancing
- From the perspective of an issuer, this is an example (albeit extreme) of the potential benefits of issuing callable bonds when rates are elevated at issuance



Historical Maturity and Non-Call Period¹

Note: X axis is not to scale

Number of Callable US Treasuries Issued Since 1917¹



Call Exercises for Bonds Issued from 1977 to 1984²

				5y UST Yield	Change in Interest	Amount Issued	Change in Interest
Issuance Date	Maturity Date	Called on	Coupon	on Call Date	After Call (%)	(\$mm)	After Call (\$mm/yr)
15-Feb-77	15-Feb-07	15-Feb-02	7.63%	4.19%	(3.4%)	4,250	(146)
15-Nov-77	15-Nov-07	15-Nov-02	7.88%	3.05%	(4.8%)	1,500	(72)
15-Aug-78	15-Aug-08	15-Aug-03	8.38%	3.40%	(5.0%)	21,360	(1,064)
15-Nov-78	15-Nov-08	15-Nov-03	8.75%	3.14%	(5.6%)	5,230	(293)
15-May-79	15-May-09	15-May-04	9.13%	3.82%	(5.3%)	4,610	(245)
15-Nov-79	15-Nov-09	15-Nov-04	10.38%	3.53%	(6.8%)	4,200	(288)
15-Feb-80	15-Feb-10	15-Feb-05	11.75%	3.71%	(8.0%)	2,650	(213)
15-May-80	15-May-10	15-May-05	10.00%	3.82%	(6.2%)	2,990	(185)
17-Nov-80	15-Nov-10	15-Nov-05	12.75%	4.50%	(8.3%)	4,080	(337)
15-May-81	15-May-11	15-May-06	13.88%	5.04%	(8.8%)	4,610	(407)
16-Nov-81	15-Nov-11	15-Nov-06	14.00%	4.62%	(9.4%)	4,900	(459)
15-Nov-82	15-Nov-12	15-Nov-07	10.38%	3.70%	(6.7%)	11,030	(736)
15-Aug-83	15-Aug-13	15-Aug-08	12.00%	3.11%	(8.9%)	14,760	(1,313)
15-May-84	15-May-14	15-May-09	13.25%	1.98%	(11.3%)	5,010	(564)
15-Aug-84	15-Aug-14	15-Aug-09	12.50%	2.42%	(10.1%)	5,130	(517)
15-Nov-84	15-Nov-14	15-Nov-09	11.75%	2.18%	(9.6%)	6,010	(575)
						102,320	(7,415)

Theoretical savings of \$7.4bn per year (on \$102bn of outstanding face value) from Treasury exercising on the first call date. Does not account for the partial buybacks prior to the call date and assumes refinancing by issuing 5-year notes at the prevailing secondary yield.

2. Source: Bloomberg, Presenting member calculation

^{1:} Source: https://fraser.stlouisfed.org/files/docs/publications/frbatlreview/pages/67310_1995-1999.pdf

Overview of the Formosa Callable Bond Market

- Formosa bonds are bonds issued in the Taiwanese market in a foreign currency
- Issuance in this market increased noticeably in the mid-2010s with growing interest and ability by Taiwanese investors (in particular life insurance companies) to invest in long-dated callable bonds denominated in foreign currency (especially USD)
 - The drivers of this demand have been the access to a broader range of issuers and the ability to earn a higher yield than in the domestic market
- The size of the outstanding USD-denominated Formosa callable bond market is ~\$129bn, with most of the issuers being financials (87%)
- Most outstanding bonds have a tenor of 30 to 40 years and a non-call period of 5 years or more
- Issuance has been slower since 2023 due to higher rates resulting in less legacy Formosa bonds being called / needing to be replaced and in more attractive yields for bullet bonds on an absolute basis
- While Formosa callable issuance was meaningful to the callable bond market for most of the past decade (especially from a risk perspective, given long tenors), we would not recommend that Treasury initially target their investors given the rate sensitivity of their demand

Breakdown of Outstanding Debt by Issuer

Financial	1		
Issuer	\$bn	%	Issuer
Citigroup	8.3	6.4%	Verizon
JPMorgan Chase	6.6	5.1%	AT&T
Barclays	6.3	4.9%	Taiwan Semicondu
Bank of Nova Scotia	5.5	4.2%	Comcast
Morgan Stanley	5.4	4.1%	Intel
Goldman Sachs	4.6	3.6%	CODELCO
BNP Paribas	4.6	3.5%	NextEra Energy
UBS / Credit Suisse	4.5	3.5%	Total
Deutsche Bank	4.4	3.4%	
Bank of America	3.9	3.0%	Suprai
Natixis	3.7	2.9%	Issuer
Abu Dhabi Commercial Bank	3.5	2.7%	Kommunalbanken
MUFG Bank	3.4	2.7%	European Investm
Credit Agricole	3.3	2.6%	Export-Import Ban
Bank of Montreal	3.2	2.5%	Total
Other	41.2	31.9%	
Total	112.4	86.9%	

Issuer	\$bn	%						
Verizon	6.4	4.9%						
AT&T	5.3	4.1%						
Taiwan Semiconductor Manufacturing	2.0	1.5%						
Comcast	0.8	0.6%						
Intel	0.6	0.5%						
CODELCO	0.6	0.5%						
NextEra Energy	0.3	0.2%						
Total	16.0	12.4%						
	-							
Supranational / Government Agency								
Issuer	\$bn	%						
Kommunalbanken (KBN)	0.4	0.3%						
European Investment Bank (EIB)	0.3	0.3%						
Export-Import Bank of Korea	0.2	0.2%						
	1.0	0.70						

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45 \$bn

Historical Gross Issuance of Formosa Callable Bonds

40 35 30 25 20 15 10 5 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2014 YTD

Breakdown of Outstanding Debt by Tenor / Non-Call Period

		Non-Call Period									
		<=1y	2у	Зу	4у	5y	6y	7у	8y	10y	Total
	<=5y	0.2%	0.0%	0.0%							0.2%
	10y	1.3%	1.1%	0.7%	1.0%	0.2%			0.0%		4.3%
	15y	0.0%	0.0%	0.1%	0.1%	0.4%					0.7%
	20y	0.1%				0.4%					0.5%
Tenor	25y			0.2%		0.2%					0.4%
	30y	0.6%	0.8%	0.2%	0.0%	40.4%	7.2%	3.1%	0.6%	4.1%	57.1%
	35y	0.2%		0.2%		7.8%	0.7%	0.0%			8.9%
	40y	0.1%				24.6%	2.8%	0.2%	0.1%		27.9%
	Total	2.5%	1.9%	1.5%	1.1%	73.9%	10.8%	3.4%	0.8%	4.1%	100%

Tenors and Non-Call Periods are rounded up

Data Source: Bloomberg, as of 17-Apr-24. Excludes Formosa bonds which are non-callables, have a make-whole call or have a very short call period (1 year or less)