# Treasury Presentation to TBAC

# Office of Debt Management



# Fiscal Year 2023 Q4 Report

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\*All sources are from Treasury unless otherwise specified

# Section I: Executive Summary

# Highlights of Treasury's November 2023 Quarterly Refunding Presentation to the Treasury Borrowing Advisory Committee (TBAC)

#### Receipts and Outlays through Q4 FY2023

	\$ 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 Q4 FY2023	\$4,439	-\$457	-9%	16.5%	-2.8%
Total Outlays thru Q4 FY2023	\$6,134	-\$137	-2%	22.8%	-2.0%

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

Treasury OFP Near Term Fiscal	Net Privately Held Marketable	Assumed End-of-Quarter	
Projections	Borrowing (\$ billion)	Cash Balance (\$ billion)	
Q1 FY2024	776	750 (Dec)	
Q2 FY2024	816	750 (Mar)	

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

Fiscal Year	Primary Dealers, Median October 2023 (\$ billion)	OMB MSR July 2023 (\$ billion)	CBO Budget, June 2023 (\$ billion)
2024	2,500	2,735	2,257
2025	1,950	1,849	1,763
2026	1,898	1,696	1,676

\*All privately-held net marketable borrowing estimates are "normalized" with details from page 18. Uncertainty regarding funding needs in FY2024 to FY2026 remains relatively high, reflecting a variety of views on the path of monetary policy, the duration of SOMA redemptions, and the outlook for the economy.

#### Latest Market Expectations for Treasury Financing in October 2023:

- Primary dealers generally expected increases in coupon auction sizes consistent with the changes that were made at the August refunding, though some expected the pace of long-end increases to moderate. In October, dealers boosted their aggregate median estimates for privately-held net marketable borrowing by a cumulative \$622 billion for the FY24-FY25 period, relative to their July estimates for the same 2 years.
- Given the forecasted financing gap over FY2024 and beyond, all dealers noted that both bill and coupon auction sizes would need to be increased to address near term financing gaps. Several dealers expect bill share to temporarily exceed TBAC's recommended 15-20% range but did not express any concerns given the current demand for T-bills.
- Most dealers expected a \$1 billion increase to the 5-year TIPS reopening in December, consistent with the increase to the October new issue, and a \$1 billion increase to the 10-year new issue in January.

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

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



Tax receipts for Q4 FY2020 reflect the adjustment of April and June 2020 tax deadlines to July 15<sup>th</sup>, 2020. Individual Income Taxes include withheld and non-withheld. Social Insurance Taxes include FICA, SECA, RRTA, UTF deposits, FUTA and RUIA. Other includes excise taxes, estate and gift taxes, customs duties and miscellaneous receipts.

### Largest Outlays



Oct - Sep FY2022

■ Oct - Sep FY2023

	YoY change thru	YoY change thru	8.1 / <sup>2</sup>
Notable Outlay Category	Q4 FY23 (\$ billion)	Q4 FY23 (%)	Comments
Social Security Administration		1	Primarily due to increases from cost-of-living adjustments and increased
(calendar adjusted)	+\$139	+11%	number of beneficiaries.
Health and Human Services		1	
(calendar adjusted)	+\$96	+6%	Due to higher Medicare and Medicaid outlays.
Department of Defense			Due to increased spending for military personnel, operations, maintenance
(calendar adjusted)	+\$53	+7%	and procurement.
			Interest on the Public Debt was \$162 billion higher (23%); while outlays for
			COVID-19 relief grants were \$105 billion lower (-99%) and Tax Credits were
Department of Treasury	-\$55	-5%	\$97 billion (-28%) lower compared to last year.
Department of Education	-\$680	-106%	Due to several Federal Direct Student Loan program modifications.
			Federal Deposit Insurance Corporation outlays are \$101 billion higher. FCC
			spectrum auction receipts (negative outlays) were booked in January 2022
Other (not in the chart above)	+\$274	+195%	(\$81 billion).

Outlays in the chart above are on calendar adjusted basis

# **Cumulative Budget Deficits by Fiscal Year**



■ FY2021 ■ FY2022 ■ FY2023

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

## **Recent Economic Forecasts**

Primary Dealer Median E	stimates O	ctober 202	23	OMB Estimates July 2023	1		
	<u>CY2023</u>	CY2024	<u>CY2025</u>		<u>CY2023</u>	<u>CY2024</u>	<u>CY2025</u>
	% Chan	<u>ge from Q4</u>	4 to Q4		<u>% Chang</u>	<u>ge from Q4</u>	4 to <u>Q</u> 4
GDP				GDP			
Real	2.5	0.5	na	Real	0.4	1.8	2.4
Nominal	5.2	2.9	na	Nominal	3.5	4.1	4.5
Inflation				Inflation			
CPI Headline	3.4	2.5	na	CPI Headline	3.3	2.5	2.3
CPI Core	4.0	2.7	na				
	Fourth	Quarter L	evels		Fourth	Quarter L	evels
Unemployment Rate (%)	3.8	4.5	na	Unemployment Rate (%)	4.2	4.3	4.1
	<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>		<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>
Deficits (\$bil)	\$1,800	\$1,850	\$1,800	Deficits (\$bil)	\$1,877	\$1,698	\$1,561
<b>CBO Estimates February</b>	2023		lä	CBO Estimates July 2023			
	<u>CY2023</u>	<u>CY2024</u>	<u>CY2025</u>	19	<u>CY2023</u>	<u>CY2024</u>	<u>CY2025</u>
	<u>% Chang</u>	e from Q4	to <u>Q4</u>		% Chang	e from Q4	to Q4
GDP				GDP			
Real	0.1	2.5	2.6	Real	0.9	1.5	2.4
Nominal	3.1	4.9	4.8	Nominal	3.8	3.9	4.5
Inflation				Inflation			
CPI Headline	4.0	2.4	2.1	CPI Headline	3.3	2.7	2.2
	Fourth (	<u>Quarter Le</u>	vels		Fourth (	Quarter Le	evels
Unemployment Rate (%)	5.1	4.8	4.6	Unemployment Rate (%)	4.1	4.7	4.5
	<u>FY2024</u>	<u>FY2025</u>	<u>FY2026</u>				

Note: Economic assumptions for July 2023 OMB and Feb 2023 CBO forecasts were established in June 2023 and December 2022, respectively. Economic assumptions from July 2023 CBO forecasts were not reflected in the most recent May CBO budget updates. <u>Budget and Economic Data | Congressional Budget Office (cbo.gov)</u>

# **Recent Deficit Forecasts**

- Primary dealers increased their deficit estimates in October relative to estimates they provided in July.
- Dealers generally suggested that risks were asymmetric to the upside, i.e., risks for higher deficits and noted a high degree of uncertainty around their estimates.
- The latest OMB and CBO estimates in the table below are provided for reference.

Deficit Estimates (\$ billion)	PD 25th Percentile	Primary Dealers (Median)	PD 75th Percentile	Change from Prior Quarter (Median)	OMB	СВО
FY2024	1,688	1,800	1,807	200	1,877	1,501
FY2025	1,725	1,850	1,900	162	1,698	1,649
FY2026	1,728	1,800	1,950	na	1,561	1,586
As of date	Oct-23	Oct-23	Oct-23		Jul-23	Jun-23

- OMB projections are using estimates are from Table S-1 of "Mid-Session Review, Budget of The U.S. Government," July 2023.
- CBO projections are using estimates are from Table 1 of "How the Fiscal Responsibility Act of 2023 Affects CBO's Projections of Federal Debt," June 2023.



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



### Interest Rate Assumptions: 10-Year Treasury Note

# Section IV: Estimated Borrowing Needs and Financing Implications

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

- Portfolio and SOMA holdings as of 9/30/2023, unless otherwise noted (see slide 20).
- Estimates assume privately announced issuance sizes and patterns remain constant for nominal coupons, TIPS, and FRNs given the issuance sizes in effect in October 2023, while using total bills outstanding of ~\$5.3 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 9/30/2023, unless otherwise noted (see slide 20).
- No attempt was made to account for future financing needs.
- **Privately-held marketable borrowing** excludes rollovers (auction "add-ons") of Treasury securities held in the Federal Reserve System Open Market Account (SOMA) but includes financing required due to SOMA redemptions. Secondary market purchases of Treasury securities by SOMA do not directly change net privately-held marketable borrowing but, all else equal, when the securities mature and assuming the Fed does not redeem any maturing securities, this would increase the amount of cash raised for a given privately-held auction size by increasing the SOMA "add-on" amount. These borrowing estimates are based upon current law and do not include any assumptions for the impact of additional legislation that may be passed.

# **Privately-Held Net Marketable Borrowing Outlook**



## Implied Bill Funding for Next Two Quarters Based on Recent Borrowing Estimates

#### Sources of Privately-Held Financing in FY24 Q1

October - December 2023	
Assuming Constant Coupon Issuance Sizes*	
reasury Announced Net Marketable Borrowing**	776
Net Coupon Issuance	316
Implied Change in Bills	460

#### January - March 2024 October - December 2023 **Fiscal Year-to-Date** Fiscal Year-to-Date **Coupon Issuance Coupon Issuance Coupon Issuance Coupon Issuance** Gross Maturing Maturing Security Gross Maturing Net Net Security Gross Maturing Net Gross Net 2-Year FRN (2)(2) 2-Year FRN (20)(22) 2-Year (24)(24)2-Year (9) (33) 3-Year 3-Year (21) (15) 5-Year 5-Year 7-Year 7-Year 10-Year 10-Year 20-Year 20-Year 30-Year 30-Year 5-Year TIPS 5-Year TIPS 10-Year TIPS 10-Year TIPS (15)30-Year TIPS 30-Year TIPS Coupon Subtotal Coupon Subtotal 1,763 1,218

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

\*\* Assumes end-of-December 2023 and end-of-March 2024 cash balances of \$750 billion and \$750 billion respectively versus end-of-September cash balance of \$657 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

	Primary Dealer		OMP	CRO		
	25th	Median	75th	ONID	CDO	
FY 2024 Deficit	1,688	1,800	1,807	1,877	1,501	
FY 2025 Deficit	1,725	1,850	1,900	1,698	1,649	
FY 2026 Deficit	1,728	1,800	1,950	1,561	1,586	
FY 2024 SOMA Redemption	540	630	720			
FY 2025 SOMA Redemption		0	180			
FY 2026 SOMA Redemption	0	0	0			
FY 2024 Privately-Held Net Marketable Borrowing*	2,305	2,500	2,560	2,735	2,257	
FY 2025 Privately-Held Net Marketable Borrowing*	1,815	1,950	2,050	1,849	1,763	
FY 2026 Privately-Held Net Marketable Borrowing*		1,898	1,994	1,696	1,676	

Estimates as of:	Oct-23	Jul-23	Jun-23

• \*All privately-held net marketable borrowing estimates of are "normalized" using:

• 1) the median Primary Dealer's estimates for SOMA redemptions, and

• 2) PD's median end of fiscal year 2024 cash balance of \$733 billion, held constant in out years.

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

 CBO projections are using estimates are from Table 1 & 2 of "How the Fiscal Responsibility Act of 2023 Affects CBO's Projections of Federal Debt," June 2023.

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





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

### **Projected Privately-Held Net Marketable Borrowing** Assuming Private Coupon Issuance & Total Bills Outstanding Remain Constant as of 10/31/2023\*



\*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 \$733 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 October 2023 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 \$5.5 trillion as of 10/31/2023 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% as of 10/31/2023 and addresses any changes in financing needs by pro rata increasing or decreasing coupon, FRN, and TIPS auction sizes.

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



#### Weighted Average Maturity of Marketable Debt Outstanding

### Consolidated WANRR Calculation\*



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

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

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



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





# 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)



**—**7-Year **—**10-Year **—**20-Year **—**30-Year

### **Bid-to-Cover Ratios for TIPS**





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

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



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

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



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

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


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

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

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



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

#### **Primary Dealer Awards at Auction**



Competitive Amount Awarded excludes SOMA add-ons.



Competitive Amount Awarded excludes SOMA add-ons.



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

■Bills ■2/3/5 ■7/10/20/30 ■TIPS ■FRN

Foreign includes both private sector and official institutions.

### **Total Foreign Holdings**

Bills



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

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

## VII. Appendix

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#### Treasury Net Nonmarketable Borrowing

**Budget Surplus/Deficit\*** 



\*OMB's projections are from OMB's Table S-1 of "Mid-Session Review, Budget of The U.S. Government," July 2023. CBO's projections are from Table 1 of "How the Fiscal Responsibility Act of 2023 Affects CBO's Projections of Federal Debt," June 2023.

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#### Sources of Privately-Held Financing in FY23 Q4

July - September 2023	
Net Bill Issuance	824
Net Coupon Issuance	185
Subtotal: Net Marketable Borrowing	1,010
Ending Cash Balance	657
Beginning Cash Balance	402
Subtotal: Change in Cash Balance	254
Net Implied Funding for FY23 Q4*	755

	July	7 - September 2	023	Fiscal Year-to-Date			
		Bill Issuance		Bill Issuance			
Security	Gross	Maturing	Net	Gross	Maturing	Net	
4-Week	975	885	90	3,214	3,094	120	
8-Week	845	650	195	2,800	2,635	165	
13-Week	875	779	96	3,133	2,948	185	
17-Week	624	477	147	1,931	1,125	806	
26-Week	784	621	163	2,668	2,316	352	
52-Week	120	102	18	466	442	24	
CMBs							
6-Week	725	510	215	870	510	360	
CMBs	0	100	(100)	813	1,138	(325)	
Bill Subtotal	4,947	4,123	824	15,894	14,207	1,687	

	July	v - September 2	.023	Fiscal Year-to-Date				
	C	Coupon Issuanc	e	C	Coupon Issuance			
Security	Gross	Maturing	Net	Gross	Maturing	Net		
2-Year FRN	72	80	(8)	276	314	(38)		
2-Year	87	115	(28)	465	566	(101)		
3-Year	126	108	18	486	334	152		
5-Year	89	43	46	476	209	267		
7-Year	71	51	20	386	297	89		
10-Year	105	41	64	402	174	228		
20-Year	28	0	28	145	0	145		
30-Year	61	7	54	232	14	218		
5-Year TIPS	0	0	0	80	43	37		
10-Year TIPS	32	49	(17)	94	98	(5)		
30-Year TIPS	8	0	8	17	0	17		
Coupon Subtotal	678	493	185	3,058	2,049	1,009		
Total	5,626	4,616	1,010	18,952	16,256	2,696		

\*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.

			1	,	
		Primary Dea	ller	OMB	CBO
	25th	Median	75th	01,12	020
FY 2024 Deficit	1,688	1,800	1,807	1,877	1,501
FY 2025 Deficit	1,725	1,850	1,900	1,698	1,649
FY 2026 Deficit	1,728	1,800	1,950	1,561	1,586
FY 2024 Change in Cash Balance	33	76	93	0	0
FY 2025 Change in Cash Balance	10	17	0	0	0
FY 2026 Change in Cash Balance	0	0	50	0	0
FY 2024 Total Net Marketable Borrowing				1,664	1,551
FY 2025 Total Net Marketable Borrowing				1,817	1,746
FY 2026 Total Net Marketable Borrowing				1,683	1,676
FY 2024 SOMA Redemption	540	630	720		
FY 2025 SOMA Redemption	0	0	180		
FY 2026 SOMA Redemption	0	0	0		
FY 2024 Privately-Held Net Marketable Borrowing*	2,305	2,500	2,560	2,735	2,257
FY 2025 Privately-Held Net Marketable Borrowing*	1,815	1,950	2,050	1,849	1,763
FY 2026 Privately-Held Net Marketable Borrowing*	1,750	1,898	1,994	1,696	1,676
Estimates as of:		Oct-23		Jul-23	Jun-23

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

- \*All privately-held net marketable borrowing estimates of are "normalized" using:
  - 1) the median Primary Dealer's estimates for SOMA redemptions, and
  - 2) PD's median end of fiscal year 2024 cash balance of \$733 billion, held constant in out years.
- OMB projections are using estimates are from Table S-1 of "Mid-Session Review, Budget of The U.S. Government," July 2023. Adjusted to reflect the latest assumptions about student loans.

• CBO projections are using estimates are from Table 1 & 2 of "How the Fiscal Responsibility Act of 2023 Affects CBO's Projections of Federal Debt ," June 2023.



#### Historical Marketable Treasury Debt Service Cost

#### Source: https://fiscaldata.treasury.gov/datasets

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

#### Various Historical Treasury Interest Rate Metrics



Source: Bloomberg

#### Projected Privately-Held Net Marketable Borrowing Assuming Private Coupon Issuance & Total Bills Outstanding Remain Constant as of 10/31/2023\*

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	197	328	793	76	14	1,409
2025	0	232	812	11	20	1,075
2026	0	15	808	29	0	851
2027	0	68	691	11	0	770
2028	0	96	375	(11)	0	460
2029	0	3	495	(8)	0	490
2030	0	0	616	7	0	623
2031	0	0	411	(5)	0	406
2032	0	0	435	(30)	0	406
2033	0	0	447	(22)	0	425

\*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	7/11/2023	5.150	2.54	65.9	50.7	1.9	47.3	4.1	0.8	0.6	
4-Week	7/18/2023	5.210	2.79	63.9	40.1	4.6	55.4	6.1	0.8	0.6	
4-Week	7/25/2023	5.255	2.66	65.4	41.1	6.1	52.8	4.6	0.8	0.6	
4-Week	8/1/2023	5.275	3.18	64.1	36.1	3.7	60.2	5.9	0.9	0.6	
4-Week	8/8/2023	5.275	2.80	65.3	42.3	4.7	53.0	4.7	0.9	0.6	
4-Week	8/15/2023	5.280	2.62	70.5	44.1	6.5	49.5	4.5	0.9	0.7	
4-Week	8/22/2023	5.280	2.67	75.7	42.3	3.2	54.5	4.3	0.9	0.7	
4-Week	8/29/2023	5.285	2.89	75.7	36.1	2.4	61.5	4.3	1.0	0.7	
4-Week	9/5/2023	5.280	2.95	75.1	37.2	1.7	61.1	4.9	0.5	0.7	
4-Week	9/12/2023	5.280	2.70	75.5	40.1	2.4	57.5	4.5	0.5	0.7	
4-Week	9/19/2023	5.285	2.66	75.5	50.6	3.5	45.9	4.5	0.5	0.7	
4-Week	9/26/2023	5.280	2.80	75.7	42.1	4.8	53.1	4.3	0.5	0.7	
4-Week	10/3/2023	5.290	2.95	80.1	38.8	4.1	57.1	4.9	0.7	0.8	
8-Week	7/11/2023	5.200	2.88	58.6	32.0	1.9	66.1	1.4	0.7	1.1	
8-Week	7/18/2023	5.230	2.87	57.9	39.7	1.8	58.5	2.1	0.7	1.1	
8-Week	7/25/2023	5.255	2.99	58.8	35.5	3.9	60.7	1.2	0.7	1.1	
8-Week	8/1/2023	5.285	2.86	56.8	41.2	4.3	54.4	3.2	0.8	1.1	
8-Week	8/8/2023	5.285	2.77	58.5	41.9	4.6	53.6	1.5	0.8	1.1	
8-Week	8/15/2023	5.280	2.96	63.5	39.6	2.5	57.9	1.5	0.8	1.2	
8-Week	8/22/2023	5.280	2.89	68.6	38.0	9.9	52.1	1.4	0.8	1.3	
8-Week	8/29/2023	5.290	2.82	68.5	37.2	2.1	60.7	1.5	0.8	1.3	
8-Week	9/5/2023	5.290	2.77	68.7	37.6	2.3	60.1	1.3	0.4	1.3	
8-Week	9/12/2023	5.290	2.79	68.7	45.6	2.9	51.5	1.3	0.5	1.3	
8-Week	9/19/2023	5.295	2.77	68.6	41.6	3.5	54.9	1.4	0.4	1.3	
8-Week	9/26/2023	5.300	2.58	68.7	48.8	5.3	45.9	1.3	0.5	1.3	
8-Week	10/3/2023	5.330	2.59	73.6	37.6	4.4	58.0	1.4	0.6	1.4	

\*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)*
13-Week	7/6/2023	5.230	3.00	62.7	37.1	2.3	60.6	2.3	5.5	2.1
13-Week	7/13/2023	5.250	3.12	61.9	38.3	2.8	58.8	3.1	5.1	2.1
13-Week	7/20/2023	5.250	3.11	62.4	34.6	4.6	60.8	2.6	5.2	2.1
13-Week	7/27/2023	5.270	2.92	60.7	38.3	3.4	58.3	4.3	5.0	2.1
13-Week	8/3/2023	5.280	2.93	62.3	38.5	5.7	55.8	2.7	8.1	2.2
13-Week	8/10/2023	5.290	2.83	64.2	37.0	4.9	58.1	2.8	6.4	2.2
13-Week	8/17/2023	5.295	3.12	66.3	38.1	4.6	57.3	2.7	7.1	2.3
13-Week	8/24/2023	5.300	2.96	66.6	38.9	3.9	57.2	2.4	5.7	2.3
13-Week	8/31/2023	5.340	3.04	66.7	46.0	2.9	51.1	2.3	5.3	2.2
13-Week	9/7/2023	5.315	2.94	66.7	45.1	4.6	50.3	2.3	1.9	2.1
13-Week	9/14/2023	5.315	2.98	66.7	36.8	3.7	59.5	2.3	1.9	2.1
13-Week	9/21/2023	5.315	2.86	66.4	42.0	5.6	52.4	2.6	0.7	2.1
13-Week	9/28/2023	5.330	2.77	66.6	42.6	5.6	51.8	2.4	2.7	2.2
17-Week	7/11/2023	5.250	3.31	44.3	37.2	2.4	60.4	1.7	0.5	1.8
17-Week	7/18/2023	5.260	3.13	44.7	39.1	3.6	57.2	1.3	0.5	1.8
17-Week	7/25/2023	5.270	3.29	45.3	38.1	3.8	58.0	0.7	0.5	1.8
17-Week	8/1/2023	5.300	2.99	45.2	41.3	6.3	52.5	0.8	0.6	1.8
17-Week	8/8/2023	5.300	3.21	45.2	39.3	4.8	55.9	0.8	0.6	1.8
17-Week	8/15/2023	5.310	3.19	47.1	40.1	5.2	54.7	0.9	0.6	1.9
17-Week	8/22/2023	5.305	3.02	49.1	48.5	3.4	48.1	0.9	0.6	2.0
17-Week	8/29/2023	5.315	3.01	49.3	41.8	4.2	54.0	0.7	0.6	2.0
17-Week	9/5/2023	5.330	3.12	47.3	40.3	5.7	54.0	2.7	0.3	2.0
17-Week	9/12/2023	5.335	2.98	47.4	38.8	3.6	57.6	2.6	0.3	2.0
17-Week	9/19/2023	5.330	2.95	47.3	47.6	3.9	48.5	2.7	0.3	2.0
17-Week	9/26/2023	5.340	2.83	47.7	46.6	4.7	48.7	2.3	0.3	2.0
17-Week	10/3/2023	5.345	3.18	49.4	38.7	3.4	57.9	2.6	0.4	2.1

\*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	7/6/2023	5.260	3.02	54.0	31.5	1.5	67.0	4.0	4.9	3.7
26-Week	7/13/2023	5.270	2.93	55.1	32.3	2.4	65.2	2.9	4.6	3.7
26-Week	7/20/2023	5.250	3.05	55.4	29.0	2.5	68.4	2.6	4.6	3.7
26-Week	7/27/2023	5.270	2.89	55.6	33.5	3.1	63.5	2.4	4.5	3.7
26-Week	8/3/2023	5.270	2.95	55.1	26.1	2.9	71.0	2.9	7.2	3.9
26-Week	8/10/2023	5.265	2.92	57.1	31.1	5.0	63.9	2.9	5.7	3.9
26-Week	8/17/2023	5.290	2.78	59.1	36.1	4.9	59.0	2.9	6.4	4.1
26-Week	8/24/2023	5.295	2.95	59.2	35.1	2.8	62.1	2.8	5.1	4.0
26-Week	8/31/2023	5.350	3.17	59.1	32.2	2.3	65.6	2.9	4.7	4.0
26-Week	9/7/2023	5.300	3.02	59.5	34.3	2.6	63.1	2.5	1.7	3.8
26-Week	9/14/2023	5.300	3.15	57.4	27.0	2.4	70.5	4.6	1.7	3.8
26-Week	9/21/2023	5.300	3.05	59.4	34.4	5.1	60.5	2.6	0.7	3.8
26-Week	9/28/2023	5.315	2.91	59.5	36.0	5.1	58.9	2.5	2.4	3.9
52-Week	7/13/2023	5.130	2.88	36.4	29.4	2.3	68.3	1.6	3.0	4.8
52-Week	8/10/2023	5.060	2.97	38.1	37.1	3.2	59.7	1.9	3.8	5.2
52-Week	9/7/2023	5.120	3.14	40.6	30.7	2.0	67.3	1.4	1.1	5.2
6-Week CMB	7/6/2023	5.170	2.73	49.9	47.3	1.9	50.8	0.1	0.0	0.7
6-Week CMB	7/13/2023	5.210	2.81	49.8	42.0	2.2	55.8	0.2	0.0	0.7
6-Week CMB	7/20/2023	5.240	3.19	49.8	42.5	5.0	52.5	0.2	0.0	0.7
6-Week CMB	7/27/2023	5.275	3.53	49.8	38.5	8.1	53.5	0.2	0.0	0.7
6-Week CMB	8/3/2023	5.280	3.24	49.8	53.6	7.2	39.2	0.3	0.0	0.7
6-Week CMB	8/10/2023	5.275	2.95	54.8	49.7	5.4	44.9	0.2	0.0	0.8
6-Week CMB	8/17/2023	5.285	3.01	59.8	41.2	3.9	54.9	0.2	0.0	0.8
6-Week CMB	8/24/2023	5.280	3.27	59.8	37.0	2.5	60.4	0.2	0.0	0.8
6-Week CMB	8/31/2023	5.290	2.81	59.8	41.1	2.6	56.3	0.2	0.0	0.8
6-Week CMB	9/7/2023	5.285	3.04	59.9	41.1	1.8	57.1	0.1	0.0	0.8
6-Week CMB	9/14/2023	5.285	3.04	59.8	37.2	2.4	60.3	0.2	0.0	0.8
6-Week CMB	9/21/2023	5.285	3.10	59.8	43.6	3.1	53.3	0.2	0.0	0.8
6-Week CMB	9/28/2023	5.290	2.89	59.8	30.4	4.0	65.6	0.2	0.0	0.8

\*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	7/31/2023	4.823	2.78	41.3	13.8	20.8	65.4	0.7	0.0	9.6
2-Year	8/31/2023	5.024	2.94	44.1	15.0	20.0	65.0	0.9	4.7	11.5
2-Year	10/2/2023	5.085	2.73	47.2	14.0	21.0	65.0	0.8	0.0	11.2
3-Year	7/17/2023	4.534	2.88	39.6	10.8	19.8	69.4	0.4	0.0	13.5
3-Year	8/15/2023	4.398	2.90	41.5	10.3	15.7	74.0	0.5	15.7	19.6
3-Year	9/15/2023	4.660	2.75	43.7	20.3	22.1	57.7	0.3	0.0	15.0
5-Year	7/31/2023	4.170	2.60	42.9	13.5	22.1	64.4	0.1	0.0	23.4
5-Year	8/31/2023	4.400	2.54	45.8	13.8	18.3	67.9	0.2	4.8	27.7
5-Year	10/2/2023	4.659	2.52	48.8	11.2	17.6	71.1	0.2	0.0	26.8
7-Year	7/31/2023	4.087	2.48	35.0	14.3	15.9	69.8	0.0	0.0	25.8
7-Year	8/31/2023	4.212	2.66	35.9	9.8	15.0	75.3	0.1	3.7	29.3
7-Year	10/2/2023	4.673	2.47	36.9	14.6	19.9	65.5	0.1	0.0	27.1
10-Year	7/17/2023	3.857	2.53	32.0	12.4	19.9	67.7	0.0	0.0	32.0
10-Year	8/15/2023	3.999	2.56	37.9	9.5	18.3	72.2	0.1	14.2	52.2
10-Year	9/15/2023	4.289	2.52	34.9	13.8	19.9	66.3	0.1	0.0	35.0
20-Year	7/31/2023	4.036	2.68	11.8	9.6	21.7	68.8	0.2	0.0	19.6
20-Year	8/31/2023	4.499	2.56	-15.9	11.4	20.2	68.4	0.1	1.7	28.4
20-Year	10/2/2023	4.592	2.74	12.9	9.3	25.4	65.4	0.1	0.0	20.5
30-Year	7/17/2023	3.910	2.43	18.0	10.9	20.1	69.0	0.0	0.0	38.8
30-Year	8/15/2023	4.189	2.42	23.0	12.5	19.6	67.8	0.0	8.6	65.5
30-Year	9/15/2023	4.345	2.46	20.0	15.8	19.7	64.5	0.0	0.0	41.4
2-Year FRN	7/31/2023	0.125	2.58	23.8	46.7	0.0	53.3	0.2	0.0	0.0
2-Year FRN	8/25/2023	0.165	2.42	24.0	62.3	1.7	36.0	0.0	0.0	0.0
2-Year FRN	9/29/2023	0.180	3.42	24.0	32.6	0.4	67.0	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	7/31/2023	1.495	2.51	16.8	1.5	12.7	85.8	0.2	0.0	18.8
10-Year TIPS	9/29/2023	2.094	2.44	14.9	6.8	21.9	71.3	0.1	0.0	16.6
30-Year TIPS	8/31/2023	1.970	2.42	8.0	4.3	19.6	76.2	0.0	0.8	24.9

\*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.

# Explaining the recent market moves across the Treasury yield curve

**Treasury Borrowing Advisory Committee** 

October 31, 2023

Please discuss the Committee's views on the factors (and their relative importance) driving market moves across the Treasury yield curve over the last quarter. Can the moves be explained mostly by fundamental factors or are there technical or positioning factors that Treasury should be aware of? To what extent have Treasury supply and demand dynamics been a factor? What are expectations for yields going forward? In the Committee's discussion, please include relevant data and analysis that supports or discounts the relative importance of factors being discussed.

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### **Executive summary**

Overview of recent market moves Framework for long-term yields Analysis of yield component moves Government supply Technical factors Why didn't term premia reprice earlier Expectations for yields Conclusion

## **Executive Summary**

- Treasury yields have risen sharply since the start of Q3, particularly in longer maturities. As of October 20<sup>th</sup>, the 30y yield has increased 124 bps, compared to 20 bps for the 2y.
- The Fed hiked the policy rate by 25 bps over this period (largely as expected), and market pricing for the fed funds rate at the end of 2025 rose roughly 75 bps, from approximately 3.35% to 4.10%, reflecting expectations that the Fed will keep policy restrictive for longer.
- Yield increases have been largest in longer maturities and far-forward rates (e.g., 5y5y has risen ~150 bps), indicating that revised views on long-run neutral and term premia have played a bigger role.
- While there was likely some reassessment of long-run neutral amid ongoing economic resilience, models and surveys suggest real term premia accounts for most of the move.
- Term premia has risen from historically low levels; increasing treasury supply likely contributed to the repricing.
- While technical factors may have amplified the moves, they likely did not play a major role.
- Looking ahead, continued normalization in term premia and increases in neutral rate expectations could drive higher yields; in contrast, a material growth slowdown would lead to lower yields.

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## **Overview of yield curve changes since start of Q3**

- From the start of the third quarter to October 20<sup>th</sup>, Treasury yields rose between 20 bps and 124 bps across maturities with the yield curve substantially steeper.
- Higher real yields accounted for most of the rise in nominal yields. Breakeven inflation rates have increased moderately for 5y and longer maturities, while only increasing slightly in the front end.





## **Overview of yield curve changes since start of Q3**

- Treasuries cheapened relative to swaps across most maturities, which accounted for 6-10 bps of the yield increases. However, the moves in swap yields and Treasury yields were not significantly different for the purposes of the charge.
- In markets more broadly, risk assets were initially resilient to higher yields but began to show impact in late Q3. Over recent weeks, as yields continued to rise, risk asset levels slipped further.





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## Framework for long-term yields

- The standard decomposition breaks term yields into short-rate expectations and term premia.
- Short-rate expectations can be decomposed further into expectations for the neutral rate and expectations for policy restraint relative to neutral (i.e., the cycle), leaving yields as a function of:
  - Expectations for the Fed policy cycle
  - Expectations for the long-run neutral nominal rate (i.e., r\* + inflation expectations)
  - Term premia
- Technical factors like liquidity, positioning, and convexity flows can lead to short-run deviations from fundamentals.
- In terms of underlying drivers for each of the components:
  - Fed policy cycle driven by expectations for inflation, the labor market, and the Fed's reaction function.
  - Neutral rate related to expectations for structural factors (e.g., productivity, demographic shifts), but views on neutral should be informed by how the economy responds to delivered Fed tightening.
  - Term premia in theory related to factors such as inflation/nominal short-rate uncertainty, the correlation of bonds with risk assets, changes in net supply to private price-sensitive investors, and cyclical factors. However, anything unrelated to short-rate expectations that shifts bond demand should flow through to term premia.

## **Decomposing yields in practice**

- Each of these fundamental components in the Framework for long-term yields is unobservable and so decomposing yields requires a term structure model or survey data on expectations.
- Both models and surveys suggest that since the start of Q3 the bulk of the yield move has been in term premia (relevant surveys are only available through mid-September), but they differ in degree and in the current levels of term premia (TP).
- Because breakeven inflation rates were little changed, the TP move seems likely to have been in real TP.



the chart employs the 10y yield change between Jun 5 and Sep 11 for SPD/SMP. The model decomps use 5y5y short-rate expectations as the expected long-run rate.



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## Fed policy cycle: Resilient data led investors to price out 2024-2025 rate cuts; the Fed also upgraded its forecasts









## Fed policy cycle: Shifts in Fed expectations have had only limited passthrough into longer-term yields

- Most of the increase in 2y yields in Q3 occurred around economic data releases, while less than 20% of the increases in 10y to 30y yield occurred in those windows.
- This is consistent with front-end yields being driven by the economic outlook and near-term Fed policy expectations and limited pass-through into longer-term yields.



Contributions of data releases to Q3 yield moves

Economic releases include: Employment situation reports, CPI, PPI, PCE, GDP, ISM manufacturing index, retail sales, durable goods, ADP employment report, unemployment, industrial production.

## r\* expectations: Higher than pre-Covid with further potential increases in Q3



- Various ways of estimating r\* suggest it has risen since pre-Covid.
- Available measures suggest r\* also increased over recent months, though as noted earlier the shift in expectations for r\* measured by models and surveys was modest.
- Uncertainty around r\* may have also increased, which would be reflected in higher term premia.

## Term premia started Q3 at levels that looked depressed versus both history and fundamentals

- Term premia had fallen to very depressed levels as measured relative to several traditional model-based factors including inflation uncertainty, interest rate volatility, and bond-equity correlations.
- It is likely that some powerful and entrenched factors helped drive term premia to very low levels pre-Covid. More recently, however, newly-formed factors may have helped catalyze term premia's recovery.







yield correlation



## Factor that may have been pressuring term premia lower: QE was (obviously) bond buying



The definition of price-sensitive investors for this charge includes all parties except for domestic central banks, insurance companies and pension funds, and the foreign official sector.

- The share of G4 sovereign bonds held by private, price-sensitive investors fell between 2010 and 2022 from 55% to 40%, primarily due to QE. This is true in the US and other advanced economies.
- This dynamic reversed in 2022 with a sharp pivot from QE to QT in the U.S.
- Since then, price-sensitive investors have increasingly set the clearing level for Treasuries.
- The smooth transmission of ON RRP balances into banks over the past year, along with improved prospects of a soft-landing, suggest that Fed balance sheet runoff could go on for longer, a sentiment echoed by Chair Powell in the July post-meeting press conference. A longer period of runoff increases the amount of privately-held borrowing by the Treasury.
# Factor that may have been pressuring term premia lower: Money market reform and near-zero yields resulted in longer-duration bond buying



- Over 2010-2020, savers chose bank deposits over money market funds, likely due to two factors: (a) yields near zero disincentivized the time and effort to switch, and (b) increased regulation of money market funds reduced their attractiveness.
- Banks hold longer-duration assets against bank deposits than money market funds hold against their cash. Savers choosing banks over money market funds likely caused more bond buying than if savers had allocated to money market funds.
- That dynamic changed starting post-Covid as (a) non-zero yields caused a significant difference in expected returns on money market funds and bank deposits, and (b) the cost of regulatory changes had largely been internalized by money market fund users. Money market demand for UST has increased recently also perhaps due to recent Tbill cheapening.
- Relative to the pre-2010 trend, this could have resulted in banks buying additional Treasuries against \$1-2trn of excess deposits instead of \$1-2trn in money market fund buying of repo or short-dated assets.

# Factor that may have been pressuring term premia lower: Competitive pressures and regulation on pension funds caused bond buying



- Some combination of plan constituent changes, competitive pressures and regulation caused defined benefit (DB) pensions to hold more bonds and less stocks.
  - Defined benefit plans had moved from 60/40 (in favor of stocks) to 50/50.
  - This shift is estimated to have caused pensions to own \$540bn more bonds than implied by the 60/40 static weighting.
  - Looking at the time series, we see that dynamic may have slowed already.

## New factor pressuring term premia higher: Banks reducing bonds and shortening the average life of holdings





Change in bank debt securities holdings (QoQ)

- After a period of increased investment, banks have been shrinking their portfolio of Treasuries and MBS since the start of Fed rate hikes. ٠
- Banks have reduced their MBS holdings, which have longer average life, at a faster pace than their Treasury holdings, suggesting shedding of duration. ٠
- Anecdotally, banks are shortening the average maturity of their securities after scrutiny on unrealized losses especially exacerbated by bank failures in March ٠ 2023.

# New factor pressuring term premia higher: International investor holdings declining as a share of USTs outstanding



- Sponsorship by the foreign official sector has not kept pace with the growth of the Treasury market over the last decade.
- This may be driven by diversification concerns as well as relative value considerations.
- For Japanese private-sector investors, several headwinds may create persistent weak demand for Treasuries:
  - JGB yields are becoming more attractive with the BOJ's likely exit from YCC, reducing the need for Japanese investors to invest abroad.
  - A strong dollar deters Japanese investors from buying USD assets.
  - For investors who own assets on a hedged basis (such as lifers), hedging costs have risen above absolute yields, thus making hedged-Treasuries a negative returning asset.

# New factor pressuring term premia higher: Households (including hedge funds) increasingly set the marginal price for Treasuries since QT



- Based on data through Q2, real money investors have either been net sellers or buyers of a relatively small portion of Treasury supply over the four quarters through Q2, leaving the bulk of new supply to non-traditional investors.
- The household sector, a category that includes domestic hedge funds, accounted for 70% of the private net supply in H2 2022 and H1 2023.
- While some of the household sector's positions reflect bond-futures basis positions, the residual non-basis positions indicate that a combination of both actual households and hedge funds are the marginal buyer of Treasuries.

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# Large and ongoing deficits have fed expectations of significant supply increases



- The US fiscal deficit is at the top end of its range outside of recession / periods of high unemployment.
- A very high deficit despite a strong economy puts focus on government borrowing.

# Yields rose following Treasury borrowing estimate and supply announcements during Q3



- In August, the Treasury announced larger-than-expected borrowing estimates and sizable coupon issuance increases across maturities.
- 10y yields rose sharply after each announcement. The immediate increase following the auction size announcement was bigger, despite changes that were largely in line with primary dealer expectations and TBAC recommendations.
- The Fitch rating downgrade on August 1st may have added to overall negative sentiment, but yields did not move notably on the announcement.

## **Coupon auction sizes are increasing, creating more supply pressure for next** year



- Since June 1, the Treasury has issued \$1.5 trillion in T-bills to meet its borrowing needs, including to rebuild the TGA from a very low level.
- As of the end of September, bill's share of marketable debt was 20.4%, above the TBAC's recommended range of 15-20%.
  - Bills are projected to remain above 20% until Q2 2025 under reasonable assumptions.
  - However, TBAC has indicated that it is comfortable with bills exceeding that range for some time.
- In August, the Treasury stated that "further gradual increases [to coupon auction sizes] will likely be necessary in future quarters".
- If Treasury were to keep the same pattern of increases announced in August for the next two quarters, auction sizes in most benchmark tenors would rise to a new record high. This would lift the duration of Treasury supply substantially higher next year as well.



# Narrowing swap spreads may again indicate supply/demand imbalance from increased Treasury issuance



- Long-dated swap spreads correlated highly with deficits pre-2008: long-dated spreads narrowed (Treasuries cheapened to swaps) as deficits went up.
- That correlation broke down from 2008-2021, perhaps due to factors discussed over the previous slides.
- While it is early to judge, the correlation may be returning; swap spread-narrowing in Q3, while relatively small, indicates deficits could be having a market impact. This narrowing overwhelmed any widening pressures that may have come from mortgage duration extension. It bears watching to see if the correlation continues to hold as it did pre-2008.

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# Market liquidity has generally been good, supporting the view that the yield rise was more driven by fundamental repricing



• Since the start of Q3, Treasury spline errors have declined, order book depth has improved, and bid-ask spreads for on-the-run Treasuries have remained stable.



# CTA position changes may have amplified the market sell off, mortgage related convexity hedging was not a primary driver



- Momentum strategies (CTAs) shortened their duration beta to the lowest level in Q3 as rates began to rise. Their position changes may have added to the market sell-off.
- Mortgage duration (Bloomberg MBS Index) extended from 6.07 years at the end of June to 6.48 years on October 20, raising the specter of convexity hedging. However, relative to prior history, this extension is modest.

# Treasury basis trade possibly counteracted some of the cheapening pressure on Treasuries



#### Indicators of Treasury Basis Positions

- The Treasury cash-futures basis trade creates demand for cash Treasuries as relative value market participants sell futures and buy bonds. In doing so, they facilitate asset managers adding duration exposure via futures.
- The ongoing attractiveness of the basis trade and market data such as leveraged fund futures short positions suggest there are growing volumes of Treasury duration being held off balance sheet in futures.
- With hedge funds willingly providing liquidity to the buyers of futures, the functioning of the basis market may have helped counteract some of the cheapening pressure on Treasuries.

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# How do we square the substantial rise in yields with an apparently moderate-size shift in supply expectations?

- We have seen similar dynamics previously where the market moved significantly on information that was seemingly wellknown and led to only modest adjustments in underlying fundamental expectations.
- The 2013 taper tantrum may be the most apt comparison. Chair Bernanke's remarks in May 2013 that the pace of Fed
  purchases could at some point slow catalyzed a sharp rise in longer-term rates (the 5y5y rate was up more than 100 bps
  between April and July), while the NY Fed's surveys showed little contemporaneous shift in expectations for the fed funds rate
  or SOMA holdings.





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## **Yield outlook: Expectations components**

- The framework helps to dimension potential moves in yields from here; while directional statements on the outlook are straightforward, magnitudes are highly uncertain.
- Fed policy cycle expectations
  - A shift to fully price the median SEP dots through 2025 could, all else equal, boost the 10y yield roughly 10 bps. A further shift up in near-term policy rate expectations should also in itself have a limited direct effect on long-term yields.
  - On the other hand, a mild recession would boost expectations for earlier Fed rate cuts, lowering yields.
- Long-run neutral expectations
  - It's difficult to gauge current neutral rate expectations. The SEP and surveys place it at 2.5% (nominal); term structure models put it much higher at around 4.4%.
  - An increase in neutral expectations from here should in theory passthrough close to 1:1 to the 10y.
  - Uncertainty around r\* may be an important factor for TP.



Note: For SPD/SMP uses expectations for the longer-run fed funds rate. For models uses the expectations component of the 5y5y rate.

## Yield outlook: Term premia

- Models similar to those used in early empirical work on LSAPs\* find significant supply effects when estimated on data through the mid-2010s. Some specifications imply 10y TP should be as much as 150 bps above current levels.
- However, estimates on samples extending to 2020 find smaller supply effects; many still forecast that TP should be higher but by more moderate amounts.
- It is possible the models omit significant factors correlated with supply post-2014, producing downwardly-biased estimates of supply effects; some of those factors were reviewed above.
- The outlook for TP depends both on the magnitude of supply effects and the importance of other factors and whether their effects depressing TP are fading.
- One potentially conservative benchmark might be that term premia return to pre-2014 averages. That would imply an increase in KW and ACM 10y TP of roughly 55-110 bps from current levels.



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### Conclusion

- Treasury yields have risen sharply since the start of Q3, particularly in longer maturities. The Fed hiked policy rates as expected over the period and the market took out some cuts priced by 2025.
- However, models and surveys suggest that most of the yield increase was due to an increase in term premia.
- Term premia entered the quarter at historically low levels, although those historically low levels had persisted for many years. We argue that several of the fundamental factors which may have led to depressed term premia have abated (QE, pension fund asset reallocation, caps on money market fund assets) and new factors have emerged (decreasing fraction of UST supply going to overseas holders, banks shortening duration, households taking largest portion of UST issuance).
- We believe the term premia repricing may have been prompted by the market acceptance of increasing UST coupon supply.
- While technical factors may have amplified the moves, they likely did not play a major role.
- Some metrics suggest term premia have space to increase further.

## **Outlook for demand for US Treasuries**

October 2023

Please discuss:

- 1 The Committee's views on how structural demand for Treasury securities will evolve in the near- and medium-term across different products and tenors.
- 2 What factors (e.g., the economic and monetary policy outlook) should Treasury consider when evaluating domestic and foreign demand from different investor classes over the next one to two years?
- 3 How should these views inform Treasury's future issuance decisions?

### **Executive Summary**

1

#### How will structural demand for Treasury securities evolve in the near- and medium-term across different products and tenors?

- In recent years, demand base for U.S. Treasuries has shifted toward more price sensitive investors
- While some of these shifts are cyclical in nature, there may also be structural factors at play
- Over the medium term, demand from mutual funds, pension funds, and money market funds is likely to increase, while that from banks and foreign investors may continue to face headwinds
- Despite shifts in demand, Treasury auctions continue to be well subscribed average auction tails have not risen, even as volatility of tails has increased in line with market volatility
- 2 What factors (e.g., the economic and monetary policy outlook) should the Treasury consider when evaluating domestic and foreign demand from different investor classes over the next one to two years?
  - Global macroeconomic outlook: A recession would likely result in increased demand from most investor bases. However, a softlanding scenario may result in a continuation of current demand patterns
  - Assessment of structural nature of higher term premium: Term premium has recently risen, driven by multiple factors including borrowing needs of ~5%+ of GDP. A structurally higher term premium might result in recent trends persisting and demand not reverting to pre-pandemic proportions
  - Synchronization of global monetary policy: Global economies have had varied responses to synchronous tightening in monetary policy, with the US economy remaining resilient. Subsequent asynchronous global monetary policy changes are likely to have implications for the demand base through FX and global portfolio allocation channels

#### How should these views inform Treasury's future issuance decisions?

- Recommend increasing flexibility of issuance strategy in light of a shifting demand base and higher term premium. Specifically:
  - Increase 2y, 5y, and 10y auction sizes greater than pro rata to skew issuance toward tenors less impacted by the rise in term premium and those that benefit from greater liquidity premium
  - o Increase TIPs issuance, especially in intermediate maturities, to reflect positive inflation risk premium
- Recommendations for further study:
  - Evaluate patterns of inflows into MMFs, and other T-bills investor bases, under various economic scenarios, and analyze their allocation decisions into T-bills to inform optimal decision making around medium-term divergence from long-term T-bills band
  - Reassess how nimbly, and within what range, should the committee recommend the Treasury change the medium term expected interest cost to roll-over risk trade-off
  - Reevaluate the products and processes, presented in the TBAC charge "Potential Innovations in Treasury Products and Tools" January 2019, to attract new and existing investors



# How will structural demand for Treasuries evolve in near and medium term?

### Increase in supply in H1'23 was absorbed by a broad cross-section of private sector demand

Private investors have absorbed a significant increase in net supply in a rising rate environment



## Trends in demand for Treasuries show evolution toward more price sensitive investors

	Change in marketable Treasuries out, ex-Fed, \$B	Households	Banks	Insurance	Private Pension	MMF	Mutual Funds, ETF	Foreign	Others <sup>1</sup>
H1 2023	1,281	53%	-6%	2%	11% 🕇	14%	↑ 5%↑	24%	-3%
2022	1,394	45%	2%	-1%	-3%	-33%	-8%	-18%	118%
Previous easing (Q1 2019-21)	4,166	-13%	20%	0%	3%	20%	13%	32%	25%
2015-2018 hike	3,136	18%	14%	2%	9%	16%	14%	5%	22%
Q1 2009-Q4 2018	7,947	13%	11%	2%	6%	4%	14%	38%	12%
Q2'23 holdings, out, ex-Fed	20,070	11%	9%	2%	5%	6%	9%	38%	19%

Source: Federal Reserve, Macrobond

- 1) Others category includes non-financial corporates, State and Local government ex-SLGS, GSE and statistical discrepancy
- 2) "Households" category includes domestic hedge funds and personal trusts

- Over the previous four quarters, marketable debt outstanding, adjusted for Federal Reserve holdings, increased by more than \$2trillion, ~3x the average in the prior decade
- Private investors have absorbed this supply in an environment of considerable macroeconomic uncertainty and sharply rising interest rates
  - Demand base has shifted toward more price sensitive buyers with "households"<sup>2</sup> absorbing more than half of the net increase in outstanding
  - Relative to 2022, demand for US Treasuries became more broad-based in H1'23. Pension funds, money market funds, mutual funds and foreign investors all absorbed a greater share
  - Banks displayed reduced demand changing regulatory environment and risk management decisions likely played a role
- Importantly, CBO and consensus forecasts over the medium term are for net supply of US Treasuries to remain at these relatively high levels

### Demand base has shifted toward more price sensitive buyers

Household demand correlates with levered fund net notional position



Source: CFTC, BNP Paribas, presenter's calculation

## The Fed displaces more price sensitive investors during QE. The latter increase their holdings in QT episodes



- In recent years, Treasuries held by households have risen
- Since 2021, household holdings of Treasuries have increased by \$1.7T – amounting to ~50% of the total increase in marketable debt outstanding, ex Fed
  - Households averaged 18% of total increase in marketable debt outstanding in the previous 2015-2018 hiking cycle and 13% from 2009-2018 overall
- The increase by household investors correlates with buildup of levered net short notional positions, concentrated in the TU contract. This suggests that the increase in household positions are partially attributable to basis trades by levered (and more price sensitive) investors
- Increased household demand, together with the Fed not rolling over maturing securities, and lower demand from official foreign investors, indicates that the demand base may have shifted toward more price sensitive investors, contributing to a rise in term premium

### While banks' securities portfolios have shrunk, their allocation to Treasuries has increased



Treasuries are a greater allocation within banks' securities portfolio...

## ...even as securities, as % of assets, have declined (as is typical in hiking cycles)



- Treasuries outstanding grew by \$1.3T ex Fed, In H1'23, however, those held by banks declined by ~\$100B
- Weakened bank demand is likely driven by:
  - <u>Slowing asset growth</u>: Total assets of commercial banks were largely unchanged over the past year compared with ~2.5% in the previous hiking cycle
  - <u>Shrinking securities portfolio</u>: With sharp rise in interest rates and underperformance of MBS assets, banks actively shrunk their securities portfolio as a percentage of their assets -- This pattern is typical in hiking cycles
- Even as securities share of assets has shrunk, allocation to Treasuries within the securities portfolio has increased, from 20% in 2017 to 30% currently

#### **Outlook for demand**

- Banks may continue to reduce allocation to securities. However, Basel 3 Endgame may encourage switches out of GSE MBS into UST/GNMA, due to differing capital treatment
- Table below outlines the potential sensitivity of these trends on Treasuries demand

Asset Growth, yoy	Securities, % of assets	Treasuries, % of securities	Additional demand, \$B
0.0%	22%	30%	\$0
1.5%	21%	33%	\$100
3.0%	21%	35%	\$220
1.5%	23%	35%	\$350

Assumes changes in asset growth, declining share of securities as a portion on assets (in line with prior hiking cycles), and continued growth in allocation of Treasuries holdings within securities portfolios by banks

Source: Federal Reserve

**Recent trends** 

### Recent T-bills cheapening vs OIS has made them attractive to money market funds

Amid the sharpest hiking cycle in decades, inflows into Government MMFs have surged



Source: ICI, Macrobond

## Allocation to T-bills in government MMFs has increased recently, with further room to rise



#### **Recent trends**

- Demand for US Treasuries from money market funds has increased this year, driven by an increase in inflows and Treasuries valuations cheapening relative to OIS
- Government and prime MMF assets have increased ~\$700B and ~\$250B YTD
  - Government MMF holdings of Treasuries increased \$160B in H1'23, and have increased an additional \$300B as T-bill issuance ramped up post Q2 debt ceiling crisis
- For much of 2021-22, MMFs substituted T-bills with Treasury repo. The recent buying of T-bills has not come entirely at the expense of Treasury repo and reflects allocation of incoming capital into T-bills

#### Outlook for demand

- T-bills allocation in government MMFs averaged 30% -40% from 2013 to 2019, increased to ~60% in the pandemic, subsequently declined to 20% amid rich valuations, and is now back to 30% with potential to rise
- With investors attracted by high T-bill yields relative to longer end of the Treasury curve, inflows into MMFs are likely to remain strong
  - A 5% annual increase in MMF assets and an increase in allocation to T-bills to 35% translates to ~\$150B in new annual demand for T-bills
- Recent changes adopted by the SEC to increase the minimum liquidity requirements for MMFs may be a marginal<sup>1</sup> tailwind for T-bills demand

### Foreign investors reversed the 2022 trend, but official demand likely faces structural headwinds

As is typical in hiking cycles, higher FX hedging costs lower the hedged Treasury yields to foreign currency funded buyers



## Foreign demand is absorbing a smaller proportion of net issuance in recent years than was true previously



#### Recent trends

- Increase in foreign investor Treasury holdings accounted for ~25% of the increase in total outstanding in H1
- This was notable for two reasons:
  - 1. The increase represented a turnaround from 2022 when foreign investors were net sellers
  - 2. The increase represented was despite prohibitively expensive costs of hedging FX risk, suggesting some of the purchases might not be FX hedged and potentially includes purchases by offshore HFs in basis trades or otherwise
- Flows from Japanese investors in 2023 are on pace to be one of the strongest year since 2013, despite yields of US Treasuries looking significantly lower than those of JGBs on a partially hedged basis

#### **Outlook for demand**

- As the end of the current hiking cycle comes into view, the headwinds from high hedging costs will diminish and may drive greater demand for US Treasuries
  - In the previous hiking cycle, foreign investors accounted for ~5% of the increase in Treasuries outstanding before increasing to ~30% when the cycle ended
- Despite this potential cyclical boost, foreign demand for Treasuries may face structural challenges due to reduced pace of international FX reserve growth
  - Foreign demand, on a structural basis, appears to have settled at a level lower, as a percentage of outstanding, than in 2009-15
  - Foreign investors are unlikely to absorb ~50% of issuance as they did in that period

### Mutual fund demand to largely reflect AUM growth and index composition

Bond mutual funds tend to experience outflows in hiking cycles. Flows tend to pickup once the cycle ends



Source: ICI, Macrobolid

## Mutual funds<sup>1</sup> have allocated more to Treasuries, in line with increase in the share of Treasuries in US Agg index



Source: Bloomberg

#### **Recent trends**

- Mutual fund demand for Treasuries was tepid in 2023, accounting for 5% (down from 12-15% historically) of the increase in marketable debt outstanding, ex-Fed
- The soft demand is in line with expectations given the negative net new cash flows in bond funds in 2022 and in the first half of 2023
- Lower demand is likely a function of negative investment returns in fixed income and the lack of correlation benefit to risk assets that Treasuries provided during the sharpest hiking cycle in decades

#### **Outlook for demand**

- Near-term flows will continue to be dictated by economic scenarios. Historically, bond funds experience outflows during hiking cycles and inflows subsequently
- Structurally, share of Treasuries outstanding held by mutual funds has risen steadily over the past 20 years, reflecting the increasing weight of Treasuries in the benchmark indices
  - Currently, Treasuries are ~41% of the index this could rise to ~43% by 2025
  - ~\$3.5T<sup>2</sup> (\$4.8T including categories that invest in international sectors) in assets in active and passive taxable bond funds and ETFs are benchmarked to the US Aggregate index or its subcomponents
  - Together, a 1% increase in weight of Treasuries in the index could represent an additional demand of ~\$40bn

### Treasury auctions have been well subscribed and have performed adequately

Auction performance has remained strong at the front end. Volatility of tails has gone up



## Auction tails have worsened a little at the 10y sector but likely reflects a typical lack of auction concession in this sector



#### Auction performance

- Despite evolving demand base over the past two years, Treasury auctions have performed well with respect to the WI yields
- While the volatility of auction results has increased, the average "tail" at auctions has not. The increased volatility of auction tails is in line with the increase in yield volatility since 2021
- The exception to this pattern is 10y auctions but given the 10y's status as the bellwether point on the curve, it perhaps has different auction dynamics than other points on the curve
- In longer tenor auctions such as 20y and 30y, where auctions provide a more critical liquidity point for investors, tails have not shown an increase
- With more price sensitive investors becoming a larger share of the demand base, cheapening of Treasuries ahead of the supply and subsequent richening post auctions has become more prominent, but unevenly across different tenors



# What factors should Treasury consider when evaluating domestic and foreign demand?

### Factor 1: Evolution of global macroeconomic outlook Large deficits have magnified the effects of a changed demand base

Current fiscal deficits are procyclical in nature and CBO projects them to remain high over the medium term



## Consensus growth forecasts have continued to trend down, suggesting the possibility of higher deficits



Cyclical and structural factors have contributed to the shifting demand base to more price sensitive investors:

#### **Cyclical**

 Private investors have absorbed supply in an environment of considerable economic uncertainty and sharply rising interest rates. These factors are likely to moderate over the medium term

#### **Structural**

- Deficits have historically moved in line with unemployment rate. However, recent fiscal policy has led to a divergence between deficits and unemployment. Deficits are structurally higher across economic scenarios, and could go higher in the event of a recession
  - Under baseline CBO projections of 1.8%, 2.7% and 2.4% real GDP growth over the next 3 years, deficits are likely to exceed 5% of GDP.
  - An economic contraction next year may further raise deficits as deficits typically rise 2-5% of GDP in recessions
- Decreasing securities allocation as percentage of bank assets and declining share of holdings by foreign investors are likely structural in nature

### Factor 1: Evolution of global macroeconomic outlook Demand base is likely to evolve differently in different macroeconomic outlooks

Demand profile varies according to macroeconomic scenarios. Due to structural reasons, current profile might evolve differently



## Money market funds experience strong inflows in recessionary environments, driving increased demand for T-bills



Evaluation the demand base across macroeconomic and monetary policy scenarios can be instructive:

#### Should a recession occur:

- The demand base broadens as Treasuries act as a flight to quality asset class, with diversifying properties for domestic and global portfolios
- MMFs experience strongly positive net new cash flow around / preceding the start of a recession, as investors seek capital preservation
- Comparison of the MMF fund flows to those of bond funds show a strong preference for MMFs in recessionary environments
- During monetary policy easing, banks tend to increase their allocations to securities overall, and increase Treasuries as a percentage of securities held

## Should a soft landing or "higher for longer" scenario be realized:

- A greater share of the borrowing needs may have to be financed domestically than historically
- Macroeconomic stability and higher return expectations are needed to drive inflows into mutual funds. In this environment, mutual funds may absorb a greater share of Treasuries than today
- Household investors are also likely to maintain a greater share of demand in this environment

### Factor 2: Assessment of structural nature of higher term premium: Several factors have driven term premium higher and may not revert equally

Macroeconomic data has been volatile, contributing to the rise in term premium



Source: Bloomberg, calculations

## Rising term premium is evident in divergence between 5y5y nominal rate and Fed expectations over the next year



• Large borrowing needs have been a key driver of the rise in term premium. However, several other factors have also contributed. These factors may revert only to varying degrees over the medium term

#### **Drivers of higher term premium**

- Macroeconomic volatility:
  - Three years after the pandemic, macroeconomic data continues to be volatile. Surprise indices however are far less volatile now, indicating that forecasters have adjusted to the higher macroeconomic volatility, and it is reflected in term premium
  - Macroeconomic data volatility is likely to subside over the medium term
- Global monetary policy
  - Over the past year, 5y5y nominal Treasury yields moved with expected near-term Fed tightening
  - However, over the past quarter longer term rates including 5y5y have risen, likely due to increased issuance expectations, changes in BOJ's Yield Curve Control (YCC) policy, and other factors.
     While the former is a structural driver of term premium, the latter may prove to be more cyclical

Source: Bloomberg

### Factor 2: Assessment of structural nature of higher term premium



## Less negative correlation between Treasuries and risk assets has contributed to rise in term premium

#### Foreign investor share of holdings are now lower than in 2015



#### Drivers of higher term premium (continued)

#### Treasury risk asset correlation

- Correlation of Treasuries and equities returns has become positive over the past year; a departure from patterns since the 2000s
- This has reduced the diversification benefit of Treasuries in portfolio construction and contributed to a rise in term premium

#### Lower foreign participation

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- Despite stronger demand in 2023 YTD, foreign demand may face structural headwinds
- Global FX reserves growth has stalled and the globalization trends of past three decades face realignment
- These changes have led to lower official foreign demand for Treasuries relative to the increases in issuance; which may be secular
- Foreign investors now hold ~20% of T-bills outstanding ex-Fed, compared with ~50% in 2015. Growth in foreign demand for coupon Treasuries has also not kept up with the pace of issuance, reducing the share held by foreigners
- It is unlikely that foreign investors maintain 35%-50% of demand like in the previous decade. A greater proportion of issuance is likely to be domestically financed
## Factor 3: Potential asynchronous easing of global monetary policy: While global monetary hikes were synchronous, subsequent policy changes might not be

US economic resilience might make the Fed more patient in normalizing policy



Source: Vanguard, BEA, Eurostat and CEIC, as of 2Q 2023

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## Progress on taming inflation in the U.S. and Euro area has been slow, but China has faced the opposite problem<sup>1</sup>



Sources: Vanguard calculations using data from the U.S. Bureau of Labor Statistics, Eurostat, PBOC

- While global central banks were largely synchronous in tightening policy, economic outlooks have meaningfully diverged
- On the growth front, US growth has been more resilient than that in Euro area and China, with real GDP in the US reaching to pre-pandemic trend
- US has also made greater progress on taming inflation relative to the Euro area

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- These factors may lead to asynchronous policy changes, with the Fed having the capacity to be more patient, which could alter Treasury demand profile
- In this scenario, investors might find non-US debt relatively more attractive from a total return perspective
- Relatively higher short rates in the US than in foreign currency would make FX hedging more expensive for foreign investors



# How should these views inform future issuance decisions?

## **Recommendations for near term debt issuance**

We recommend tilting issuance toward tenors less impacted by the rise in term premium and those with greater liquidity premium



#### There is room to increase TIPS ex-T-bills marketable debt outstanding



#### **Recommendations**

- Given the analysis of the evolving demand base shifting toward more price sensitive investors and rising term premium, we recommend greater flexibility and variation in issuance profile, within the construct of regular and predictable issuance to increase responsiveness to shifting demand
- Specifically:
- Increase auction sizes greater than pro-rata for issues less impacted by the rise in term premium (e.g., 2Y, 5Y), and issues that benefit from greater liquidity (e.g., 10Y)
- Positive inflation risk premium, which may persist, makes TIPS cheaper to issue ex-ante
  - There is room to increase TIPS universe, as a percentage of outstanding (currently less than 10%), with a focus on intermediate issuance
    - As was noted in the Q2 2023 TBAC charge 'TIPS Issuance, Demand, and Level of Supply', demand for TIPS remains structurally strong and demand for shorter duration TIPS has increased considerably over the past decade
    - While demand slowed cyclically in 2022, flows into the largest two TIPS ETFs show stabilization over the past six months, likely as the end of the hiking cycle comes into view

### **Recommendations for further study**



#### Interest rate expense, as % of GDP, is likely to rise over the medium term





#### **Recommendations**

- While the long-term guidance of T-bills outstanding at 15-20% of total, and recent deviations to maintain regular and predictable approach to coupon issuance, are appropriate, we recommend the committee explore if more meaningful deviations are necessary
  - The analysis should evaluate patterns of inflows into MMFs, and other T-bills investor bases, under various economic scenarios, and their allocation decisions into T-bills -- This analysis could inform optimal decision making for the flexibility of the Tbills band
- Consider additional responsiveness of issuance strategy to key metrics such as interest rate expense, as % of GDP, and a reexamination of the optimal tradeoff between cost to tax-payer and rollover risk management
  - Specifically, we recommend evaluating the tradeoffs between reduced interest expense vs. higher debt funding cost volatility
- We recommend evaluating the suitability of new inflation related products, such as front-end TIPS, for investors who may view increased volatility of this product to be attractive from a risk / reward perspective

## Conclusions

- Composition of demand for US Treasuries has shifted toward more price sensitive investors over the past two years, contributing to a rise in term premium
- Borrowing needs, which are expected to be structurally higher across economic scenarios and could go higher still if there is a recession, have magnified the effects of a changed demand base
- Demand base evolution is a function of economic scenarios. A recession would likely result in increased demand from most key investor bases. However, a soft-landing scenario might result in a continuation of current demand patterns. Subsequent asynchronous monetary policy actions could also shape demand landscape
- In light of these conclusions, we recommend:
  - The Treasury consider tilting issuance toward tenors less impacted by the rise in term premium and those that benefit from greater liquidity premium, including TIPS (especially in intermediate maturities)
  - The committee maintain the long-term guidance that T-bills make up 15-20% of outstanding but support meaningful deviation in the medium term
  - A further study into how nimbly, and within what range, should the committee recommend the Treasury change the medium term expected interest cost to roll-over risk ratio
  - The committee conduct further analysis into new products and processes, such as those presented in the January 2019 TBAC charge "Potential Innovations in Treasury Products and Tools", to further appeal to the needs of both new and existing investors