## Treasury Presentation to TBAC

## Office of Debt Management



Fiscal Year 2023 Q3 Report

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## Section I:

## Executive Summary

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

## Receipts and Outlays through Q3 FY2023

|  | \$ billions | Change from same <br> period last year (\$ bn) | Change from same <br> period last year $(\%)$ | As \% of <br> GDP | Change from same <br> period last year <br> $(G D P ~ \%)$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Total Receipts thru Q3 FY2023 | $\$ 3,413$ | $-\$ 423$ | $-11 \%$ | $17.1 \%$ | $-3.3 \%$ |
| Total Outlays thru Q3 FY2023 | $\$ 4,805$ | $+\$ 455$ | $+10 \%$ | $24.1 \%$ | $0.9 \%$ |

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

| Treasury OFP Near Term Fiscal <br> Projections | Net Privately Held Marketable <br> Borrowing (\$ billion) | Assumed End-of-Quarter <br> Cash Balance (\$ billion) |
| :---: | :---: | :---: |
| Q4 FY2023 | 1,007 | 650 (Sep) |
| Q1 FY2024 | 852 | 750 (Dec) |

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

| Fiscal Year | Primary Dealers Median July 2023 <br> (\$ billion) | OMB budget, March 2023 (\$ billion) | CBO Budget, February 2023 (\$ billion) |
| :---: | :---: | :---: | :---: |
| 2023 | 2,440 | 2,378 | 2,193 |
| 2024 | 2,078 | 2,324 | 2,105 |
| 2025 | 1,750 | 1,809 | 1,844 |

*All privately-held net marketable borrowing estimates are "normalized" with details from page 18.
Uncertainty regarding funding needs in FY2024 and FY2025 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 July 2023:

- Primary dealers generally expected gradual increases to coupon auction sizes, beginning at the August refunding. In July, dealers boosted their aggregate median estimates for privately-held net marketable borrowing by a cumulative $\$ 770$ billion for the FY23FY25 period, relative to their April estimates.
- Given the forecasted financing gap over FY2023 and beyond, all dealers noted that both bill and coupon auction sizes could be increased to address near term financing gaps. Several dealers expect bills share to temporarily exceed TBAC's recommended 15$20 \%$ range.
- Most dealers expected Treasury to gradually increase TIPS sizes in the upcoming quarters.


## Section II:

Recent Fiscal Results
Receipts, Outlays, and Deficits

## Monthly Receipt Levels

## (12-Month Moving Average)



| Notable Receipt Category | YoY change thru <br> Q3 FY23 (\$ billion) | YoY change thru <br> Q3 FY23 (\%) |  |
| :--- | :---: | :---: | :--- |
| Comments |  |  |  |

Tax receipts for Q4 FY2020 reflect the adjustment of April and June 2020 tax deadlines to July $15^{\text {th }}, 2020$. 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



Cumulative Budget Deficits by Fiscal Year


## Section III:

Various Fiscal Forecasts Primary Dealers, OMB, CBO

## Recent Economic Forecasts

Primary Dealer Median Estimates July 2023

|  | CY2023 | CY2024 | CY2025 |
| :---: | :---: | :---: | :---: |
|  | \% Change from Q4 to Q4 |  |  |
| GDP |  |  |  |
| Real | 1.1 | 0.9 | na |
| Nominal | 4.3 | 3.2 | na |
| Inflation |  |  |  |
| CPI Headline | 3.1 | 2.5 | na |
| CPI Core | 3.9 | 2.7 | na |
|  | Fourth Quarter Levels |  |  |
| Unemployment Rate (\%) | 4.0 | 4.7 | na |
|  | FY2023 | FY2024 | $\underline{F Y 2025}$ |
| Deficits (\$bil) | \$1,550 | \$1,600 | \$1,688 |

CBO Estimates February 2023

|  | CY2023 | CY2024 | CY2025 |
| :---: | :---: | :---: | :---: |
|  | \% Change from Q4 to Q4 |  |  |
| GDP |  |  |  |
| Real | 0.1 | 2.5 | 2.6 |
| Nominal | 3.1 | 4.9 | 4.8 |
| Inflation |  |  |  |
| CPI Headline | 4.0 | 2.4 | 2.1 |
| Unemployment Rate (\%) | Fourth Quarter Levels |  |  |
|  | 5.1 | 4.8 | 4.6 |
|  | $\underline{F Y 2023}$ | FY2024 | $\underline{F Y 2025}$ |
| Deficits (\$bil) | \$1,535 | \$1,501 | \$1,649 |

OMB Estimates March 2023

|  | $\begin{aligned} & \frac{C Y 2023}{\text { \% Change from Q } 4} \frac{\text { CY2024 }}{} \frac{\text { CY2025 }}{} \\ & \hline \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| GDP |  |  |  |
| Real | 0.4 | 2.1 | 2.4 |
| Nominal | 3.2 | 4.3 | 4.6 |
| Inflation |  |  |  |
| CPI Headline | 3.0 | 2.3 | 2.3 |
|  | Fourth Quarter Levels |  |  |
| Unemployment Rate (\%) | 4.6 | 4.5 | 4.4 |
|  | FY2023 | FY2024 | FY2025 |
| Deficits (\$bil) | \$1,570 | \$1,847 | \$1,672 |

CBO Estimates July 2023


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

## Recent Deficit Forecasts

- Primary dealers increased their deficit estimates in July relative to estimates they provided in April. Their changes reflected a slower economy, possible recession and higher interest costs.
- Dealers generally suggested that risks were asymmetrical 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 <br> Percentile | Primary Dealers <br> (Median) | PD 75th <br> Percentile | Change from Prior <br> Quarter (Median) | OMB | CBO |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| FY2023 | 1,450 | 1,550 | 1,625 | 150 | 1,570 | 1,535 |
| FY2024 | 1,500 | 1,600 | 1,699 |  | 25 | 1,847 |
| FY2025 | 1,650 | 1,688 | 1,800 | 38 | 1,672 | 1,649 |
| As of date | Jul-23 | Jul-23 | Jul-23 |  | Mar-23 | Jun-23 |

- OMB projections are using estimates are from Table S-1 of "Budget of The U.S. Government Fiscal Year 2024," March 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 $6 / 30 / 2023$, 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 July 2023, while using total bills outstanding of $\sim \$ 4.5$ 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 $6 / 30 / 2023$, 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 FY23 Q4


Sources of Privately-Held Financing in FY24 Q1

| October - December 2023 |  |
| :---: | :---: |
| Assuming Constant |  |
| Coupon Issuance Sizes* |  |
| Treasury Announced Net  <br> Marketable Borrowing** 852 <br> Net Coupon Issuance 216 <br> Implied Change in Bills 636${ }^{\text {In }}$ |  |


| Security | July - September 2023 Coupon Issuance |  |  | Fiscal Year-to-Date Coupon Issuance |  |  | Security | October - December 2023 Coupon Issuance |  |  | Fiscal Year-to-Date Coupon Issuance |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Gross | Maturing | Net | Gross | Maturing | Net |  | Gross | Maturing | Net | Gross | Maturing | Net |
| 2-Year FRN | 68 | 80 | (12) | 272 | 314 | (42) | 2-Year FRN | 68 | 76 | (8) | 68 | 76 | (8) |
| 2-Year | 84 | 115 | (31) | 462 | 566 | (104) | 2-Year | 126 | 174 | (48) | 126 | 174 | (48) |
| 3-Year | 120 | 108 | 12 | 480 | 334 | 146 | 3-Year | 120 | 131 | (11) | 120 | 131 | (11) |
| 5-Year | 86 | 43 | 43 | 473 | 209 | 264 | 5-Year | 129 | 73 | 56 | 129 | 73 | 56 |
| 7-Year | 70 | 51 | 19 | 385 | 297 | 88 | 7-Year | 105 | 73 | 32 | 105 | 73 | 32 |
| 10-Year | 99 | 41 | 58 | 396 | 174 | 222 | 10-Year | 99 | 55 | 44 | 99 | 55 | 44 |
| 20-Year | 27 | 0 | 27 | 144 | 0 | 144 | 20-Year | 39 | 0 | 39 | 39 | 0 | 39 |
| 30-Year | 57 | 7 | 50 | 228 | 14 | 214 | 30-Year | 57 | 0 | 57 | 57 | 0 | 57 |
| 5-Year TIPS | 0 | 0 | 0 | 80 | 43 | 37 | 5-Year TIPS | 40 | 0 | 40 | 40 | 0 | 40 |
| 10-Year TIPS | 32 | 49 | (17) | 94 | 98 | (4) | 10-Year TIPS | 15 | 0 | 15 | 15 | 0 | 15 |
| 30-Year TIPS | 8 | 0 | 8 | 17 | 0 | 17 | 30-Year TIPS | 0 | 0 | 0 | 0 | 0 | 0 |
| Coupon Subtotal | 651 | 493 | 158 | 3,031 | 2,048 | 982 | Coupon Subtotal | 798 | 582 | 216 | 798 | 582 | 216 |

* Keeping announced issuance sizes and patterns constant for nominal coupons, TIPS, and FRNs.
** Assumes an end-of-September 2023 and end-of-December 2023 cash balances of $\$ 650$ billion and $\$ 750$ billion respectively versus end-of-June 2023 cash balance of $\$ 402$ billion. Financing Estimates released by the Treasury can be found here: http://www.treasury.gov/resource-center/data-chart-center/quarterlyrefunding/Pages/Latest.aspx


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

FY 2023-2025 Deficits and Privately-Held Net Marketable Borrowing Estimates, in \$ billions

|  | Primary Dealer |  |  | OFP | OMB | CBO |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| FY 2023 Deficit | 25 th | Median | 75 th |  |  |  |
| FY 2024 Deficit | 1,450 | 1,550 | 1,625 |  | 1,570 | 1,535 |
| FY 2025 Deficit | 1,500 | 1,600 | 1,699 |  | 1,847 | 1,501 |
| FY 2023 SOMA Redemption | 1,650 | 1,688 | 1,800 |  | 1,672 | 1,649 |
| FY 2024 SOMA Redemption | 699 | 720 | 720 | 698 |  |  |
| FY 2025 SOMA Redemption | 348 | 451 | 563 |  |  |  |
| FY 2023 Privately-Held Net Marketable Borrowing* | 2,297 | 2,440 | 2,508 | 2,693 | 2,378 | 2,240 |
| FY 2024 Privately-Held Net Marketable Borrowing* | 1,913 | 2,078 | 2,094 |  | 2,324 | 2,002 |
| FY 2025 Privately-Held Net Marketable Borrowing* | 1,613 | 1,750 | 1,831 |  | 1,809 | 1,746 |

- *All privately-held net marketable borrowing estimates of are "normalized" using:
- 1) the median Primary Dealer's estimates for SOMA redemptions, and
- 2) assuming OFP's end of fiscal year 2023 cash balance of $\$ 650$ billion, held constant in out years.
- OMB projections are using estimates are from Table S-1 of "Budget of The U.S. Government Fiscal Year 2024," March 2023.
- 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.
- OFP's SOMA redemption estimate excludes securities maturing on 9/30/2023 (Saturday).


## 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.


## Projected Privately-Held Net Marketable Borrowing

 Assuming Private Coupon Issuance \& Total Bills Outstanding Remain Constant as of 07/31/2023*
*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 "Budget of The U.S. Government Fiscal Year 2024," March 2023. 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 FY23 to FY25 are normalized to privately-held net borrowing after adding PD survey median SOMA redemption assumptions for FY23/24/25. In addition, all privately-held net borrowing estimates are normalized with OFP FY23 ending cash balance of $\$ 650$ billion.

## Section V: Select Portfolio Metrics

Note: Several of the portfolio metric charts that follow include three years of projected metrics.
These projections are hypothetical and are meant for illustrative purposes only. The projections contained in these charts should not be interpreted as representing any future policy decisions regarding Treasury financing.

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

The scenarios are:

1) "Coupons Constant": Treasury maintains coupon, FRN, and TIPS auction sizes constant starting in August 2023 and addresses any changes in financing needs by only increasing or decreasing Tbill auction sizes;
2) "Bills Constant": Treasury maintains T-bills aggregate supply constant at $\$ 4.8$ trillion as of $7 / 31 / 2023$ 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 19\% as of $7 / 31 / 2023$ 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 FY23, FY24, \& FY25 (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

Calendar Year

Projection Bills TIPS $\quad$ FRNs ——Bills Constant Coupons Constant ——Prorated Bills and Coupons

## Treasury Maturity Profile



# Section VI: Select Demand Metrics 

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

Bid-to-Cover Ratios for Treasury Bills


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


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


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


## Bid-to-Cover Ratios for TIPS



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


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

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


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

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


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

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



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

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



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

Direct Bidder Awards at Auction


Competitive Amount Awarded excludes SOMA add-ons.

Total Foreign Awards of Treasuries at Auction, \$ billions


Foreign includes both private sector and official institutions.

Total Foreign Holdings


Source: Treasury International Capital (TIC) System as of May 2023.
For more information on foreign participation data, including more details about the TIC data shown here, please refer to Treasury Presentation to TBAC "Brief Overview of Key Data Sources on Foreign Participation in the U.S. Treasury Securities Market" at the Treasury February 2019 Refunding.

## VII. Appendix

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Quarterly Tax Receipts
The spike for Corporate Taxes was $781 \%$ and the spike for Non-Withheld was $541 \%$ as of 6/30/2021


[^0]Quarterly tax receipts for Q4 FY2020 reflect the adjustment of April and June 2020 tax deadlines to July $15^{\text {th }}, 2020$.

## Treasury Net Nonmarketable Borrowing



$\backsim$ CBO's President Budget (Jun 23) Surplus/Deficit as a \% of GDP (RHS)
*OMB's projections are from OMB's Table S-1 of "Budget of The U.S. Government Fiscal Year 2024," March 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.

## Sources of Privately-Held Financing in FY23 Q3

| April - June 2023 |  |
| ---: | :---: |
| Net Bill Issuance | 410 |
| Net Coupon Issuance | 247 |
| Subtotal: Net Marketable Borrowing | 657 |
| Ending Cash Balance | 402 |
| Beginning Cash Balance | 178 |
| Subtotal: Change in Cash Balance | 225 |
| Net Implied Funding for FY23 Q3* | 432 |


|  | April - June 2023 <br> Bill Issuance <br> Maturing |  |  | Net | Fiscal Year-to-Date |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Security | Gross | Gross | Maturing | Net |  |  |  |
| 4-Week | 665 | 695 | $(30)$ | 2,240 | 2,210 | 30 |  |
| 8-Week | 590 | 695 | $(105)$ | 1,955 | 1,985 | $(30)$ |  |
| 13-Week | 779 | 759 | 20 | 2,258 | 2,169 | 89 |  |
| 17-Week | 515 | 450 | 65 | 1,307 | 648 | 659 |  |
| 26-Week | 681 | 582 | 99 | 1,884 | 1,695 | 189 |  |
| 52-Week | 108 | 102 | 6 | 346 | 340 | 6 |  |
| CMBs |  |  |  |  |  |  |  |
| 6-Week | 145 | 0 | 145 | 145 | 0 | 145 |  |
| CMBs | 445 | 235 | 210 | 813 | 1,038 | $(225)$ |  |
| Bill Subtotal | 3,927 | 3,518 | 410 | 10,947 | 10,084 | 863 |  |


|  | April - June 2023 <br> Coupon Issuance <br> Security |  |  | Gross | Fiscal Year-to-Date <br> Coupon Issuance <br> Maturing |  |  | Net | Gross | Maturing | Net |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2-Year FRN | 68 | 80 | $(12)$ | 204 | 234 | $(30)$ |  |  |  |  |  |
| 2-Year | 126 | 154 | $(28)$ | 378 | 451 | $(74)$ |  |  |  |  |  |
| 3-Year | 120 | 97 | 22 | 360 | 226 | 134 |  |  |  |  |  |
| 5-Year | 129 | 67 | 62 | 387 | 165 | 222 |  |  |  |  |  |
| 7-Year | 105 | 68 | 37 | 315 | 246 | 69 |  |  |  |  |  |
| 10-Year | 99 | 42 | 57 | 297 | 133 | 164 |  |  |  |  |  |
| 20-Year | 39 | 0 | 39 | 117 | 0 | 117 |  |  |  |  |  |
| 30-Year | 57 | 0 | 57 | 171 | 7 | 164 |  |  |  |  |  |
| 5-Year TIPS | 40 | 43 | $(3)$ | 80 | 43 | 37 |  |  |  |  |  |
| 10-Year TIPS | 15 | 0 | 15 | 62 | 50 | 12 |  |  |  |  |  |
| 30-Year TIPS | 0 | 0 | 0 | 9 | 0 | 9 |  |  |  |  |  |
| Coupon Subtotal | 798 | 551 | 247 | 2,380 | 1,555 | 824 |  |  |  |  |  |

*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 <br> 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.

FY 2023-2025 Deficits and Privately-Held Net Marketable Borrowing Estimates, in \$ billions

|  | Primary Dealer |  |  |  | OMB | CBO |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| FY 2023 Deficit | 25th | Median | 75 th | OFP |  |  |
| FY 2024 Deficit | 1,450 | 1,550 | 1,625 |  | 1,570 | 1,535 |
| FY 2025 Deficit | 1,500 | 1,600 | 1,699 |  | 1,847 | 1,501 |
| FY 2023 Change in Cash Balance | 1,650 | 1,688 | 1,800 |  | 1,672 | 1,649 |
| FY 2024 Change in Cash Balance | -36 | -36 | -32 | 14 | 14 | 0 |
| FY 2025 Change in Cash Balance | 0 | 15 | 89 |  | 0 | 0 |
| FY 2023 Total Net Marketable Borrowing | 0 | 15 | 7 |  | 0 | 0 |
| FY 2024 Total Net Marketable Borrowing |  |  |  |  | 1,658 | 1,506 |
| FY 2025 Total Net Marketable Borrowing |  |  |  |  | 1,873 | 1,551 |
| FY 2023 SOMA Redemption |  |  |  |  | 1,809 | 1,746 |
| FY 2024 SOMA Redemption | 348 | 451 | 563 |  |  |  |
| FY 2025 SOMA Redemption | 0 | 0 | 0 |  |  |  |
| FY 2023 Privately-Held Net Marketable Borrowing* | 2,297 | 2,440 | 2,508 | 2,693 | 2,378 | 2,240 |
| FY 2024 Privately-Held Net Marketable Borrowing* | 1,913 | 2,078 | 2,094 |  | 2,324 | 2,002 |
| FY 2025 Privately-Held Net Marketable Borrowing* | 1,613 | 1,750 | 1,831 |  | 1,809 | 1,746 |

- *All privately-held net marketable borrowing estimates of are "normalized" using:
- 1) the median Primary Dealer's estimates for SOMA redemptions, and
- 2) assuming OFP's end of fiscal year 2023 cash balance of $\$ 650$ billion, held constant in out years.
- OMB projections are using estimates are from Table S-1 of "Budget of The U.S. Government Fiscal Year 2024," March 2023.
- 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..
- OFP's SOMA redemption estimate excludes securities maturing on 9/30/2023 (Saturday).

Historical Marketable Treasury DebtService Cost


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

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

## Various Historical Treasury Interest Rate Metrics

Treasury Nominal Yield Curve as of specified dates


Treasury Real Yield Curve as of specified dates


Nominal Yield Changes in Selected Tenors
Through the end of 06/30/23

-100

Real Yield Changes in Selected Tenors
Through the end of $06 / 30 / 23$


Bills-SOFR OIS spreads
Through the end of $06 / 30 / 23$


Breakevens
Through the end of 06/30/23


Source: Bloomberg

## Projected Privately-Held Net Marketable Borrowing Assuming Private Coupon Issuance \& Total Bills Outstanding Remain Constant as of 7/31/2023*

| Fiscal <br> Year | Bills | $2 / 3 / 5$ | $7 / 10 / 20 / 30$ | TIPS | FRN | Historical/Projected <br> Net Borrowing <br> Capacity |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2018 | 438 | 197 | 493 | 45 | 23 | 1,196 |
| 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 | 1,178 | 307 | 668 | 50 | $(42)$ | 2,160 |
| 2024 | 0 | 28 | 682 | 75 | $(10)$ | 776 |
| 2025 | 0 | $(47)$ | 704 | 10 | 0 | 666 |
| 2026 | 0 | $(160)$ | 700 | 28 | 0 | 568 |
| 2027 | 0 | $(40)$ | 583 | 10 | 0 | 553 |
| 2028 | 0 | 0 | 271 | $(12)$ | 0 | 259 |
| 2029 | 0 | 0 | 387 | $(6)$ | 0 | 381 |
| 2030 | 0 | 0 | 507 | 9 | 0 | 516 |
| 2031 | 0 | 0 | 339 | $(3)$ | 0 | 337 |
| 2032 | 0 | 0 | 363 | $(27)$ | 0 | 336 |
| 2033 | 0 | 0 | 384 | $(20)$ | 0 | 364 |

[^1]| Bills |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Issue | Settle Date | Stop Out <br> Rate (\%) | Bid-to- <br> Cover <br> Ratio | Competitive <br> Awards (\$bn) | $\begin{gathered} \text { \% Primary } \\ \text { Dealer } \end{gathered}$ | \% Direct | \% Indirect | Non- <br> Competitive Awards (\$bn) | SOMA "Add Ons" (\$bn) | $\begin{gathered} \text { 10-Year } \\ \text { Equivalent } \\ (\$ b n)^{*} \end{gathered}$ |
| 4-Week | 4/11/2023 | 4.440 | 2.81 | 56.9 | 35.7 | 2.2 | 62.1 | 3.1 | 1.3 | 0.6 |
| 4-Week | 4/18/2023 | 4.030 | 3.08 | 56.8 | 25.2 | 2.5 | 72.3 | 3.3 | 1.4 | 0.6 |
| 4-Week | 4/25/2023 | 3.190 | 3.01 | 47.3 | 27.2 | 1.6 | 71.2 | 2.7 | 1.2 | 0.5 |
| 4-Week | 5/2/2023 | 3.830 | 2.50 | 47.9 | 35.8 | 4.8 | 59.4 | 2.1 | 1.2 | 0.5 |
| 4-Week | 5/9/2023 | 5.840 | 2.51 | 47.8 | 47.9 | 10.0 | 42.1 | 2.2 | 1.2 | 0.5 |
| 4-Week | 5/16/2023 | 5.605 | 3.18 | 30.5 | 51.5 | 5.2 | 43.3 | 4.5 | 1.0 | 0.3 |
| 4-Week | 5/23/2023 | 5.370 | 3.15 | 30.9 | 41.3 | 3.2 | 55.5 | 4.1 | 0.9 | 0.3 |
| 4-Week | 5/30/2023 | 5.750 | 2.79 | 31.7 | 43.4 | 2.6 | 54.0 | 3.3 | 0.8 | 0.3 |
| 4-Week | 6/6/2023 | 5.130 | 2.85 | 32.1 | 52.8 | 3.2 | 44.0 | 2.9 | 0.7 | 0.3 |
| 4-Week | 6/13/2023 | 5.090 | 2.49 | 55.8 | 54.7 | 6.3 | 39.0 | 4.2 | 0.8 | 0.5 |
| 4-Week | 6/20/2023 | 5.010 | 3.03 | 61.3 | 39.6 | 1.8 | 58.6 | 3.7 | 0.8 | 0.6 |
| 4-Week | 6/27/2023 | 5.010 | 2.93 | 66.5 | 30.4 | 2.2 | 67.4 | 3.5 | 0.8 | 0.6 |
| 4-Week | 7/5/2023 | 5.085 | 2.53 | 66.8 | 43.2 | 3.0 | 53.9 | 3.2 | 0.8 | 0.6 |
| 8-Week | 4/11/2023 | 4.650 | 2.50 | 48.9 | 44.7 | 3.1 | 52.1 | 1.1 | 1.0 | 0.9 |
| 8-Week | 4/18/2023 | 4.790 | 2.52 | 48.8 | 51.9 | 3.4 | 44.8 | 1.2 | 1.2 | 0.9 |
| 8-Week | 4/25/2023 | 4.850 | 2.47 | 43.7 | 52.4 | 2.0 | 45.6 | 1.3 | 1.1 | 0.8 |
| 8-Week | 5/2/2023 | 4.940 | 2.70 | 43.7 | 39.6 | 3.1 | 57.4 | 1.3 | 1.0 | 0.8 |
| 8-Week | 5/9/2023 | 5.400 | 2.93 | 43.3 | 16.2 | 1.0 | 82.7 | 1.7 | 1.1 | 0.9 |
| 8-Week | 5/16/2023 | 4.680 | 3.04 | 33.7 | 18.7 | 0.0 | 81.3 | 1.3 | 1.0 | 0.7 |
| 8-Week | 5/23/2023 | 5.020 | 2.39 | 34.1 | 62.3 | 3.4 | 34.3 | 0.9 | 0.9 | 0.6 |
| 8-Week | 5/30/2023 | 5.350 | 2.82 | 34.1 | 41.1 | 2.9 | 56.0 | 0.9 | 0.8 | 0.6 |
| 8-Week | 6/6/2023 | 5.220 | 2.83 | 34.1 | 57.7 | 3.0 | 39.2 | 0.9 | 0.7 | 0.6 |
| 8-Week | 6/13/2023 | 5.120 | 2.86 | 46.6 | 43.5 | 2.7 | 53.8 | 3.4 | 0.7 | 0.9 |
| 8-Week | 6/20/2023 | 5.080 | 3.06 | 51.7 | 44.2 | 2.5 | 53.3 | 3.3 | 0.7 | 1.0 |
| 8-Week | 6/27/2023 | 5.140 | 2.78 | 56.7 | 49.3 | 2.7 | 48.0 | 3.3 | 0.7 | 1.1 |
| 8-Week | 7/5/2023 | 5.190 | 2.61 | 57.6 | 48.5 | 2.4 | 49.0 | 2.4 | 0.7 | 1.1 |

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

| Bills (cont.) |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Issue | Settle Date | Stop Out Rate <br> (\%) | Bid-to- <br> Cover <br> Ratio | Competitive <br> Awards (\$bn) | \% Primary Dealer | \% Direct | \% Indirect | Non- <br> Competitive <br> Awards (\$bn) | $\begin{array}{\|c} \text { SOMA } \\ \text { "Add Ons" } \\ \text { (\$bn) } \\ \hline \end{array}$ | $\begin{aligned} & \text { 10-Year } \\ & \text { Equivalent } \\ & (\$ b n)^{*} \end{aligned}$ |
| 13-Week | 4/6/2023 | 4.780 | 2.49 | 54.7 | 44.5 | 2.7 | 52.9 | 2.3 | 6.6 | 1.9 |
| 13-Week | 4/13/2023 | 4.980 | 2.28 | 54.6 | 55.1 | 4.2 | 40.8 | 2.4 | 5.7 | 1.9 |
| 13-Week | 4/20/2023 | 5.080 | 2.59 | 54.0 | 35.5 | 4.2 | 60.3 | 3.0 | 6.6 | 1.9 |
| 13-Week | 4/27/2023 | 5.065 | 2.74 | 53.8 | 36.1 | 2.7 | 61.3 | 3.2 | 6.2 | 1.9 |
| 13-Week | 5/4/2023 | 5.120 | 2.44 | 54.2 | 44.9 | 6.6 | 48.5 | 2.8 | 8.4 | 1.9 |
| 13-Week | 5/11/2023 | 5.140 | 2.66 | 53.5 | 41.2 | 4.1 | 54.7 | 3.5 | 6.5 | 1.9 |
| 13-Week | 5/18/2023 | 5.060 | 2.79 | 54.7 | 29.2 | 3.9 | 66.9 | 2.3 | 7.5 | 1.9 |
| 13-Week | 5/25/2023 | 5.250 | 2.56 | 55.0 | 32.8 | 3.0 | 64.2 | 2.0 | 5.8 | 1.8 |
| 13-Week | 6/1/2023 | 5.300 | 2.38 | 61.3 | 54.9 | 3.0 | 42.1 | 1.7 | 5.0 | 2.0 |
| 13-Week | 6/8/2023 | 5.220 | 3.15 | 61.0 | 27.8 | 5.0 | 67.3 | 4.0 | 3.3 | 2.0 |
| 13-Week | 6/15/2023 | 5.150 | 2.99 | 60.6 | 31.9 | 4.2 | 63.9 | 4.4 | 3.9 | 2.0 |
| 13-Week | 6/22/2023 | 5.130 | 2.58 | 61.7 | 44.7 | 3.4 | 51.9 | 3.3 | 1.4 | 1.9 |
| 13-Week | 6/29/2023 | 5.180 | 2.99 | 62.7 | 47.3 | 4.4 | 48.3 | 2.3 | 5.2 | 2.1 |
| 17-Week | 4/11/2023 | 4.750 | 2.81 | 35.2 | 43.6 | 5.7 | 50.7 | 0.8 | 0.8 | 1.4 |
| 17-Week | 4/18/2023 | 4.980 | 2.70 | 35.1 | 42.3 | 4.2 | 53.5 | 0.9 | 0.8 | 1.4 |
| 17-Week | 4/25/2023 | 5.060 | 2.91 | 35.1 | 44.3 | 2.9 | 52.8 | 0.9 | 0.9 | 1.4 |
| 17-Week | 5/2/2023 | 4.975 | 2.85 | 35.2 | 39.9 | 3.1 | 57.0 | 0.8 | 0.8 | 1.4 |
| 17-Week | 5/9/2023 | 4.980 | 2.95 | 35.4 | 30.6 | 2.9 | 66.5 | 0.6 | 0.9 | 1.4 |
| 17-Week | 5/16/2023 | 5.000 | 2.98 | 35.6 | 41.5 | 2.3 | 56.2 | 0.4 | 1.1 | 1.4 |
| 17-Week | 5/23/2023 | 5.100 | 2.57 | 38.7 | 55.4 | 3.6 | 41.0 | 0.3 | 1.0 | 1.5 |
| 17-Week | 5/30/2023 | 5.260 | 2.73 | 41.6 | 54.2 | 5.8 | 40.0 | 0.4 | 1.0 | 1.6 |
| 17-Week | 6/6/2023 | 5.325 | 2.97 | 43.6 | 38.3 | 2.8 | 58.9 | 0.4 | 0.9 | 1.7 |
| 17-Week | 6/13/2023 | 5.200 | 3.36 | 43.3 | 33.4 | 3.6 | 63.0 | 2.7 | 0.6 | 1.8 |
| 17-Week | 6/20/2023 | 5.150 | 3.18 | 43.6 | 39.7 | 2.9 | 57.4 | 2.4 | 0.6 | 1.8 |
| 17-Week | 6/27/2023 | 5.220 | 3.27 | 45.2 | 42.9 | 3.5 | 53.7 | 0.8 | 0.5 | 1.8 |
| 17-Week | 7/5/2023 | 5.225 | 3.44 | 45.3 | 43.2 | 3.3 | 53.5 | 0.7 | 0.5 | 1.8 |

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

| Bills (cont.) |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Issue | Settle Date | Stop Out Rate (\%) | Bid-to- <br> Cover <br> Ratio | Competitive Awards (\$bn) | \% Primary Dealer | \% Direct | \% Indirect | NonCompetitive Awards (\$bn) | SOMA "Add Ons" (\$bn) | 10-Year <br> Equivalent (\$bn)* |
| 26-Week | 4/6/2023 | 4.705 | 2.79 | 45.5 | 36.7 | 2.2 | 61.1 | 2.5 | 5.6 | 3.2 |
| 26-Week | 4/13/2023 | 4.795 | 2.70 | 46.0 | 44.7 | 3.0 | 52.3 | 2.0 | 4.8 | 3.1 |
| 26-Week | 4/20/2023 | 4.870 | 2.78 | 45.9 | 30.5 | 2.6 | 67.0 | 2.1 | 5.5 | 3.2 |
| 26-Week | 4/27/2023 | 4.840 | 2.77 | 45.9 | 33.6 | 2.9 | 63.5 | 2.1 | 5.2 | 3.2 |
| 26-Week | 5/4/2023 | 4.900 | 2.60 | 46.3 | 42.9 | 1.9 | 55.1 | 1.7 | 7.1 | 3.3 |
| 26-Week | 5/11/2023 | 4.890 | 2.83 | 46.0 | 37.7 | 1.8 | 60.5 | 2.0 | 5.5 | 3.2 |
| 26-Week | 5/18/2023 | 4.980 | 2.61 | 49.1 | 44.6 | 3.1 | 52.3 | 1.9 | 6.7 | 3.4 |
| 26-Week | 5/25/2023 | 5.170 | 2.96 | 52.2 | 32.1 | 3.3 | 64.7 | 1.8 | 5.5 | 3.5 |
| 26-Week | 6/1/2023 | 5.290 | 2.58 | 54.3 | 47.9 | 2.1 | 50.0 | 1.7 | 4.5 | 3.5 |
| 26-Week | 6/8/2023 | 5.250 | 3.14 | 54.0 | 35.2 | 3.1 | 61.7 | 4.0 | 3.0 | 3.6 |
| 26-Week | 6/15/2023 | 5.155 | 3.02 | 53.7 | 32.4 | 2.4 | 65.2 | 4.3 | 3.4 | 3.6 |
| 26-Week | 6/22/2023 | 5.170 | 2.65 | 55.8 | 40.8 | 4.2 | 55.0 | 2.2 | 1.2 | 3.5 |
| 26-Week | 6/29/2023 | 5.215 | 2.73 | 55.9 | 38.2 | 2.4 | 59.4 | 2.1 | 4.6 | 3.7 |
| 52-Week | 4/20/2023 | 4.530 | 2.97 | 32.8 | 28.2 | 1.9 | 69.9 | 1.2 | 3.9 | 4.5 |
| 52-Week | 5/18/2023 | 4.645 | 2.49 | 35.0 | 46.3 | 2.3 | 51.4 | 1.0 | 4.7 | 4.7 |
| 52-Week | 6/15/2023 | 4.930 | 2.83 | 36.6 | 36.2 | 2.4 | 61.4 | 1.4 | 2.3 | 4.7 |
| 6-Week CMB | 6/15/2023 | 5.020 | 3.38 | 44.9 | 53.2 | 4.9 | 42.0 | 0.1 | 0.0 | 0.6 |
| 6-Week CMB | 6/22/2023 | 5.070 | 2.77 | 49.9 | 53.0 | 2.0 | 44.9 | 0.1 | 0.0 | 0.7 |
| 6-Week CMB | 6/29/2023 | 5.105 | 2.79 | 49.9 | 45.5 | 2.7 | 51.8 | 0.1 | 0.0 | 0.7 |
| CMB | 5/1/2023 | 4.350 | 2.44 | 45.0 | 44.2 | 2.3 | 53.5 | 0.0 | 0.0 | 0.2 |
| CMB | 5/4/2023 | 4.490 | 2.59 | 40.0 | 41.2 | 4.2 | 54.6 | 0.0 | 0.0 | 0.3 |
| CMB | 5/16/2023 | 5.040 | 2.33 | 44.9 | 55.5 | 2.1 | 42.4 | 0.1 | 0.0 | 2.2 |
| CMB | 5/18/2023 | 5.075 | 2.68 | 44.9 | 49.1 | 1.3 | 49.7 | 0.1 | 0.0 | 2.2 |
| CMB | 5/23/2023 | 5.230 | 2.40 | 44.9 | 56.7 | 2.9 | 40.4 | 0.1 | 0.0 | 2.2 |
| CMB | 5/25/2023 | 6.200 | 2.21 | 34.8 | 77.7 | 3.4 | 18.9 | 0.2 | 0.0 | 0.2 |
| CMB | 6/1/2023 | 5.340 | 2.89 | 49.9 | 32.1 | 2.4 | 65.5 | 0.1 | 0.0 | 2.6 |
| CMB | 6/2/2023 | 6.150 | 2.38 | 25.0 | 71.4 | 3.0 | 25.6 | 0.0 | 0.0 | 0.0 |
| CMB | 6/5/2023 | 5.250 | 3.40 | 50.0 | 37.3 | 2.9 | 59.8 | 0.0 | 0.0 | 0.6 |
| CMB | 6/5/2023 | 5.060 | 4.11 | 15.0 | 43.1 | 6.0 | 50.9 | 0.0 | 0.0 | 0.0 |
| CMB | 6/6/2023 | 5.150 | 3.19 | 49.9 | 33.3 | 0.2 | 66.5 | 0.1 | 0.0 | 0.7 |

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

| Nominal Coupons \& FRNs |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Issue | Settle Date | Stop Out <br> Rate (\%)* | Bid-to- <br> Cover <br> Ratio | Competitive <br> Awards (\$bn) | \% Primary Dealer | \% Direct | \% Indirect | NonCompetitive Awards (\$bn) | SOMA <br> "Add <br> Ons" <br> (\$bn) | 10-Year <br> Equivalent (\$bn)** |
| 2-Year | 5/1/2023 | 3.969 | 2.68 | 41.6 | 18.9 | 19.9 | 61.2 | 0.4 | 4.1 | 10.7 |
| 2-Year | 5/31/2023 | 4.300 | 2.90 | 41.7 | 16.2 | 15.6 | 68.2 | 0.3 | 7.9 | 11.3 |
| 2-Year | 6/30/2023 | 4.670 | 2.86 | 41.5 | 13.3 | 18.2 | 68.5 | 0.5 | 0.0 | 9.6 |
| 3-Year | 4/17/2023 | 3.810 | 2.59 | 39.8 | 17.7 | 21.0 | 61.3 | 0.2 | 2.6 | 14.4 |
| 3-Year | 5/15/2023 | 3.695 | 2.93 | 39.9 | 13.0 | 13.7 | 73.3 | 0.1 | 10.9 | 17.5 |
| 3-Year | 6/15/2023 | 4.202 | 2.70 | 39.9 | 16.7 | 21.7 | 61.5 | 0.1 | 0.0 | 13.4 |
| 5-Year | 5/1/2023 | 3.500 | 2.54 | 42.9 | 13.6 | 17.3 | 69.1 | 0.1 | 4.2 | 26.0 |
| 5-Year | 5/31/2023 | 3.749 | 2.58 | 42.9 | 9.3 | 18.0 | 72.7 | 0.1 | 8.1 | 27.7 |
| 5-Year | 6/30/2023 | 4.019 | 2.52 | 42.9 | 12.2 | 19.7 | 68.1 | 0.1 | 0.0 | 23.3 |
| 7-Year | 5/1/2023 | 3.563 | 2.41 | 35.0 | 14.8 | 21.1 | 64.1 | 0.0 | 3.4 | 28.7 |
| 7-Year | 5/31/2023 | 3.827 | 2.61 | 35.0 | 10.4 | 17.3 | 72.3 | 0.0 | 6.6 | 30.4 |
| 7-Year | 6/30/2023 | 3.839 | 2.65 | 35.0 | 8.1 | 16.6 | 75.3 | 0.0 | 0.0 | 25.7 |
| 10-Year | 4/17/2023 | 3.455 | 2.36 | 31.9 | 17.1 | 19.9 | 63.0 | 0.1 | 2.0 | 34.0 |
| 10-Year | 5/15/2023 | 3.448 | 2.45 | 35.0 | 13.0 | 19.5 | 67.5 | 0.0 | 9.5 | 45.6 |
| 10-Year | 6/15/2023 | 3.791 | 2.36 | 32.0 | 17.8 | 19.9 | 62.3 | 0.0 | 0.0 | 32.0 |
| 20-Year | 5/1/2023 | 3.920 | 2.66 | 12.0 | 12.0 | 19.2 | 68.7 | 0.0 | 1.2 | 21.8 |
| 20-Year | 5/31/2023 | 3.954 | 2.56 | 14.9 | 11.3 | 18.1 | 70.6 | 0.1 | 2.8 | 29.0 |
| 20-Year | 6/30/2023 | 4.010 | 2.87 | 12.0 | 7.8 | 17.6 | 74.6 | 0.0 | 0.0 | 19.7 |
| 30-Year | 4/17/2023 | 3.661 | 2.36 | 18.0 | 11.1 | 19.8 | 69.1 | 0.0 | 1.2 | 41.5 |
| 30-Year | 5/15/2023 | 3.741 | 2.43 | 21.0 | 10.2 | 17.4 | 72.4 | 0.0 | 5.7 | 58.0 |
| 30-Year | 6/15/2023 | 3.908 | 2.52 | 18.0 | 9.0 | 18.1 | 72.9 | 0.0 | 0.0 | 38.8 |
| 2-Year FRN | 5/1/2023 | 0.169 | 3.04 | 23.9 | 29.2 | 1.5 | 69.4 | 0.1 | 2.3 | 0.0 |
| 2-Year FRN | 5/26/2023 | 0.170 | 2.88 | 22.0 | 27.1 | 1.0 | 71.9 | 0.0 | 0.0 | 0.0 |
| 2-Year FRN | 6/30/2023 | 0.134 | 3.39 | 22.0 | 38.9 | 0.0 | 61.1 | 0.0 | 0.0 | 0.0 |


| Issue | Settle Date | Stop Out <br> Rate (\%) | Bid-to- <br> Cover <br> Ratio | Competitive <br> Awards (\$bn) | \% Primary <br> Dealer | \% Direct | \% Indirect | Non- <br> Competitive <br> Awards (\$bn) | SOMA <br> "Add <br> Ons" <br> (\$bn) | 10-Year <br> Equivalent <br> (\$bn)** |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $5-$ Year TIPS | $4 / 28 / 2023$ | 1.320 | 2.34 | 20.8 | 10.2 | 17.2 | 72.6 | 0.2 | 0.0 | 12.1 |
| $5-$ Year TIPS | $6 / 30 / 2023$ | 1.832 | 2.56 | 18.9 | 3.9 | 11.0 | 85.1 | 0.1 | 0.0 | 10.5 |
| 10-Year TIPS | $5 / 31 / 2023$ | 1.395 | 2.31 | 15.0 | 7.7 | 15.9 | 76.4 | 0.0 | 2.8 | 19.1 |

*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



Treasury's Current Views on the Operational Design of a Regular Buyback Program

August 2023

## Executive Summary

## This presentation provides Treasury's current views on the operational design parameters of a regular buyback program for liquidity support and cash management.

- At the May 2023 Quarterly Refunding, Treasury announced plans to implement a regular buyback program in 2024 and released a presentation on its high-level current views on the use cases and design.
- The following slides go into more detail on Treasury's current views on important operational design parameters, specifically:
- Buckets
- Purchase Amounts
- Security Exclusions
- Purchase Limits per CUSIP
- Announcements
- Results
- Once the program is implemented, Treasury will regularly evaluate these parameters to determine if adjustments are needed in order to achieve its liquidity support and cash management objectives.


## Buckets

## Treasury plans to conduct buyback operations in 9 buckets across-the-curve for nominal coupon and TIPS securities.

- For liquidity support: Treasury plans to conduct operations in each bucket 1 to 2 times per quarter (~ 1 operation per week) but is still determining the exact number of operations per bucket.
- For cash management: Treasury anticipates conducting operations regularly, though the size and frequency will depend on a variety of factors, including the seasonality of fiscal flows.
- Possible that multiple operations could occur in a week
- Cash management buyback operations will likely occur predominantly during the weeks immediately surrounding major tax payment dates (e.g., April 15, June 15, September 15, and December 15)

| Bucket \# | Product | Objective | Maturity Sector (Years) |
| :---: | :---: | :---: | :---: |
| 1 | Nominal Coupons | Cash Management \& Liquidity Support | 0 to 2 |
| 2 | Nominal Coupons | Liquidity Support | 2 to 3 |
| 3 | Nominal Coupons | Liquidity Support | 3 to 5 |
| 4 | Nominal Coupons | Liquidity Support | 5 to 7 |
| 5 | Nominal Coupons | Liquidity Support | 7 to 10 |
| 6 | Nominal Coupons | Liquidity Support | 10 to 20 |
| 7 | Nominal Coupons | Liquidity Support | 20 to 30 |
| 8 | TIPS | Liquidity Support | 0 to 7.5 |
| 9 | TIPS | Liquidity Support | 7.5 to 30 |

## Purchase Amounts

## At each quarterly refunding, Treasury plans to announce the maximum amount it is willing to buy back during the upcoming quarter for liquidity support and cash management.

- For liquidity support:
- Initially, Treasury plans to set a maximum amount of $\$ 30$ billion per quarter across buckets.
- A maximum amount of $\$ 4$ billion per bucket for nominal coupons per quarter.
- A maximum amount of $\$ 1$ billion per bucket for TIPS per quarter.
- Treasury anticipates that over time modest adjustments to the maximum amounts could be considered and any adjustments would be announced at quarterly refundings.
- For cash management:
- The maximum amount per quarter may vary, but Treasury anticipates cash management buybacks in the first year of implementation will be no more than $\$ 120$ billion.
- Treasury plans to conduct most cash management buybacks in the 0 to 2-year nominal coupon bucket but may also consider cash management buybacks in short maturity TIPS.
- Treasury does not plan to establish a fixed minimum amount to buy back in operations for liquidity support or for cash management.
- Actual buyback amounts will depend on market conditions and quality of offers in an operation. It is possible that Treasury may not buy back any securities during an operation.


## Security Exclusions

Treasury plans to exclude securities from buyback operations that will not help it achieve its liquidity support and cash management objectives.

- In general, securities that have the characteristics below will likely be excluded:
- Cheapest-to-deliver against futures contracts
- Trading with extreme repo specialness
- Trading extremely rich based on relative value measures
- On-the-run and near off-the-runs
- Specifically, for cash management:
- Securities with maturity dates that would not benefit Treasury from a cash management perspective would also be excluded.
- For example, if Treasury bought back securities with maturities that occur on dates with high cash inflows (such as major tax payment dates) this would potentially amplify rather than mitigate cash balance and issuance volatility.


## Purchase Limits per CUSIP

Treasury understands that if buybacks excessively reduce the amount of privately-held supply in a specific CUSIP this could harm rather than support secondary market liquidity.

- Treasury plans to set purchase limits per CUSIP based on maintaining a sufficient privately-held amount outstanding.
- Treasury will consider factors that may affect the actual privately-held float reasonably available for trading, such as STRIPS outstanding per CUSIP.
- Treasury will consider SOMA holdings.
- Limits may vary depending on product and maturity sector.


## Announcements

## Treasury anticipates announcing buyback operations in the following manner:

- Tentative Schedule
- At each quarterly refunding, Treasury will release a tentative schedule for liquidity support and cash management buyback operations for the upcoming quarter.
- The schedule will include dates, purpose, bucket, and maximum purchase amount.
- Announcement Date
- Treasury will generally confirm the details from the tentative schedule one business day in advance of the buyback operation.
- Treasury will also provide a list of potential eligible CUSIPs for the buyback operation.
- Operation Date
- The eligible CUSIP list for the buyback operation will be confirmed at or prior to the operation opening.
- Participants in the buyback operation will be notified via FedTrade when the operation begins and ends.


## Results

## Treasury plans to publicly release information regarding buyback results shortly after the end of each buyback operation.

- Treasury aims to provide transparency regarding operations while also avoiding any risks that might arise from providing market sensitive information too quickly.
- Given these aims, Treasury plans to release the following results shortly after each operation ends:
- Total Offers Accepted
- Total Offers Submitted
- Offers Accepted per CUSIP
- Weighted Average Price of Offers Accepted per CUSIP
- Treasury plans to regularly evaluate the appropriate degree and timing of information provided in connection with conclusion of a buyback.


## Outstanding Issues for Further Consideration

- Pricing methodology for evaluating offers
- Number of operations per quarter in each bucket
- Approach to scheduling buyback operations (expected day and timeslots, adjustments around holidays/market events, etc.)

TBAC CHARGE
"In the May 2023 quarterly refunding announcement, Treasury indicatedit may need to modestly increase auction sizes as early as the August 2023 refunding announcement. If Treasury begins increasing coupon issuance, in which tenors and sectors should Treasury change auction sizes? Do certain tenors or sectors show greater demand or capacity for increased auction sizes than others? How should the outlook for Treasury bill demand affect Treasury's approach to increasing coupon issuance?"

## Executive Summary

This presentation addresses a variety of considerations that Treasury should assess when determining how and where they increase issuance to meet future financing needs:

- Optimal Treasury Debt Structure Model refreshed for current market conditions, including additional analysis under different term premium scenarios
- Highlights the increased cost to Treasury relative to 2019 and 2022 updates
- Demand for coupon Treasuries, through a review of Treasury auction performance across tenors
- Highlights generally strong auction demand; however secondary market conditions warrant some caution around increasing $7 y$ and $20 y$ auction sizes relative to other tenors
- Current market functioning
- Examines relative volume metrics, market depth as well as secondary market pricing efficiency across tenors
- Demand for increased Bill issuance for remainder of the year
- Highlights that Money Market Funds are well positioned to absorb the expected issuance
- Different issuance scenarios
- Shows how WAM, TIPS and Bills-share evolves across various issuance scenarios


## Key findings from the analysis include:

- Treasury should increase coupon issuance across the curve, including in TIPS
- Some tenors exhibit better liquidity and support in the secondary market, including 5 s , 10 s and 30 s, and should be considered to absorb a higher percentage of issuance increase than other tenors, such as 7 s and 20s
- If TIPS share is increased at a rate of 1 bn per auction, TIPS share will decline below the TBAC recommended range. Higher increases in TIPS issuance will be needed to maintain TIPS share in $7 \%-9 \%$ range. Further study to consider options like adjustment in TIPS calendar schedule to accommodate higher total issuance could be helpful

Optimal Treasury Debt Structure Model and Term Premium Considerations

## Optimal Debt Structure Model* - Comparison as of 2023 vs 2019 of Macroeconomic and Fiscal Variable Behavior Model Projections

- After an initial COVID induced dislocation, major macro-economic variables (Unemployment gap, Real GDP, Core PCE) revert to the pre-COVID trend
- The 2023 projection anticipates significantly higher deficits compared to the 2019 projection due to the significant fiscal expansion during COVID


[^2]
## Optimal Debt Structure Model - Comparison as of 2023 vs 2019 of Model Rate Projections

- Different initial conditions have a strong effect on the path of main variables in the model, but terminal distributions are similar
- Cost and variability of each issuance strategy depends upon the entire path. So it is important to note the significantly different evolutions implied by the two sets of initial conditions
- While these macroeconomic and rates models are useful for analyzing long term effects of debt management decisions, they are not sophisticated forecasting models and these outputs should not be understood as taking a meaningful view on the near-term outlook for either rates or the economy





## Model Output: Comparisons as of 2019, 2022, and 2023 of Model Cost and Volatility for Each Individual Security that Treasury Issues

- Single security issuance model output has been shifting up and to the right over the past several years (i.e. more cost and more volatility), primarily due to increased size of the stock of Treasury Debt



## Efficient Frontiers and Historical Issuance

- Efficient frontiers are calculated by comparing the trade-off between debt service costs and the volatility in the size of the deficits over time
- Here we compare the model efficient frontier using macroeconomic and fiscal environments observed at the end of 2019Q4 (blue line), to those observed at the end of 2023Q1 (red line)
- The efficient frontier has moved up (higher cost) and to the right (higher volatility). This is largely driven by change in fiscal environment
- The blue and the red dots in the upper right represent Treasury's issuance kernel as of 2019Q1 and 2023Q1 respectively. The degree to which issuance lies off the model efficient frontier has remained about the same
- The graph on the lower right shows the efficient frontier using the macroeconomic environment in 2019Q4, but fiscal environment from 2023Q1. To do this, we use debt stock from 2023Q1 shifted back 17 quarters and rescaled to nominal GDP. We also use the primary deficit as percentage of GDP from 2023Q1
- The modified 2019Q4 frontier lies almost on top of the 2023Q1 frontier, implying that most of the difference in the frontiers is attributable to the shift in fiscal environment


Debt Service vs. Deficit Vol After 20 Years, Using 2019 Macro Env and 2023 Fiscal Env


## Term Premium

- While historically Term Premium (TP) has tended be positive, more recently ACM and KW models TP has stayed negative
- The ACM TP Model shows that even after making a 1 StdDev adjustment higher to the current TP level, TP would still be flat to negative
- Kim-Wright (KW) model shows that most of the decline in TP is coming from decline in real term premium
- If one measures TP as difference between current $10 y$ and average expected FF rate over the next 10 years then, based upon the NY Fed dealer survey*, TP has been positive and moved higher more recently
- TP is an important variable for Optimal Debt Structure Model. Note, there are many factors that have played a role in lower TP. It could move higher from levels seen in last 10y years given increase in aggregate debt outstanding, potential increase in inflation risk premium and if QE programs are less ambitious during future downturns




Term Premium Across 2y, 10y, and 30y Tenors, Using Standard and Lower TP Assumptions


## Sensitivity of Model Cost and Volatility for Lower Term Premium Scenarios

- In the plots below, we show outputs as of 2023 using the standard model assumption, and then scenarios if $10 y$ term premium is 25 bps or 50bps lower than the standard assumption (with term premium for rest of the curve adjusted per the Model)
- Model continues to favor belly issuance under lower term premium assumptions, but also shows a significant reduction in the relative cost of longer-dated issuance in the lower term premium scenarios



## Efficient Frontier under Lower Term Premium (TP) Scenarios

- Under lower Term Premium scenarios, current issuance kernel moves further away from the efficient frontier. This is because a sustained reduction in Term Premium would call for more issuance further out the curve



## Insights for Future Issuance

- Fundamental conclusions remain similar to Q3-2022 TBAC study. The model continues to favor more belly, Bill, TIPS and FRN issuance, and favors increasing issuance less in the longer end relative to the current issuance mix
- When risk is measured as volatility in the deficit (right chart), increasing TIPS issuance is a small positive, as it lowers expected cost and does not increase risk (hence, it moves the issuance pattern closer to the efficient frontier)
- When risk is measured by the variation in funding costs (left chart), expected cost can only be reduced if more risk is assumed. However, that trade-off appears reasonably attractive, especially if achieved by increasing belly issuance

Debt Service vs. Debt vol After 20 Years



## Insights for Future Issuance under Lower Term Premium Scenarios

- Increasing issuance of longer maturities reduces both volatility of debt service costs as well as volatility in the size of future deficits. This doesn't increase debt service costs significantly, especially when considering scenarios assuming reduced future term premium

Base




TP10 Down 25
Debt Service vs. Debt vol After 20 Years

Debt Service vs. Deficit vol After 20 Years



TP10 Down 50
Debt Service vs. Debt vol After 20 Years


## Sensitivity of Model Cost and Volatility for Higher Term Premium Scenarios

- In the plots below, we show outputs as of 2023 using the standard model assumption, and then scenarios if $10 y$ term premium is 25 bps or 50bps higher than the standard assumption (with term premium for rest of the curve adjusted per the model)
- Model continues to favor belly issuance under higher term premium assumptions, and also shows a significant additional increase in the relative cost of longer-dated issuance in the higher term premium scenarios



## Efficient Frontier Under Higher Term Premium Scenarios

- Under higher Term Premium scenarios, the current issuance kernel is even closer to the efficient frontier, suggesting proportionate increases in future debt issuance if this is the expected future term premium

Base







## Demand Assessment

## Auction Statistics over Time

- Customer takedown trending higher over past decade across all sectors points to broadly robust demand for issuance
- Less variability in bid-to-cover among tenors over the past decade points to a more balanced demand picture


Bid-to-Cover (Average per Year)


Customer Takedown per Tenor (Average per Year)


Bid-to-Cover (Average per Year)



## Auction Allotment over Time

- Dealer participation in issuance has steadily declined over the past decade

All Issuance Excluding Bills


## Auction Allotment over Time - Split by Tenor

2s


3s


- Depository institutions
- Individuals
 Ins. Co.

5s


7s


| - Depository institutions | - Individuals | $\begin{aligned} & \text { Dealers } \\ & \text { and } \\ & \text { brokers } \end{aligned}$ | Pension <br> and Retirement funds and Ins. Co. | - Investment funds | Foreign and international | - Other |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |

## Auction Allotment over Time - Split by Tenor



## Historical Auction Tails

- On average, auctions have cleared very close to pre-auction levels indicating the market is well suited at time of auction to take down supply
- COVID-related fiscal increases in 2020-2021 resulted in larger auction sizes, but Fed buying also increased, absorbing much of that issuance
- More recently, as the Fed is reducing balance sheet, auctions have continued to clear in line with pre-auction yields but that has coincided with a modest reduction in auction sizes
- It remains to be seen how auctions will perform as issuance sizes increase while the Fed continues to reduce balance sheet
- The auction process can demonstrate unintuitive results:
- $20 y$ auctions have averaged well through the deadline yield, pointing to the market using the auction as a liquidity event
- While 10 s are the most liquid coupon in the secondary market, they have cleared on average at a small tail more recently. This shouldn't be interpreted as a lack of demand in the $10 y$ sector, rather that investors are less reliant on the auction process to source liquidity for 10 s


[^3]
## Intraday Performance Before and After Auction

- $2 \mathrm{~s} / 3 \mathrm{~s} / 5 \mathrm{~s}$ have shown a propensity over time to require an intraday concession to clear supply
- 7s/10s/20s/30s exhibit more mixed performance in the hours surrounding the auction
- Similarly, auctions seem to be good liquidity events for 20s and 30s as evidenced by negative concession and negative tails on average
- Both intraday performance and tail data generally demonstrate that there is consistent strong demand for Treasury auctions
- The small tail and intraday concession in the 10y both likely indicate that there is less need for end users to tap auction liquidity in this sector. Secondary liquidity and relative valuation metrics both point to healthy end-user demand for the $10 y$ sector
- Auction statistics and concessions are just a few of the many metrics to consider when evaluating issuance, and should be observed in the context of overall valuations and secondary liquidity

Concession $+/-2$ hrs from Auction Clearing Time


■2009■2010■2011■2012■2013■2014■2015■2016

*Source: Presenting MemberData
*Total gross concession in the 2hrs preceding auction and 2hrs post auction
Higher the number, morethe intraday concession required to clear supply

## Relative Value Considerations Using Swap Spreads

- Duration neutral swap spread butterflies indicate that:
- On-the-run 7s have generally been cheap vs 5 s and 10s
- On-the-run 20s have generally been cheap vs 10 s and 30 s
- On-the-run 3s could be somewhat volatile locally relative to $2 s$ and 5 s but have not exhibited consistent cheapness as exhibited by 7s and 20s

5s7s10s Matched Maturity Asset Swap Spread Fly


2s3s5s Matched Maturity Asset Swap Spread Fly


10s20s30s Matched Maturity Asset Swap
Spread Fly


[^4]
## Relative Value Considerations Using Cash Butterflies

- Duration neutral butterflies support the assessment from the swap spread analysis :
- On-the-run 7s have generally been cheap vs 5 s and 10s. More recently 7s have normalized on the 5 s 7 s 10 s fly, but they are at the rich end of their history
- On-the-run 20s have generally been cheap vs 10s and 30s
- On-the-run 3s have no discernable cheapness vs 2 s and 5 s




10s20s30s Duration Neutral Treasury Butterfly Yield


[^5]
## Relative Value Considerations Across Broad Curve Segments

- Swaps spreads have materially declined post the GFC (USTs cheapened). The swaps spread curve trades very inverted - UST curve steeper than swap curve
- There are structural reasons behind demand for off-balance sheet long duration needs. There is no indication of this dynamic disappearing. The decline in long end swap spreads is more likely a function of the off-balance sheet supply/demand imbalance, rather than an indication of excessive Treasury supply
- Swap spreads have become significantly less correlated to Treasury supply.
- Refer to Q-1 2021 TBAC charge* for a more detailed discussion on swap spread dynamics


30y Swap Spreads vs Fwd Looking Total Coupon Issuance(Pre \& Post 2009)


Source: JP Morgan Research - Pre 2009 Post 2009
SOFR swap spreads prior to 2019 are estimated using post-2019 relationship between SOFR \& OIS swap spreads and historical OIS swap spreads.
Above chart assumes that Treasury is transparent with their refunding needs and that 6Mlook ahead expectations are mostly in line with actual subsequent issuance

Spread of SOFR Swap Curve to Treasury Curve (More Recent History)


## Assessing Market Demand Using Trading Volumes Relative to Auction Size

- While 5 s and 10 s constitute $>50 \%$ of trading volumes, they only make up $31 \%$ of annual issuance
- On the other hand 7 s and 20 s constitute only $11 \%$ of trading volumes, while they make up $21 \%$ of annual issuance
- Pension and Insurance investors, who tend to trade less frequently, have a bigger footprint in longer tenors than shorter on the curve. Additionally, 30y on-the-run trading volumes are distorted lower relative to shorter on-the-run tenors because 30y corporate bonds are traded off of once-old 30yrs, while shorter tenor corporates are traded off of on-the-run issues
- 5 s and 10 s are preferred hedging points for IG and MBS community, garnering more volumes
- The trading volume data suggests there is capacity for Treasury to concentrate more of its issuance in 5 s , 10 s , and 30s, while making smaller increases in issue sizes of 7 s and 20 s

Trading Volumes and Issuance Split Across
Benchmark Points (Jan2022-May2023)

|  | Treasury Volume | Treasury Issuance | Trading \$/ Issuance \$* |
| :---: | :---: | :---: | :---: |
| 2 s | $16 \%$ | $18 \%$ | 31 |
| 3 s | $13 \%$ | $17 \%$ | 26 |
| 5 s | $29 \%$ | $18 \%$ | 54 |
| 7 s | $8 \%$ | $15 \%$ | 18 |
| 10 s | $23 \%$ | $13 \%$ | 58 |
| 20 s | $3 \%$ | $6 \%$ | 15 |
| $30 y$ | $6 \%$ | $8 \%$ | 27 |
| $5 y$ TIPs | $1 \%$ | $2 \%$ | 15 |
| $10 y$ TIPs | $1 \%$ | $3 \%$ | 9 |
| $30 y$ TIPs | $0.2 \%$ | $1 \%$ | 12 |

* Based on on-the-run trading volumes during the period (TRACE data)


## TIPS Discussion

- TIPS share is currently $7.6 \%$. Under current auction sizes, TIPS share declines further - driven by original issue 20y TIPS maturing in the coming years. TIPS share generally declines further during recessions
- Investor demand, especially for shorter duration TIPS, has increased over past decade. However, more recent data is showing outflows from such funds which could indicate a less favorable backdrop relative to the prior two years for a larger increase in TIPS issuance
- The growth of Target Date Funds (TDFs) continues to add to TIPS demand, with an estimated $2 \%$ allocation to TIPS
- TBAC charges from Q2 2023* and Q4 2021** discuss TBAC's assessment of recommended TIPS share and demand assessment. Treasury should also further explore options like adjustment in TIPS calendar schedule and sizes to incorporate larger total TIPS issuance as total Treasury debt increases

TIPS Assets Under Management


1999200120032005200720092011201320152017201920212023

TIPS Share of Marketable Debt


Target Date Funds Assets Under Management (\$B, log scale)


Market Functioning and Liquidity Analysis

## Market Functioning - Market Depth

- Even with a modest improvement relative to 2022, market depth remains lower versus pre-COVID period, pointing to somewhat tighter liquidity conditions
- Market depth is generally a function of volatility. When volatility is elevated market depth is generally shallow
- As issuance has picked up post-COVID, market depth as percentage of issuance has receded



Ratio of 10y Auction Size to 10y Market Depth


Market depth: cash market depth is the average of the top 3 bids and offers on hotrun Treasuries in the inter-dealer broker CLOB, averaged between 8:30am ET and 10:30amET daily

## Market Functioning - UST Yield Error vs Spline

- Local dislocations, as measured by yield error vs fitted spline, have come down from peak levels observed in 2022 but remain wider than the pre-COVID period
- Yield error vs spline, sector comparison:
- If we look at different maturity sectors, yield errors (mkt vs fitted spline) are more stretched in the front end of the curve than the very long end of the curve (with the exception of the $20 y$ sector)
- Due to aged issues rolling down, there are more issues with wider range of coupons and issue size per maturity window as time to maturity shrinks, i.e. there are more issues per sector in the $0-7 \mathrm{yr}$ range than the $7 \mathrm{y}+$ range
- $20 y$ sector continues to exhibit higher yield error even as yield error has improved vs last year

Average Yield Error vs Spline Split by Sector


Source: Barclays research

Average Yield Error vs Spline (>1y USTs)


Source: Bloomberg

Average Yield Error vs Spline Split by Sector


## Market Functioning - Bid-Ask Spreads

- At the start of the year, bid-ask spreads widened to levels similar to those experienced during pandemic stress. Bid-ask spreads are off the highs of the year but still elevated vs pre-COVID levels
- Both yield error vs spline and bid-ask spread data suggest that the 7y and 20y are more challenged than other points on the curve

[^6]Bid-Ask Spreads for On-the-Run $2 y / 3 y / 5 y$ Notes


Duration Weighted Bid-Ask Across Tenors



Source: Barclays Research

Bid-Ask Spreads for On-the-Run 20y/30y Bonds


## Assessment of Market Functioning

- Market conditions can sustain additional coupon issuance increases but metrics such as relative value and bid-ask spreads warrant caution when increasing auction sizes more meaningfully in 7s and 20s and also favor relative increases in 5s, 10s and 30s
- Treasury market liquidity is driven by many factors: exogenous ones like elevated uncertainly in the macro outlook causing higher realized volatility, as well as micro ones such as aggregate dealer balance sheet size relative to the overall US Treasury market and a lack of true all-to-all platform
- Measures of liquidity such as market depth, yield error, and bid-ask spreads have improved from their most stretched metrics in 2022 but have not returned to their pre-COVID levels
- Trading and liquidity conditions are hard to gauge precisely. In periods of stress, intermediation demand has sometimes exceeded capacity. Treasury should remain vigilant, but we do not see an issue with market functioning at present as it pertains to increases in Treasury coupon issuance

Bills Discussion

## Bills - Ownership Breakdown

- Over the last two years the biggest migration has been from Govt MMF to "Other" which is a catchall for a variety of participants including individuals, investment funds, and corporate treasury accounts

T-Bill Ownership as of $3 / 31 / 23$


T-Bill Ownership 3/31/21


Source: JPM research, Cranes data, TIC data, Federal Reserve Bank of New York, Fitch, Company 10Qs and other disclosures

## Bills - Recent Demand

- Since the debt ceiling resolution, the inflow of recent T-Bill issuance has been well absorbed
- Money Market Funds (mainly Government Only MMFs) have been supportive of absorbing this new issuance (uptick from near low \% of ownership of bills outstanding)
- MMFs likely to help absorb the estimated additional \$250bn-\$800bn bill supply over the second half of 2023. Currently Gov MMFs ~500bn under their average UST holdings as \% of AUM

US Tsys as \% of Gov MMF AUM


Source: IMoneyNet, Bank of America Research, Bloomberg, committee member data, committee member dealer survey *committee member dealer survey

Bills as \% of Total UST Outstanding


Cumulative Net T-Bill June through
December (Realized and Expected*) High


## Bills - MMF Capacity and WAM

- Government only MMFs have gradually lengthened WAM
over the course of 2023, but are still well below the historical average of about 30.5 days WAM
- The bills absorbed by MMFs since debt ceiling resolution have largely been funded by reductions in ON RRP
- As MMFs perceive that we are nearing the end of the Fed's hiking cycle, they have capacity to increase both their WAM and their allocation to bills to more historically typical levels. If MMFs move back to their average WAM while buying bills with an average tenor of 85 days, they would need to need to buy ~\$600bn* (estimated by extrapolating capacity of Top 15 RRP Counterparties based upon their share of AUM)


## Money Market Fund WAMs



$$
\begin{aligned}
& \text { WAM } 15 \text { Largest RRP Counterparties (Days) } \\
& - \text { 5y Average (30.5 Days) }
\end{aligned}
$$

| MMF AUM (\$bn) | 5458 |
| ---: | ---: |
| Top 15 RRP Counterparty AUM (\$bn) | 2519 |
| Top 15 RRP Counterparty RRP (\$bn) | 1192 |
| Current WAM | 21 |
| Average WAM | 30 |
| Max WAM | 48 |


| \$bn to Buy |  | Days to Add for Top 15 RRP Counterparties |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 4 | 8 | 12 | 16 | 20 | 24 | 28 |
| n | 75 | 134 | 269 | 403 | 537 | 672 | 806 | 940 |
| \% | 80 | 126 | 252 | 378 | 504 | 630 | 756 | 882 |
| $\Sigma$ | 85 | 119 | 237 | 356 | 474 | 593 | 711 | 830 |
| 3 | 90 | 112 | 224 | 336 | 448 | 560 | 672 | 784 |
| $\stackrel{\square}{\square}$ | 95 | 106 | 212 | 318 | 424 | 530 | 636 | 742 |
| 5 | 100 | 101 | 202 | 302 | 403 | 504 | 605 | 705 |
| - | 105 | 96 | 192 | 288 | 384 | 480 | 576 | 672 |

[^7]
## Bills - Valuation Sensitivity to Issuance Changes

- $3 m$ Bills spread to 3 m OIS shows very little sensitivity to issuance changes
- In 2020 when issuance went up ~2.5T, 3m bills widened ~10bps to 3 m OIS
- During the 2022 aggressive hiking cycle, bills remained rich to what the market was pricing for Fed action
- Net, there appears to be sufficient demand from MMFs to further increase Bills supply slated for rest of the year. Over the medium to longer term, Bills issuance should be looked at in context of overall WAM as well as Bills as a percentage of Treasury Debt Outstanding, generally staying within the TBAC recommended range of $15-20 \%$ bill share

Change Bills Outstanding vs Change 3m Bill OIS


Bills Out vs 3m Bill - 3m OIS


Issuance Scenarios

## Issuance Scenarios

We analyze different issuance scenarios to better understand the impact on WAM, Bills share \& TIPS share

- Baseline - Status Quo Scenario where issuance increases in line with the TBAC recommendations to the Treasury from Q2-2023* and then stays static
- Scenario 1: Neutral Issuance Scenario - Coupon issuance increases proportionately along the curve including in TIPS with smaller increase in 7s and 20s with the objective of keeping bills in the 15-20\% range long term. Under this scenario, we incorporate the need to increase coupon issuance across the curve as demonstrated by the output of Status Quo. We take into consideration concerns about the relative liquidity of 7 s and 20 s by increasing those sectors proportionately less vs surrounding sectors
- Scenario 2: Longer Tenors - Here we incorporate the history suggesting that term premium could be less steep than assumed in the Optimal Debt Structure Model \& increase issuance in longer tenors while reducing issuance in shorter tenors proportionately. Per the output of the Optimal Debt Structure model, this reduces deficit volatility while incurring only a small increase in cost
- Scenario 3: Shorter Tenors - Here we adopt a strategy focused on cost minimization \& increase issuance in shorter tenors while proportionately reducing issuance in longer tenors. While expected costs are reduced, this increases deficit volatility


## Issuance Scenarios Details

Status Quo Scenario（in \＄bn）

| MM | YY | え | ¢ | is | خ | ¢ | ત্র | ১্লি | $\begin{aligned} & \stackrel{0}{5} \\ & \stackrel{\pi}{\circ} \end{aligned}$ | $\begin{aligned} & \hline \text { 믄 } \\ & \underset{\circ}{\circ} \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | 2023 | 42 | 40 | 43 | 35 | 35 | 15 | 21 | 0 | 15 | 0 | 22 |
| 6 | 2023 | 42 | 40 | 43 | 35 | 32 | 12 | 18 | 20 | 0 | 0 | 22 |
| 7 | 2023 | 42 | 40 | 43 | 35 | 32 | 12 | 18 | 0 | 17 | 0 | 24 |
| 8 | 2023 | 44 | 42 | 45 | 36 | 37 | 16 | 23 | 0 | 0 | 8 | 22 |
| 9 | 2023 | 46 | 44 | 47 | 37 | 34 | 13 | 20 | 0 | 15 | 0 | 22 |
| 10 | 2023 | 46 | 44 | 47 | 37 | 34 | 13 | 20 | 22 | 0 | 0 | 24 |
| 11 | 2023 | 46 | 44 | 47 | 37 | 37 | 16 | 23 | 0 | 15 | 0 | 22 |
| 12 | 2023 | 46 | 44 | 47 | 37 | 34 | 13 | 20 | 20 | 0 | 0 | 22 |

Status Quo Scenario Increases（in \＄bn）

| MM | YY | え | 戸 | え | え | ¢ | ટ̀ | ¢ | 号 | $\xrightarrow{\bigcirc}$ | $\xrightarrow{0}$ | $\xrightarrow[\substack{\text { ¢ } \\ \text { ¢ } \\ \text { え } \\ \text { え }}]{\text { d }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |  | 0 |
| 6 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  | 0 |
| 7 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 |
| 8 | 2023 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |  |  | 0 | 0 |
| 9 | 2023 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |  | 0 |  | 0 |
| 10 | 2023 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 |  |  | 0 |
| 11 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |  | 0 |
| 12 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  | 0 |

Scenario 1：Neutral Issuance（in \＄bn）

| MM | YY | 入 | ¢ | is | خ | － | $\underset{\sim}{\text { No }}$ | ત্ট | $\underset{i}{\stackrel{0}{1}}$ |  |  | 爻 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7 | 2023 | 42 | 40 | 43 | 35 | 32 | 12 | 18 | 0 | 17 | 0 | 24 |
| 8 | 2023 | 45 | 43 | 46 | 37 | 38 | 17 | 24 | 0 | 0 | 8 | 22 |
| 9 | 2023 | 48 | 46 | 49 | 39 | 35 | 14 | 21 | 0 | 15 | 0 | 22 |
| 10 | 2023 | 51 | 49 | 52 | 41 | 35 | 14 | 21 | 23 | 0 | 0 | 25 |
| 11 | 2023 | 54 | 52 | 55 | 43 | 41 | 19 | 27 | 0 | 15 | 0 | 23 |
| 12 | 2023 | 57 | 55 | 58 | 45 | 38 | 16 | 24 | 21 | 0 | 0 | 23 |
| 1 | 2024 | 59 | 57 | 60 | 46 | 38 | 16 | 24 | 0 | 18 | 0 | 26 |
| 2 | 2024 | 61 | 59 | 62 | 47 | 43 | 20 | 29 | 0 | 0 | 10 | 24 |
| 3 | 2024 | 63 | 61 | 64 | 48 | 40 | 17 | 26 | 0 | 16 | 0 | 24 |
| 4 | 2024 | 65 | 63 | 66 | 49 | 40 | 17 | 26 | 24 | 0 | 0 | 27 |
| 5 | 2024 | 67 | 65 | 68 | 50 | 45 | 21 | 31 | 0 | 16 | 0 | 25 |
| 6 | 2024 | 69 | 67 | 70 | 51 | 42 | 18 | 28 | 22 | 0 | 0 | 25 |
| 7 | 2024 | 69 | 67 | 70 | 51 | 42 | 18 | 28 | 0 | 19 | 0 | 27 |
| 8 | 2024 | 69 | 67 | 70 | 51 | 45 | 21 | 31 | 0 | 0 | 9 | 25 |
| 9 | 2024 | 69 | 67 | 70 | 51 | 42 | 18 | 28 | 0 | 17 | 0 | 25 |

Scenario 1：Neutral Issuance Increases（in \＄bn）

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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |  | 0 |
| 8 | 2023 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |  |  | 0 | 0 |
| 9 | 2023 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |  | 0 |  | 0 |
| 10 | 2023 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |  |  | 1 |
| 11 | 2023 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |  | 0 |  | 1 |
| 12 | 2023 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 1 |  |  | 1 |
| 1 | 2024 | 2 | 2 | 2 | 1 | 3 | 2 | 3 |  | 1 |  | 1 |
| 2 | 2024 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |  |  | 1 | 1 |
| 3 | 2024 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |  | 1 |  | 1 |
| 4 | 2024 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 |  |  | 1 |
| 5 | 2024 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |  | 1 |  | 1 |
| 6 | 2024 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 |  |  | 1 |
| 7 | 2024 | 0 | 0 | 0 | 0 | 2 | 1 | 2 |  | 1 |  | 0 |
| 8 | 2024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  | 1 | 0 |
| 9 | 2024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1 |  | 0 |

## Issuance Scenarios Details

Scenario 2：Longer Tenors（in \＄bn）

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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7 | 2023 | 42 | 40 | 43 | 35 | 32 | 12 | 18 | 0 | 17 | 0 | 24 |
| 8 | 2023 | 44 | 42 | 45 | 36 | 39 | 17 | 25 | 0 | 0 | 8 | 22 |
| 9 | 2023 | 46 | 44 | 47 | 37 | 36 | 14 | 22 | 0 | 15 | 0 | 22 |
| 10 | 2023 | 48 | 46 | 49 | 38 | 36 | 14 | 22 | 23 | 0 | 0 | 25 |
| 11 | 2023 | 50 | 48 | 51 | 39 | 43 | 19 | 29 | 0 | 15 | 0 | 23 |
| 12 | 2023 | 52 | 50 | 53 | 41 | 40 | 16 | 26 | 21 | 0 | 0 | 23 |
| 1 | 2024 | 54 | 52 | 55 | 42 | 40 | 16 | 26 | 0 | 18 | 0 | 26 |
| 2 | 2024 | 56 | 54 | 57 | 43 | 46 | 21 | 32 | 0 | 0 | 10 | 24 |
| 3 | 2024 | 58 | 56 | 59 | 44 | 43 | 18 | 29 | 0 | 16 | 0 | 24 |
| 4 | 2024 | 60 | 58 | 61 | 45 | 43 | 18 | 29 | 24 | 0 | 0 | 27 |
| 5 | 2024 | 62 | 60 | 63 | 46 | 49 | 23 | 35 | 0 | 16 | 0 | 25 |
| 6 | 2024 | 64 | 62 | 65 | 47 | 46 | 20 | 32 | 22 | 0 | 0 | 25 |
| 7 | 2024 | 64 | 62 | 65 | 47 | 46 | 20 | 32 | 0 | 19 | 0 | 27 |
| 8 | 2024 | 64 | 62 | 65 | 47 | 49 | 23 | 35 | 0 | 0 | 9 | 25 |
| 9 | 2024 | 64 | 62 | 65 | 47 | 46 | 20 | 32 | 0 | 17 | 0 | 25 |

Scenario 3：Shorter Tenors（in \＄bn）

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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7 | 2023 | 42 | 40 | 43 | 35 | 32 | 12 | 18 | 0 | 17 | 0 | 24 |
| 8 | 2023 | 46 | 43 | 47 | 37 | 38 | 16 | 23 | 0 | 0 | 8 | 22 |
| 9 | 2023 | 50 | 46 | 51 | 39 | 35 | 13 | 20 | 0 | 15 | 0 | 22 |
| 10 | 2023 | 54 | 49 | 55 | 41 | 35 | 13 | 20 | 23 | 0 | 0 | 25 |
| 11 | 2023 | 58 | 52 | 59 | 43 | 41 | 17 | 25 | 0 | 15 | 0 | 23 |
| 12 | 2023 | 62 | 55 | 63 | 45 | 38 | 14 | 22 | 21 | 0 | 0 | 23 |
| 1 | 2024 | 65 | 57 | 66 | 46 | 38 | 14 | 22 | 0 | 18 | 0 | 26 |
| 2 | 2024 | 68 | 59 | 69 | 47 | 43 | 17 | 26 | 0 | 0 | 10 | 24 |
| 3 | 2024 | 71 | 61 | 72 | 48 | 40 | 14 | 23 | 0 | 16 | 0 | 24 |
| 4 | 2024 | 74 | 63 | 75 | 49 | 40 | 14 | 23 | 24 | 0 | 0 | 27 |
| 5 | 2024 | 77 | 65 | 78 | 50 | 45 | 17 | 29 | 0 | 16 | 0 | 25 |
| 6 | 2024 | 79 | 67 | 81 | 51 | 42 | 14 | 24 | 22 | 0 | 0 | 25 |
| 7 | 2024 | 79 | 67 | 81 | 51 | 42 | 14 | 24 | 0 | 19 | 0 | 27 |
| 8 | 2024 | 79 | 67 | 81 | 51 | 45 | 17 | 29 | 0 | 0 | 9 | 25 |
| 9 | 2024 | 79 | 67 | 81 | 51 | 42 | 14 | 24 | 0 | 17 | 0 | 25 |

Scenario 2：Longer Tenors Increases（in \＄bn）

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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |  | 0 |
| 8 | 2023 | 2 | 2 | 2 | 1 | 4 | 2 | 4 |  |  | 0 | 0 |
| 9 | 2023 | 2 | 2 | 2 | 1 | 4 | 2 | 4 |  | 0 |  | 0 |
| 10 | 2023 | 2 | 2 | 2 | 1 | 4 | 2 | 4 | 1 |  |  | 1 |
| 11 | 2023 | 2 | 2 | 2 | 1 | 4 | 2 | 4 |  | 0 |  | 1 |
| 12 | 2023 | 2 | 2 | 2 | 2 | 4 | 2 | 4 | 1 |  |  | 1 |
| 1 | 2024 | 2 | 2 | 2 | 1 | 4 | 2 | 4 |  | 1 |  | 1 |
| 2 | 2024 | 2 | 2 | 2 | 1 | 3 | 2 | 3 |  |  | 1 | 1 |
| 3 | 2024 | 2 | 2 | 2 | 1 | 3 | 2 | 3 |  | 1 |  | 1 |
| 4 | 2024 | 2 | 2 | 2 | 1 | 3 | 2 | 3 | 1 |  |  | 1 |
| 5 | 2024 | 2 | 2 | 2 | 1 | 3 | 2 | 3 |  | 1 |  | 1 |
| 6 | 2024 | 2 | 2 | 2 | 1 | 3 | 2 | 3 | 1 |  |  | 1 |
| 7 | 2024 | 0 | 0 | 0 | 0 | 3 | 2 | 3 |  | 1 |  | 0 |
| 8 | 2024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  | 1 | 0 |
| 9 | 2024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1 |  | 0 |

Scenario 3：Shorter Tenors Increases（in \＄bn）

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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 7 | 2023 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 |  | 0 |
| 8 | 2023 | 4 | 3 | 4 | 2 | 3 | 1 | 2 |  |  | 0 | 0 |
| 9 | 2023 | 4 | 3 | 4 | 2 | 3 | 1 | 2 |  | 0 |  | 0 |
| 10 | 2023 | 4 | 3 | 4 | 2 | 3 | 1 | 2 | 1 |  |  | 1 |
| 11 | 2023 | 4 | 3 | 4 | 2 | 3 | 1 | 2 |  | 0 |  | 1 |
| 12 | 2023 | 4 | 3 | 4 | 2 | 3 | 1 | 2 | 1 |  |  | 1 |
| 1 | 2024 | 3 | 2 | 3 | 1 | 3 | 1 | 2 |  | 1 |  | 1 |
| 2 | 2024 | 3 | 2 | 3 | 1 | 2 | 0 | 1 |  |  | 1 | 1 |
| 3 | 2024 | 3 | 2 | 3 | 1 | 2 | 0 | 1 |  | 1 |  | 1 |
| 4 | 2024 | 3 | 2 | 3 | 1 | 2 | 0 | 1 | 1 |  |  | 1 |
| 5 | 2024 | 3 | 2 | 3 | 1 | 2 | 0 | 3 |  | 1 |  | 1 |
| 6 | 2024 | 2 | 2 | 3 | 1 | 2 | 0 | 1 | 1 |  |  | 1 |
| 7 | 2024 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |  | 1 |  | 0 |
| 8 | 2024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  | 1 | 0 |
| 9 | 2024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1 |  | 0 |

## Issuance Scenarios

- If Coupon issuance is not increased beyond 2023Q2 TBAC recommendations, Bills share increases significantly and WAM declines
- Bills share exceeds $20 \%$ for a period before stabilizing within recommended range in all increased coupon issuance scenarios but begins to decline below the $15 \%-20 \%$ range sooner under Scenario 3 (higher shorter tenor issuance)
- Without further increases to TIPS auction sizes, TIPS share falls in all issuance scenarios. Stabilizing TIPS issuance within the $7-9 \%$ range requires increasing TIPS auction sizes by 2bn at each auction
- Further study to consider options like adjustment in TIPS calendar schedule to accommodate higher total TIPS issuance could be helpful

Bills as a \%age of Treasury Debt Outstanding


WAM


TIPS as a \%age of Treasury Debt Outstanding


## Conclusions

- Optimal Debt Structure Model highlights elevated debt service cost, primarily due to increased size of the stock of Treasury debt
- Model preferences include belly issuance, small TIPS issuance increases, and if lower term premium persists, increases in longer dated issuance, which would reduce deficit volatility at small incremental costs
- While demand for Treasury issuance remains strong across all tenors, some segments bear watching:
- Cheapness in 7 s has reduced recently, but could reemerge as auction sizes increase
- Cheapness in 20s has been persistent and supports lower relative increases in issuance
- Given its funding needs, Treasury should increase coupon issuance in a regular and predictable manner across the curve, including in TIPS, while making less than proportionate increases in 7 s and 20s.(Scenario 1)
- Decline in Term Premium, if it persists, supports additional incremental issuance in longer tenors vs shorter tenors (Scenario 2). Note, some of the factors that have lead to decline in term premium can reverse
- Treasury should continue to focus on Bills share, TIPS share, WAM and relative sector valuation when analyzing its auction choices, and will need to make trade-offs recognizing the increase in coupon issuance needed
- TIPS demand has declined somewhat more recently as shorter dated TIPS ETFs have seen outflows. Nonetheless, we think the market can absorb increases of at least 1bn per auction across TIPS tenors due to generally healthy demand. Further study to consider options like adjustment in TIPS calendar schedule to accommodate higher total TIPS issuance could be helpful
- The recent rapid increase in Bills supply has been well absorbed. MMFs have significant room to absorb additional Bills supply particularly as we approach the late stages of the hiking cycle, when MMFs may find it desirable to extend WAM toward prior averages, which can be facilitated by adding more Bills
- Market functioning analysis continues to point towards weaker liquidity environment relative to pre-COVID period with elevated volatility as the largest driver. Treasury should remain vigilant, but we do not see an issue with market functioning at present as it pertains to increases in Treasury issuance


[^0]:    —Corporate Taxes -- Non-Withheld Taxes (incl SECA) ——Withheld Taxes (incl FICA)

[^1]:    *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.

[^2]:    Refer: https://www.brookings.edu/articles/optimizing-the-maturity-structure-of-u-s-treasury-debt

    * https://home.treasury.gov/system/files/221/CombinedChargesforArchivesQ32022.pdf

[^3]:    Source: Presenting Member Data

[^4]:    Source: Riskval; Fly weights: $-1 / 2 /-1$; more negative the number cheaper the belly vs wings

[^5]:    Source: Riskval; Fly duration weights: -1/2/-1; more positive the number cheaper the belly vs wings

[^6]:    Source: Barclays Research

[^7]:    **Top 15 RRP Counterparties represent $\sim 46 \%$ of MMF AUM as of May 31st

