

## US Rates Watch

Follow the money: cash & collateral trends  
October 3 update**Money map: typical quarter-end dynamics prevail**

Quarter-end was relatively benign with the front-end moving in line with typical quarter-end dynamics. Fed balance sheet data, which is as of the Wednesday before quarter-end shows a continuation of the theme of Fed RRP declining from QT and TGA refill, while reserve balances remain resilient. SOFR experienced mid-week volatility ahead of quarter-end, which appeared driven by bilateral repo transactions. We are unsure of what drove those moves. Funding pressure from quarter-end is likely to dissipate later in the week, in line with recent quarter-end dynamics. Going forward, we expect a continuation of the reduction in Fed ON RRP, which will likely greatly outpace the decline in reserve balances.

**Cash: Fed bal sheet shows RRP back on the decline**

Fed balance sheet data for the week ending Sep 27, showed a \$17b decline in securities holdings from QT in addition to a \$3b decline in FDIC bank loans (Exhibit 1). On the liability side, the reduction in Fed assets was most acute for take-up at the Fed's RRP facilities which declined \$5b and \$44b for foreign and domestic RRP (Exhibit 3), respectively. Conversely, TGA and reserves increased on the week, with reserves partially recovering from the large drop around the September corporate tax date (Exhibit 2). Daily data for the Fed's ON RRP shows that take-up of the facility jumped \$104b on Friday, consistent with typical quarter end dynamics, but declined \$192b on Monday, the largest non year-end one day drop since quarter-end in March '22. This was likely both a continuation of the large drawdowns we have been seeing in ON RRP take-up since the debt limit resolution but also partially attributable to quarter-end falling on a weekend, which resulted in Treasury issuing \$35b in coupons on Monday.

**Cash: MMFs continue to see inflows, esp gov't inst'l MMFs**

Over the week ending Sept 27, MMF AUM declined \$7b according to ICI, but increased later in the week according to Crane Data (Exhibit 5, Exhibit 4). The increase, according to Crane data, shows MMFs have fully replaced the outflows leading into the Sept 15 corporate tax-date and are now up \$1tn on the year as of Sept month-end. Most inflows moved into gov't institutional funds, a trend that has continued since the bank stress events in March.

**Cash: Banks saw deposit outflows around corp tax-date**

Bank balance sheet data, which is lagged an additional week compared to Fed balance sheet data, shows banking system assets declined \$170b on the week ending Sep 20, in line with the drop in reserves we saw around the corporate tax date on Sept 15 (Exhibit 6). While cash holdings declined across domestic and foreign banks, deposits declined for domestic banks but increased for foreign banks on the week. Domestic banks partially offset some of the decline in deposits and net due to related foreign offices by increasing borrowings.

03 October 2023

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[See Team Page for List of Analysts](#)**Abbreviations:**

BTFP: bank term funding program  
ME: month-end  
CB: Central bank  
DW: discount window  
FHLB: Federal Home Loan Banks  
FIMA: Foreign and international monetary authorities  
Gov't: government  
GSE: Government sponsored enterprises  
Inst'l: institutional  
MMF: Money market funds  
ON RRP: Overnight reverse repo facility  
P&I: principal & interest  
TGA: Treasury General Account  
w/w: week on week  
DL: debt limit  
WTD: week to date  
DN: Discount Note  
PD: Primary Dealer  
UST: US Treasury  
FRN: Floating rate note  
FF: Fed funds  
QT: Quantitative Tightening

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Timestamp: 03 October 2023 07:00AM EDT

**Cash bottom line:** Fed balance sheet data saw RRP decline further, with part of the outflows moving into TGA and bank reserve balances. The increase in reserves is a partial reversal of the large drop in bank balances from the prior week around the corporate tax date. Bank balance sheet data shows a consistent decline in cash on the week ending Sept 20. MMF AUM increased on the week ending Sept 29 and likely parked cash their cash at RRP on quarter-end, as borrowers pulled out of the market, in line with typical quarter-end dynamics. ON RRP take-up declined significantly on Monday, in line with prior quarter-ends, but was likely exacerbated by quarter-end falling on a weekend, which resulted in Treasury coupon issuance being pushed to Monday. As we have seen lately, coupon settlement dates have aligned with lower ON RRP take-up, higher repo volumes and even upward pressure in repo rates driven by dealers needing to finance the Treasuries until they can find an end buyer.

## Collateral:

**UST issuance** increased \$345b in September, including \$137b from coupons (Exhibit 7). Treasury has recently increased bill auction sizes, including for the 42-day CMB, in line with expectations for a higher deficit in October and November. Bill auction takedown by primary dealers was lower last week relative to the prior three months (Exhibit 8) which implies more real money demand and aligns with the reversal in some of the recent cheapening we have seen in bills.

**FHLB debt** increased \$4b on the week ending Sept 29 (Exhibit 9), driven by a large increase on Sept 25 (Exhibit 17), but declined into quarter-end. Over the same time, we saw Fed funds volumes decline on the week, primarily on quarter-end, in line with typical dynamics as banks tend to reduce borrowing on reporting dates.

**CP issuance:** Data from the Federal Reserve shows that CP outstanding declined on the week ending Sep 27, with a \$10b decline in financial CP and an \$11b increase in non-financial CP (Exhibit 11). We recently updated our CP monitor here: [CP monitor: supply stable, bank funding needs high 27 September 2023](#).

**Collateral bottom line:** UST issuance continues with bill auction sizes increasing leading into the large deficit months of October and November. Banks appeared to cut back on borrowing in the days leading into quarter-end, including in CP and in fed funds, in line with typical dynamics.

## Funding:

To translate cash / collateral dynamics into funding markets we examine dealer holdings, repo volumes, & realized funding levels.

**Dealer holdings**, which are lagged, show a decline in Treasury holdings on the week ending Sep 20 (Exhibit 12, Exhibit 13). Dealer take-down of bills has also declined as a % of offering relative to the prior 3-month average for bills of the same tenor (Exhibit 8), implying an increase in real money demand. As UST auction sizes grow, dealers will likely need to take down more and more of each auction and as a result USTs are likely to cheapen and repo rates and volumes could move higher.

**Repo volumes:** SOFR volumes were volatile last week, with a large drop on the 27<sup>th</sup> followed by a significant reversal on the 28<sup>th</sup> but flat on quarter-end. This volatility was driven primarily by bilateral repo. BGCR volumes, which is a broad measure of tri-party UST repo, and is included in the SOFR calculation, shows a steady decline in tri-party volumes leading into quarter-end. The drop in SOFR volumes coincided with a 1bp increase in SOFR on the 27<sup>th</sup>, which reversed on the 28<sup>th</sup> with the reversal in volumes and was flat for quarter-end. Sponsored bilateral repo volumes generally saw the same trend last week with volatility around the 27<sup>th</sup> and 28<sup>th</sup> but are overall \$57b higher on the week (Exhibit 16).

**Funding bottom line:** dealer UST holdings declined on the week ending Sept 20. Repo volumes were volatile for bilateral repo last week which drove moves in the SOFR rate. Quarter-end was relatively uneventful with SOFR rate and volume flat vs the prior day.

**Key takeaway:** quarter-end was relatively benign with SOFR little changed on the day. Treasury and FHLB net issuance were higher on the week and Fed RRP saw a typical jump in take-up on quarter-end. We expect to see some overhang in repo rates in the days following quarter-end but we expect SOFR to return to the rate on ON RRP later this week as cash re-enters the system. There are risks of SOFR seeing more upward pressure, especially around large Treasury settlement dates due to dealers needing to finance their UST portfolios in repo. We expect the trends we've been seeing in ON RRP and reserves to continue, especially as the Treasury continues to issue a significant amount of bills (see our latest bill supply update here: [Bill supply: still heavy & bills cheaper 28 September 2023](#)). We expect greater funding pressure in coming months & quarters as collateral slowly overwhelms cash.

#### Exhibit 1: Fed balance sheet, selected assets & liabilities (\$bn, Wednesday comparison data)

RRP declined but was offset by TGA and Reserves increasing

| Assets     |            |      |                 |      |                            |          |       | Liabilities |             |        |     |          |       |       |
|------------|------------|------|-----------------|------|----------------------------|----------|-------|-------------|-------------|--------|-----|----------|-------|-------|
| Dates      | Securities | Repo | Discount Window | BTFP | FDIC bank credit extension | FX Swaps | Other | Currency    | Foreign RRP | ON RRP | TGA | Reserves | Other | Total |
| 12/28/2022 | 8,145      | 0    | 5               | 0    | 0                          | 0        | 451   | 2,307       | 334         | 2,293  | 410 | 2,980    | 277   | 8,601 |
| 9/20/2023  | 7,458      | 0    | 3               | 108  | 85                         | 0        | 421   | 2,325       | 318         | 1,487  | 662 | 3,144    | 139   | 8,075 |
| 9/27/2023  | 7,440      | 0    | 3               | 108  | 82                         | 0        | 419   | 2,324       | 312         | 1,443  | 672 | 3,169    | 133   | 8,053 |
| WoW Change | -17        | 0    | 0               | 0    | -3                         | 0        | -2    | -1          | -5          | -44    | 10  | 24       | -6    | -22   |
| YTD Change | -704       | 0    | -1              | 108  | 82                         | 0        | -32   | 17          | -22         | -850   | 262 | 189      | -144  | -548  |

Source: BofA Global Research, Federal Reserve

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#### Exhibit 2: Fed reserve balances outstanding (\$bn)

Change in reserve balance from prior week was \$24bn as of 9/27



Source: Federal Reserve

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#### Exhibit 3: ON RRP take-up (\$bn)

ON RRP take-up increased \$130bn from prior week as of 9/29, due to QE



Source: FRBNY

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#### Exhibit 4: Daily Crane MMF AUM (\$bn)

MMF AUM increased \$54b WoW as of Sep 29, with inflows primarily into gov't institutional funds

| Dates      | Total | Prime | Gov't | Tax exempt | Retail | Institutional | Prime Institutional | Gov't Institutional | Prime Retail | Gov't Retail |
|------------|-------|-------|-------|------------|--------|---------------|---------------------|---------------------|--------------|--------------|
| 12/30/2022 | 5,073 | 1,077 | 3,996 | 0          | 1,584  | 3,489         | 655                 | 2,834               | 421          | 1,163        |
| 9/22/2023  | 6,019 | 1,256 | 4,642 | 122        | 2,067  | 3,831         | 628                 | 3,203               | 628          | 1,439        |
| 9/29/2023  | 6,073 | 1,257 | 4,693 | 123        | 2,073  | 3,877         | 626                 | 3,251               | 631          | 1,442        |
| WoW change | 54    | 1     | 51    | 2          | 6      | 46            | -2                  | 48                  | 3            | 3            |
| YTD Change | 1,000 | 180   | 696   | 123        | 489    | 387           | -30                 | 417                 | 210          | 279          |

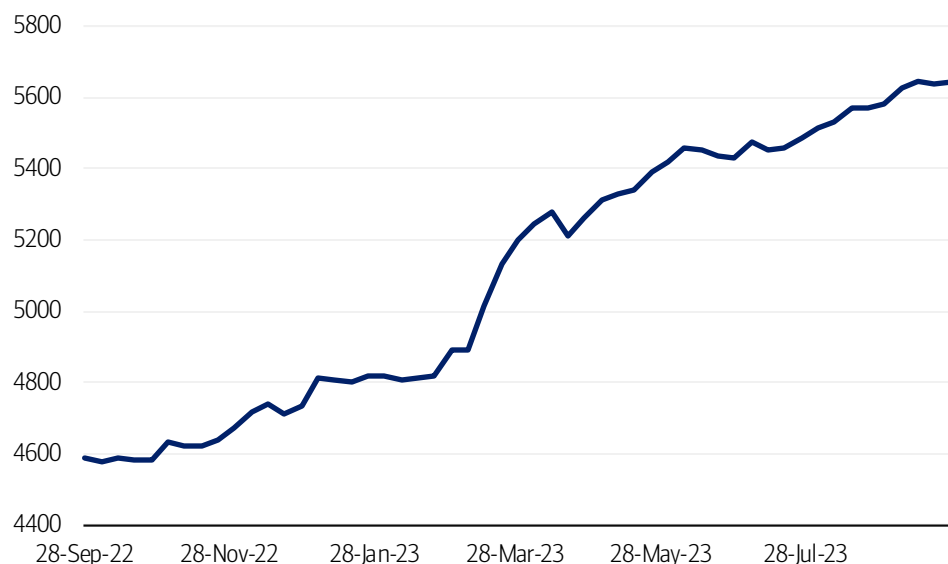
Source: Crane Data

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**Exhibit 5: MMF AUM (\$bn)**

MMFs saw \$6bn in flows from prior week



Source: ICI, Bloomberg

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**Exhibit 6: US Commercial Bank balance sheets, selected assets & liabilities (\$bn)**

Domestic banks saw cash decline significantly on the week corresponding with the Sept Corp tax date largely due to deposit outflows

|                |           | Total | Assets |           |      |           |                |       | Liabilities |            |                                    |       |
|----------------|-----------|-------|--------|-----------|------|-----------|----------------|-------|-------------|------------|------------------------------------|-------|
|                |           |       | Cash   | UST & Agy | MBS  | Repo & FF | Loans & Leases | Other | Deposits    | Borrowings | Net due to related foreign offices | Other |
| All Banks      | 9/20/2023 | 22746 | 3237   | 1519      | 2563 | 587       | 12179          | 2661  | 17238       | 2281       | 252                                | 2976  |
|                | 1w Chg    | -170  | -168   | 19        | -7   | -12       | 3              | -6    | -85         | -7         | -68                                | -10   |
|                | 1m Chg    | -35   | -20    | 16        | -17  | -4        | 38             | -47   | -11         | 19         | -34                                | -9    |
|                | YTD Chg   | -230  | 141    | -134      | -211 | -14       | 75             | -86   | -706        | 428        | -18                                | 67    |
| Domestic Banks | 9/20/2023 | 19724 | 1948   | 1406      | 2535 | 249       | 11152          | 2435  | 15949       | 1310       | -353                               | 2818  |
|                | 1w Chg    | -117  | -117   | 15        | -7   | -4        | -1             | -3    | -92         | 11         | -29                                | -7    |
|                | 1m Chg    | -8    | 0      | 11        | -21  | 4         | 32             | -35   | -19         | 32         | -21                                | -1    |
|                | YTD Chg   | -279  | 78     | -141      | -203 | -65       | 105            | -52   | -682        | 326        | -14                                | 91    |
| Large Banks    | 9/20/2023 | 13211 | 1528   | 1118      | 1936 | 213       | 6739           | 1677  | 10694       | 874        | -381                               | 2024  |
|                | 1w Chg    | -89   | -85    | 15        | -5   | -4        | -6             | -3    | -66         | 11         | -26                                | -8    |
|                | 1m Chg    | 1     | 14     | 14        | -16  | 6         | 15             | -32   | -25         | 47         | -22                                | 1     |
|                | YTD Chg   | -214  | 57     | -103      | -43  | -55       | -29            | -41   | -537        | 280        | -5                                 | 48    |
| Small Banks    | 9/20/2023 | 6513  | 420    | 288       | 599  | 36        | 4413           | 758   | 5256        | 436        | 28                                 | 793   |
|                | 1w Chg    | -28   | -32    | 1         | -2   | 0         | 5              | 0     | -26         | 0          | -3                                 | 1     |
|                | 1m Chg    | -8    | -14    | -4        | -4   | -2        | 17             | -2    | 7           | -14        | 1                                  | -2    |
|                | YTD Chg   | -65   | 21     | -39       | -160 | -9        | 133            | -11   | -145        | 46         | -9                                 | 43    |
| Foreign Banks  | 9/20/2023 | 3022  | 1289   | 113       | 28   | 338       | 1028           | 226   | 1289        | 971        | 604                                | 158   |
|                | 1w Chg    | -53   | -51    | 4         | 1    | -8        | 4              | -3    | 7           | -18        | -40                                | -3    |
|                | 1m Chg    | -27   | -21    | 5         | 3    | -8        | 6              | -12   | 8           | -14        | -13                                | -8    |
|                | YTD Chg   | 50    | 63     | 7         | -8   | 51        | -29            | -34   | -24         | 102        | -4                                 | -24   |

Source: Federal Reserve H8

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**Exhibit 7: Treasury bill and coupon issuance (\$000s)**

Treasury issuance has grown \$345b in Sept, primarily from bills

|      | Net total | Net bills | Net coupons | Gross new issue | Gross bill issue | Gross coupon issue | Gross maturing | Gross bill maturing | Gross coupon maturing |
|------|-----------|-----------|-------------|-----------------|------------------|--------------------|----------------|---------------------|-----------------------|
| MTD  | 344,618   | 207,198   | 137,420     | 1,891,000       | 1,606,000        | 285,000            | 1,546,382      | 1,398,802           | 147,580               |
| YTD  | 2,360,337 | 1,615,405 | 744,932     | 15,170,025      | 12,630,025       | 2,540,000          | 12,809,688     | 11,014,620          | 1,795,068             |
| FYTD | 2,733,587 | 1,688,554 | 1,045,033   | 19,102,025      | 15,896,025       | 3,206,000          | 16,368,438     | 14,207,471          | 2,160,967             |

Source: BofA Global Research, Haver Analytics

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**Exhibit 8: Treasury bill auctions**

Treasury bill auction data are showing PDs are taking down less of the recent auctions than the auctions of the same tenor over the last 3 months

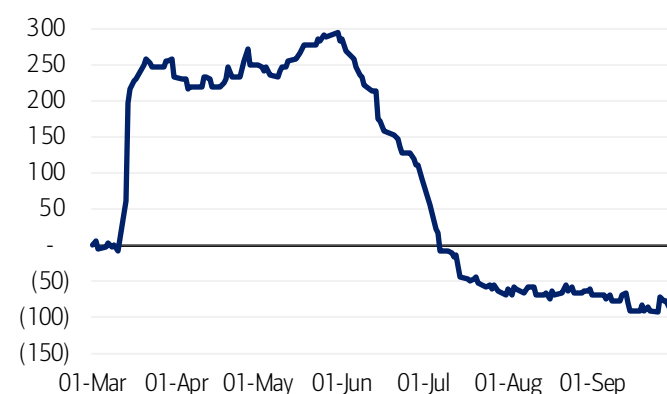
|                           | Tenor   | Auction Date | Maturity Date | Offering amount (\$mn) | High rate | Bid to Cover ratio | % Direct bidders | % Indirect bidders | % Primary Dealers |
|---------------------------|---------|--------------|---------------|------------------------|-----------|--------------------|------------------|--------------------|-------------------|
| Upcoming bill auctions    | 42-Day  | 10/3/2023    | 11/16/2023    | 65,000                 |           |                    |                  |                    |                   |
|                           | 52-Week | 10/3/2023    | 10/3/2024     | 44,000                 |           |                    |                  |                    |                   |
| This week's bill auctions | 13-Week | 10/2/2023    | 1/4/2024      | 71,000                 | 5.35%     | 2.77               | 4.79%            | 54.65%             | 40.56%            |
|                           | 26-Week | 10/2/2023    | 4/4/2024      | 64,000                 | 5.34%     | 2.88               | 2.84%            | 66.87%             | 30.29%            |
| Last week's bill auctions | 4-Week  | 9/28/2023    | 10/31/2023    | 85,000                 | 5.29%     | 2.95               | 4.07%            | 57.14%             | 38.79%            |
|                           | 8-Week  | 9/28/2023    | 11/28/2023    | 75,000                 | 5.33%     | 2.59               | 4.37%            | 58.04%             | 37.59%            |
|                           | 17-Week | 9/27/2023    | 1/30/2024     | 52,000                 | 5.35%     | 3.18               | 3.37%            | 57.88%             | 38.74%            |
|                           | 42-Day  | 9/26/2023    | 11/9/2023     | 60,000                 | 5.29%     | 2.89               | 3.96%            | 65.64%             | 30.40%            |
|                           | 13-Week | 9/25/2023    | 12/28/2023    | 69,000                 | 5.33%     | 2.77               | 5.57%            | 51.81%             | 42.62%            |
|                           | 26-Week | 9/25/2023    | 3/28/2024     | 62,000                 | 5.32%     | 2.91               | 5.14%            | 58.87%             | 35.99%            |

Source: BofA Global Research, US Treasury. Note: green highlight represents higher than the avg over the last 3 months, red highlight is lower than the avg over the last 3 months

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**Exhibit 9: Cumulative growth in FHLB debt since March 1 (\$bn)**

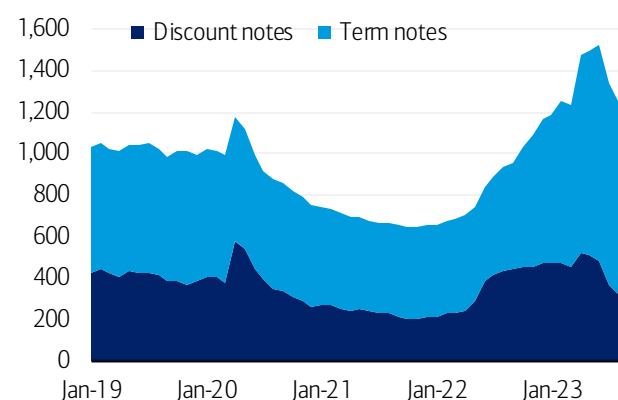
Daily FHLB cumulative debt is roughly \$86bn lower since March 1



Source: Bloomberg, FHLB Office of Finance. Note: we use estimates of daily net issuance  
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**Exhibit 10: FHLB debt issuance (\$bn)**

FHLB debt issuance has declined since the bank stress events

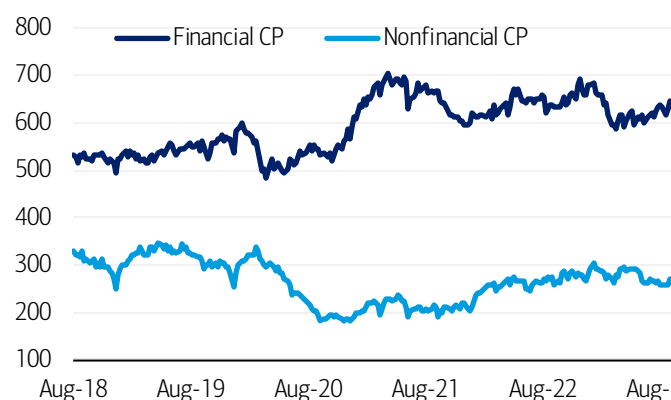


Source: BofA Global Research, FHLB Office of Finance

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**Exhibit 11: Commercial paper (\$bn)**

Financial CP is \$10b lower WoW, nonfin is \$11b lower WoW as of Sept 27



Source: Bloomberg

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**Exhibit 12: Primary dealer holdings (\$mn)**

PD holdings of UST has declined roughly \$3b over the week ending Sept 20, with declines across US Treasury types

|           | Total   | US Treasuries |        |         |        |        | Agency ex MBS | MBS    | Corporates | Commercial Paper | State & Munis | ABS   | Variable Rate Notes |
|-----------|---------|---------------|--------|---------|--------|--------|---------------|--------|------------|------------------|---------------|-------|---------------------|
|           |         |               | Bills  | Coupons | FRNs   | TIPS   |               |        |            |                  |               |       |                     |
| 9/20/2023 | 363,230 | 211,159       | 64,142 | 129,304 | 4,424  | 13,352 | 16,995        | 89,820 | 19,359     | 9,209            | 13,735        | 8,635 | 3,527               |
| 1w Chg    | 8,106   | -3,319        | -754   | -1,960  | -1,026 | 484    | 858           | 10,202 | -1,468     | 37               | 1,183         | -268  | 918                 |
| 1m Chg    | 25,349  | 17,149        | 5,044  | 16,888  | -3,865 | -855   | 376           | 2,444  | 6,182      | 1,957            | -580          | -72   | -150                |
| YTD Chg   | 104,673 | 61,350        | 35,512 | 31,451  | -2,478 | -3,072 | 3,744         | 17,533 | 13,924     | 5,669            | 2,525         | 2,815 | 2,782               |

Source: BofA Global Research, Bloomberg

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**Exhibit 13: US Treasuries as a % of overall PD holdings**

USTs as a % of PD holdings has declined slightly vs the prior week of data



Source: BofA Global Research, Bloomberg

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**Exhibit 14: PD UST holdings by security type (\$mn)**

PD holdings of bills and coupons are still higher MTD but declining

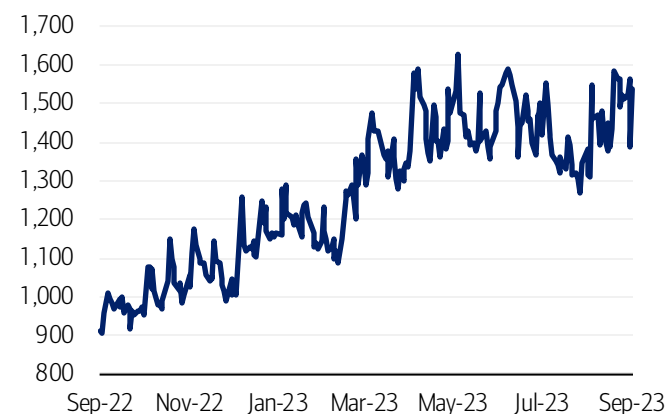
|               | Bills  | Coupons | FRNs    | TIPS   | Total   |
|---------------|--------|---------|---------|--------|---------|
| 8/30/2023     | 55,607 | 126,704 | 5,971   | 13,690 | 201,972 |
| 9/20/2023     | 64,142 | 129,241 | 4,424   | 13,352 | 211,159 |
| MTD Change    | 8,535  | 2,537   | (1,547) | (338)  | 9,187   |
| Level Z-score | 1.33   | 0.56    | (0.57)  | 0.75   | 0.90    |

BofA Global Research, Bloomberg. Note: Level Z-score is as of Aug 2; change Z-score is based on the 1w change

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**Exhibit 15: SOFR volumes (\$bn)**

SOFR volumes are flat on the week but volatile intraweek from bilateral

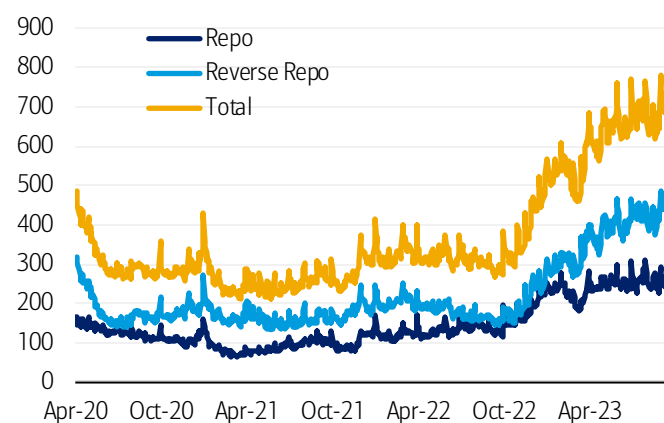


Source: FRBNY

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**Exhibit 16: Sponsored Repo Volumes (\$bn)**

Sponsored repo volumes have risen \$57b WoW as of 9/29



Source: OFR

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# Appendix

## Exhibit 17: Daily FHLB debt issuance estimates (\$mn)

We estimate daily issuance from Bloomberg and FHLB Office of Finance website. Data is subject to revisions

|           | O/N    | Term DN | Auction | Maturing DN | FRNs  | Callable | Bullets | Maturing | Called  | Total    |
|-----------|--------|---------|---------|-------------|-------|----------|---------|----------|---------|----------|
| 9/1/2023  | 16,950 | 5,880   | -       | (30,902)    | 600   | 53       | 31      | (2,736)  | (27)    | (10,152) |
| 9/5/2023  | 18,776 | 3,306   | 1,220   | (18,680)    | 850   | 118      | 52      | (4,366)  | -       | 1,276    |
| 9/6/2023  | 20,155 | 1,847   | -       | (26,429)    | 6,325 | 25       | 10      | (9,335)  | -       | (7,402)  |
| 9/7/2023  | 19,779 | 2,854   | 4,230   | (22,391)    | 2,500 | 15       | 114     | (155)    | -       | 6,946    |
| 9/8/2023  | 19,932 | 1,882   | -       | (25,153)    | 2,653 | 40       | 50      | (9,103)  | (15)    | (9,714)  |
| 9/11/2023 | 18,093 | 3,014   | -       | (22,777)    | 2,675 | 122      | 155     | (1,072)  | -       | 210      |
| 9/12/2023 | 16,750 | 8,294   | 1,995   | (20,439)    | 1,350 | 1,065    | 100     | (15)     | -       | 9,100    |
| 9/13/2023 | 27,475 | 2,459   | -       | (26,167)    | -     | 222      | 380     | (2,245)  | (100)   | 2,024    |
| 9/14/2023 | 15,830 | 3,469   | 4,600   | (18,780)    | -     | 65       | 74      | (19,135) | (63)    | (13,940) |
| 9/15/2023 | 17,630 | 14,275  | -       | (40,434)    | -     | 30       | 170     | (761)    | (1,240) | (10,330) |
| 9/18/2023 | 17,046 | 5,399   | -       | (22,643)    | 2,885 | 483      | 252     | (2,281)  | -       | 1,142    |
| 9/19/2023 | 20,850 | 6,776   | 7,105   | (26,873)    | 2,885 | 330      | 177     | (3,255)  | -       | 7,995    |
| 9/20/2023 | 17,199 | 7,020   | -       | (26,700)    | 1,050 | 110      | 100     | (7,716)  | (325)   | (9,262)  |
| 9/21/2023 | 18,482 | 2,861   | 7,200   | (20,563)    | -     | 22       | 858     | (2,662)  | -       | 6,198    |
| 9/22/2023 | 16,149 | 2,945   | -       | (30,291)    | 1,862 | 4,035    | 845     | (1,275)  | (25)    | (5,756)  |
| 9/25/2023 | 20,262 | 4,046   | -       | (21,886)    | 2,150 | 105      | 157     | (6,110)  | -       | (1,275)  |
| 9/26/2023 | 27,998 | 7,195   | 6,680   | (23,637)    | 4,200 | 2,356    | 62      | (3,374)  | (520)   | 20,960   |
| 9/27/2023 | 16,400 | 4,887   | -       | (28,079)    | 2,650 | 510      | 372     | (1,215)  | (132)   | (4,608)  |
| 9/28/2023 | 9,300  | 2,918   | 2,630   | (18,097)    | 2,750 | 444      | -       | (1,461)  | (237)   | (1,752)  |
| 9/29/2023 | 15,973 | 2,276   | -       | (30,501)    | 3,750 | 815      | 835     | (2,079)  | (30)    | (8,962)  |

Source: Bloomberg, FHLB Office of Finance. Note: We use estimates of daily FHLB debt issuance

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